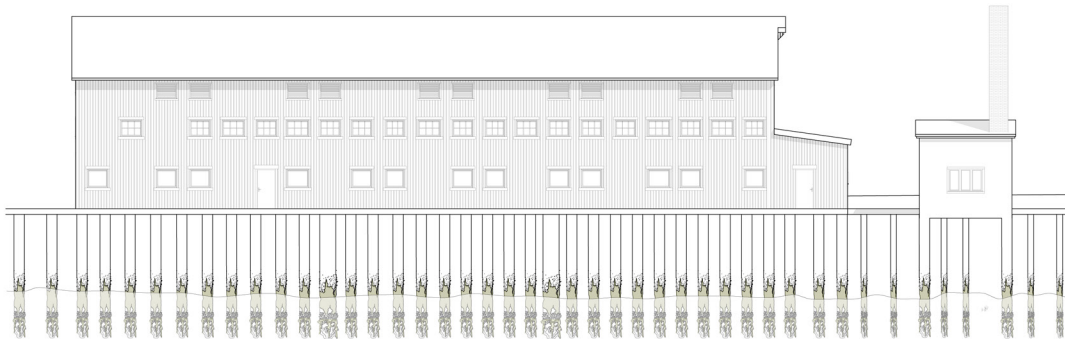


# FANGST

ET FOREDLINGSANLEGG FOR FISK OG TANG

Project: Seafood processing facility



Diploma Spring 2023

Marie Mork Nielsen

BINDER 2

Marie Mork Nielsen

Oslo School of Architecture and Design

Diploma Spring 2023

Supervisor Tine Hegli

Note,

Unless stated otherwise all illustrations and images are by author.



PØBEL, In cod we trust  
Photo: By author

## CONTENTS

Abstract	8
Thesis	12
Method	14
Programme	15
Semester schedule	16
The history of Vardø	18
Past & present	22
Sami & Kven	26
Pomor trade	28
The witchcraft trials	30
Second world war	32
Geopolitics	34
Fishing village	36
Komafest	38
Vardø harbor today	40
Timeline	42
The history of fishery in Barents sea	44
Biodiversity	48
Fiskarbonden	50
Egning	52
Family buisness	54
The origins	58
Small vessels	62
Trawlers	64
Quota politics	66
Kystoprøret	70
Interview local fishermen	74

<b>Seaweed cultivation in Varangerfjorden</b>	76
Seaweed and kelp	78
Seaweed map	80
Seaweed nutritions	81
Mapping seaweed in Vardø	82
Traditional use of seaweed	84
Kindergarden for species	86
Mapping biodiversity in Vardø	88
<b>Ocean Cultivation</b>	90
Fishery & seaweed	93
Traditional fishing VS fish farming	94
Natural harvest VS seaweed cultivation	98
Processing of raw materials in Vardø	100
Vardø Fiskemottak	102
Kiberg Fiskekjøkken	104
Programme research: Production line	106
<b>FANGST</b>	120
<b>Process material</b>	206

# ABSTRACT

## The fishing industry

With the case of Vardø, my diploma project investigates the current problems with the fishing industry in coastal communities in Northern Norway and suggests how to strengthen local settlement. Over the past couple of years, I have worked a lot with Vardø, a small island off the coast in Øst-Finnmark and developed a deep interest in the fishing industry. I was first introduced to Vardø through elective course Urban Preservation in spring 2021, later through studio course Climate Form fall 2022. I have subsequently worked with several fishermen and main actors in Vardø, as well as Vardø municipality.

As a consequence of overfishing in Norwegian waters from the 80s, the Norwegian government decided to regulate and reclaim most of the fishing quotas around year 2000<sup>1</sup>. As the rights to fish shifted hands from local fishermen to bigger investors, operative and flourishing fishing villages in the north were left depopulated, depressed and dilapidated. Most fishing villages along the Norwegian coast remain today as symbols of the past industry, while the actual industry takes place far off the coast, on the boats we cannot see.

Traditionally, fishing was synonymous with physically tough and dangerous work. Only men went to sea, while wives, children, youth and elderly contributed to the household and the industry on land. They were responsible for large parts of the fish production related to gutting, baiting, tying nets, drying fish heads, salting, drying fish etc. <sup>2</sup>. As the processing of fish was more or less removed from the fishing villages, so was the land-based workplaces and diversity within the industry. Major loss of workplaces led to depopulation, and the coastal villages have as a consequence been diminished mainly to drop off points of fish. With the aim of managing the settlement and strengthening the population growth in the north, I want to investigate how one can contribute to bring back local workplaces through architectural proposals and program. With Vardø harbor as a point of departure, the project investigates how a vacant harbor building can be transformed and reused to house future industry. To re-establish a connection to the mainland and secure future work and settlement.

1 Nofima: 2022

2 Balsvik: 2001, s 125-133



Photo: By author

## Ocean cultivation

Being first and foremost a fishing village makes Vardø extremely vulnerable to political, economic and ecological changes. Traditionally the coastal people in the north subsisted through a combination of fishing and farming, in Norwegian called *fiskarbonden*. In the harsh and rocky northern areas there was little nutrient-rich soil to cultivate, and fishing was a dangerous profession depending on ecological seasons. The combination of two sources of nutrition and income provided families with what they needed to secure the settlement. Diving into the past and learning from our history, my exploration for the future comes from an inspiration of these historical traditions. The project further investigates how the industry of small-scale fishing can be expanded and strengthened through symbiosis with a new, up and coming industry; seaweed farming. Hereby referred to as Ocean Cultivation.

Seaweed is one of the most unexploited natural resources on the planet, and the conditions in Finnmark, with its pure arctic water and midnight sun, are particularly good for high quality farming. As it is among the fastest growing plants in the world, packed with nutrients, there is a growing interest for cultivating seaweed in Norway today<sup>1</sup>. Research even indicates that the growth of seaweed is important for fish spawning and can strengthen the overall fish population<sup>2</sup>. Seaweed have traditionally been used in Varanger as animal feed and emergency supply, but somewhere along the way we have forgotten to include this macro-algae in our own diet. Through exploring a symbiosis between small-scale fishing and seaweed cultivation, the project aims to expand the seafood industry in a more diverse direction, that can bring back local workplaces for processing and open up for greater participation across gender and age.

---

1 Øverland: 2021  
2 Barents Seaweed

## Transformation and reuse

Due to decrease of population over the last decade, Vardø harbor is today characterized by a large proportion of abandoned buildings and massive decay. The backdrop of my diploma comes with the local urgency to reinhabit the harbor and preserve the use of harbor buildings for the fish industry. The project will look into transforming one of the abandoned buildings on the west side of the harbor into an operative facility for seafood processing. With the aim to reduce the carbon footprint of the entire industry, my architectural suggestion will focus on climate mitigation and adaptation through reusing existing structures and materials. My interest is how the merge between the traditional architecture and the new industrial demands can inform architectural space. I believe that the incorporation of seaweed farming as a part of the fishing industry is a method that can be turned into an important source of income for coastal communities. The end result is a first step towards yielding a sustainable change in the current fish politics, preserving the traditional small-scale fishing through a symbiosis with seaweed farming, all whilst transforming a vacant building that once was optimized for fishing.

# THESIS

When the Norwegian government around year 2000 bought the fishermen out of the fishery to regulate declining fish stocks, coastal villages in the North were left unemployed and robbed from their livelihood.

With the case of Vardø, the diploma investigates a strategy to reinhabit and strengthen the coastal settlement through symbiosis between small-scale fishing and seaweed cultivation. With an urgent need to put the buildings in Vardø harbor back into operation, the project investigates how a vacant harbor building can be transformed and reused to house future industry to bring back local workplaces. How does the merge between the traditional coastal architecture and the new industrial demands inform architectural space?



Kystopprøret, Naturressursene tilhører alle  
Photo: By author

## METHOD

With this project I want be as hands on and investigative on site as possible. I have therefore planned to stay one month in Vardø to be close to the industry, the site and the context.

Through the following three steps, the project will look into transforming a vacant building that once were optimized for fishing to an operative ocean cultivation facility.

Step 1: Investigating the existing context and structure

Step one is to survey what is the current condition of the building and what urgent needs are missing. What does it take to maintain the building mass to be put back into operation and what possibilities does the construction offer for transformation?

Step 2: Understanding the programme

What does the new programme require? How is the production line and how does the differens functions follow this?

Step 3: Adding and adapting to the programme

What is the required programme and how can it be spatially designed for effectiveness and greater participation across gender and age? How much can be built from local and reused materials?

## PROGRAMME

### FISH INDUSTRY

PREPARATION	PROCESSING	PRODUCTION
Baiting	Mooring space	Shop for sale of products
Bait preparation	Crane for lifting catch to land	Smokehouse
Freezers for "stamper"	Reception of catch	Racks for drying fish
Storage for gear	Space for gutting and filleting fish	Salting facility
Workshop		Freezers
Break room with kitchen and bathroom		
Laundry		
Office space		

### SEAWEED CULTIVATION

PREPARATION	PROCESSING	PRODUCTION
Office space	A lifting and rinsing space	Shop for sale of products
Storage for gear	Space to cut and sort the seaweed	Packing space
Workshop	Freezer storage	Production kitchen with a cold storage
Wardrobe with a shower and drying cabinet	Dripping spave	Freezers
Break room with kitchen and bathroom	Dry storage	
Laundry		
Lab with growing room		



# SEMESTER SCHEDULE

January	February	March	April	May
Research programme - Fishing industry - Seaweed cultivation	Analytical Study building/structure Develop architectural concept	Analytical/Project Stay one month in Vardø Take measurements, talk to fishermen etc.	Project Develop drawings, talk to engineer	Project/Presentation

## AIM OF DELIVERABLES

- Site plan scale x : xxxxx
- General arrangement drawings
  - Plan 1:100
  - Section 1:100
  - Facade 1:100
- Tectonic principals (axo/model)
- Details 1:10/1:20
- Structure diagrams (iso perspective)
- Illustrations
- Model
- Cultivation process diagram (fish and seaweed)
- Concept diagram
- Project diagram
- Workbook

Chapter 1:

# THE HISTORY OF VARDØ

PAST & PRESENT



**“The countryside is an amalgamation of tendencies that are outside our overview and outside our awareness. Our current obsession with only the city is highly irresponsible because you cannot understand the city without understanding the countryside.”**

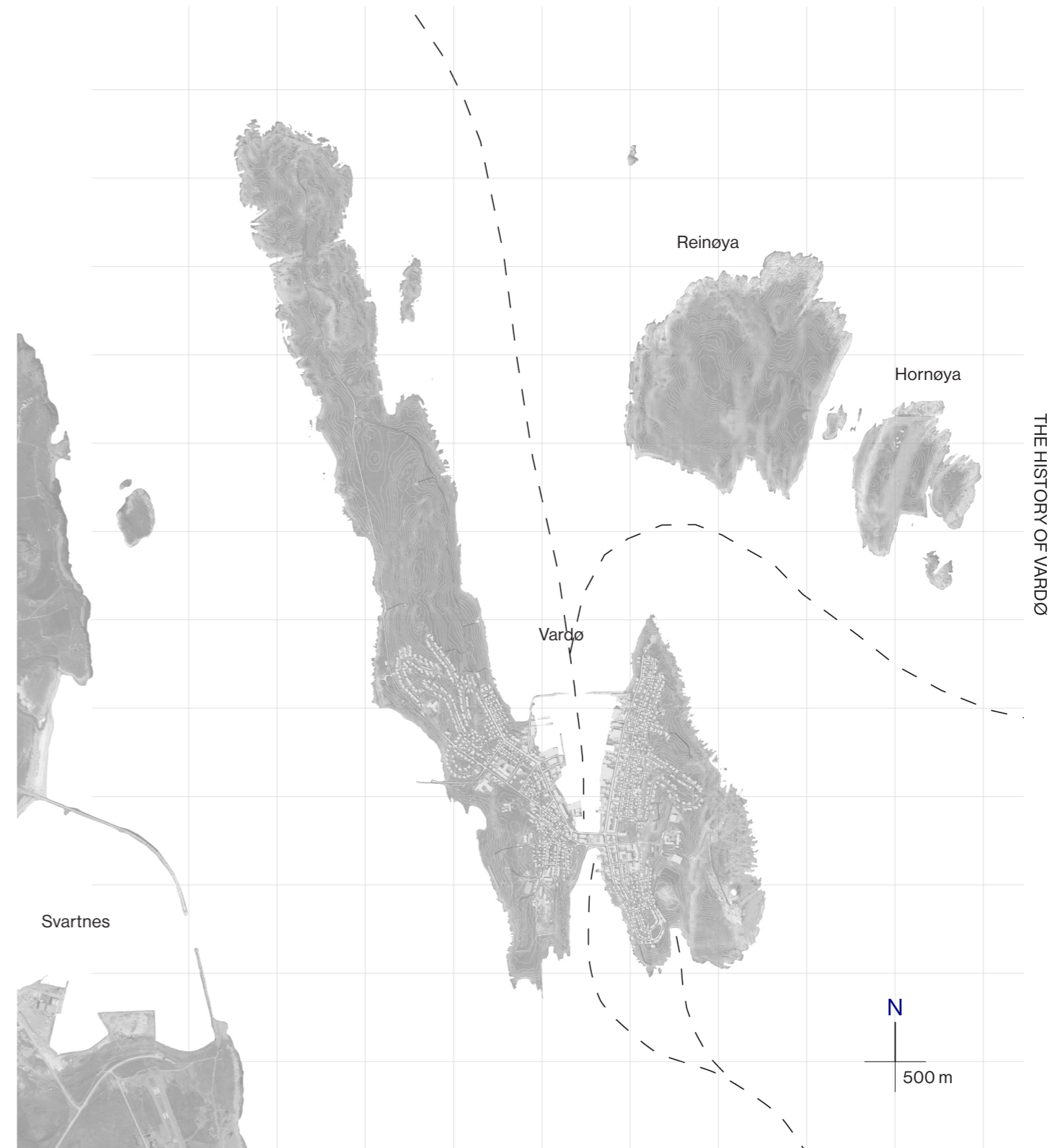
**Rem Kolhaas**  
Icon Magazine, 2014



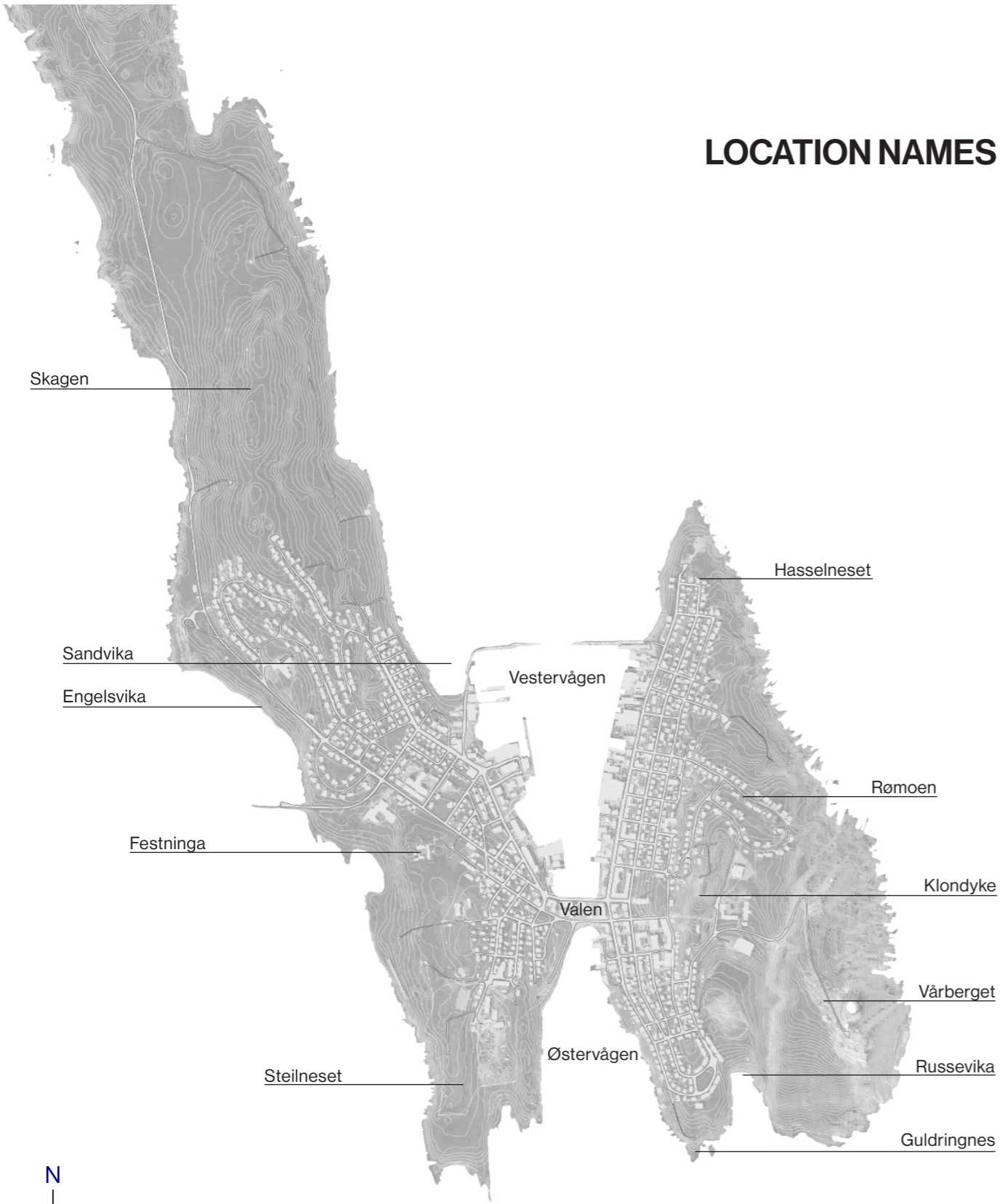
## THE HISTORY OF VARDØ - PAST & PRESENT

70° north, 31° east the lunge-shaped island Vardø is located. Situated on an island by the Varanger peninsula, off the mainland surrounded by the flourishing Barents Sea. Vardø is the easternmost settlement in Norway and one of oldest cities in Finnmark. It has a deep history of vernacular coastal settlements, Pomor trade and fishing traditions. It is a city, an island and a village. Vardø is located within the post arctic climate zone, and is quite unique with its long, cold winters and short, cool summers. A harsh environment with wind from all directions, characterized by a rocky landscape without trees. From the very first settlement people have lived from the sea. Norwegians started to settle in Vardø during the 14th century, and around this time the city's first church and fortress was built<sup>1</sup>. During the 16th century the demand for stockfish increased rapidly, leading to more people moving to Vardø<sup>2</sup>. Up until the 60s Vardø's history has been characterized by wealth and great trading culture. Today Vardø is portrayed as a ghost town. The harbor is mostly lacking in operation, and the society has suffered from recession and depression since the 90s

1 Varanger Museum IKS and Vardø Restored AS, Kulturminneplan, 2016: p. 6  
2 Varanger Museum IKS and Vardø Restored AS, Kulturminneplan, 2016: p. 7



### LOCATION NAMES



### HISTORIC LOCATIONS



Map: Previous student work\_UP

## SAMI & KVEN

Archaeological discoveries in Vardø and the surrounding area indicate that the area has had settlements for more than 2,500 years. As Varanger is located within *Sápmi*, many of the archeological discoveries in Varanger can be linked to Sami settlements. The oldest discovery that is assumed to be Sami was found on Kjelmøya in Sør-Varanger. Varanger is particularly known for Sea Sami settlements that have traditionally subsisted from fishing, hunting and agriculture. They were also known as excellent boat builders<sup>1</sup>.

Settlements in Vardø have always been diverse and characterized by migration. Between the 18th and the 19th century, a group of Finnish speaking people called Kvens, migrated to Northern Troms and Finnmark from Finland, Northern Sweden and Russia. This led to a major population growth in Vardø, from 407 inhabitants in 1855 to 3,023 inhabitants in 1910 and made Vardø the highest populated city in Finnmark. The large immigration of Kvens started after the Great Nordic War (1700–1720) which drained big parts of the population in northern Sweden and Finland. Strong population growth, along with a series of bad years with failed crops can be reasons why people were forced to emigrate. They came to Finnmark and Troms in search for work, and many ended up with jobs such as copper miners in Kåfjord or fishers in Varanger<sup>2</sup>.

<sup>1</sup> Nilsen: 2003

<sup>2</sup> Varanger Museum IKS



Photo: Ellisif Rannveig Wessel, Grenselandsmuseet



Photo: Ellisif Rannveig Wessel, Grenselandsmuseet

## POMOR TRADE

The geographical proximity between Varanger and Russia to the east has historically meant a close relationship between the neighboring countries. Between the 1700s and 1917 a close trading network called Pomor trade arose between the Pomors and Finnmark. This tradition of trade has had a great importance to Vardø.

The Pomors came from the area around Kvitesjøen and lived primarily from fishing. Fish from Norway was traded with Russian timber, grains and other products that were not possible to obtain in the north. Part of the reason for the barter trade to be of great value to both sides was the orthodox fasting period called Lent. During these holidays the Pomors were only allowed to eat fish or vegetarian food. Even if they had a lot of fish themselves, it was not enough for the whole area during Lent. The people in Vardø had plenty of fish, and where the Pomors lacked fish, they had plenty of wood which was needed on the Norwegian side.

This era is an important part of Vardø's history not only because of the trade, but also the exchange of culture and international impulses that have been a part of shaping Vardø into the city it is today<sup>1</sup>.



Vestervågen harbor, 1897. Photo: Ellisif Rannvei Wessel, Grenselandsmuseet



Source: Varanger Museum IKS, Illustration: By author

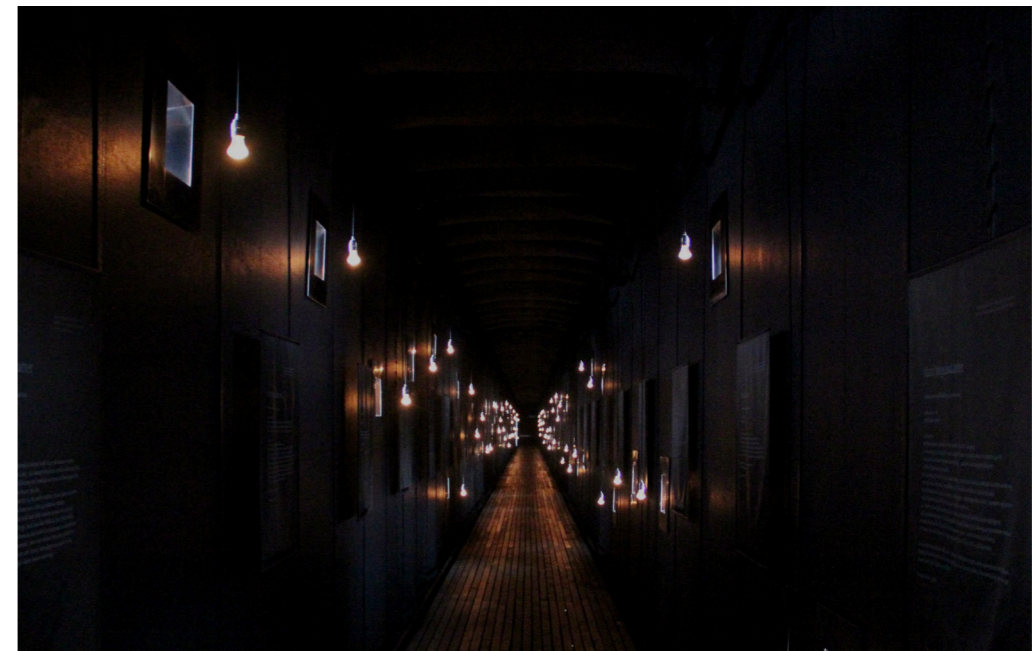
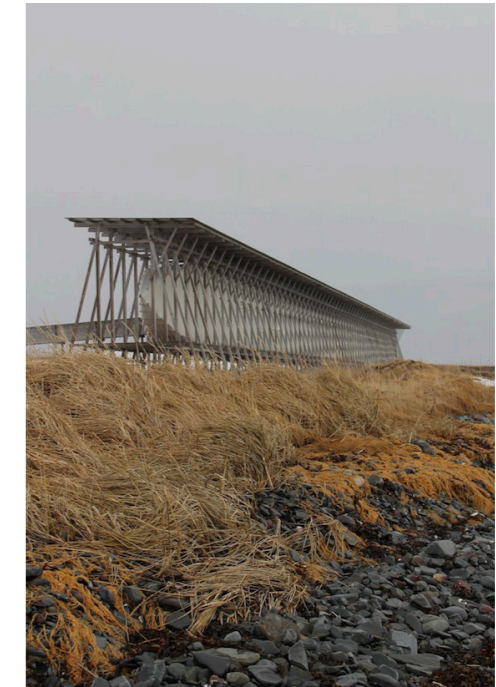
## THE WITCHCRAFT TRIALS

In the medieval period Vardø was established as the administrative headquarters in Finnmark. The history of witchcraft trials in Finnmark – where 135 persons were prosecuted – took place between 1600 and 1692. As the administrative center in the north, it was natural that most of the witchcraft cases in Finnmark were conducted here. The victims were mainly local Norwegians and Samis. Out of the persons tried, as many as 91 persons – 77 women and 14 men – were executed.

The accused were placed at Vardøhus fortress, in what was called “the witch hole”, awaiting their fate. Most of the women here were accused of making a pact with the devil, which was the worst crime that could be committed at that time. Some were prosecuted in individual cases, others in so-called chain processes. At most, as many as 20 people were burned at the stake based on the same case. The so-called “floating test” consisted of throwing the accused person into the sea with hands and feet tied. Floating was an indication of guilt, while sinking was a sign of innocence. The victims were often tortured or drowned before even being sentenced to death in fire at the stake.

In memory of the victims of the witchcraft trials in Finnmark, two memorials was opened in 2011 at Steilneset, as part of the National Tourist Routes. One installation consists of the Flame House, with the burning chair surrounded by seven mirrors by Louise Bourgeois. The second, Hall of Remembrance by the Swiss architect Peter Zumthor, consists of a more than 100-meter-long memorial hall, with a small window and a light dedicated to each victim<sup>1</sup>.

<sup>1</sup> Balsvik: 2007, s 33-36





## SECOND WORLD WAR

During second world war Vardø was under German occupation. When Vardø was invaded the 9th of April 1940, the commander at Vardøhus fortress refused to disturb the weekend peace. They had only 250 poorly equipped soldiers, so the entire population contributed with forces. After two months of battles Norway capitulated.

In June 1941, German forces entered the Soviet Union, traveling from Finnmark. This led to a heavy bombing of the German occupied areas in Varanger, such as Vardø, Vadsø and Kirkenes. In 1943, Vardø was bombed 47 times by British and Russian planes. The Russian bombing in Finnmark increased in the summer of 1944, and the 23rd of August Vardø was almost totally destroyed. 32 people died during this attack.

Despite going through periods characterized by bombing and destruction, some parts of the old city managed to get through the war without severe damages. As the rest of Finnmark was burned down and destroyed, a third of the houses in Vardø were left standing after the war, as the Germans were in too much of a hurry when they escaped East Finnmark. This makes Vardø an unique and important place for cultural heritage. The city center was the district that experienced the greatest destruction and was rebuilt in the post-war years<sup>1</sup>.

Nevertheless, Vardø is the city in Finnmark with the highest amounts of pre-war buildings, with about 250 buildings still standing.<sup>6</sup>

<sup>1</sup> Varanger Museum IKS and Vardø Restored AS, Kulturminneplan, 2016: p. 9



Vardø i flammer, 1944. Photo: Herbert Isaksen/Varanger Museum IKS

## GEOPOLITICS

As Varanger is located in the border area between Norway, Russia and Finland, it is a turning point both climatically, geologically, culturally and politically. Although people in the area have interacted and traded across borders throughout all times, the governments have a more tense relationship. As Norway's easternmost city, Vardø becomes extremely important in a geopolitical context in monitoring towards east.

The first thing you see when you arrive in Vardø, whether you arrive by sea, plane or car, is the white, enormous domes that tower over Vårberget. The Pentagon-funded radar system monitors the Barents Sea and neighboring Russia. These are some of the US and NATO's most important ears and eyes towards military activity on the heavily armed Kola Peninsula. The white radar dome has been a natural part of the cityscape in Vardø for many decades. In the last decade, new radar buildings have been erected next to the old one, which has been operational since the beginning of the 1980s!



## FISHING VILLAGE

One of the consequences of Vardø being first and foremost a fishing village, means that it is continuously adapting to the political and economic paradigms all over the world. This has throughout history heavily affected the population of Vardø.

In 1886, fish products accounted for more than half of total exports of goods from Norway, and stockfish from Vardø accounted for the largest part of it<sup>1</sup>. Every winter the harbor was filled with hundreds of boats and 4–5,000 fishermen to take part in the winter fishing. During the 1980s, Vardø's fish industry suffered from a big seal invasion. The overall fish stock was threatened, and the government had to introduce quota regulations that led to extensive downsizing of public enterprises. Along with regulated quotas the community in Vardø have suffered especially from the consequences of the herring crisis in the 80s. This led to a situation in 1989 where local fishermen started to sell their boats and quotas to the bigger investors as they could no longer afford it. As the quotas were sold the rights to fish changed hands. The promise was to retain the production and workplaces within the community, but the promise was not kept, and the village of traditional small-scale fishing was traded for the bigger and highly technological fleets and trawlers<sup>2</sup>.

Today the once thriving fishing harbor in Vardø, is reduced to a symbol of the industry that used to be, and a constant reminder of the decline of Vardø. While the actual industry takes place far off the coast, on the boats we cannot see.

1 UP\_Larsen: 2021

2 UP\_Stamnes & Nielsen: 2021



The fishing fleet in Vardø harbour 1935. Photo: Varanger Museum IKS



Fish racks at Rømoen. Photo: Unknown, cut out from local newspaper

## KOMAFEST

Walking around in what may seem as a vacant city, Vardø represent impressively many layers of culture and history. Although it may appear as a little dot on the map, it is surprisingly important in a bigger context.

After many years of decay and absence of maintenance, the buildings had gone into a phase of coma. In collaboration with the artist Pøbel, local enthusiasts decided in 2012 to host a street art festival in Vardø, called Komafest. The main goal was to push the abandoned buildings out of their coma and add new value to them. Several famous international graffiti artists contributed to turn the buildings into art pieces. The result was a boost in visitors, and today one third of Vardøs visitors come mainly to see the street art and architecture<sup>1</sup>.

One of the street arts “Laks er viktig for Norge”, made by Pøbel himself, is tagged on one of the decommissioned fishing buildings in the harbor. With the motive of “the Godfather” holding a salmon, it is a political sting towards the Norwegian government’s investment in the aquaculture industry. Fish farming is today considered the biggest threat to the Norwegian fish population<sup>2</sup>.

<sup>1</sup>  
<sup>2</sup>



E.B. Itso, Denmark  
Photo: Ian Cox



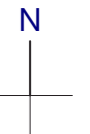
PØBEL, Laks er viktig for Norge  
Photo: By author

## VARDØ HARBOR TODAY

Due to decrease of population over the last decade, Vardø harbor is today characterized by a large proportion of abandoned buildings and massive decay. From the 90s up until today the society has gone through a deep depression. Major parts of the harbor are still today non-operational and lacking critical infrastructure to become a self-sufficient port. To secure and strengthen future settlements, there is a local urgency to reinhabit the harbor and preserve the use of harbor buildings for the fish industry. Even though there is a long way to go, the city have slowly over the last four years started to wake up again from it's deep coma thanks to local politicians and enthusiasts. The long tradition of Vardø as a fishery is deeply rooted in the local culture and manifested in vernacular architecture such as the traditional fish racks, piers and small scale production facilities. There is a great desire from the locals to preserve these buildings through use. Improvements must also be made to ensure a safe marina, and the municipality is waiting for the go to build a new outer breakwater.



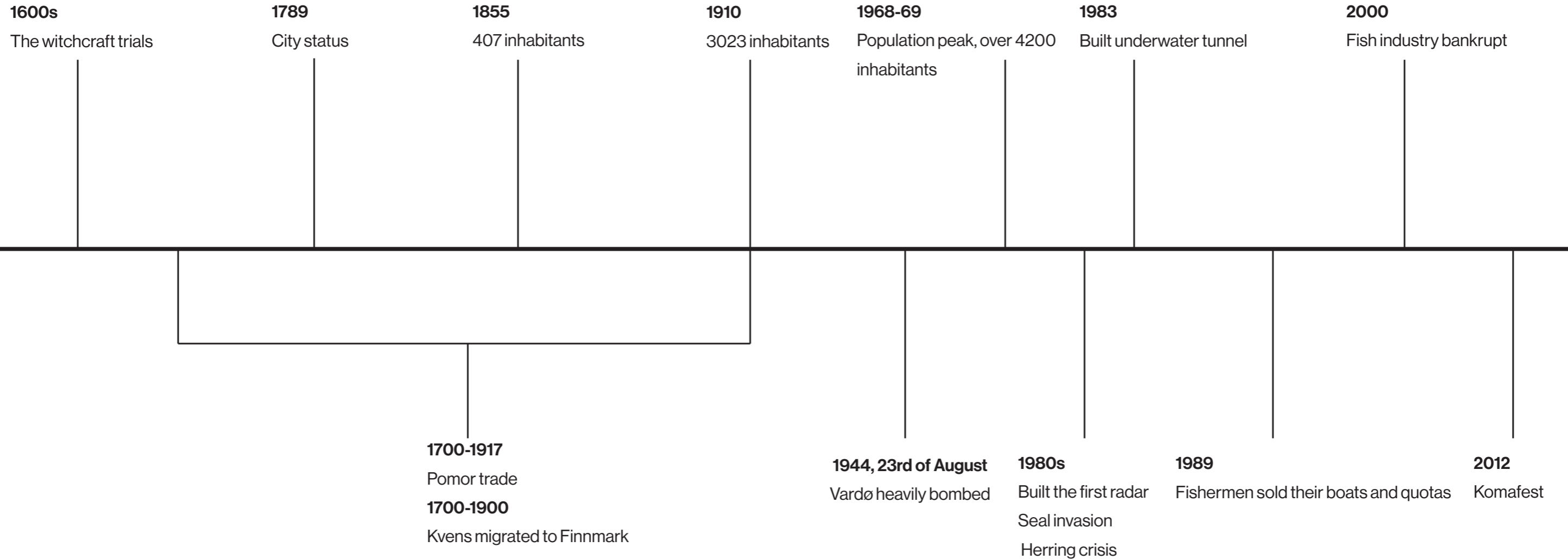
- Harbor buildings operative for fish industry
- Historical fish buildings not operative/other programme
- Demolished/burned down



Map: Gustav Cederblad Stamnes & Marie Mork Nielsen\_UP 2021, updated by author

# TIMELINE

CHAPTER 1



THE HISTORY OF VARDØ

Chapter 2:

# THE HISTORY OF FISHERIES IN BARENTS SEA

PAST & PRESENT



Han sa  
Det ekke lenger lønnsomt  
med fiske i nord  
Jo! Hvis du vil skap  
og hvis du har tro  
på at lønnsomhet e mer  
enn bare effektivitet  
og jævli høy provisjon.  
For effektivisering ekke verdt no  
hvis fisken effektivt serveres bort  
bli bortevekk  
på frysehotell  
Langt bort fra fiskehjell  
dem som landa fisken  
og dem skal foredle den  
For edlere dela  
fra norlige landsdela  
må deles på flere  
fileteres i lokalfjæra!  
Sånn kan vi hindre  
at kysten forelda  
smuldra opp og bi historia  
til Vårres foreldra

Ingvild Austgulen / slampoe



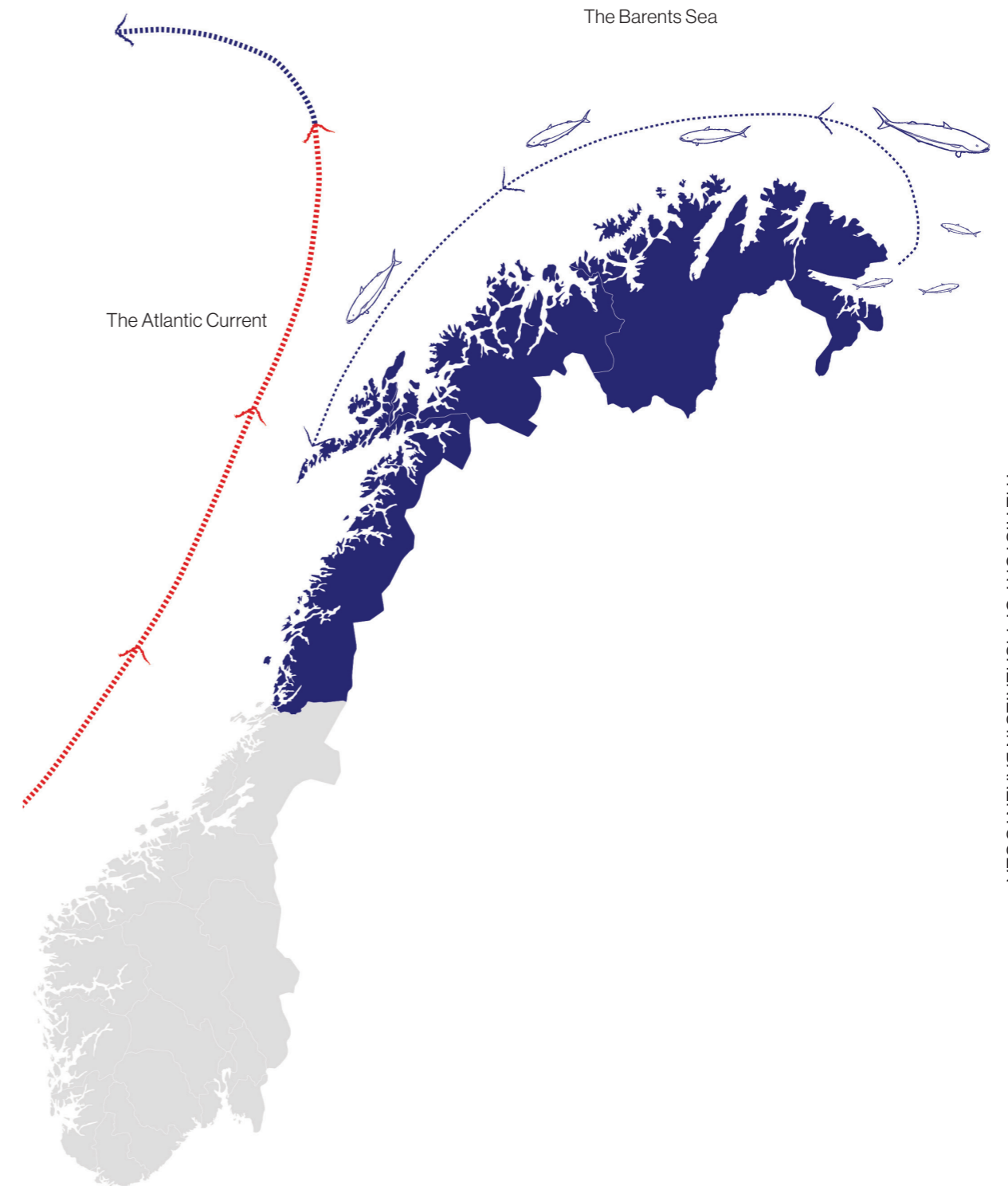
Paragrafkroken. Foto: Bertine Tønseth, Komafest



## BIODIVERSITY

Vardø's close access to one of the best fishing areas in the world is given by a number of factors. Nutritional production in the sea takes place in the deep-water layer close to the seabed. In order for plankton to grow – which is the fish's main source of nutrition – water must rise to the surface to receive light. This happens when the warm Atlantic current from the south meets cold water in the Barents Sea. The warm water cools, sinks to the seabed and pushes the nutrient-rich bottom water up to the surface. This creates rich grazing areas for fish.

The Norwegian cod population grow up in these arctic waters. When the cod is mature, it gathers from all sides of the Barents Sea and heads south in shoals along the coast to spawn. Most of the cod, at this stage called Skrei, spawn in Lofoten. The cod then returns to the Barents Sea to eat and grow. The Varangerfjord is also an incredibly important spawning area for several types of fish, including Capelin. Capelin is a small salmon fish that the cod hunt for!<sup>1</sup>



Source: Vardø - Grensepost og Fiskevær  
Illustration: By author

<sup>1</sup> Balsvik: 2007, s 42-43

## FISKARBONDEN

Traditionally the coastal people in the north subsisted through a combination of fishing and farming, in Norwegian called *fiskarbonden*.

Fiskarbonden comprised two persons; a fisherman and his farmer wife. The two together formed the core in a type of household that included over ninety percent of coastal people until far into the 20th century. A couple of hundred years ago, almost the entire coastal population in the north were fishermen and farmers.

In a European context, Norway is a pile of rocks, and in the north of the country there are few places with enough land to cultivate. Fishing, in contrast, was a stable source of income, but also a dangerous profession depending on ecological seasons. The combination of two sources of nutrition and income provided families with what they needed to secure their settlement. For large parts of the year, the men were away - they fished in Lofoten or in Finnmarka. The wife ruled the farm and took care of livestock, children, housework and home fishing with *juksa*.

The *fiskarbonden* household was responsible for both harvesting, processing and consumption in the traditional coastal society, and was also an exporter of fish products. This adaptation thus created values that provided income for several levels of society, from the household and the parish to the citizenry and the administration<sup>1</sup>.



Illustrations: Leidulf Olsrud

## EGNING

*Egning* means to thread bait on the fishing hooks that are used on lines for line fishing. Traditionally this has been women's work that has taken place on land, often in a *egnebu*.

*Egnebu* is a small shed to store, prepare and repair fishing gear. Each fishing boat have their own *bu*. It is normally heated, connected to a freezing storage with facilities for cutting and preparing bait and has a small kitchen bench with water. It is also a social place where you meet and hang out with other fishers over a coffee. Egnebus are often placed in a row along the harbor, or connected on the ground floor of a larger building.

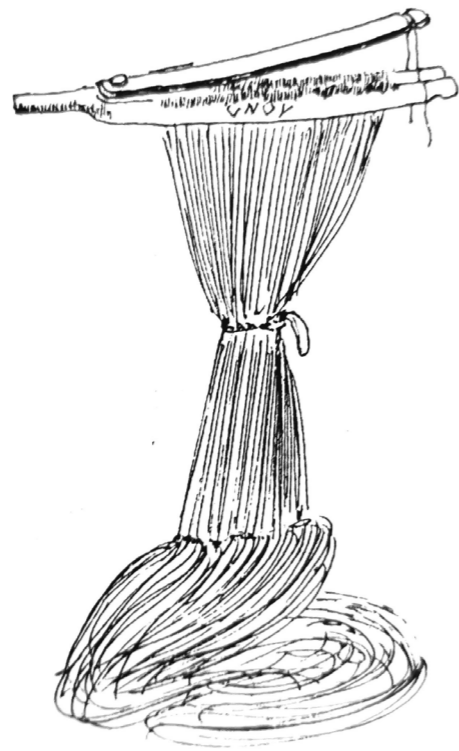


Illustration: Leidulf Olsrud



Illustrating *egning* used in longline fishing, 1955. Digitalarkivet



Egning i Kiberg. Photo: Wessel, Ellisif Rannveig / Grenselandsmuseet.

## FAMILY BUSINESS

Traditionally, fishing was synonymous with physically tough and dangerous work. Only men went to sea, while wives, children, youth and elderly contributed to the household and the industry on land. They were responsible for large parts of the fish production related to gutting, baiting, tying nets, drying fish heads, salting, drying fish etc.<sup>1</sup> As the processing of fish was more or less removed from the fishing villages, so was the land-based workplaces and diversity in the industry.

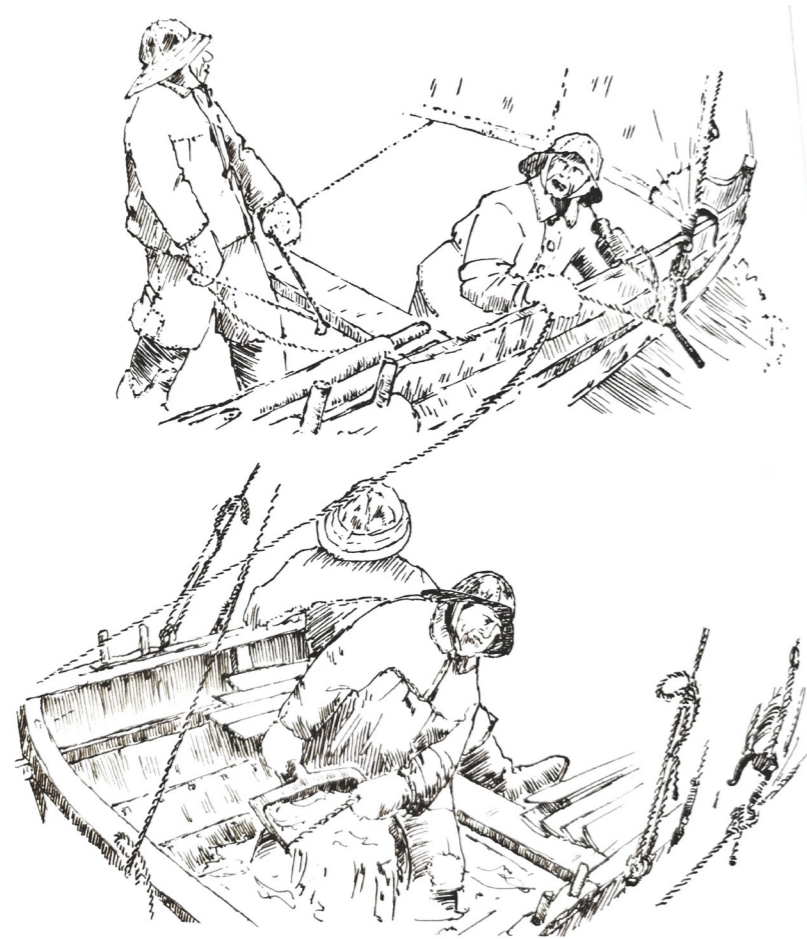


Illustration: Leidulf Olsrud



Photo: Paulaharju, Samuli / Varanger Museum IKS



Photo: Simonsen, Erling / Museene for kystkultur og gjenreisning i Finnmark IKS



Flat racks, Vardø. Photo: Bredrup, Jakob Lauritz Smith / Finnmark Fylkesbibliotek



Flat racks, Vardø. Photo: Unknown, local photographer

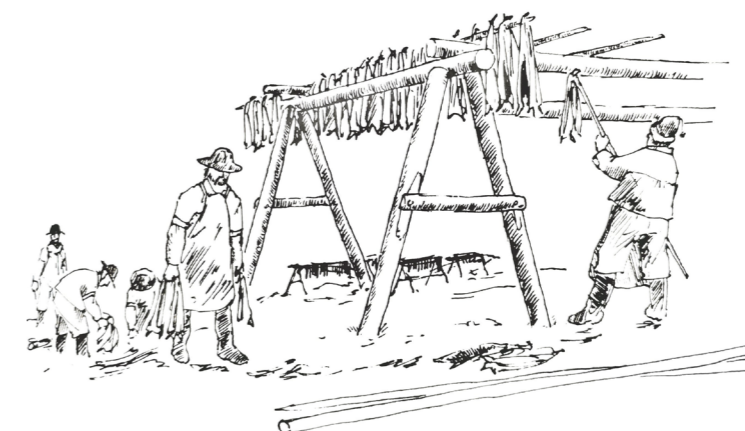


Illustration: Leidulf Olsrud

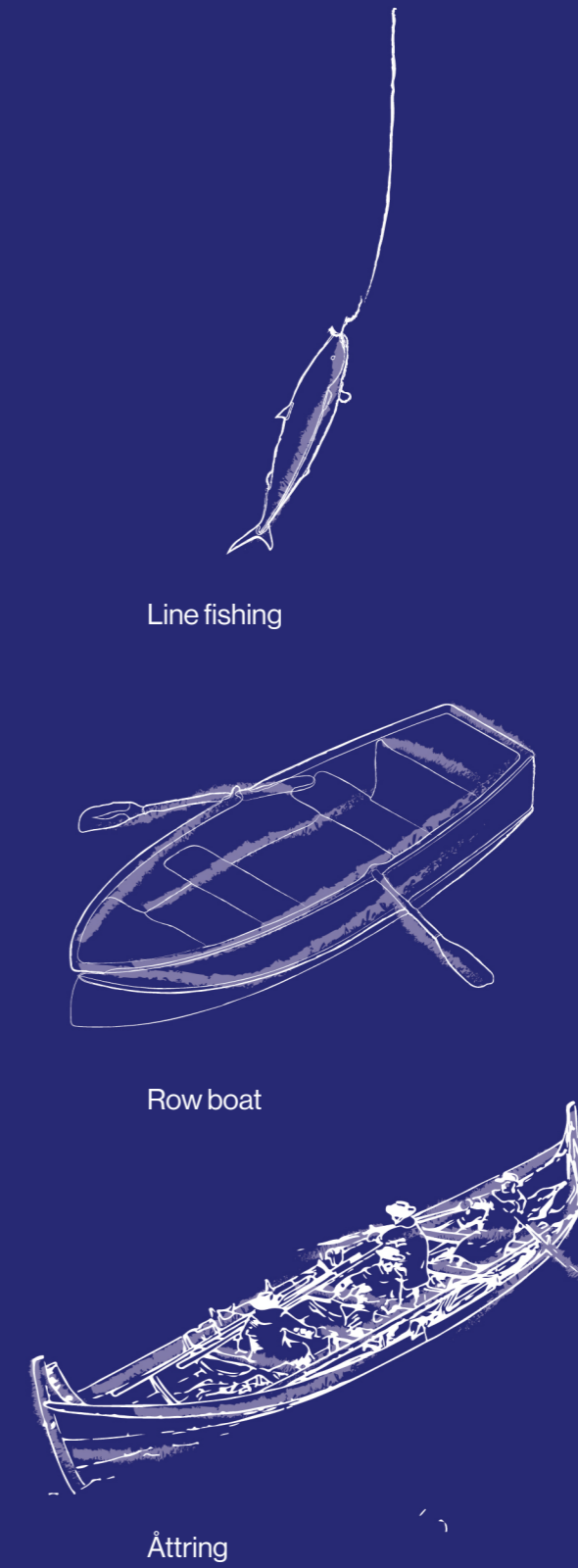


## THE ORIGINS

From the earliest times, fishing gear ment a simple line with fishhook on the end, used both with and without bait. The boats were primitive wooden rowing boats with a removable mast for a single sail. The boats were open without any kind of deck and the waves could easily flood the boat at rough sea <sup>1</sup>. The currents together with the wind made life as a fisherman the most dangerous profession in the last century. In the decade from 1865 to 1875 25 % of the male residents in Vardø died on the sea. From 1890 to the second world war, it applied to 15 %. Because of safety reasons it was common in Vardø to fish close to shore <sup>2</sup>.

Being a fisherman required good health, physique and great knowledge. As the fish moved silently in the water, it placed big requirements on equipment such as boats, clothing and tools. The knowledge was not written down but transmitted orally and passed on from father to son. Before modern technology, only the signs of nature could be used as an indicator to forecast the weather or fish conditions. The fishermen used the sky to navigate, watching the movement of clouds, the sound of the open sea, tides, the currents and the movement of birds as guiding points. It was vitally important to be able to interpret nature's signs correctly.

1 Balsvik: 2007, s 23  
2 Balsvik: 2001, s 124

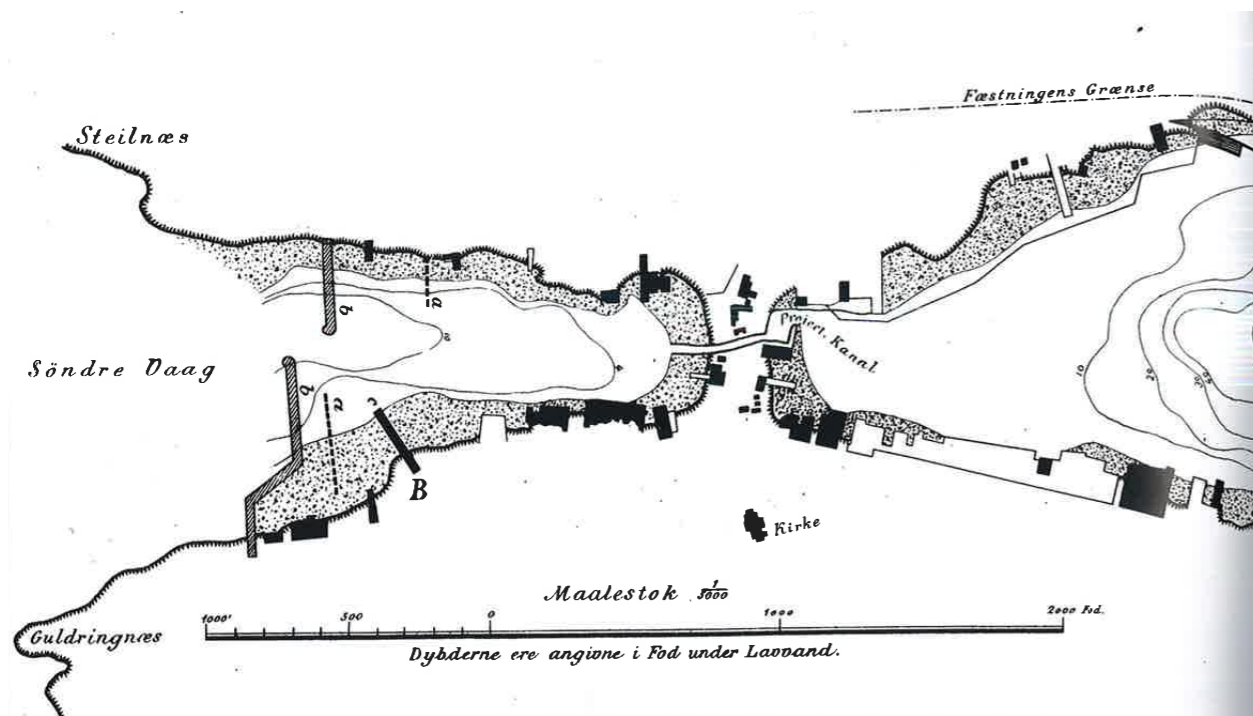


Line fishing

Row boat

Åtring

Before the breakwater, it was common for the fishermen to push their boats onto land after coming back from the sea. When there was a storm, the boats sought shelter in the northern or southern harbor<sup>1</sup>. Based on findings, there is much evidence that there has been a channel between the two harbors for easy movement of boats in case of a storm<sup>2</sup>.



Old map of potential channel at Valen. Varanger Museum IKS.

1 Balsvik: 2007, s 69-78  
2 Balsvik: 2007, s 205



Fishing inn Vadsø. Picture: Wessel, Ellisif Rannveig. Grenselandsmuseet.



Fishing inn Vadsø. Picture: Wessel, Ellisif Rannveig. Varanger Museum IKS.

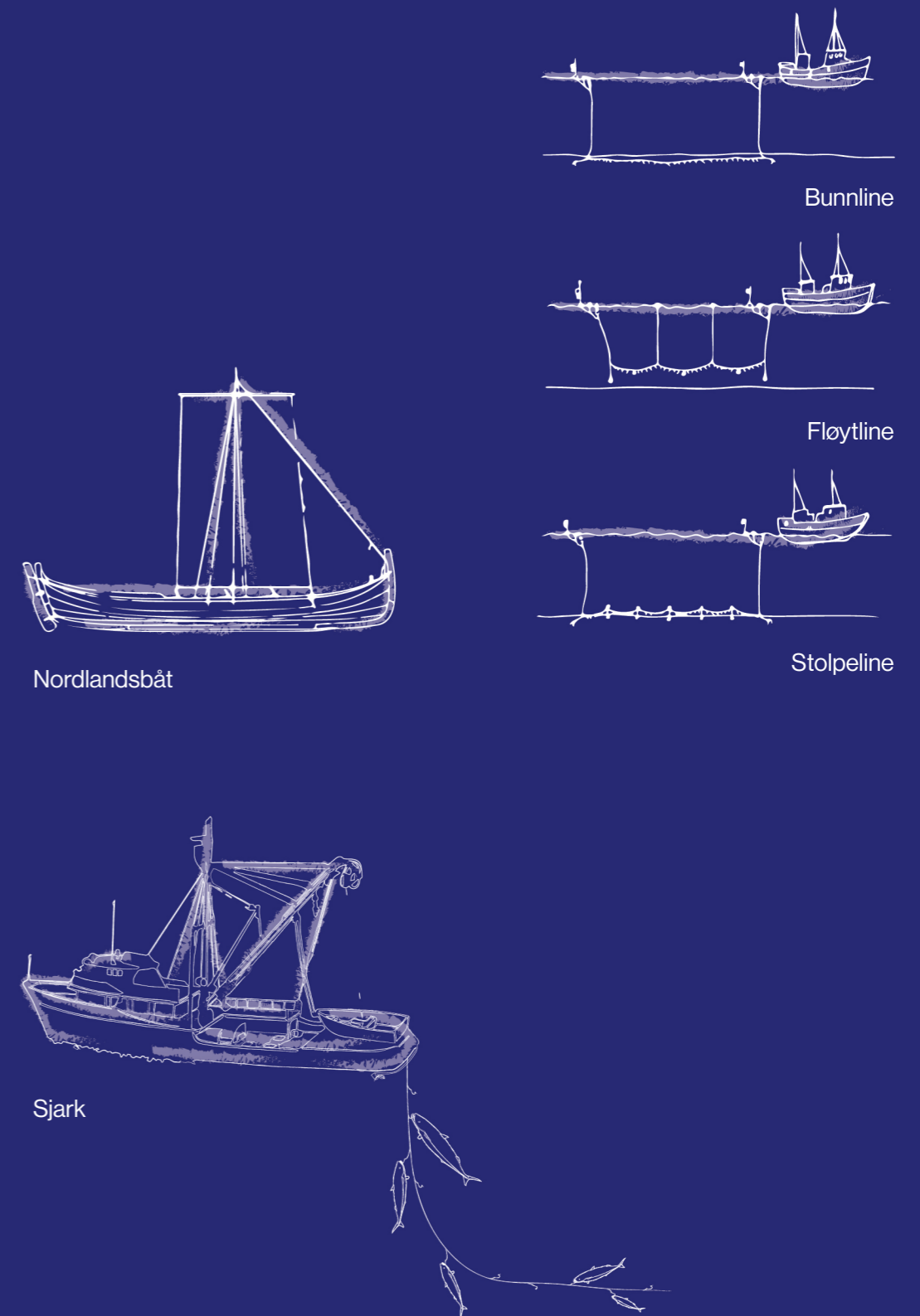
## SMALL VESSELS

The primitive boats gave too many constraints, as the fishermen could not seek the fish where it was located. From the 1860s we started to see development. Due to the large influx of boats every spring, boat building in especially Vardø was affected by new inflowing technology. In 1885 around 50 deck vessels had arrived in Vardø.

The development of boats provided better conditions for fishing with line, and line fishing increased the demand for bait and baiting. The main line could be between 10–100 meters connected to shorter, thinner lines with fishhooks and bait. In the middle of the 19th century, the fishermen got bigger boats, and line fishing became more and more common. It meant more expensive effort, but a bigger catch.

In the early 20th century, the boats gradually became motorized and more technological. In 1914 there were around 2,500 motorized vessels in the Norwegian fishing fleet. From here motorization proceeded very quickly, and in 1920 the number had risen to 6,000 vessels. In recent times, most fishing boats are equipped with advanced underwater maps and sonar<sup>1</sup>.

<sup>1</sup> Balsvik: 2007, s 70-78



Source: Svein Harald Holmen  
Illustration: By author



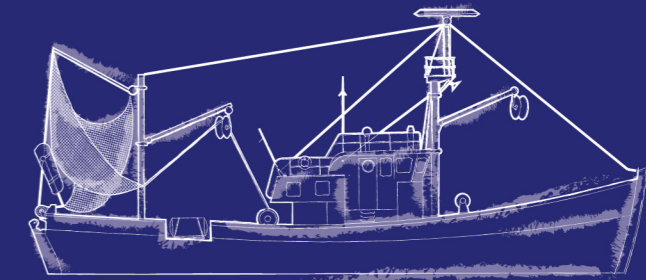
## TRAWLERS

Trawl fishing is often seen as a symbol of modern fishery, but as early as the 14th century, trawl fishing was carried out in shallow coastal waters around Europe. A trawl is a vessel with fishing nets shaped like a long funnel which is towed along the sea bottom.

With the First World War, from 1914 to 1918, conditions for fishing in the North Sea were made impossible. The trawlers in the North Sea were aware of the large quantities of fish in the Barents Sea, which led to a large trawler traffic to the coast of Finnmark<sup>1</sup>.

Trawling in northern Norway, especially Troms and Vesterålen, exploded in 1934 and developed rapidly with foreign trawlers in an area where Norwegian fishermen had previously been dominant. During the 1950s, trawling developed to become an important part of the fishery in Finnmark, and subsequently much of the catch quantity was taken away by the small trawlers. The cod fishing in Finnmark was one of the major seasons in Norway and took place from January to June each year. The introduction of new technology such as sonar, power block and ring seine had made the fishing fleet very efficient. The intense trawling led to over taxation of the fish stocks, especially cod and haddock. Provisions were made regarding mesh size in the trawl and quantity restrictions were implemented in accordance with international agreements<sup>2</sup>.

1 Svane: 2022  
2 Strand: 2014, s 58



Trawl



Trawl



Illustration: By author

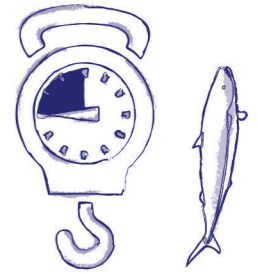
## QUOTA POLITICS

Free fishery: The introduction of new technology such as sonar, power block and ring seine had made the fishing fleet very efficient, and the limits of what the fish stocks could withstand were reached. This led to the collapse of the herring stock in 1970 and huge variations in the overall fish stock in the 1980s<sup>1</sup>. Up until 1980 fishing was basically free of quotas. At this point the Norwegian government had to introduce fishing quotas to regulate the fishery. This gave the authorities much greater opportunities to intervene and regulate fishing when fish stocks were threatened with extinction. One strategy was not to allow new fishing vessels into the fishery, another was to set total quotas; a limit on how much of each species that could be caught each year.

Vessel quotas: To avoid overfishing during certain periods of the year, fishing had to be distributed over the whole year and participation limited. A system of vessel quotas was therefore introduced. When the size of the vessel determined the quota, it became attractive to acquire a larger boat. To avoid too many and too large vessels, each vessel was allocated a fixed share of the total quota. This provided predictability for the fishermen and simplified the distribution job for the authorities.

<sup>1</sup> Balsvik: 2007

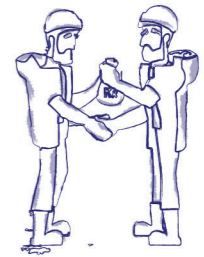
**1970s:** Herring crisis



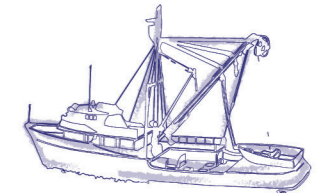
**1980:** Fishing quotas introduced



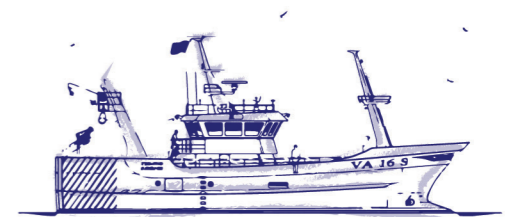
**1990:** Vessel quotas introduced



**2003:** The structural quota scheme



**TODAY:** Open and closed group



Source: Nofima  
Illustration: By author



Local fishermen spend most of their time in the harbor maintaining their boats and equipment. Many have fished their quota already by April. Photo: Quentin Roche

Closed group: Although the vessel quotas solved several problems, fishing was still unprofitable because the quotas were distributed among too many vessels. To reduce overcapacity, the authorities started paying fishermen to condemn their fishing vessels. Essentially this was left to the fishermen to solve themselves, through the so-called “structural quota scheme”. If one vessel was taken out of the system, the quota could be transferred to another vessel that already had a quota. With fewer people to distribute the quotas, the remaining vessels received larger quotas, and the economy improved<sup>1</sup>. After years of strong restrictions on fishing, most Norwegian fish stocks were rebuilt, and quotas increased. Only the lucky ones with extra money could secure a quota in this group. These quotas are still today limited and are often referred to as closed group.

Open group: The open group has considerably less quota than the closed group but opened up to recruitment of new fishers with vessels up to 11 meters. Most of the remaining fishermen in coastal villages cling to this quota in order to survive. Everything caught is delivered to Norges Råfisklag and distributed<sup>2</sup>.

1 Nofima: 2022  
2 Holmen: 2021

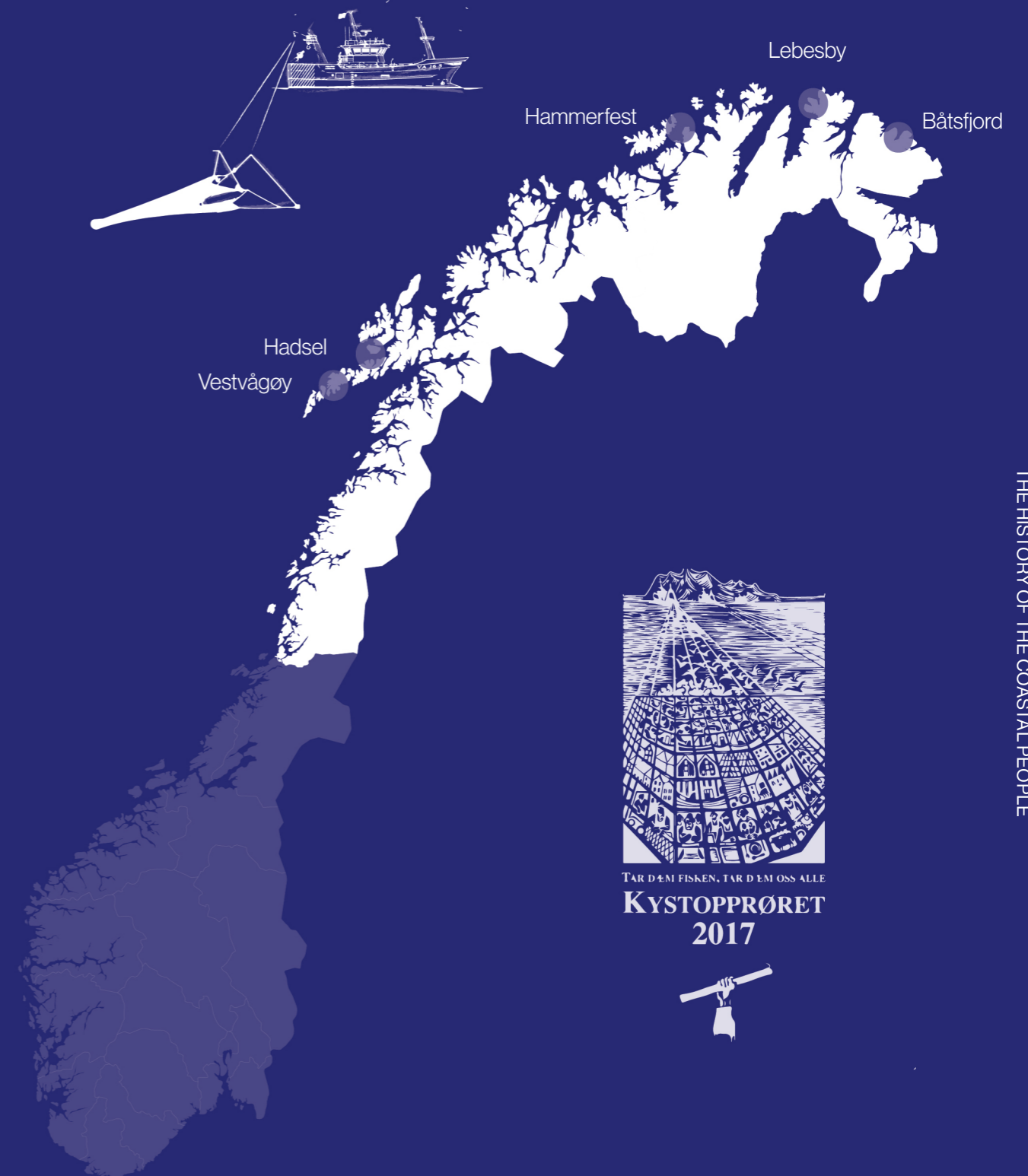
## KYSTOPPRØRET

“There was a time when Vardø Town was full of life. Ships arrived in the harbour, big and small to take part in the fishing. [...] Around the turn of the millennium it came to a stop. The fisheries went into crisis, corporations went bankrupt. The trawlers delivered their harvest elsewhere. A large percentage of the public workplaces shut down and people moved away. People lost their income, shops had to close down, society fell apart. Vardøs population was halved in the period 1980–2010. [...]

You can still find some places along the coast that reminds of what Vardø used to be like, operative village based fisheries. Here the trawlers still land their obligated percentage of fish. Our government has suggested that the trawlers should be released from their duty to deliver fish to these places. Will these villages face the same destiny of decline?

It is deeply unfair that the fish caught off our coast does not create work ashore. Even in China they work more with our fish than we do. [...] It went as bad as it could with Vardø, and we don't want this to happen to the rest of our beautiful coast. It is not OK to rob the coastal societies up north of their living. The coastal people are angry! It is a coast in rebellion, now our Parliament has to listen to what the people along the coastline are saying. The natural resources belong to the people and the fish should be used to create more work and activity along the coast.“

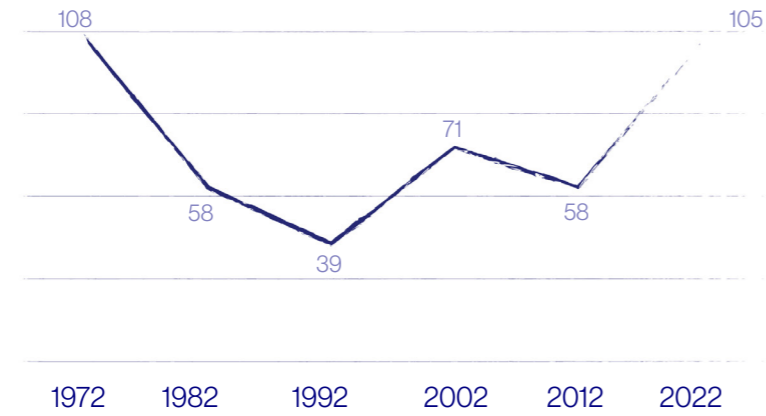
Kystopprøret, 2017



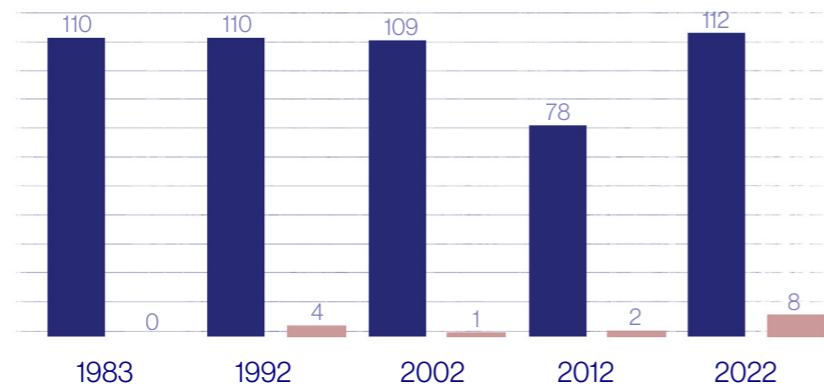
Current delivery points for trawlers

Source: Daouli, 2018, s 24-28

Illustration: By author



Development in number of vessels - Vardø



Gender distribution in the fish industry - Vardø

- Male fishers
- Female fishers

Source: Fiskedirektoratet



Drawing by: Brasø, Evy. Published in Finnmarken

”MORE THAN 500 PEOPLE HAD MOVED FROM VARDØ - IT WAS THOSE PEOPLE DANCING TO VENGABOYS ON FRIDAY NIGHTS THAT HAD LEFT.”



Svein Harald, Local fisher



Stig Tore, Local fisher

## Reintroducing small-scale fishing and Vengaboys

MARIE MORK NIELSEN & GUSTAV CEDERBLAD STAMNES  
URBAN PRESERVATION\_2021

**“Stig Tore: In the mid-90s, Vardø was the place to be.**

Svein Harald: We are the same age, Stig Tore and I, and we used to go to discos when we were ...18

**Stig Tore: 16, hahaha!**

Svein Harald: The only reason we managed to sneak in was that it was packed with people. We were at the disco every Friday with around 300 dancing people. In addition to that it was also open at Naustet and at the North Pole - probably 600 people were out dancing every weekend. That was Vardø in the 90s, when we grew up. Around year 2000 it was over for the imperial period of the fishing industry. The city changed radically - I was gone from 98 to 2003, and the city was not recognizable when I returned. More than 500 people had moved from Vardø - it was those people dancing to Vengaboys on Friday nights that had left.

**Stig Tore: No one to dance with anymore. Haha! “1**

Chapter 4:

# SEAWEED CULTIVATION IN VARANGERFJORDEN

Picture: Morten Munthe / Lofoten Seaweed



## SEAWEED AND KELP

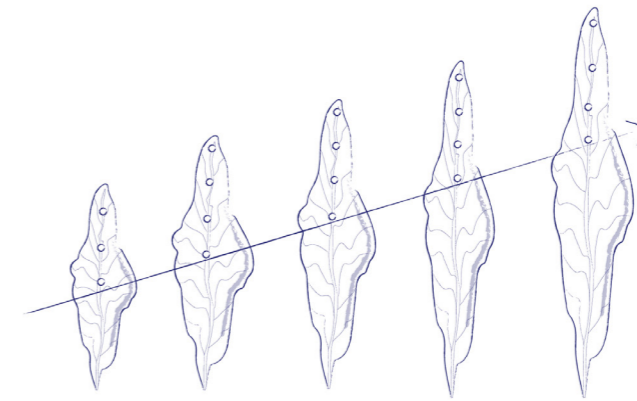
Seaweed is a type of macroalgae - a term that is used to describe a diverse group of larger organisms that come in many shapes and sizes. The largest species of marine algae can grow up to 60 m long, forming enormous kelp forests in the ocean. Different species of seaweed grow in different depths, but many species thrive particularly well in the tidal zone.

Seaweed is among the fastest growing plants in the world and one of the biggest unexploited natural resources we have. As it only needs seawater and sunlight to grow, seaweed has several advantages over land-based plants. Seaweed is also considered a *super-plant* as the most nutrient-rich plant in the world. It grows rapidly under the cold conditions in Norway and we see a growing interest in cultivating seaweed. Seaweed also binds large amounts of carbon from the water<sup>1</sup>.

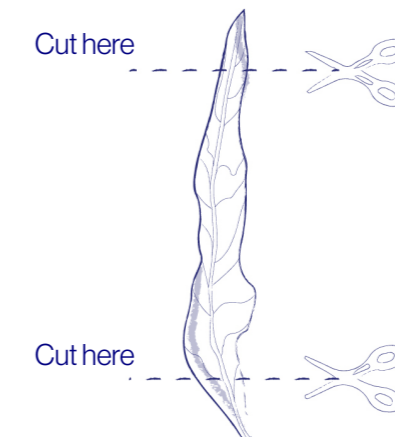
Varangerfjorden creates a perfect condition for growing seaweed – with its pure arctic water and midnight sun. The constant daylight means that the vegetation grows rapidly. Seaweed blooms during the spring and can grow several meters over just a few weeks. Very few places in the world have the same growing conditions<sup>2</sup>.

Mann, K. H. (1973). "Seaweeds – their productivity and strategy for growth." *Science* 182 (4116): 975–981.

1 Øverland: 2021  
2 Lofoten Seaweed



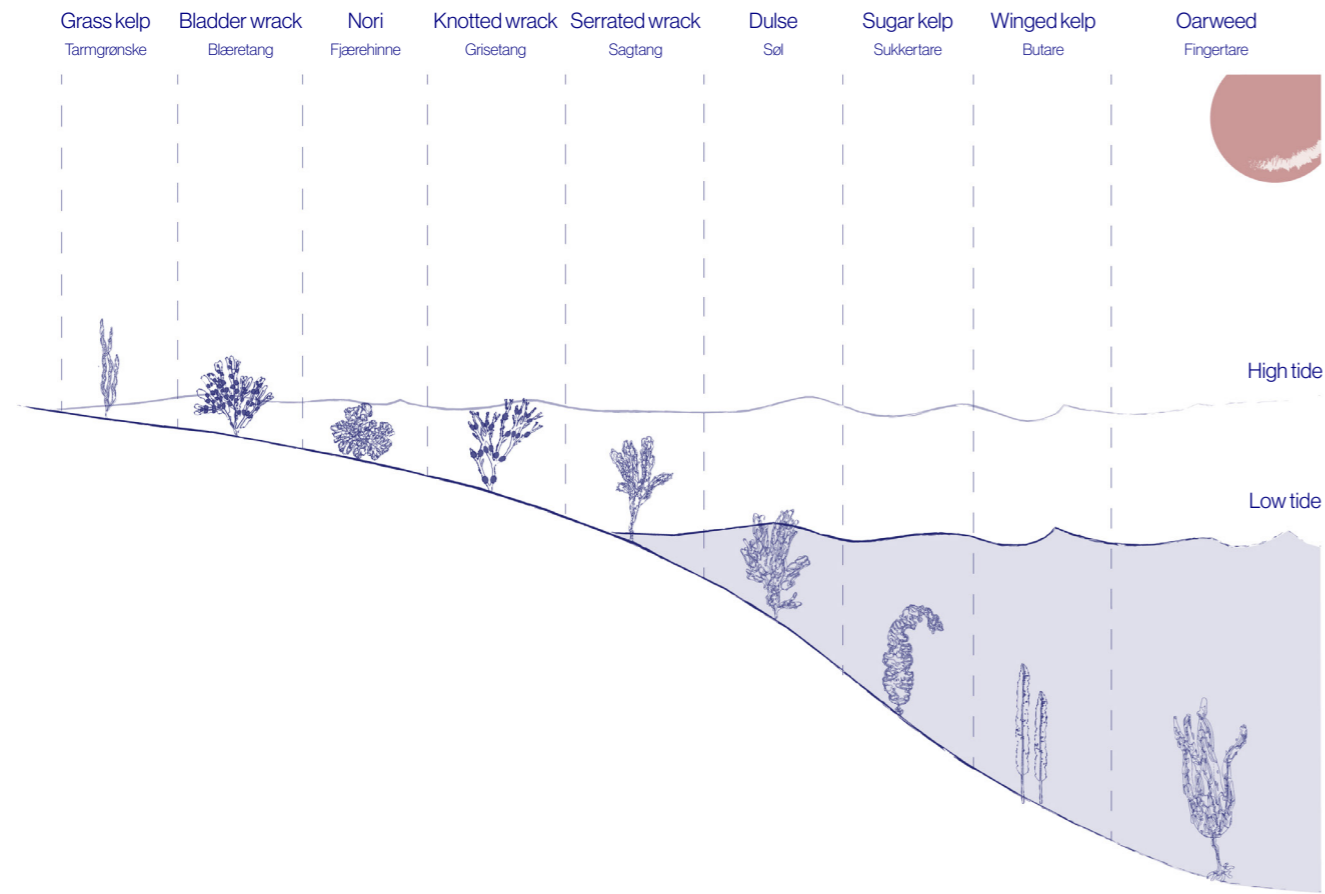
How seaweed and kelp grows: New leaf pushes the old in front of it. The longitudinal growth is measured by the distance from stem to holes. Holes are made for measuring growth. The stem also grows a little each year.



Source: Mann, 1973: 975-981  
Illustration: By author



# SEAWEED MAP



Source: Lofoten Seaweed & Future North

# SEAWEED NUTRITION



Source: Morrissey, J.; Kraan, S. & Guiry, M.D. A Guide to Commercially Important Seaweeds on the Irish Coast

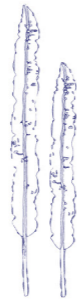
# MAPPING SEAWEED IN VARDØ



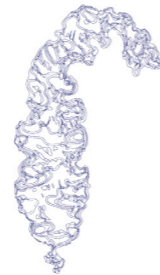
Cuvie  
Stortare



Oarweed  
Fingertare



Winged kelp  
Butare



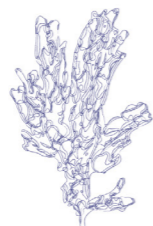
Sugar kelp  
Sukkertare



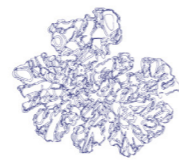
Bladder wrack  
Blæretang



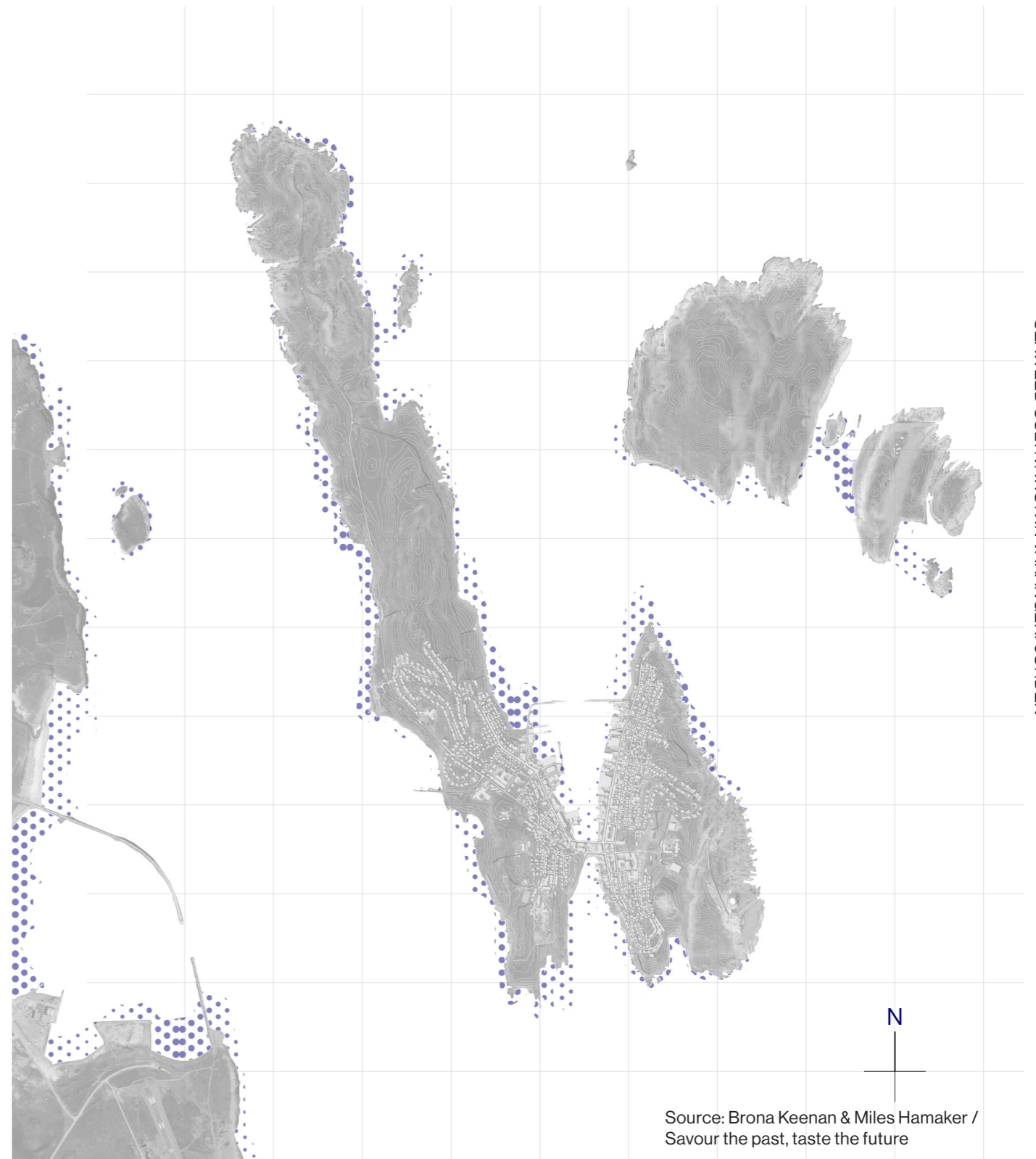
Knotted wrack  
Grisetang



Dulse  
Sol



Nori  
Fjærehinne



## TRADITIONAL USE OF SEAWEED

Cultivation of seaweed and kelp has a long tradition among Norway's coastal population as a food supplement for people and livestock. Cutting kelp was most often done by the women on the farm. Kelp for fertilizer was piled by the shore and used when it had been desalinated. Almost all types of seaweed and kelp were used for animal feed and fertilizer<sup>1</sup>.

The Sea Samis have long traditions of using and harvesting seaweed and kelp, mainly as animal feed. In the spring, kelp was collected, which was cut with a long-bladed scythe at a depth of 2-3 fathoms. Seaweed and kelp were usually cooked in the barn pot together with hay and fish waste<sup>2</sup>.

During second world war several people survived by hiding under seaweed in the tidal belt. For this the award Tang- og taremedaljen for fremragende innsats in 2019. the seaweed is honored for its importance in coastal history the medal is made from casts of seaweed and kelp in tin using alginate.<sup>3</sup>

1 Snekkestad, 2022: p. 40  
 2 Kalstad, 1982  
 3 Johannessen, Tangboka: p. 62



Women harvesting seaweed. Illustration: Leidulf Olsrud



Sheeps eating seaweed. Picture: Susan Swarbrick / The Herald

## KINDERGARDEN FOR SPECIES

Seaweed has a positive impact on the environment. It has proven to be important spawning areas for fish, especially lumpsucker, and has a high ability to recycle waste from fish farms into valuable sources of nitrogen and phosphorus. Seaweed also binds large amounts of carbon from the water<sup>1</sup>. Life in the ocean is depending on reefs and kelp forests in order to protect from surrounding dangers, and seaweed and kelp plays a vital role for a healthy ocean.

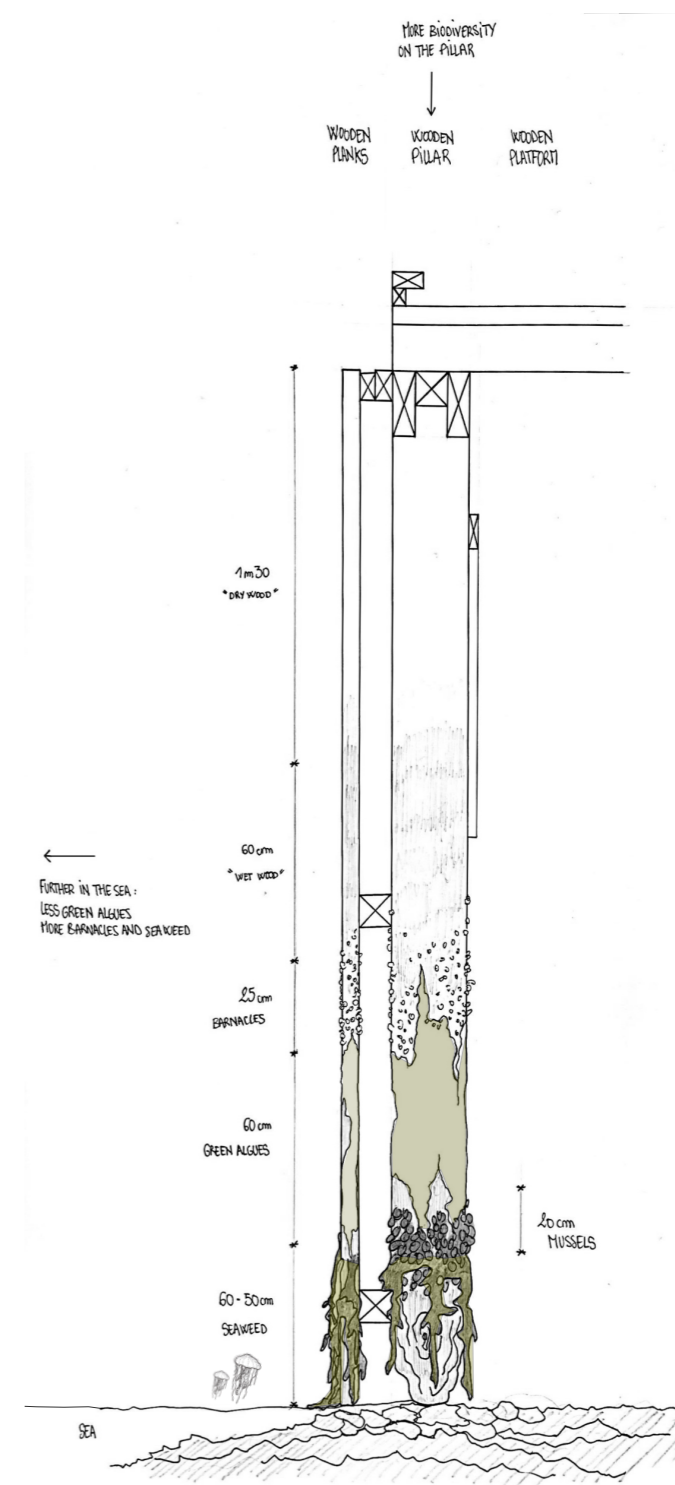
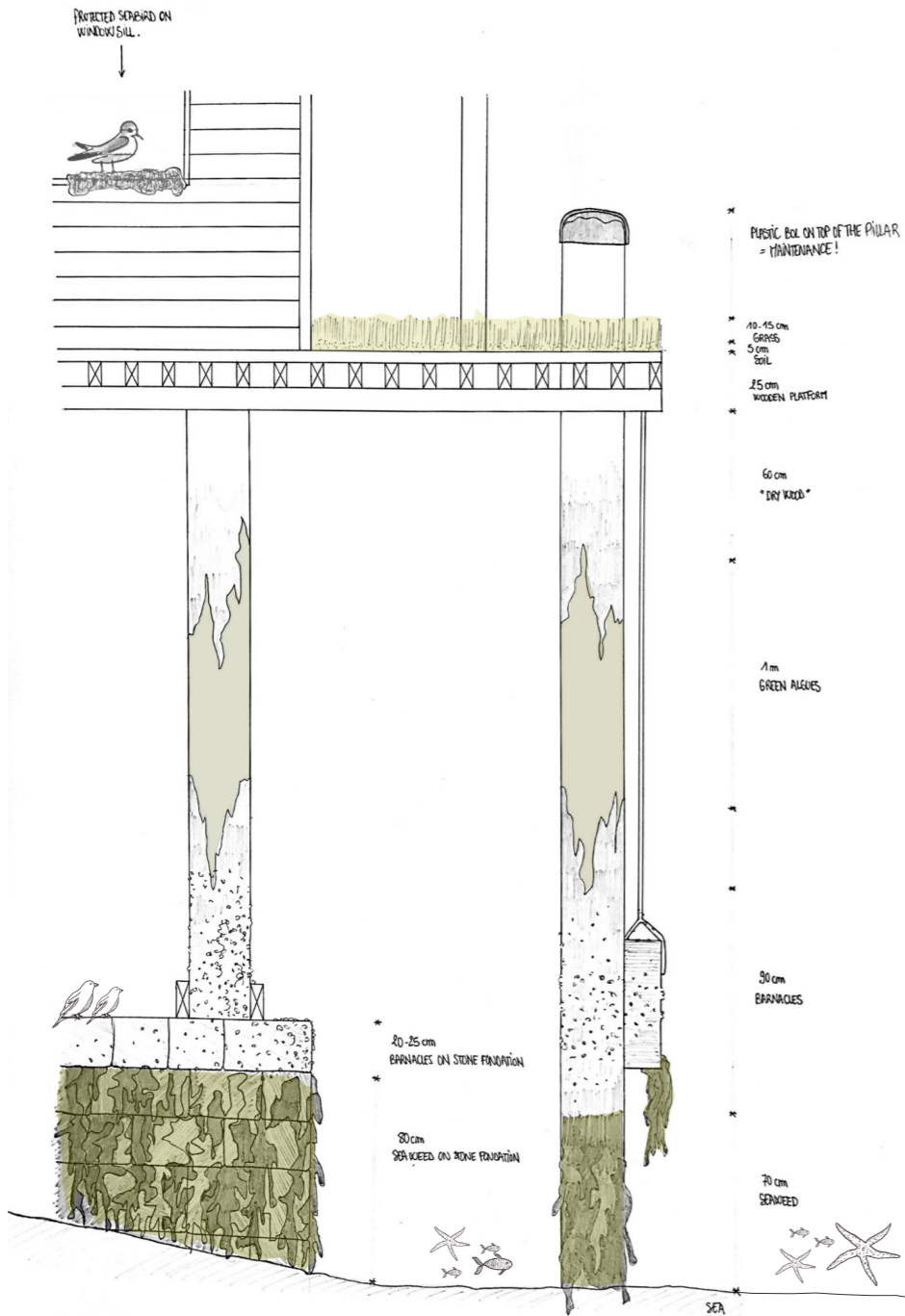


Picture: Sjø Seaweed

**“Seaweed are to the sea what forests, undergrowth, bushes and groundcover are to the land. They produce oxygen and release it in to their surroundings while at the same time functioning as a physical structure that provides a habitat for a wealth of other organisms.”**

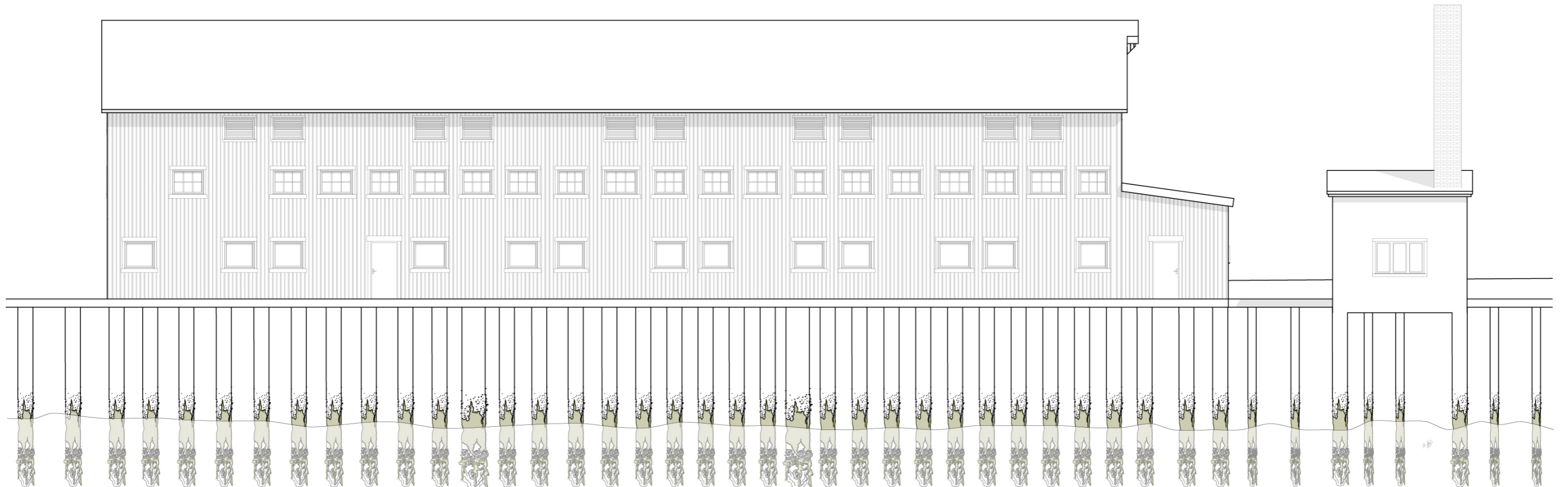
**Ole Mouritsen**

# MAPPING BIODIVERSITY IN VARDØ



Chapter 5:

# OCEAN CULTIVATION



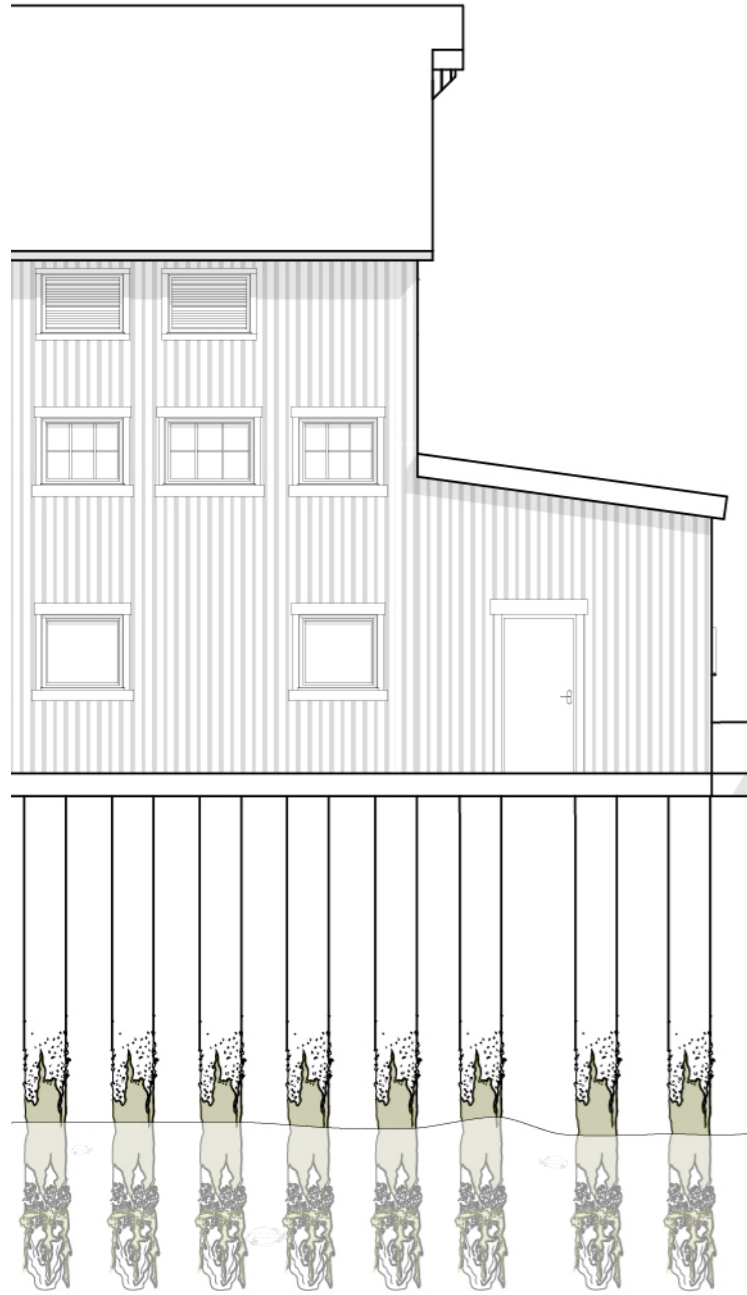


Illustration: By author

## FISHERY & SEAWEED

Through political decisions and centralization many of our fishing villages are on their way to extinction. There is an urgent need to come up with a strategy that preserves the operation of the fishing villages along the coast, and to make the fishery more sustainable in both a local and a global perspective. The fishing industry in Norway is large and well established, with one of the largest proportions of fish coming straight from Vardø. Through a symbiosis between the fish industry and seaweed cultivation, the project aims to highlight ocean cultivation as a vital part of a sustainable future.

## TRADITIONAL FISHING VS FISH FARMING

The world's population is steadily increasing parallel with the need for protein. The Norwegian government have identified the ocean industry as the most important priority area for a sustainable future. At the same time, the global spotlight has been put lately on the sustainability aspect of the fishing industry. Overfishing, large amounts of bycatch, and trawling of the seabed that destroys important spawning areas to mention some. As a counterweight to this came Norwegian fish farming, which solved the biggest problems with overfishing, bycatch of whales and dolphins and destruction of spawning areas. Fantastic. Instead, we encountered new problems with parasites, sick fish, fish that died, fish that escaped, fish that threatened and exterminated populations of wild stocks and fish that were directly harmful to human health<sup>1</sup>.

Through this diploma, I strongly distance myself from the fish farming industry and focus exclusively on traditional small-scale fishing. Although traditional fishing does not come without problems either. Coastal communities in Norway have experienced the consequences of overfishing, lack of natural resources and lost vital income. Lack of economic profitability in the fishing fleet leads to important jobs disappearing and societies collapsing. A separate chapter could have been written about trawling the seabed, and scientist fear that the ocean globally is at the breaking point of what it can withstand. This will mean life or death for the coastal communities. Small scale fish facilities were phased out because of economic profitability, but are perhaps the only correct answer for sustainable coastal communities and sustainable exploitation of marine resources.

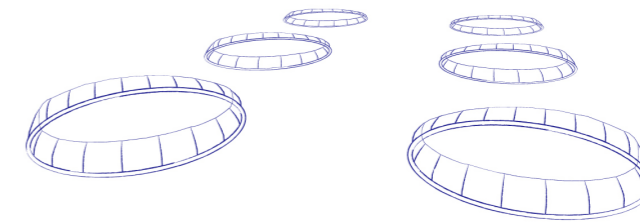
<sup>1</sup> Sætre, Østli: 2022



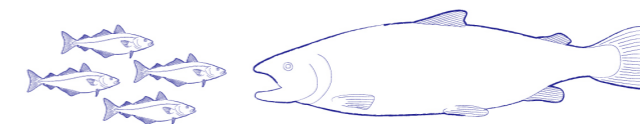
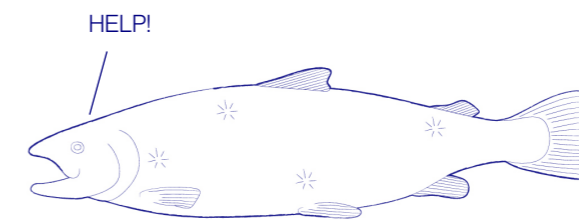
PØBEL, Laks er viktig for Norge  
Photo: By author



Since the mid-1960s, Norway has invested heavily in an industry often referred to as the “industry of the future for sustainable food production”. It started with placing Norwegian wild salmon in a cage for farming. But it didn’t take long for the salmon, specialized for the wild rivers it came from, to die from captivity. In a lab, the new, domesticated, salmon was bred. This salmon was fond of food and bred in order to gain weight quickly. It was then placed in open facilities in the sea. A parasite, that naturally drift with seawater, attached to the salmon and reproduced explosively. Even wild salmon passing by got infected. Antibiotics and other chemicals were used to defeat the parasite, but this ended up threatening all other life in the nearby sea. The parasite became resistant, and a crisis arose. Methods such as flushing and heat treatment were developed, but it often killed the fish due to severe stress. Fish farmers stopped eating salmon from their own farms, but still profited from sale in Norwegian grocery stores. The facilities were filled up with infected and dead fish – but large proportions had escaped. Domesticated salmon crossed with wild salmon and reproduced a sterile, deformed species that often died of wounds. Today, Norwegian wild salmon stocks are threatened with extinction. As the salmon no longer ate crustaceans the meat did not naturally acquire the characteristic red colour, and was therefore coloured by additives of which we know little about the long-term effects. The domesticated salmon was fed on fish oil from wild fish, but the gluttonous fish gave less food than it needed itself. It took 1,2 kg of wild fish for the salmon to put on 1 kg of meat. Sustainable? Today fish feed is based on soy, which means rainforests are being cut down and land confiscated<sup>1</sup>.



Fish cage



1,2 kg wild fish = 1 kg gained salmon meat

<sup>1</sup> Sætre, Østli: 2022

## NATURAL HARVEST VS SEAWEED CULTIVATION

Harvesting wild seaweed can be done in a few different ways, but not all of them equally environmental. Commercial trawling can disrupt the natural environment, destroy reefs and harm ocean wildlife. Harvesting by hand is a greener alternative, but it is possible to over-pick certain areas, damaging habitats and limiting regrowth potential<sup>1</sup>.

Seaweed cultivation can have, in contrast to agriculture, a large positive effect on the surrounding environment. Seaweed and kelp makes use of sunlight and nutrients in the water, without the use of fertilizers or other nutrients. It absorbs carbon dioxide and nitrogen and produce oxygen, contributing to a better environment in the sea. By now we know little of the long-term environmental risks involved in the cultivation of seaweed and kelp in Norway, but what we do know is that there is generally less risk than, for example, fish farming because seaweed and kelp absorb nutrient salts instead of releasing them<sup>2</sup>. Cultivation of seaweed and kelp will lead to increased knowledge about, and will be able to help solve the problem that the kelp forest has retreated in the last 30 years, and is in the process of disappearing from entire areas. The kelp forest is extremely important for a number of species, and when it disappears, the species diversity also disappears<sup>3</sup>.

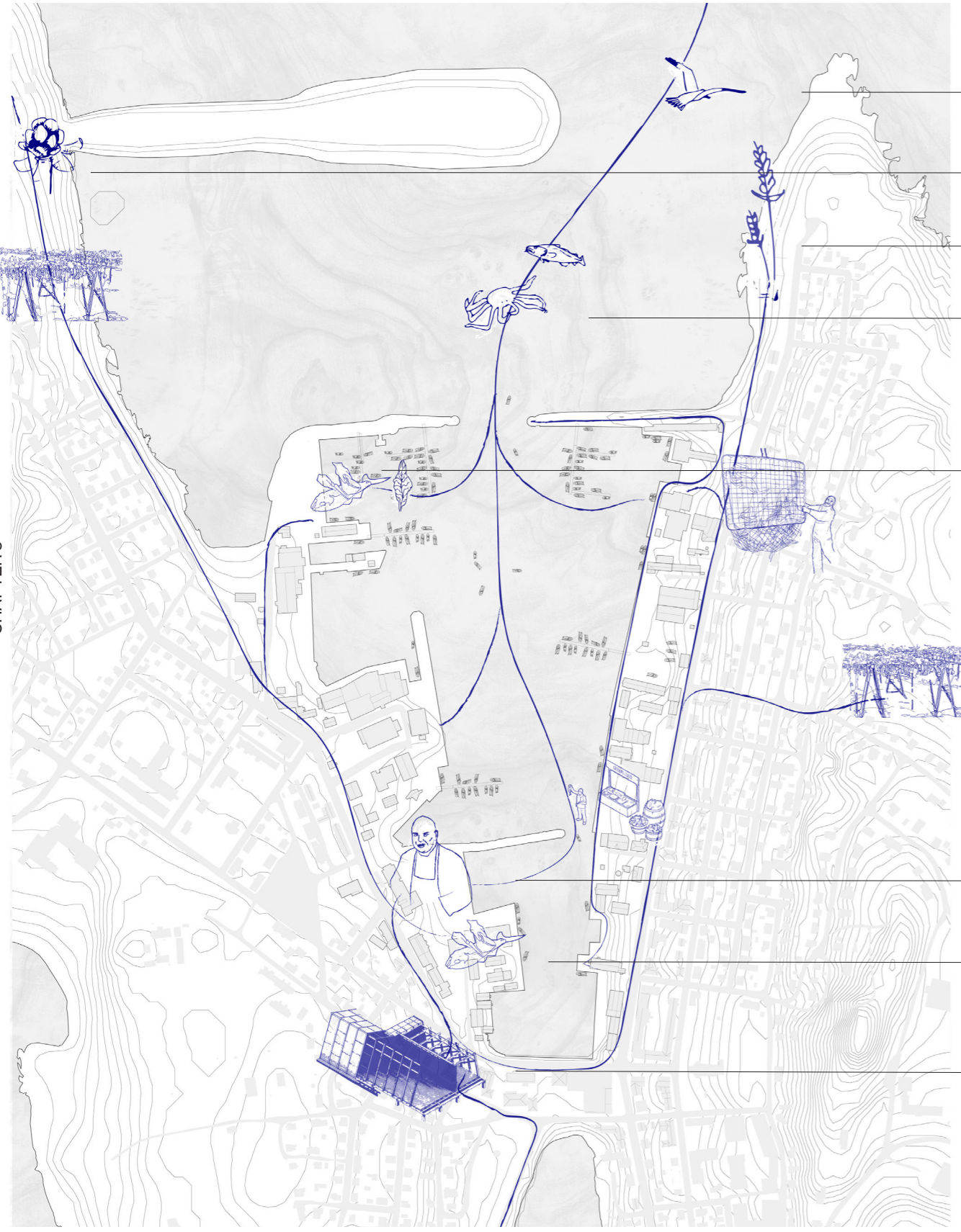
1 Lofoten Seaweed  
2 Norderhaug, Havforskningsinstituttet  
3 Lofoten Blue Harvest

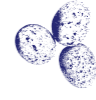


Picture: Sjø Seaweed


# PROCESSING OF RAW MATERIALS IN VARDØ


CHAPTER 5



Seagull eggs 

Mulberry 


Wild growing herbs 


Seafood 

Seaweed 

Stockfish 

Varangerkokken 

Sjømatlinja 

Dyrk Varanger 

OCEAN CULTIVATION

Source: Conversation with locals

# VISIT TO VARDØ FISKEMOTTAK

06.03.2023

CHAPTER 5

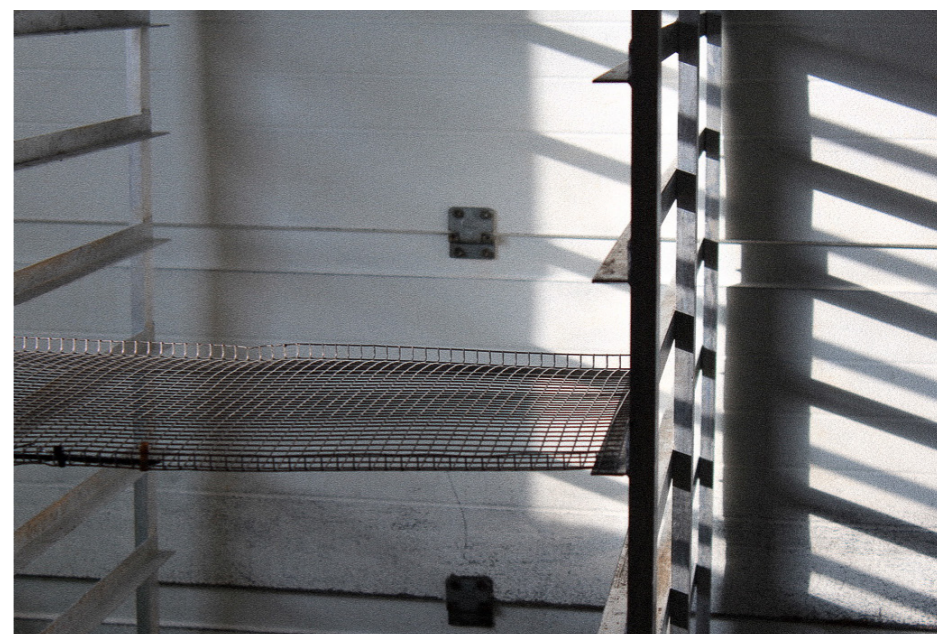


OCEAN CULTIVATION



# VISIT TO KIBERG FISKEKJØKKEN




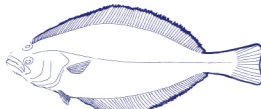




22.03.2023



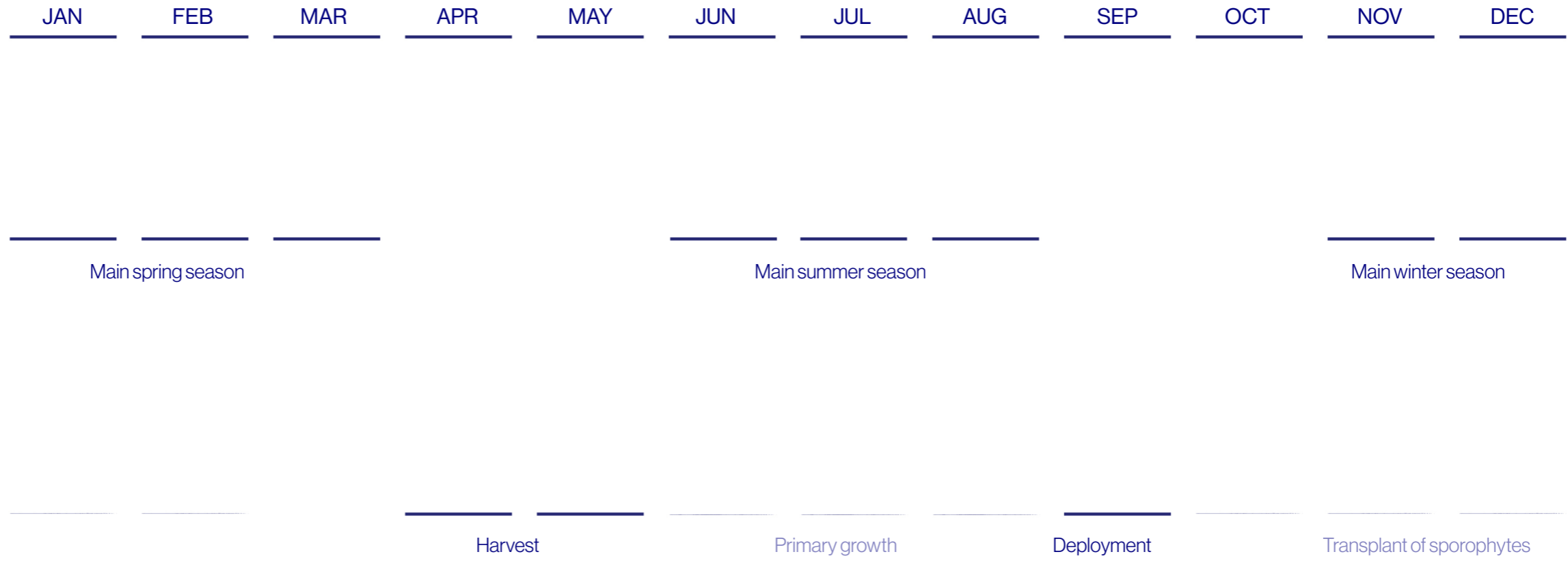
# PROGRAMME RESEARCH

## PRODUCTION LINE

# SEASON SPECIES

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
 Capelin		————	————									
 Cod	————	————	————	————								————
 Haddock						————	————	————	————			
 Halibut						————	————	————				
 King crab	————	————		 Illegal		————	————				————	————
 Seaweed - harvest				————	————							
 Seaweed - deployment									————			

# SEASONS



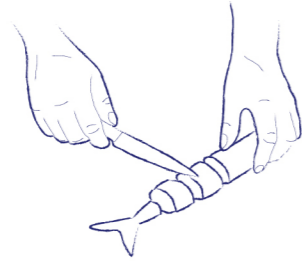


# PREPARATION

## FISH



Bait fish supply



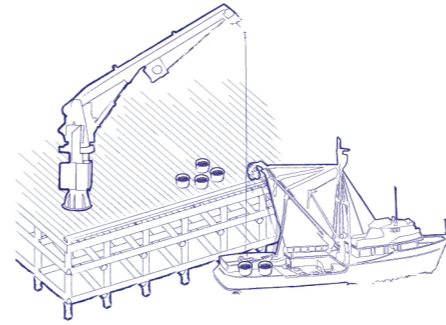
Bait preparation



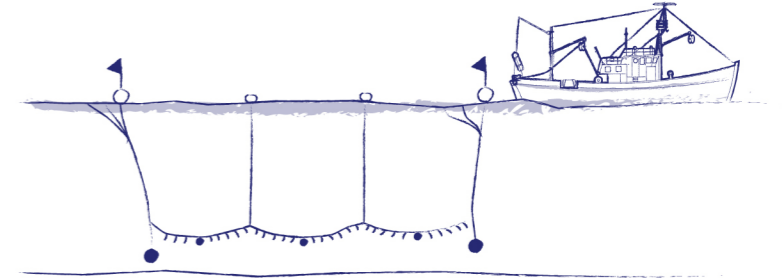
Baiting



Ready line

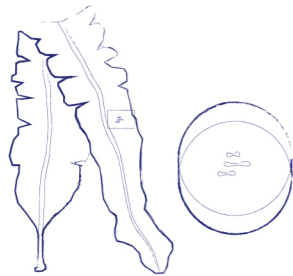


Load boat

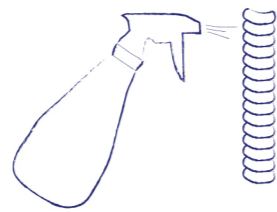


Set line

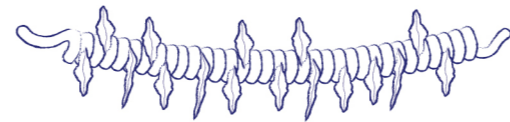
## SEAWEED



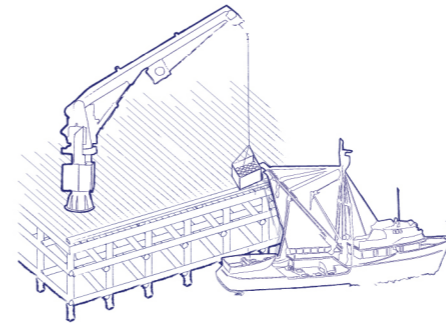
Growing spores from mother plant



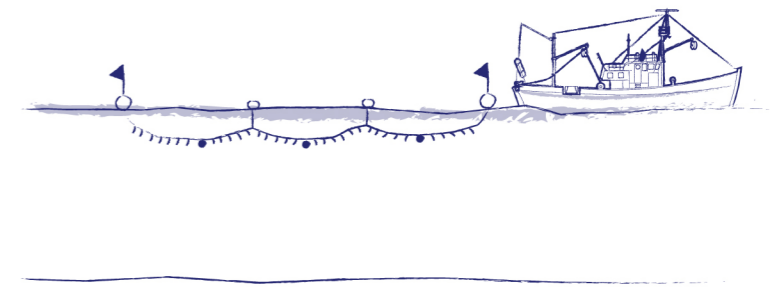
Spray to rope



Grow in lab



Load boat

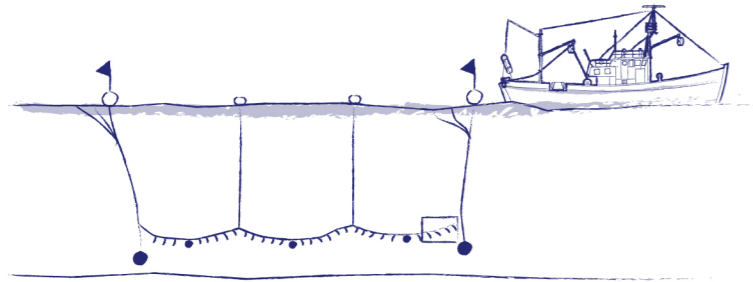


Set in growing field

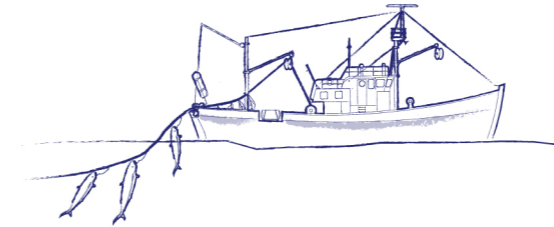
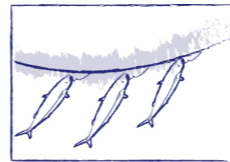


# FROM SEA TO SHORE

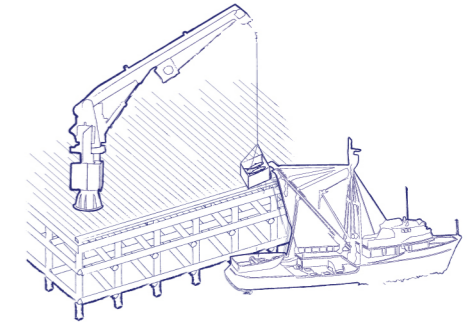
## FISH



Line fishing

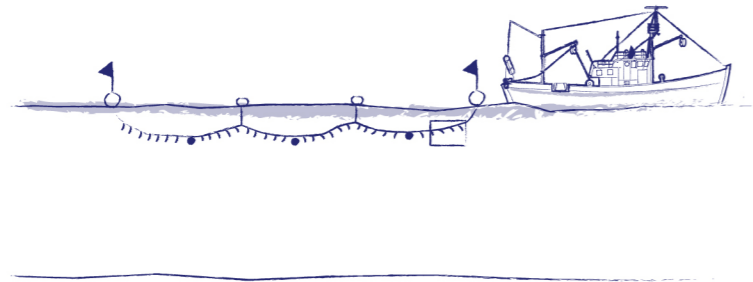


Harvest catch

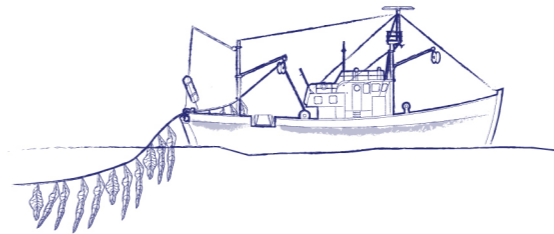
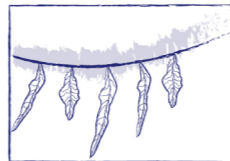


Lift to land

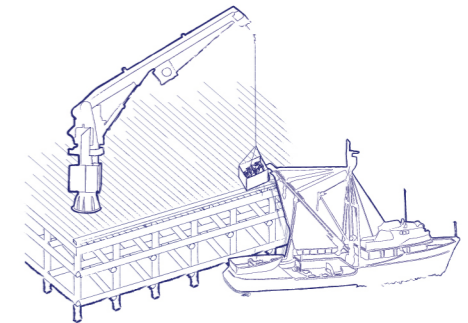
## SEAWEED



Growing fields



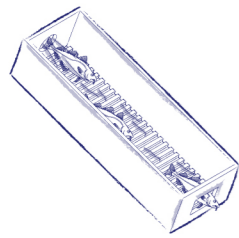
Harvest crop



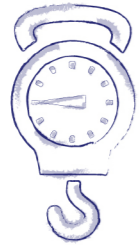
Lift to land

# PROCESSING FISH

## RECEPTION



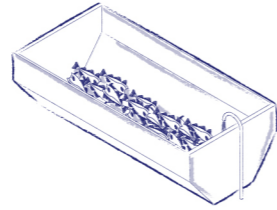
Run off  
Immediately



Weighing  
Immediately

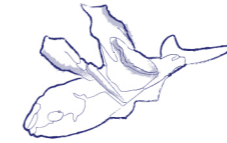


Gutting  
Within few hours



Rinsing  
Within few hours

## PROCESSING



Filleting  
Within the next day



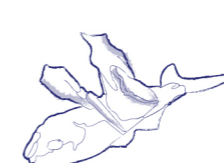
Cutting  
Within the next day



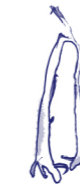
Fresh product / Frozen product  
1-3 days



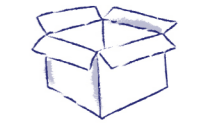
## DRIED PRODUCT



Filleting/ Round cut  
Within the next day

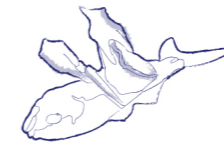


Long-term drying  
3-6 months

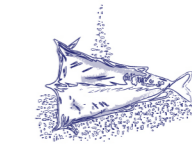


Packing/sale  
3-6 months

## SALTED PRODUCT



Filleting/ Split cut  
Within the next day



Salting  
14 days each side



Packing/sale  
1-2 months

## UNPROCESSED SHIPPED PRODUCT



Icing  
Immediately

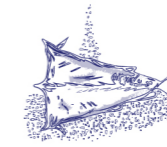


Packing  
Immediately

NORGES  
RÅFISKLAG

Receive salary directly, no local processing  
Within few hours

## SMOKED PRODUCT



Salting  
3 hours



Drying  
3 hours



Smoking  
5-10 hours



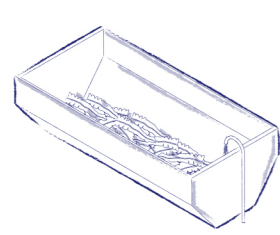
Packing/sale  
2-3 days

## FRESH/FROZEN PRODUCT

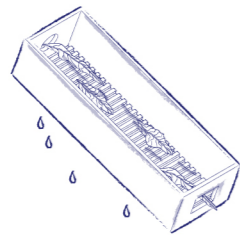
Today: Remote production + distribution

# PROCESSING SEAWEED

## RECEPTION



Rinse  
Immediately



Bulk dripping  
Immediately



Quality control  
Within 12 hours



Cut and sort  
Within 12 hours

## PROCESSING

### DRIED PRODUCT



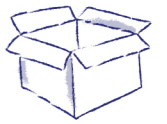
Drying  
2-6 days



Fine cutting  
After drying



Weighing + packing  
Weighed and split into portions



Sale/shipping  
3-6 days

### SMOKED PRODUCT



Smoking  
5-10 hours



Weighing + packing  
Weighed and split into portions



Sale/shipping  
2-3 days

### FROZEN PRODUCT



Weighing + packing  
Wet seaweed is weighed and split into portions



Freeze  
Within 12 hours



Freezer storage  
1-2 days

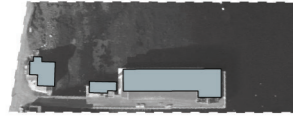
Chapter 6:

# FANGST

ET FOREDLINGSANLEGG FOR FISK OG TANG



# POTENTIAL SITES



**1. Servicekaia:**  
 Best connection to the sea - with wooden quay standing in the sea  
 Wooden/concrete buildings with transformation potential  
 Cultural and historical preservation value  
 Not operative today with potential for new program  
 Big plot with room to expand  
 Area under development with new filling coming  
 Exiting meeting between human structure and biodiversity



**2. Voiekaia:**  
 Connection to the sea - with wooden quay  
 Wooden/concrete buildings with transformation potential  
 Cultural and historical preservation value  
 Not operative today with potential for new program  
 Big occupied plot with little room to expand  
 Massive buildings, visually very dilapidated



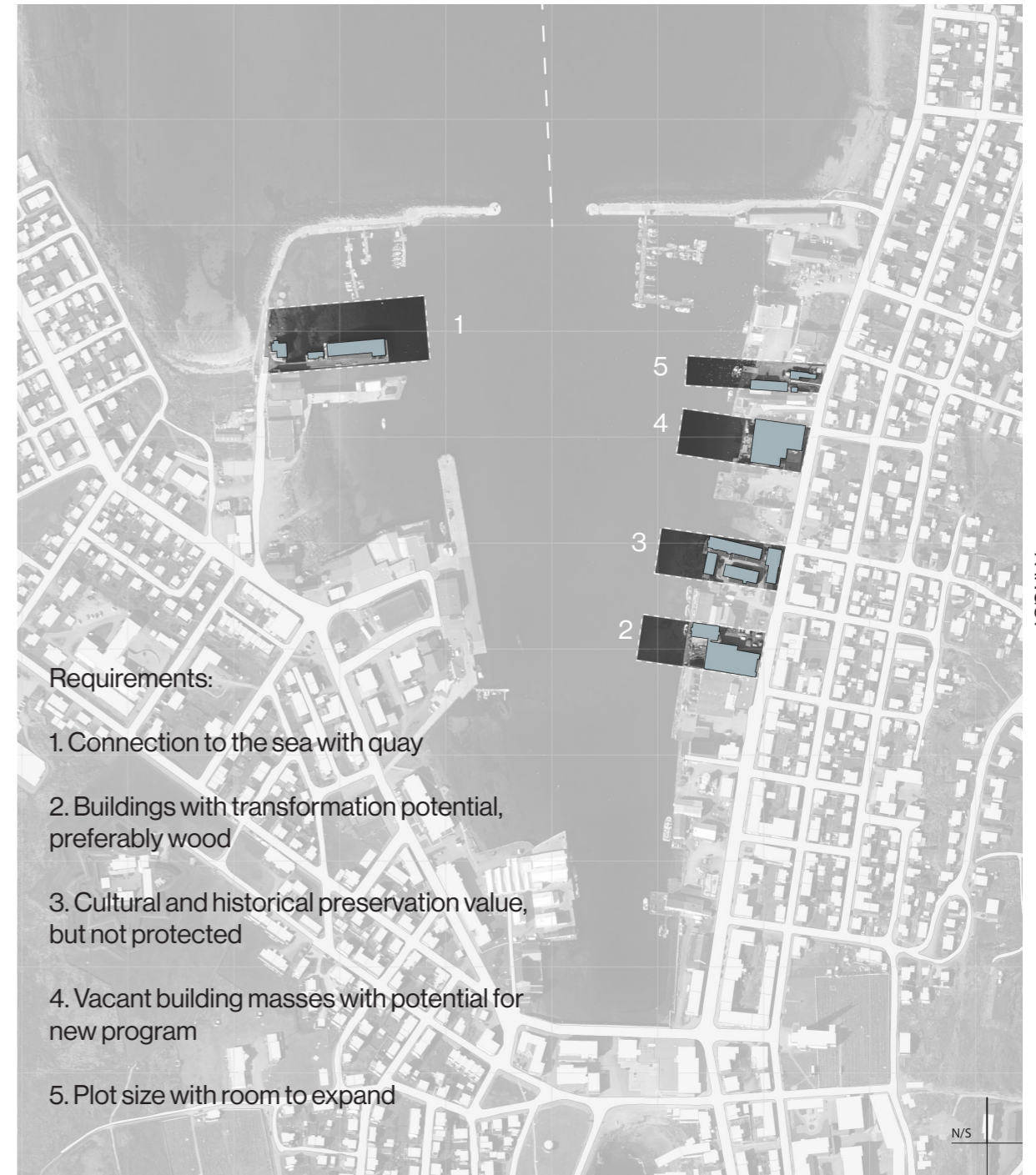
**3. Martin Olsen-bruket:**  
 Connection to the sea - with wooden quay  
 Wooden buildings with transformation potential  
 High cultural and historical preservation value - oldest fish facility in Norway  
 Not operative today with potential for new program  
 Medium occupied plot with little room to expand



**3. Aarsæther:**  
 Connection to the sea - but no quay  
 Concrete building with transformation potential  
 Cultural and historical preservation value  
 Not operative today with potential for new program  
 Big occupied plot with little room to expand  
 Massive industrial building



**3. Strandgata 49:**  
 Connection to the sea - with wooden quay  
 Wooden/concrete buildings with transformation potential  
 High cultural and historical preservation value - oldest cod liver factory in Vardø  
 Not operative today with potential for new program  
 Narrow plot with limited room to expand



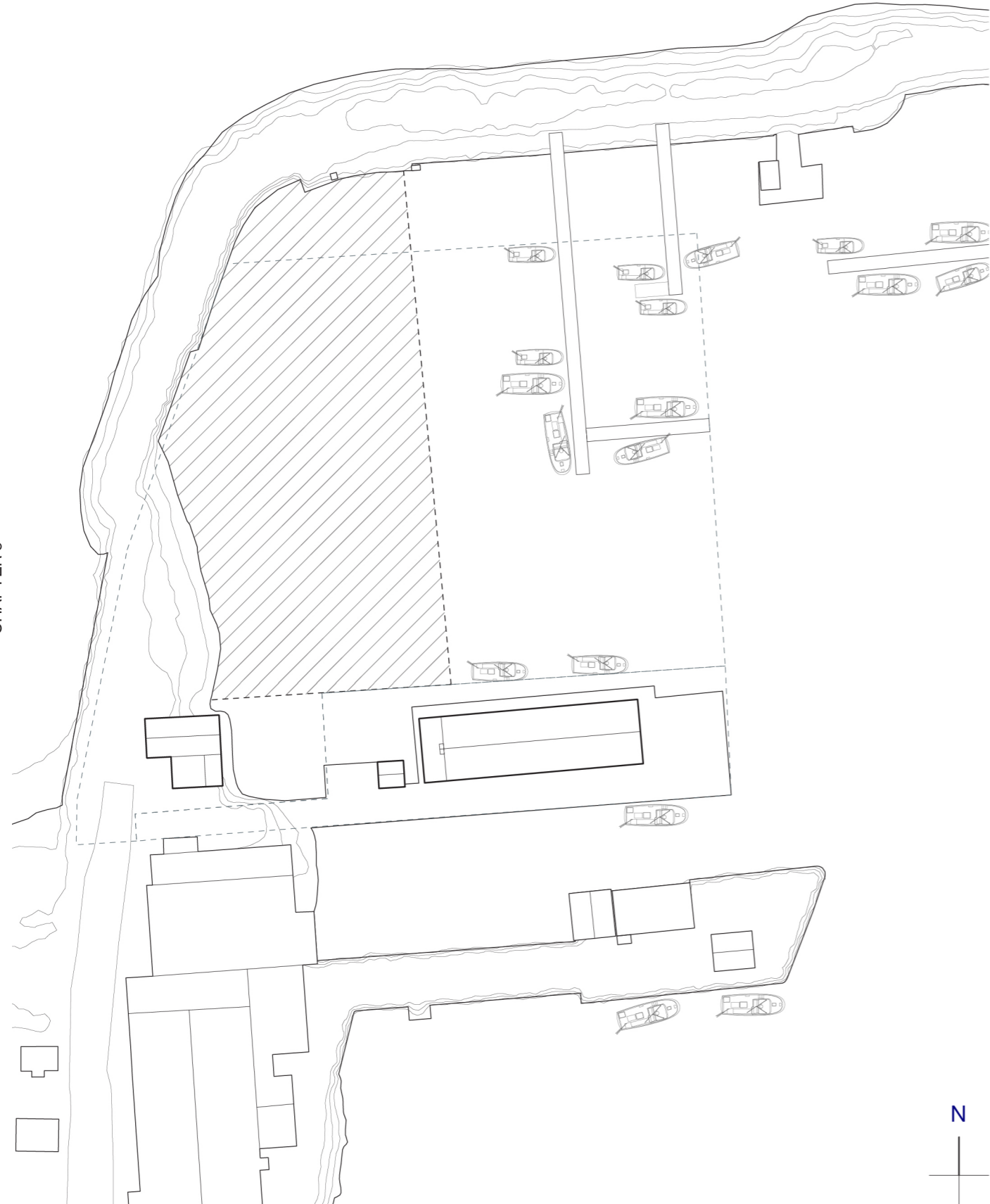
## Requirements:

1. Connection to the sea with quay
2. Buildings with transformation potential, preferably wood
3. Cultural and historical preservation value, but not protected
4. Vacant building masses with potential for new program
5. Plot size with room to expand

■ Sites/buildings with particular transformation interest

# MAPPING THE EXISTING

# SITE PLAN



CHAPTER 6

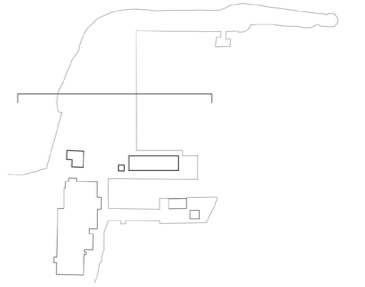
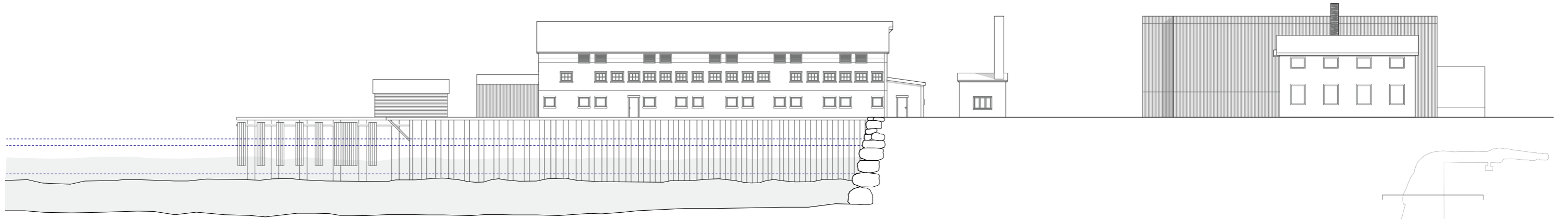
# PICTURE FROM SITE



FANGST



# SITE SECTIONS



CHAPTER 6

FANGST

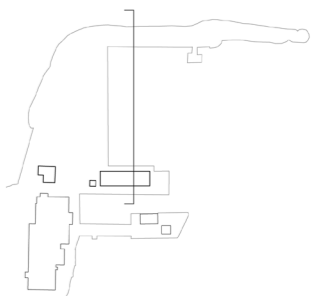
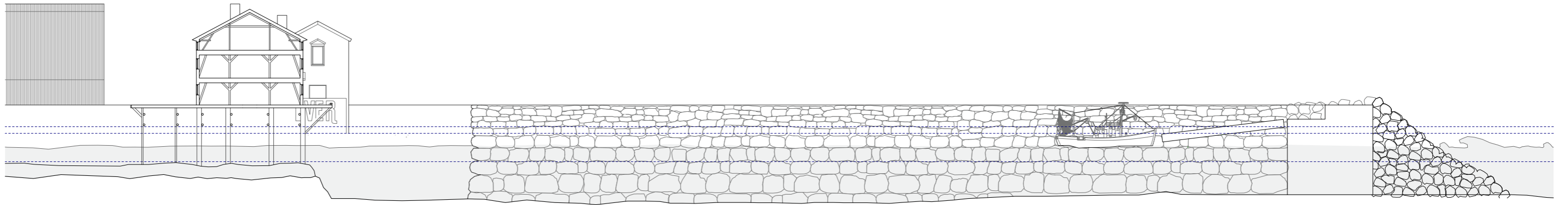




Photo: Unknown

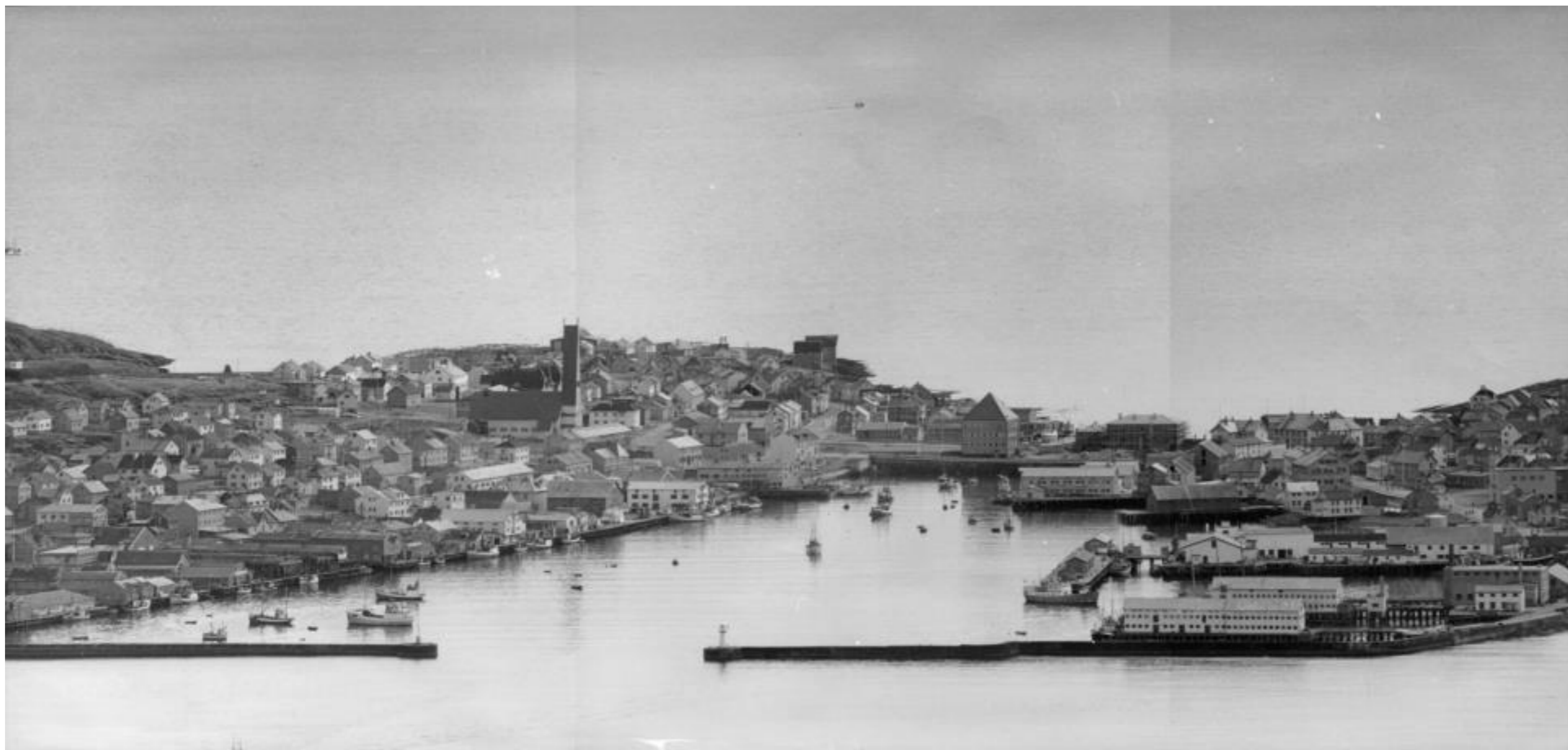
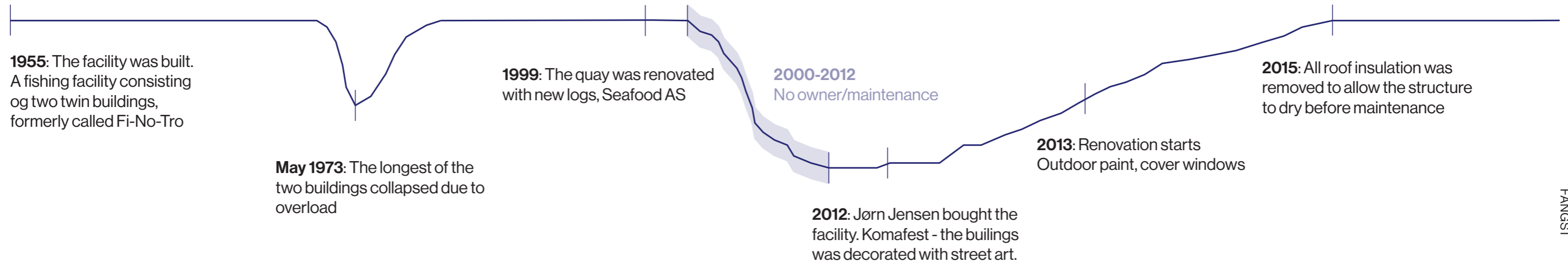


Photo: Unknown

# TIMELINE BUILDING

CHAPTER 6



FANGST



Photo: Ian Cox

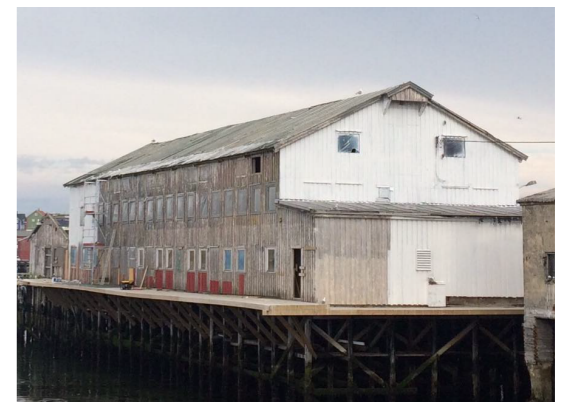


Photo: Jørn Jensen

“Bygget hadde et tragisk forløp. Der det sto, var det en tragedie. Man står foran noe spennende når bygninger er på vei til å kollapse. På en annen side er det i grunnen det øyeblikk man ser en bygning dø, at ideen til en ny funksjon fødes.”

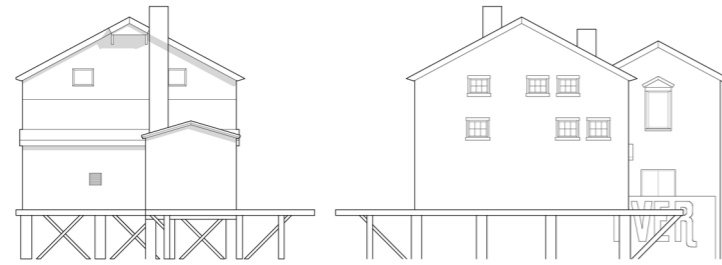
Sverre Fehn

Interview about Storhamarlåven



Photo: Ian Cox

# ORIGINAL DRAWINGS



Facade west

Facade east



Facade north

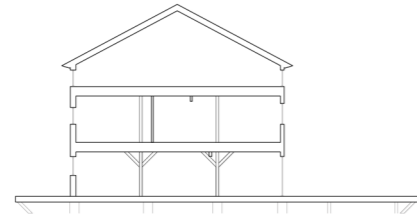


Facade south

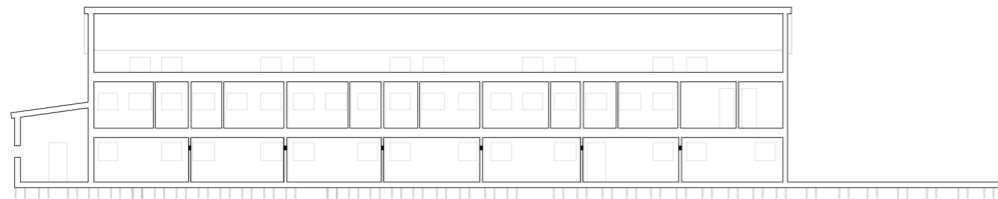
## The characteristics of coastal architecture:

The symmetrically organized gable facing the sea and the salt roof above the large, unbroken volume is one of coastal architecture's significant form expressions. Openings with an overhanging winch in the central axis – symmetrical and well-ordered. Roof often covered with corrugated iron sheets. This pier type, with minor morphological variations along the coast, is formally distinct and easily recognisable.<sup>1</sup>

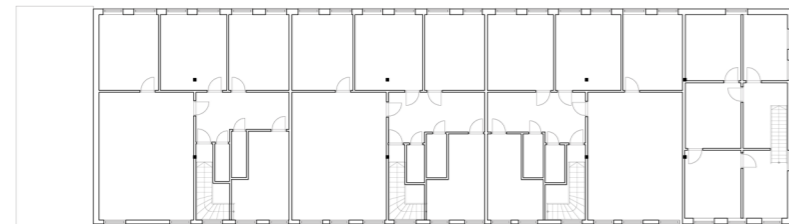
# ORIGINAL DRAWINGS



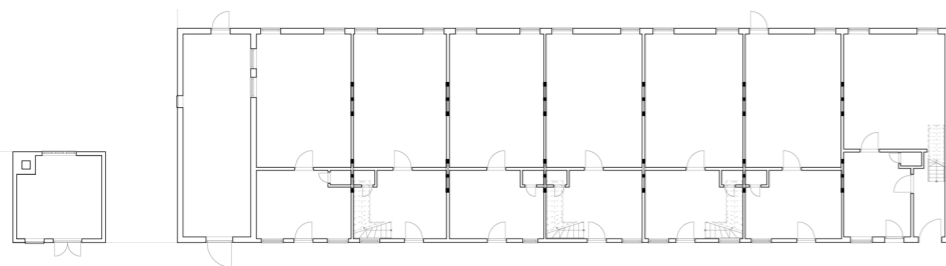
Cross section



Longitudinal section



First floor plan

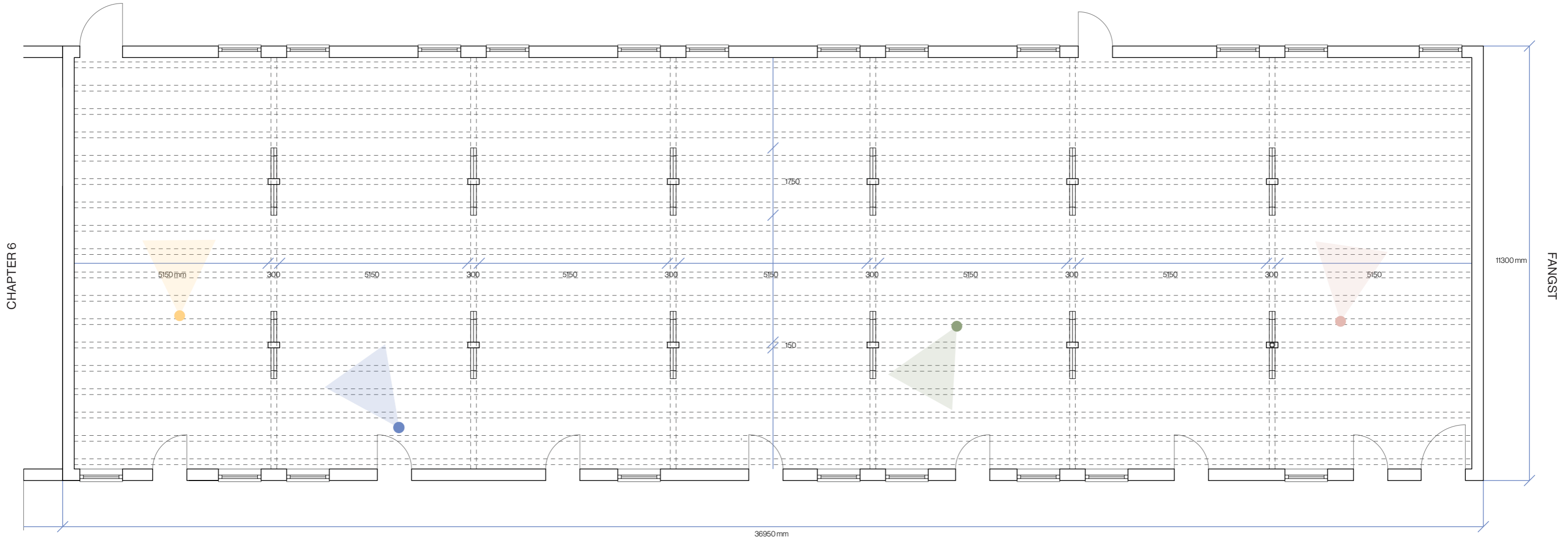


Ground floor plan

## Some discovered issues with the building for new industry:

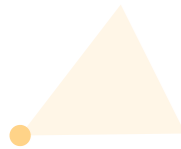
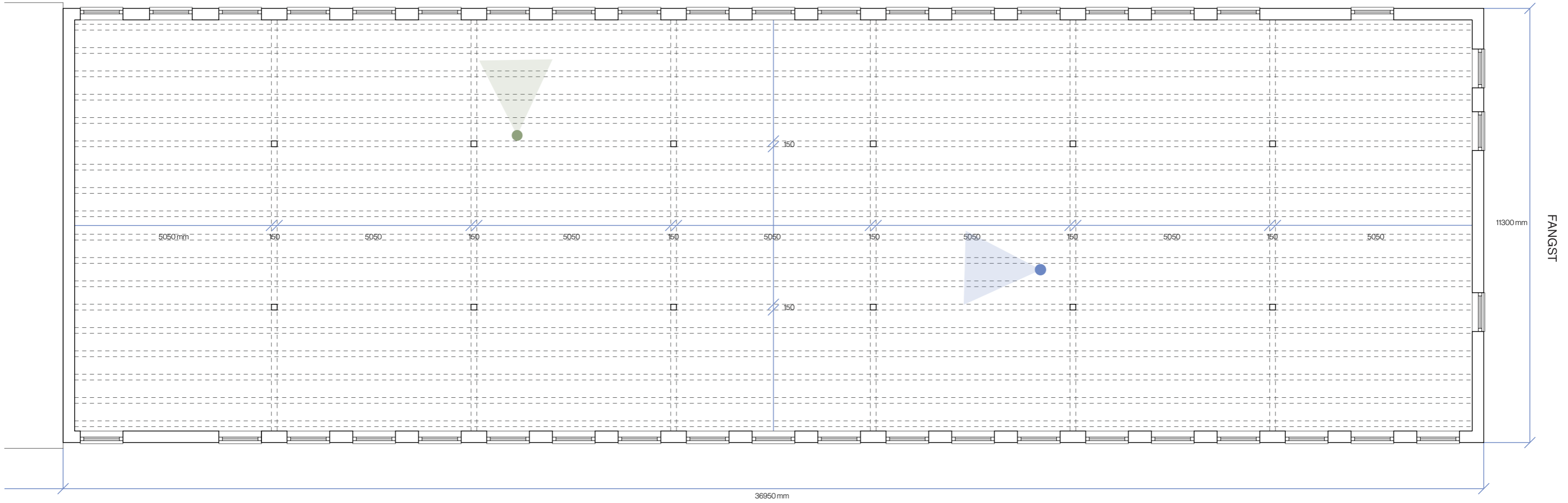
- The ceiling height is not enough to tilt bulks inside the building. This is a requirement from Mattilsynet.
- The building consist today of seven divided sections. The closed rooms gives limited space and use for different activities. Very little of the beautiful construction is visible today

# GROUND FLOOR PLAN – MEASUREMENTS

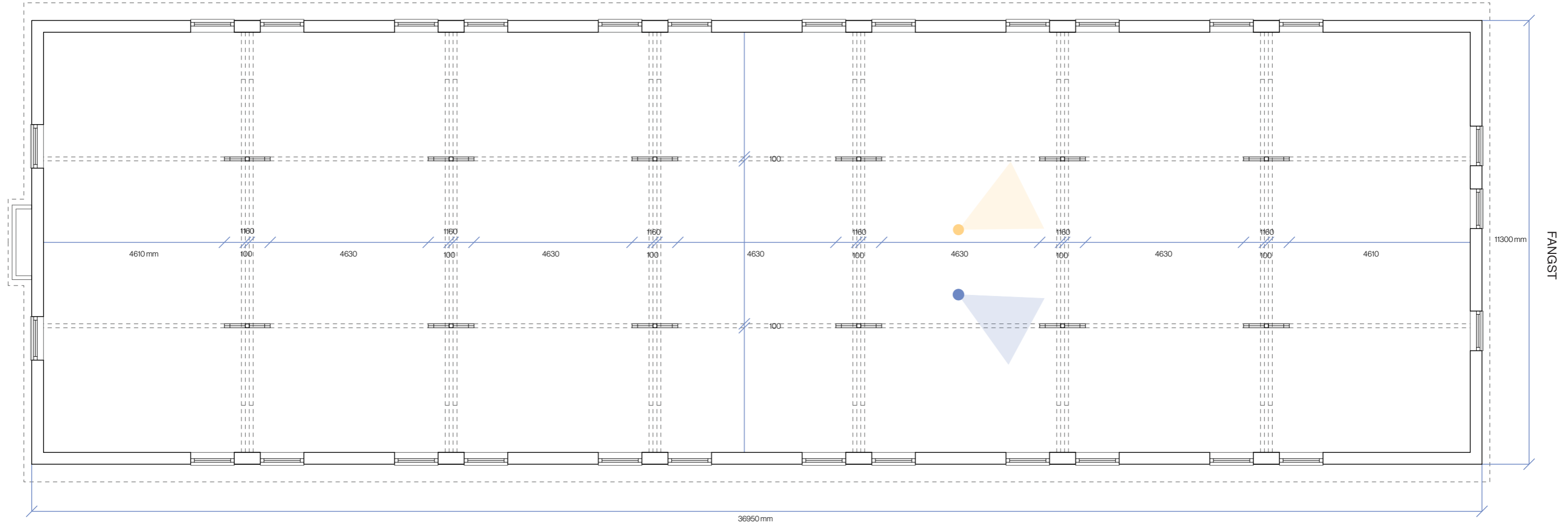




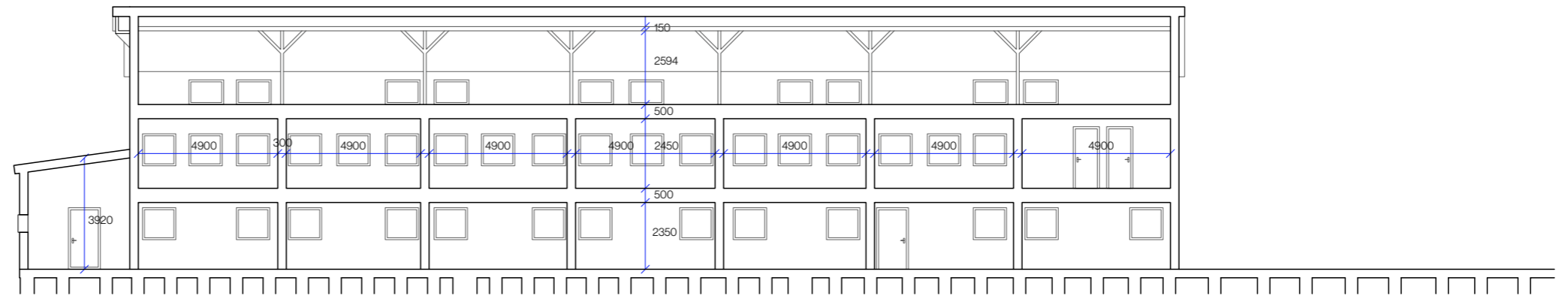
# FIRST FLOOR PLAN – MEASUREMENTS



# SECOND FLOOR PLAN – MEASUREMENTS



# LONGITUDINAL SECTION – MEASUREMENTS



# PICTURES FROM SITE



FANGST

# REUSING MATERIALS



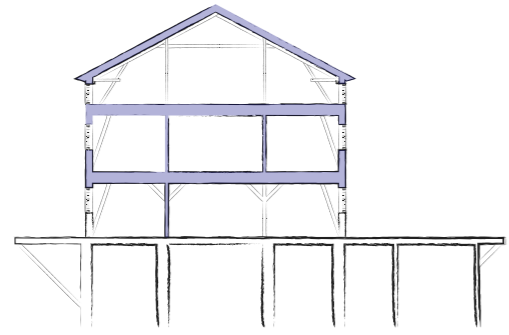
# PICTURES FROM LOFT



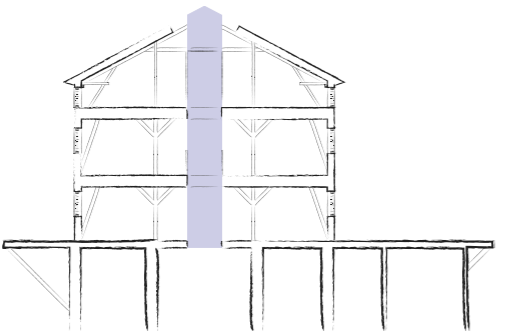
CHAPTER 6

# ARCHITECTURAL PROPOSAL

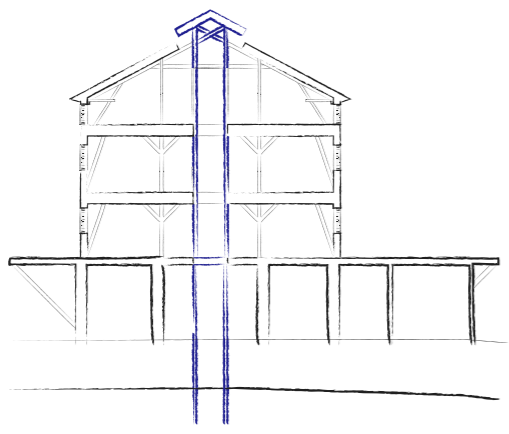
# ARCHITECTURAL CONCEPT



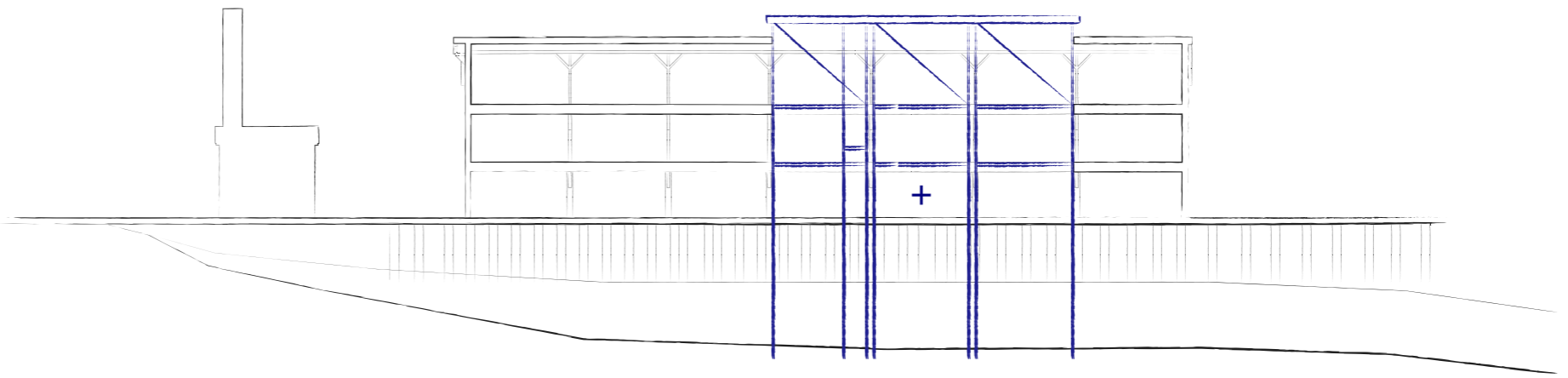
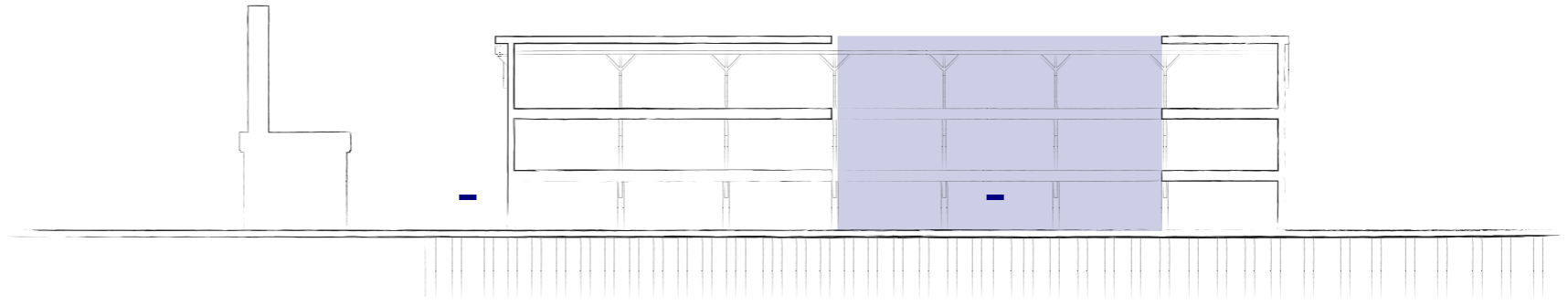
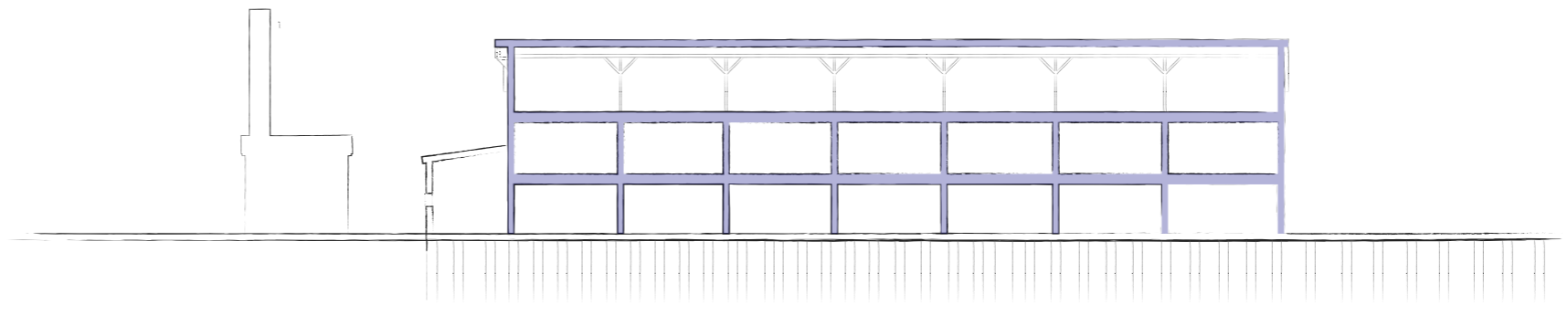
Existing building



Exposing construction + opening core  
More functional space for industry  
Removing old freezer



Reinforce structure with new core  
Anchored in bedrock  
Taking use of old winch

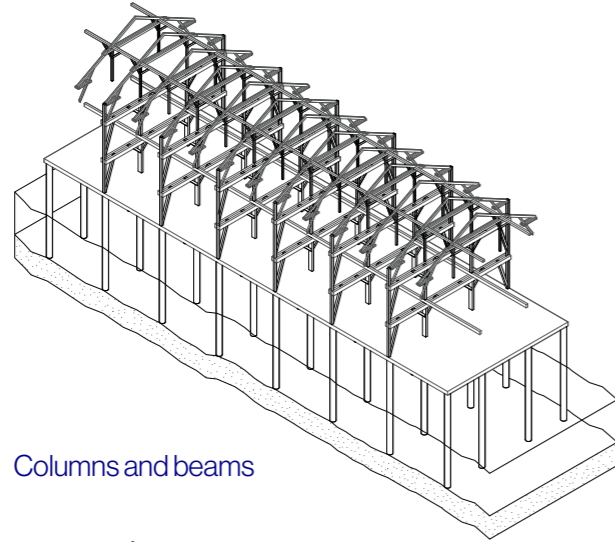


CHAPTER 6

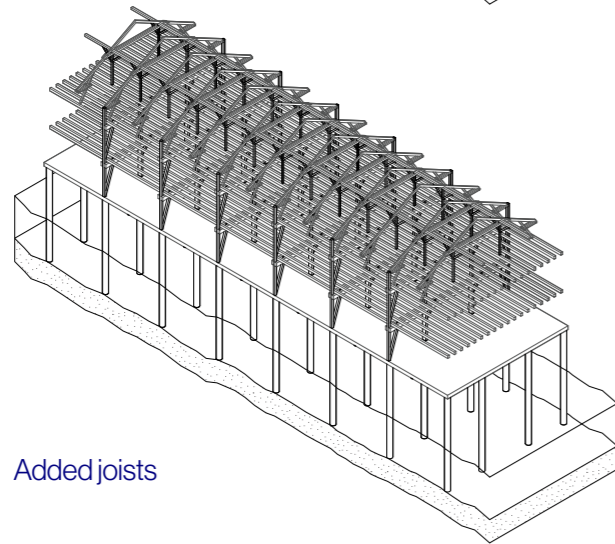
FANGST

N/S

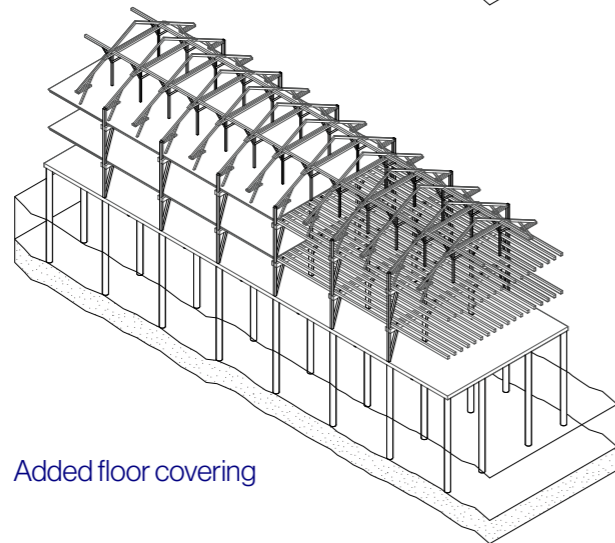
EXISTING STRUCTURE



Columns and beams

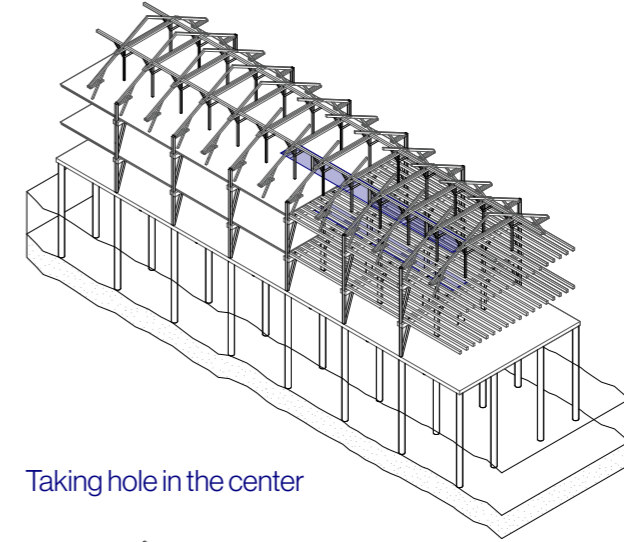


Added joists

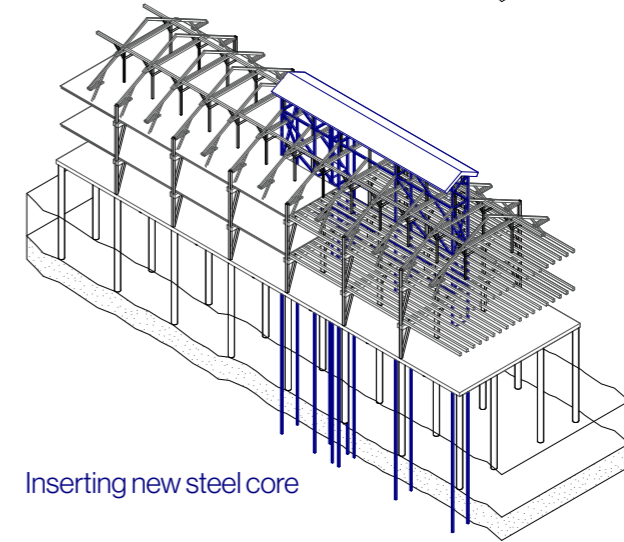


Added floor covering

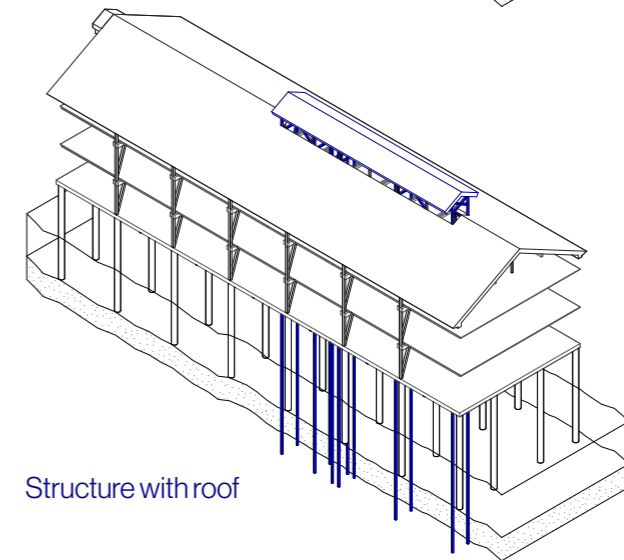
WITH ARCHITECTURAL PROPOSAL



Taking hole in the center



Inserting new steel core



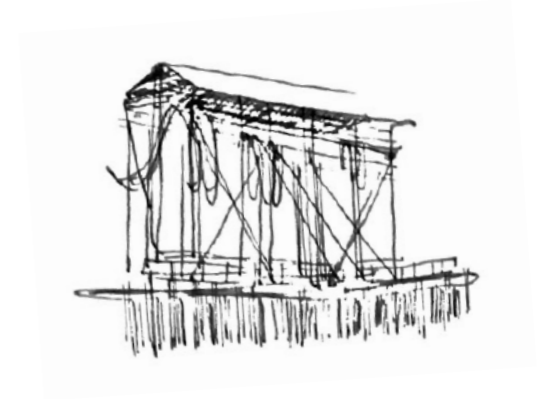
Structure with roof



## NOTHENG

The structure I add within the existing building is inspired by the vernacular structure *notheng* or *nothjell*. These structures used to be found all the way along the norwegian coast, even several in Vardø, and was used to hand and dry the not (a type of net used for fishing). Today only a few examples are still standing.

The nothjell was often built in the most simple way, often with whatever they had available of local materials, but all the different connections together made the structure properly stiff and resistant to the harsh coastal weather.

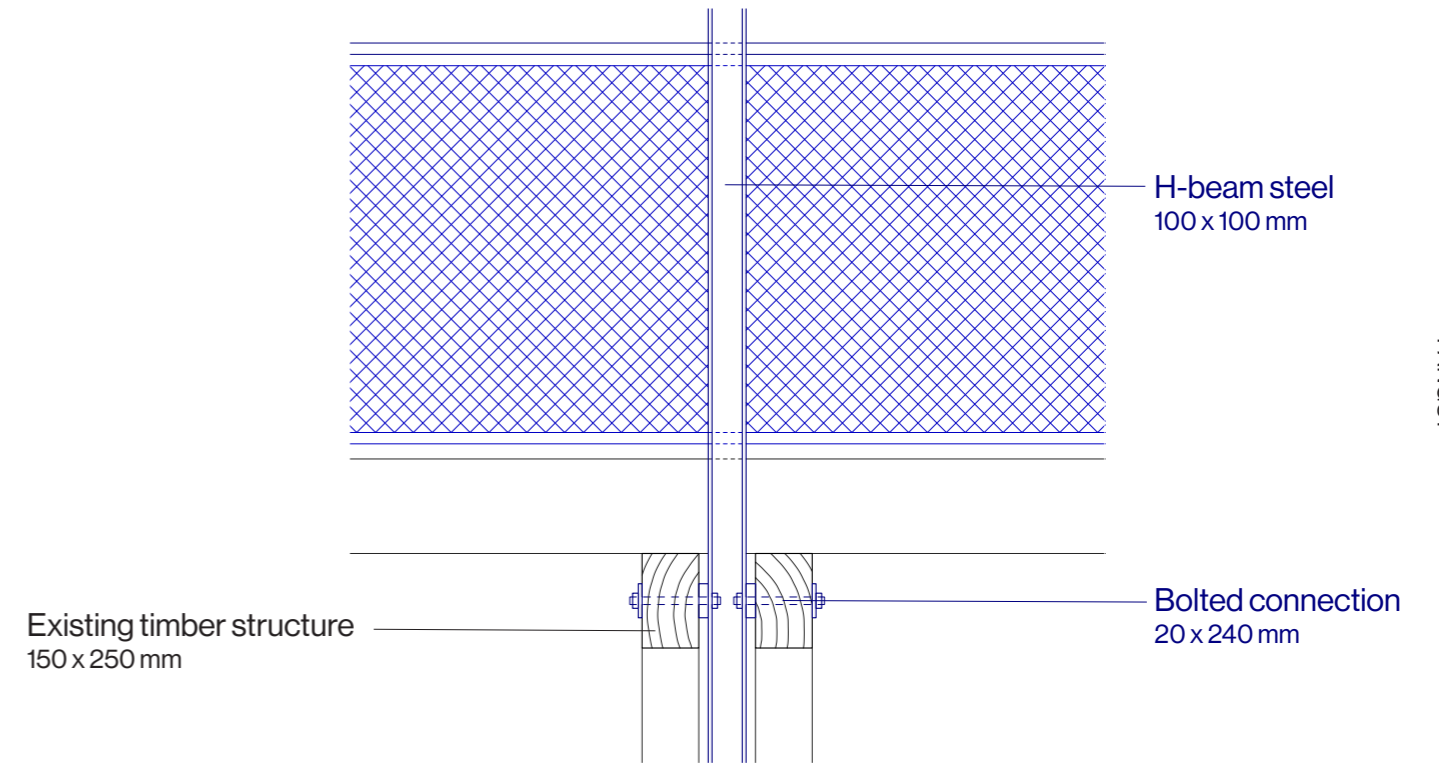


Previous work



Notheng på Rasteby. Photo: Siri Urdal

# DETAIL CONNECTIONS



Scale 1:20

# MODEL PHOTOS

CHAPTER 6



FANGST

# AREA DISTRIBUTION

## AREA DISTRIBUTION

FISH Preparation		Reception	Processing	Production			Supporting functions/administration							Sale of products						
Freezer for live	Baiting Bait preparation room	Reception of catch Mooring space	Runoff area Weighing	Packing Icing Filleting Sorting Rinsing Gutting	Freezer storage	Cold storage	Smoking	Production kitchen	Drying Long term storage	Salting	Equipment storage	Workshop	Technical rooms	Circulation	Office	Wardrobe	Lunch room	Laundry Sluice	Storage	Packing/Sale
15 m <sup>2</sup> -18 °C	20 m <sup>2</sup> 19 °C	350 m <sup>2</sup> Unclimatized	30 m <sup>2</sup> 15 °C	450 m <sup>2</sup> 15 °C	10 m <sup>2</sup> -24 °C	9,5 m <sup>2</sup> 3 °C	20 m <sup>2</sup> 30 °C	23 m <sup>2</sup> 19 °C	350 m <sup>2</sup> Unclimatized	30 m <sup>2</sup> 15 °C	100 m <sup>2</sup> 15 °C	25 m <sup>2</sup> 15 °C	40 m <sup>2</sup> 15 °C	110 m <sup>2</sup> 19 °C	20 m <sup>2</sup> 19 °C	20 m <sup>2</sup> 19 °C	30 m <sup>2</sup> 19 °C	30 m <sup>2</sup> 19 °C	55 m <sup>2</sup> 15 °C	85 m <sup>2</sup> 15 °C

## COMMON USE

Reception of catch Mooring space	Runoff area Weighing	Packing Icing Filleting Sorting Gutting Rinsing	Freezer storage	Cold storage	Smoking	Production kitchen	Drying Long term storage	Equipment storage	Workshop	Technical rooms	Circulation	Office	Wardrobe	Lunch room	Laundry Sluice	Storage	Packing/Sale
350 m <sup>2</sup> Unclimatized	30 m <sup>2</sup> 15 °C	450 m <sup>2</sup> 15 °C	10 m <sup>2</sup> -24 °C	9,5 m <sup>2</sup> 3 °C	20 m <sup>2</sup> 30 °C	23 m <sup>2</sup> 19 °C	350 m <sup>2</sup> Unclimatized	100 m <sup>2</sup> 15 °C	25 m <sup>2</sup> 15 °C	40 m <sup>2</sup> 15 °C	110 m <sup>2</sup> 19 °C	20 m <sup>2</sup> 19 °C	20 m <sup>2</sup> 19 °C	30 m <sup>2</sup> 19 °C	30 m <sup>2</sup> 19 °C	55 m <sup>2</sup> 15 °C	85 m <sup>2</sup> 15 °C

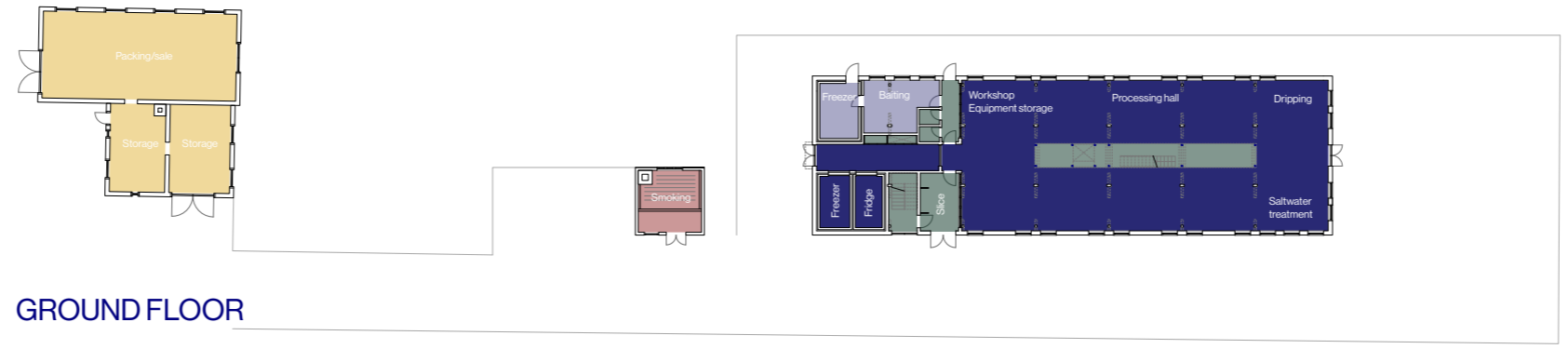
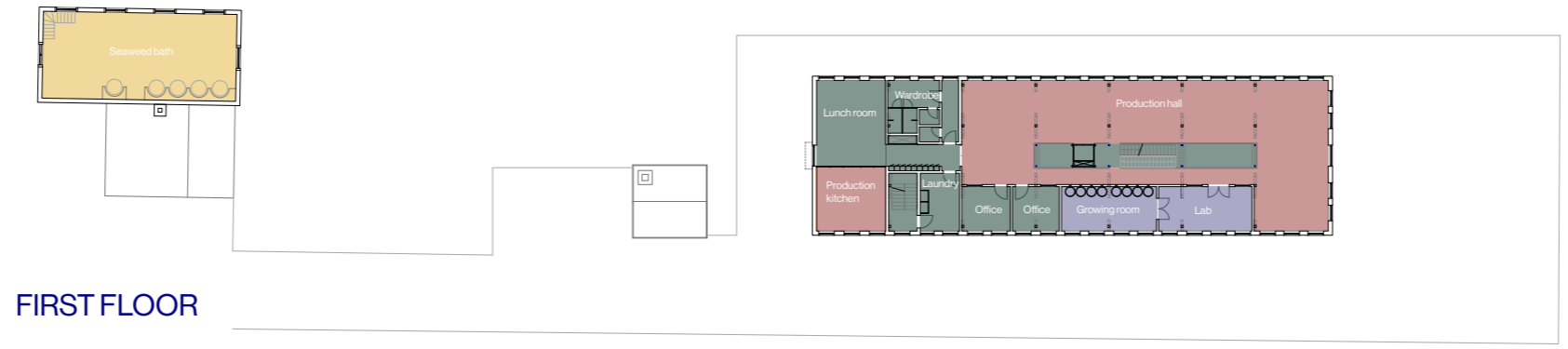
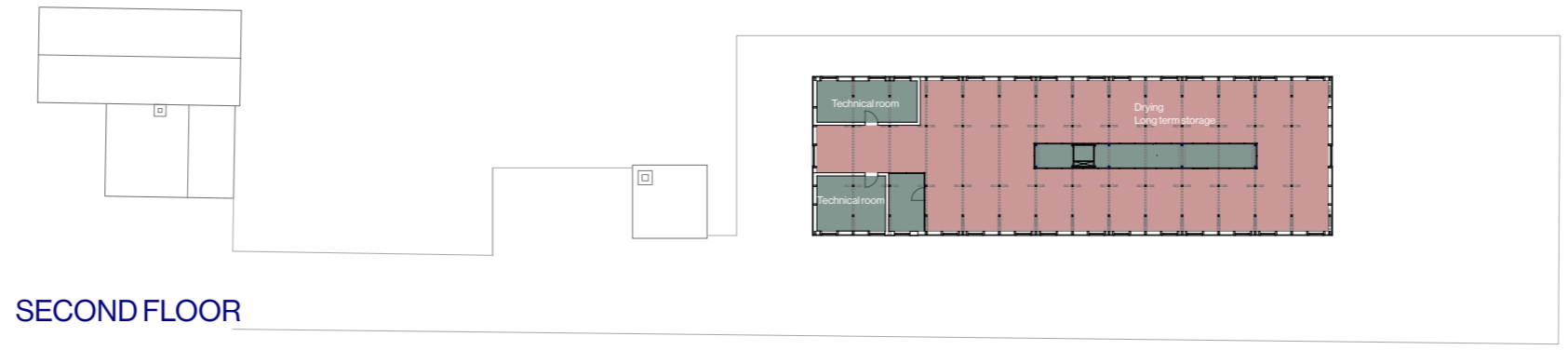
## SEAWEED

Grow in lab Grow sporophytes	Salt water treatment	Reception of crop Mooring space	Rinsing Bulk dripping	Packing Freezing Sorting Cutting Quality control	Freezer storage	Cold storage	Smoking	Production kitchen	Drying Long term storage	Cut-off processing	Equipment storage	Workshop	Technical rooms	Circulation	Office	Wardrobe	Lunch room	Seaweed bath	Storage	Packing/Sale
45 m <sup>2</sup> 21 °C	30 m <sup>2</sup> 15 °C	350 m <sup>2</sup> Unclimatized	30 m <sup>2</sup> 15 °C	450 m <sup>2</sup> 15 °C	10 m <sup>2</sup> -24 °C	9,5 m <sup>2</sup> 3 °C	20 m <sup>2</sup> 30 °C	23 m <sup>2</sup> 19 °C	350 m <sup>2</sup> Unclimatized	40 m <sup>2</sup> 15 °C	100 m <sup>2</sup> 15 °C	25 m <sup>2</sup> 15 °C	40 m <sup>2</sup> 15 °C	110 m <sup>2</sup> 19 °C	20 m <sup>2</sup> 19 °C	20 m <sup>2</sup> 19 °C	30 m <sup>2</sup> 19 °C	55 m <sup>2</sup> 15 °C	55 m <sup>2</sup> 15 °C	85 m <sup>2</sup> 15 °C

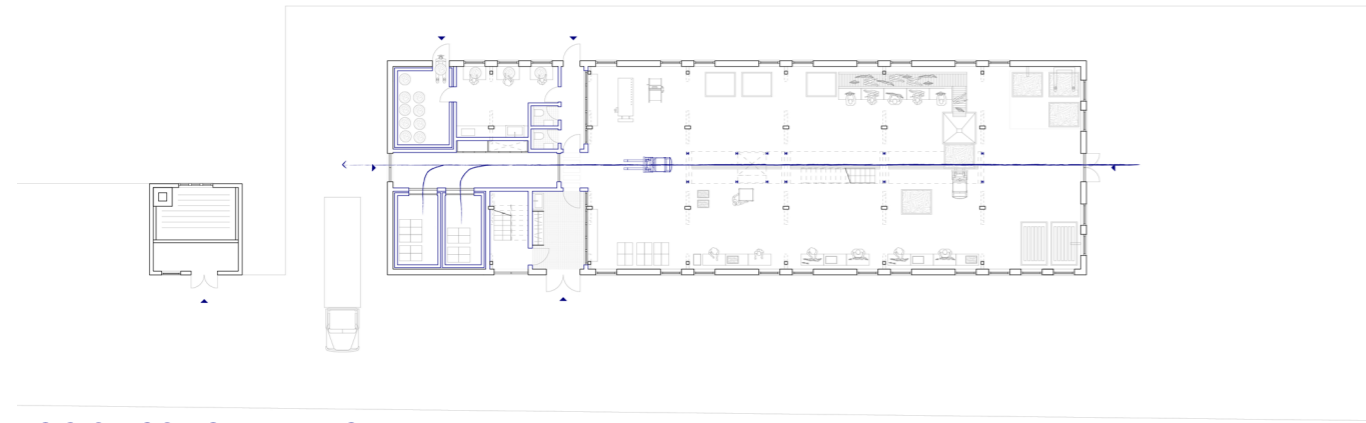
# AREA DISTRIBUTION

CHAPTER 6

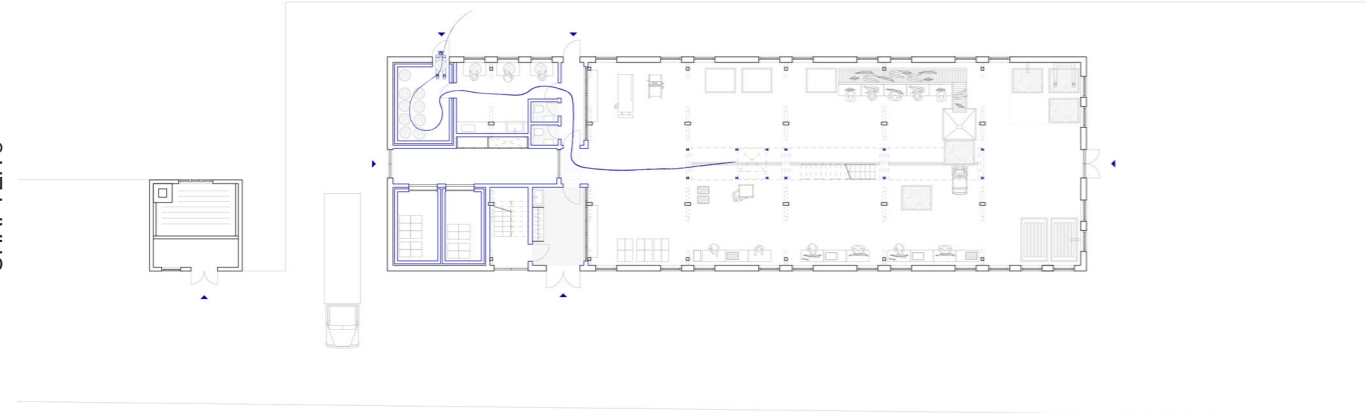
FANGST



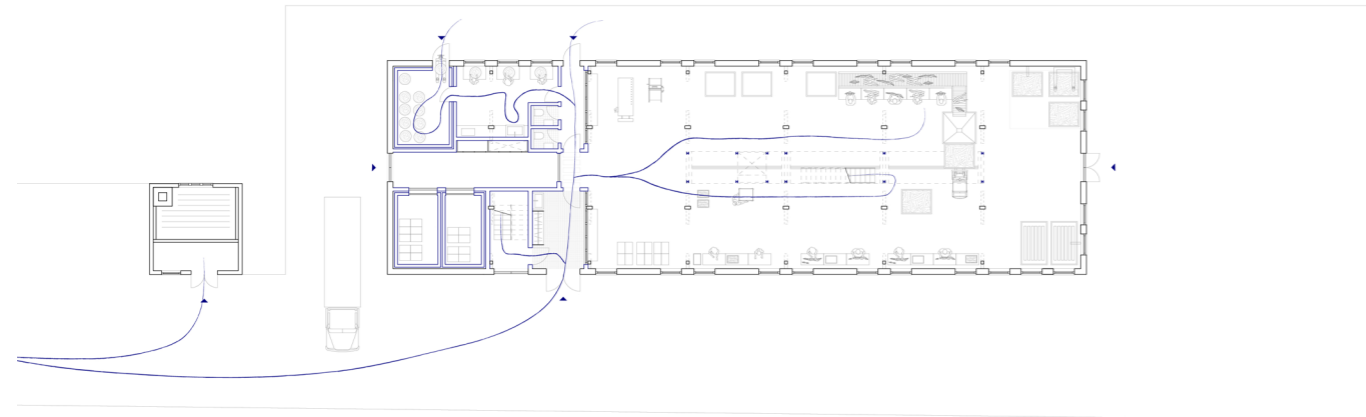
# DIAGRAM LOGISTICS



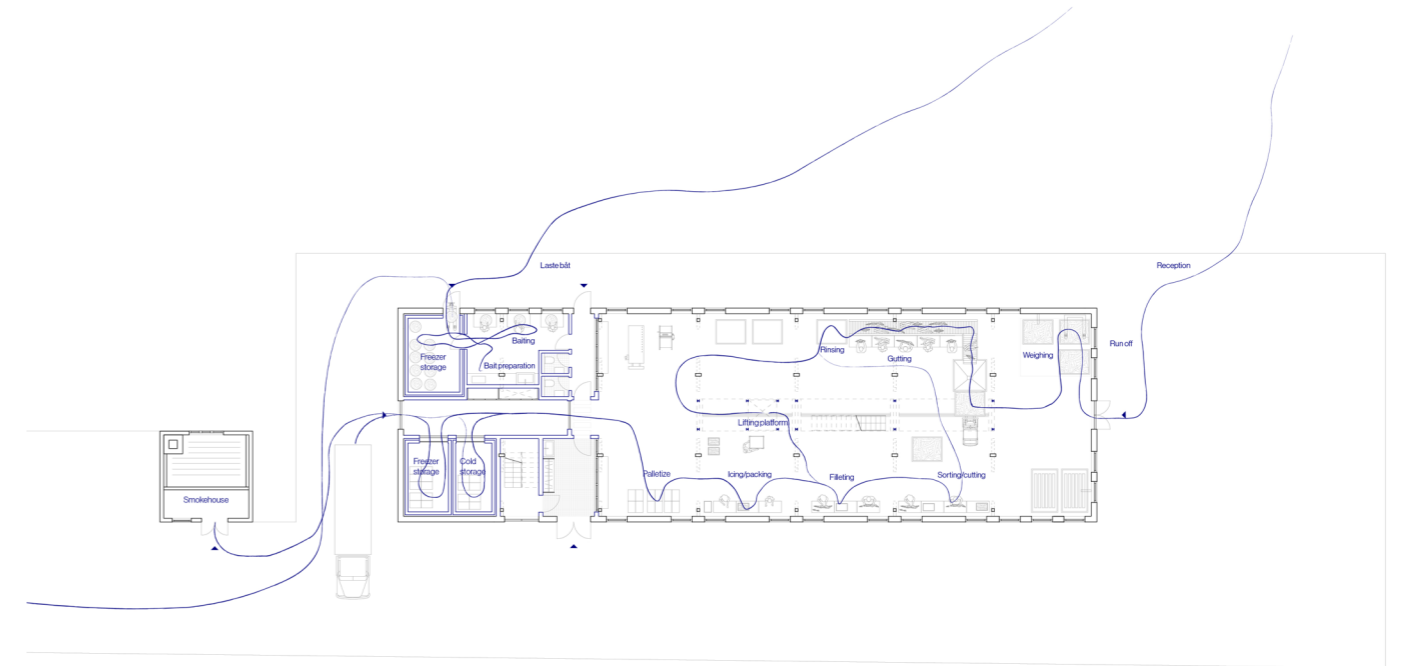
LOGISTICS FORK TRUCK



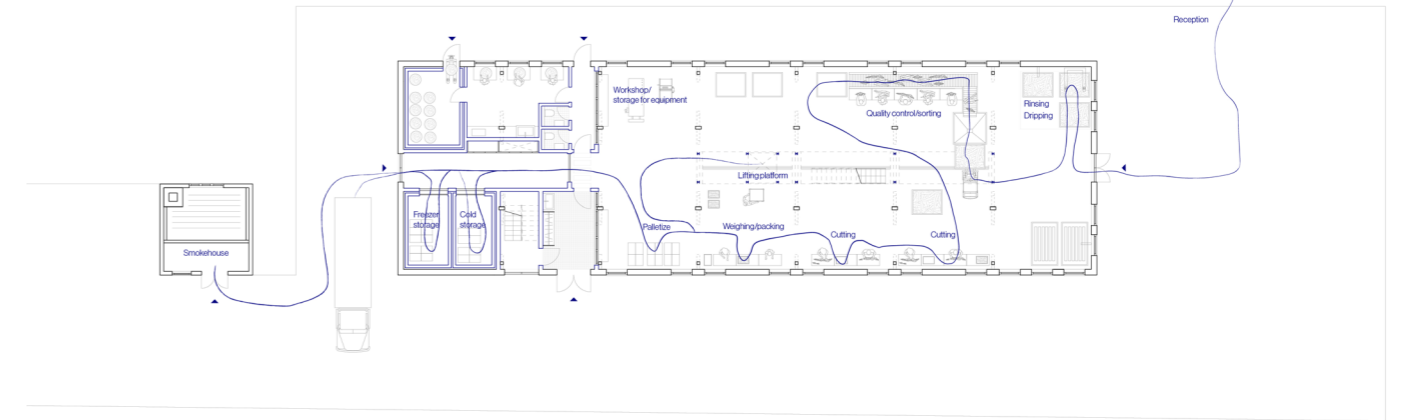
LOGISTICS JACK TROLLEY



LOGISTICS PEOPLE



LOGISTICS FISH SEASON

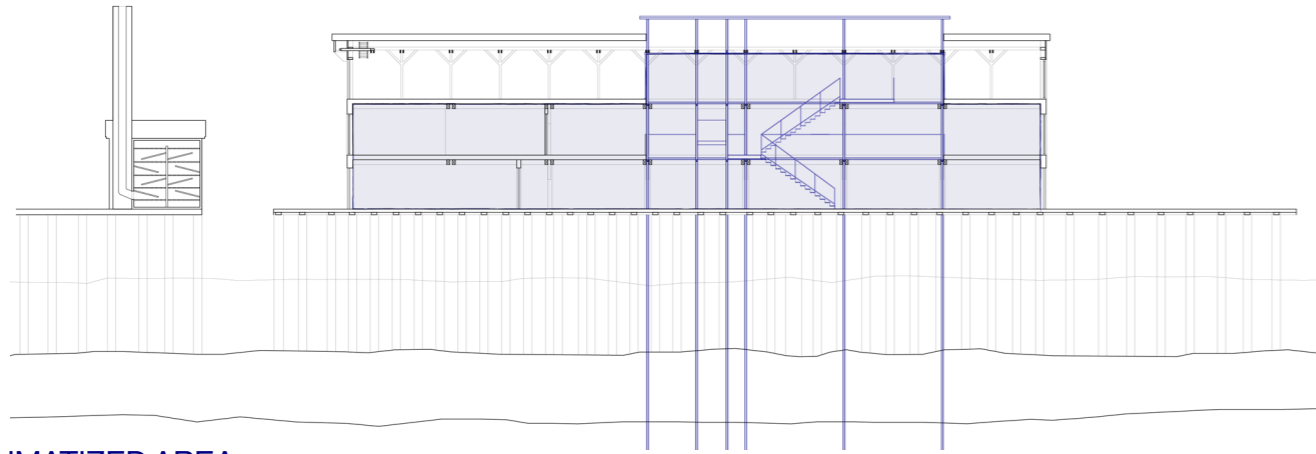


LOGISTICS SEAWEED SEASON

CHAPTER 6

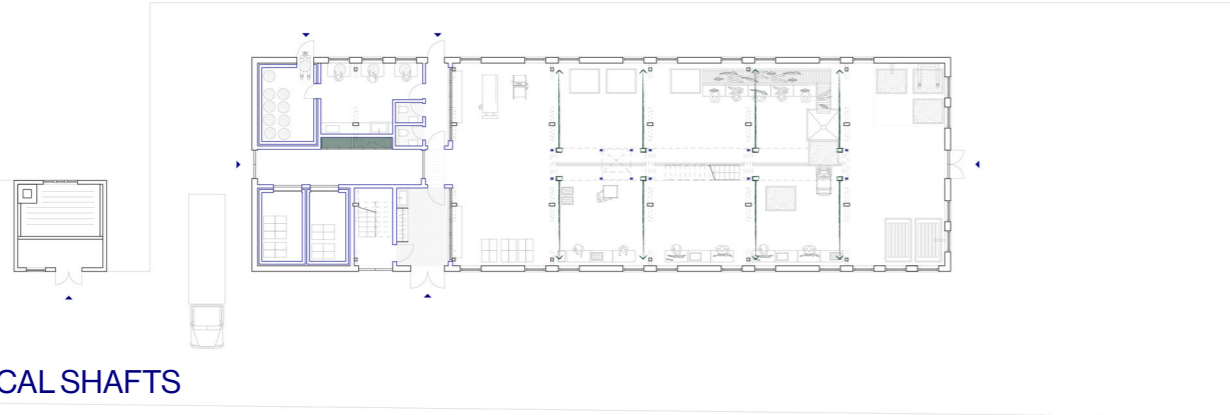
FANGST

# DIAGRAM TECHNICAL

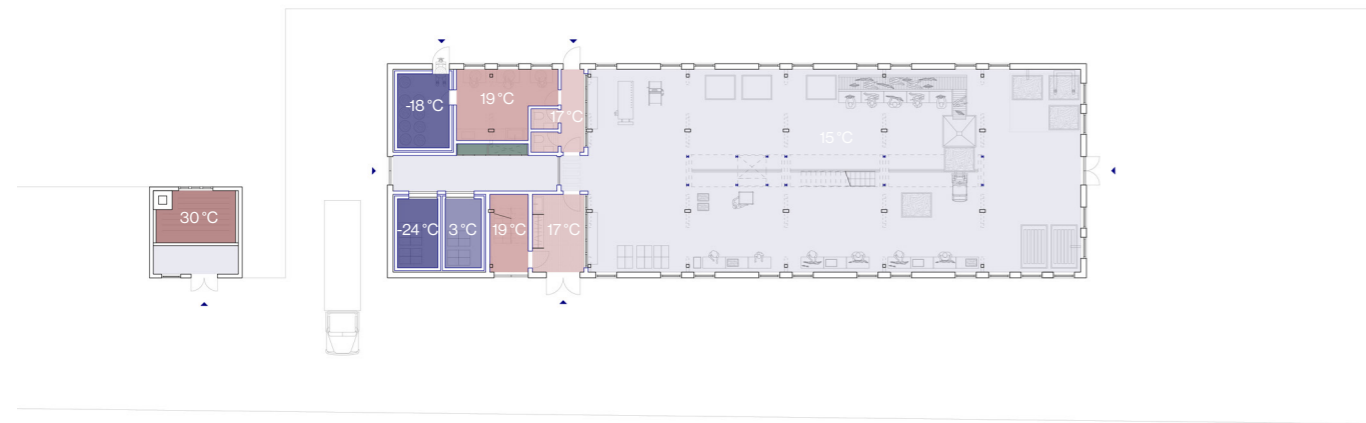


CLIMATIZED AREA

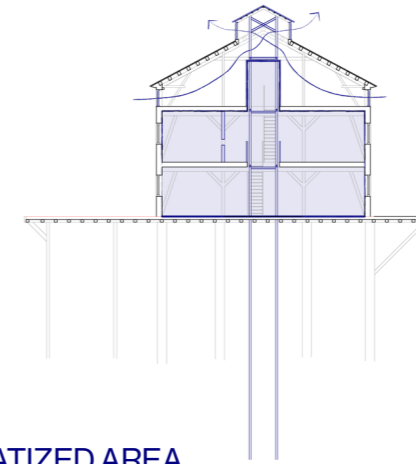
CHAPTER 6



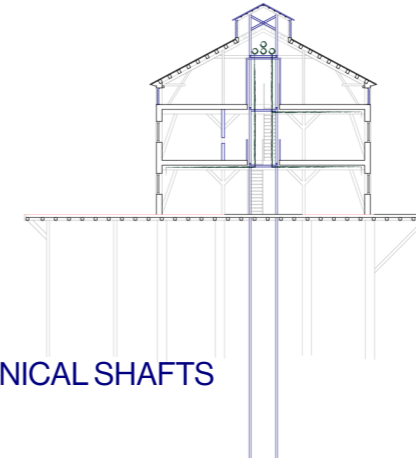
TECHNICAL SHAFTS



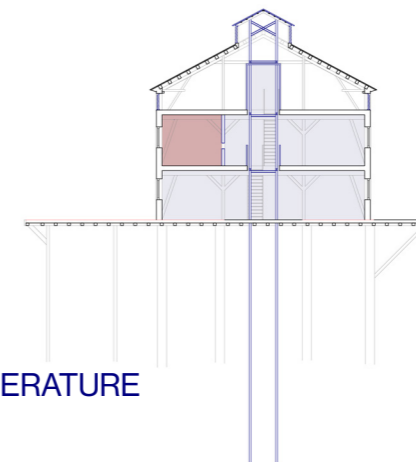
TEMPERATURE



CLIMATIZED AREA



TECHNICAL SHAFTS

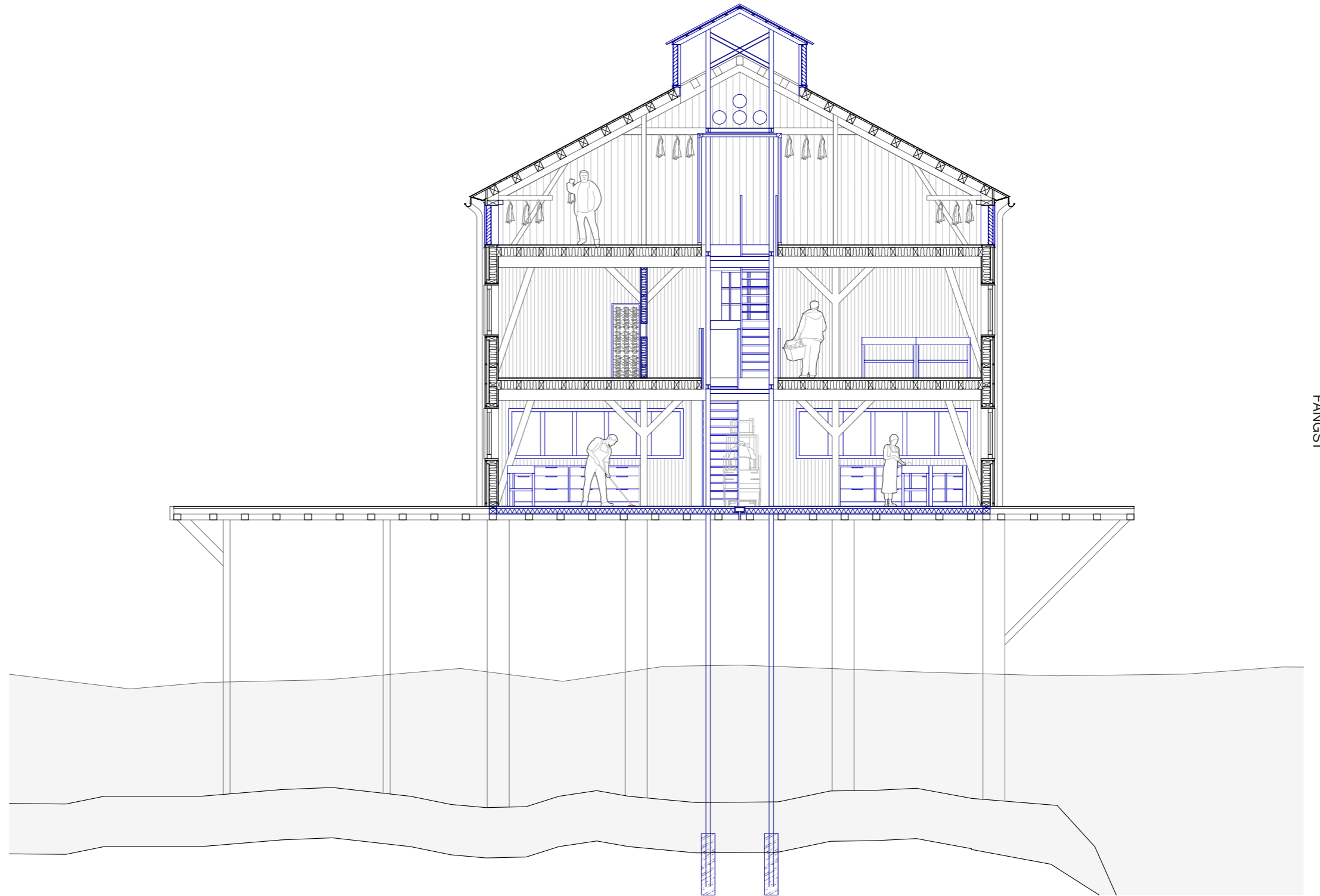


TEMPERATURE

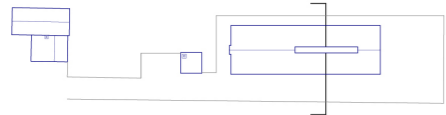
FANGST

# CROSS SECTION

CHAPTER 6



FANGST

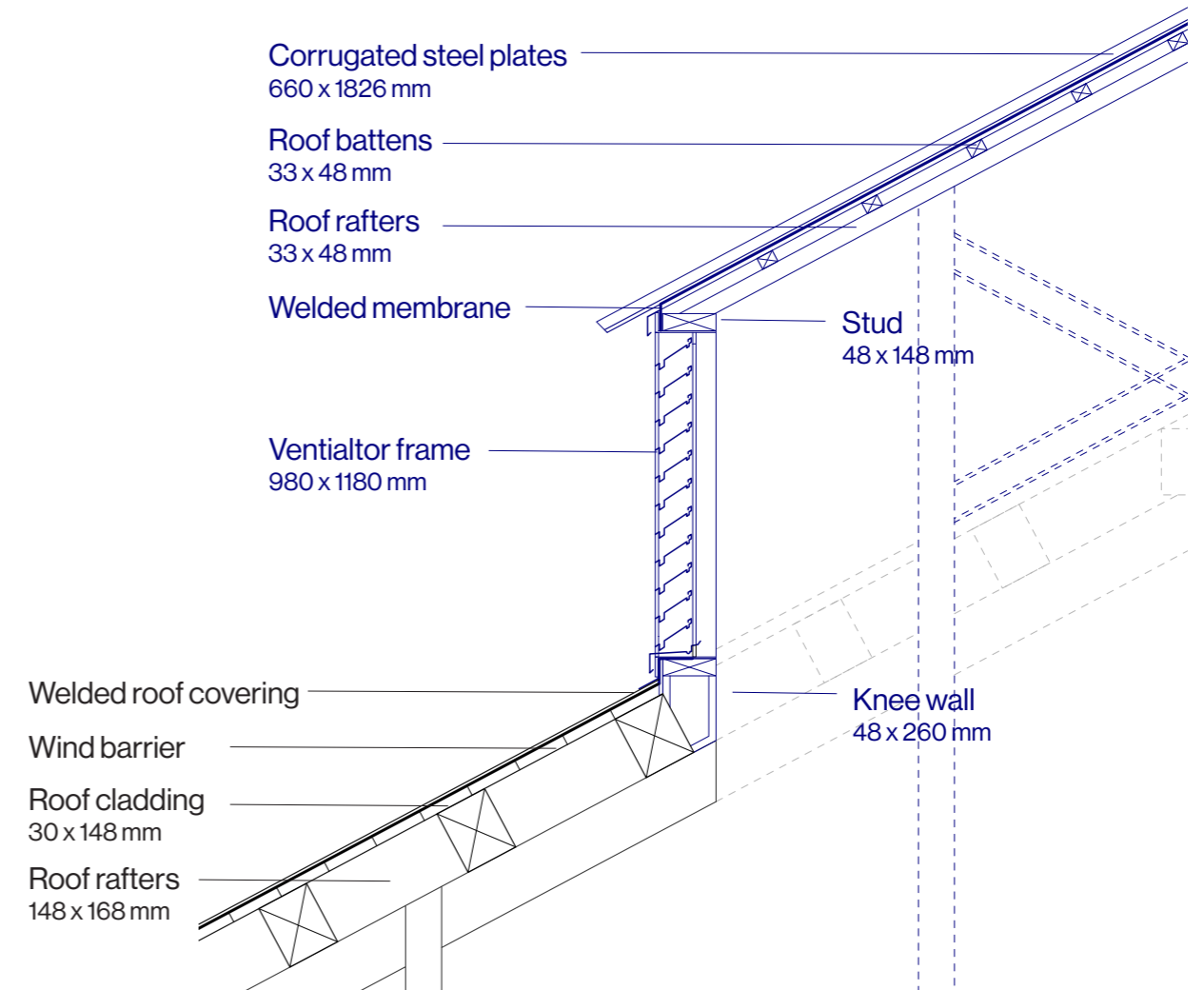
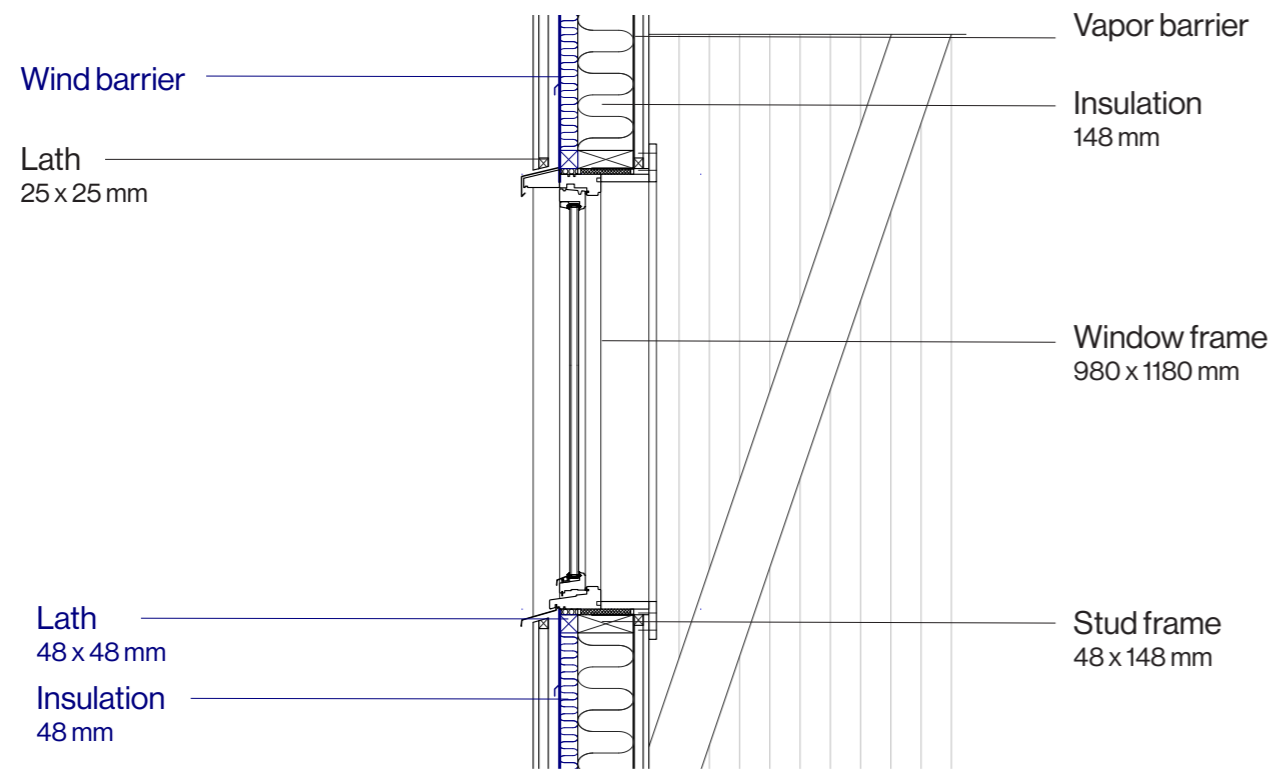


Scale 1:00



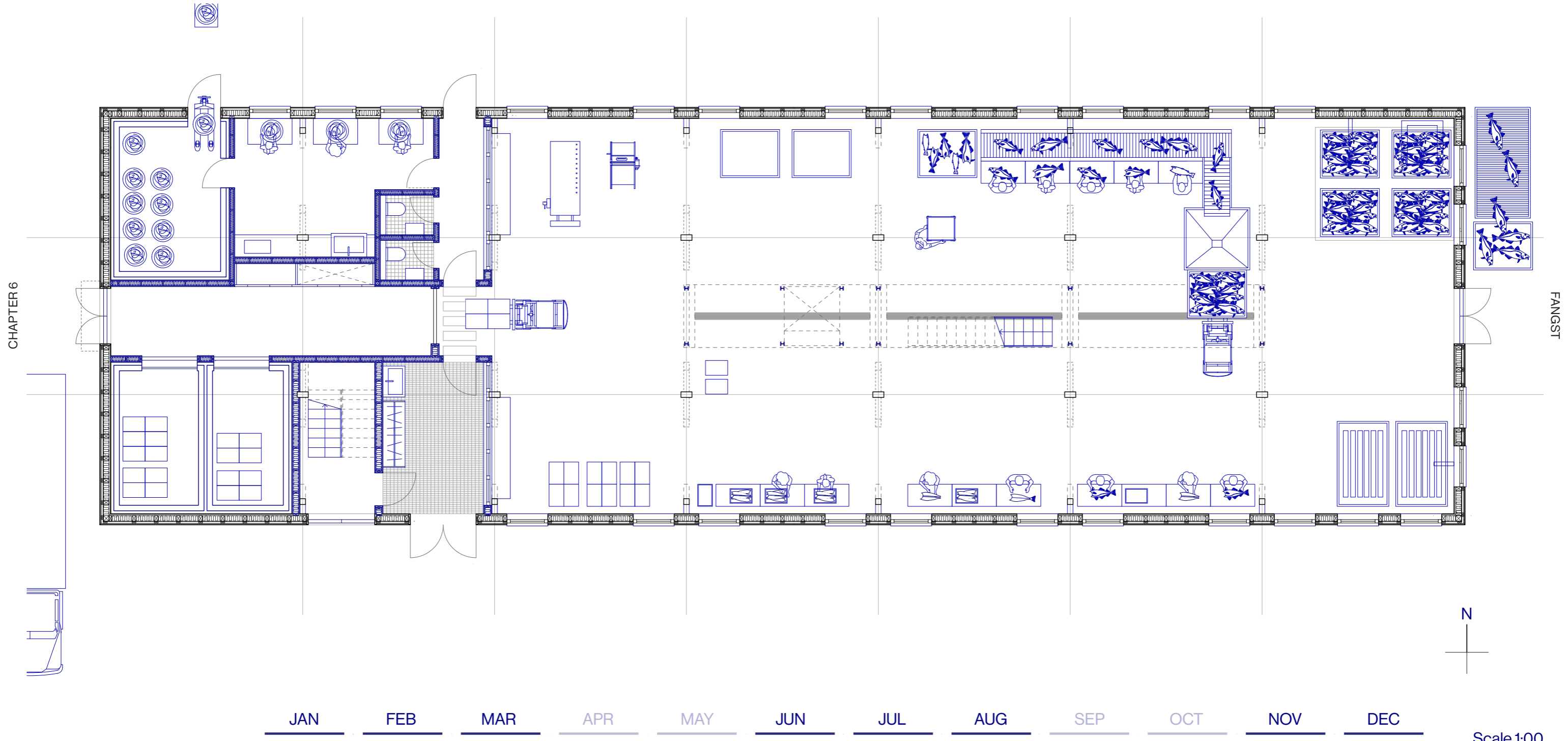
# DETAIL CONNECTIONS

CHAPTER 6



FANGST

# GROUND FLOOR PLAN FISH SEASON



CHAPTER 6

FANGST

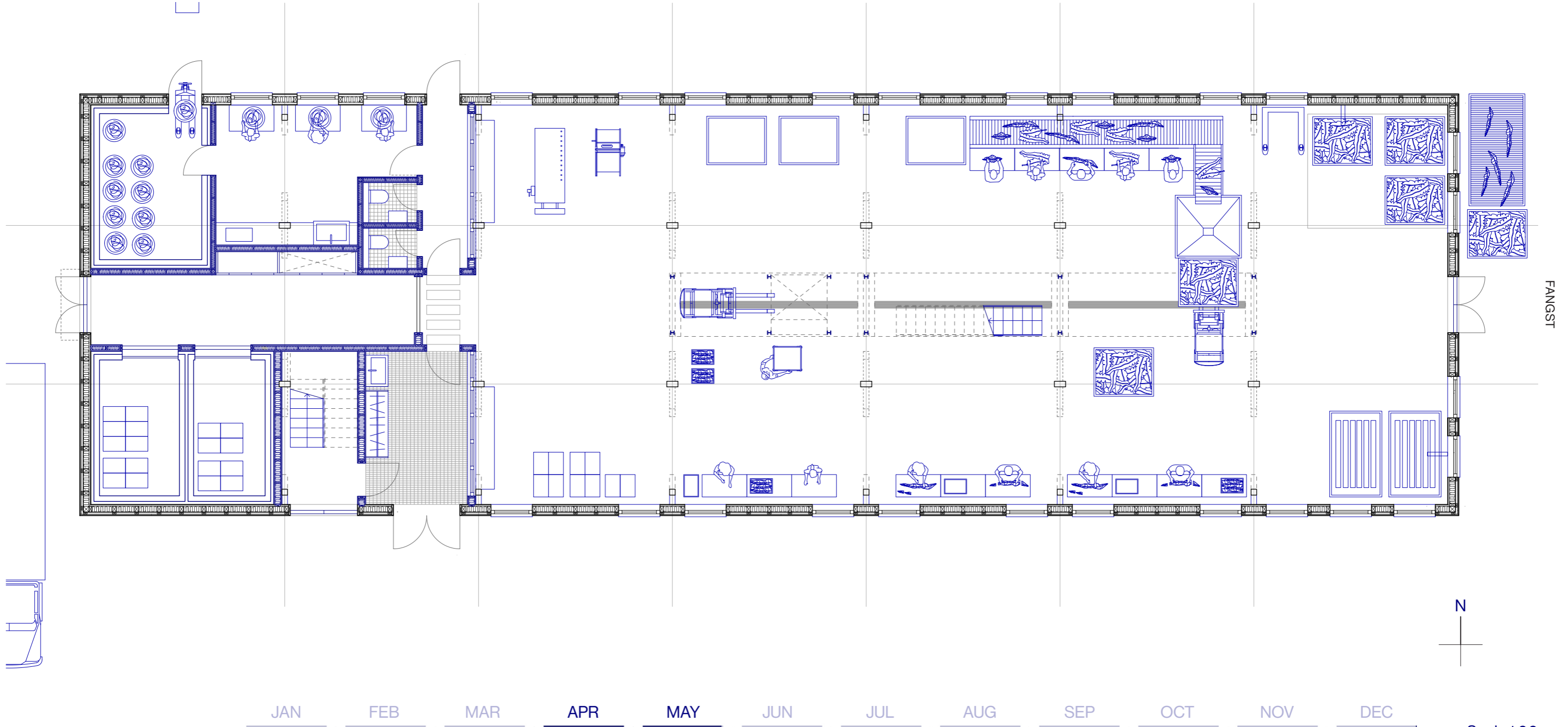
JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC



Scale 1:00

# GROUND FLOOR PLAN SEAWEED SEASON

CHAPTER 6



FANGST



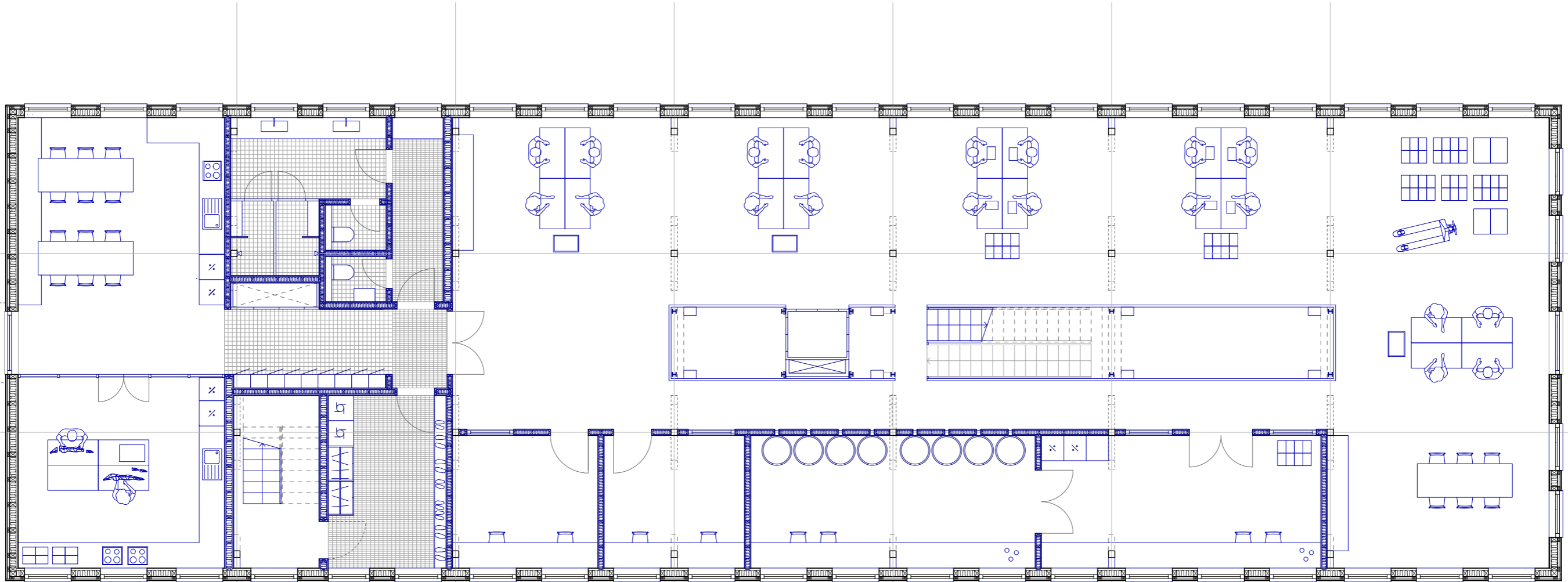
Scale 1:00

**MODEL PHOTO  
PROCESSING HALL**



# FIRST FLOOR PLAN

CHAPTER 6



FANGST

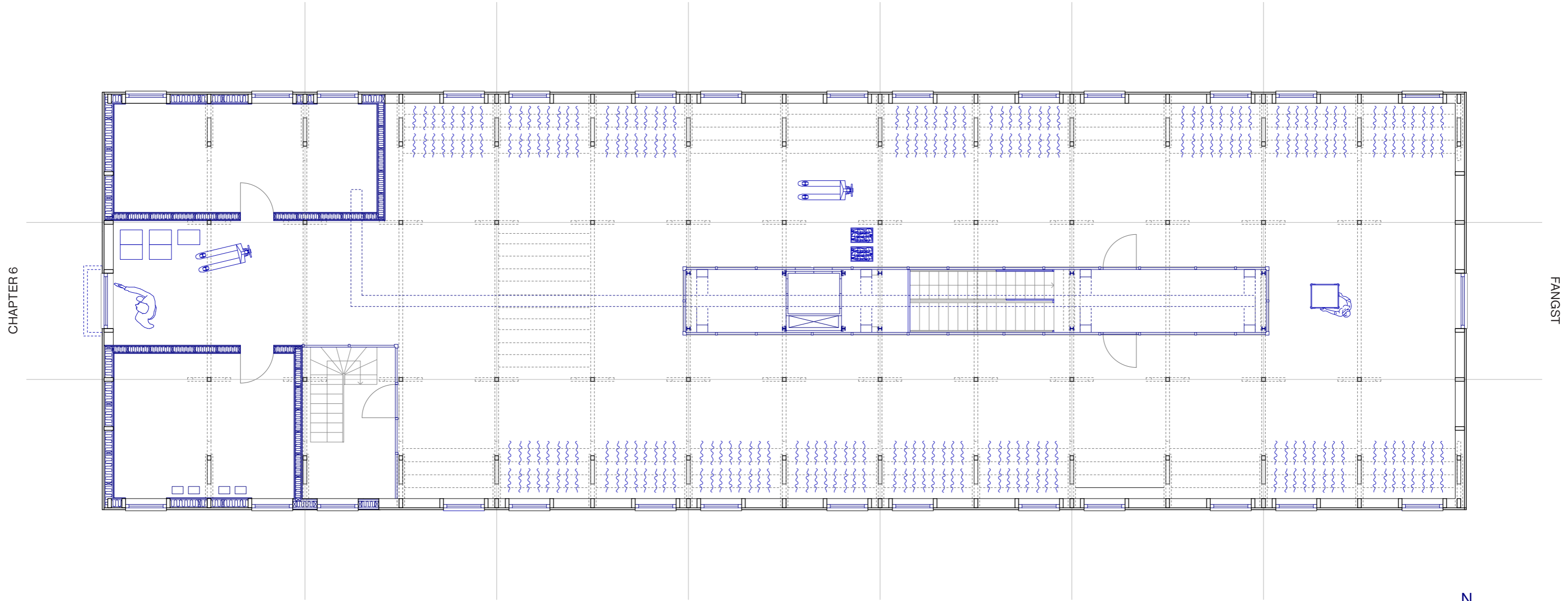


Scale 1:00

MODEL PHOTO  
PRODUCTION HALL



# SECOND FLOOR PLAN



CHAPTER 6

FANGST

N

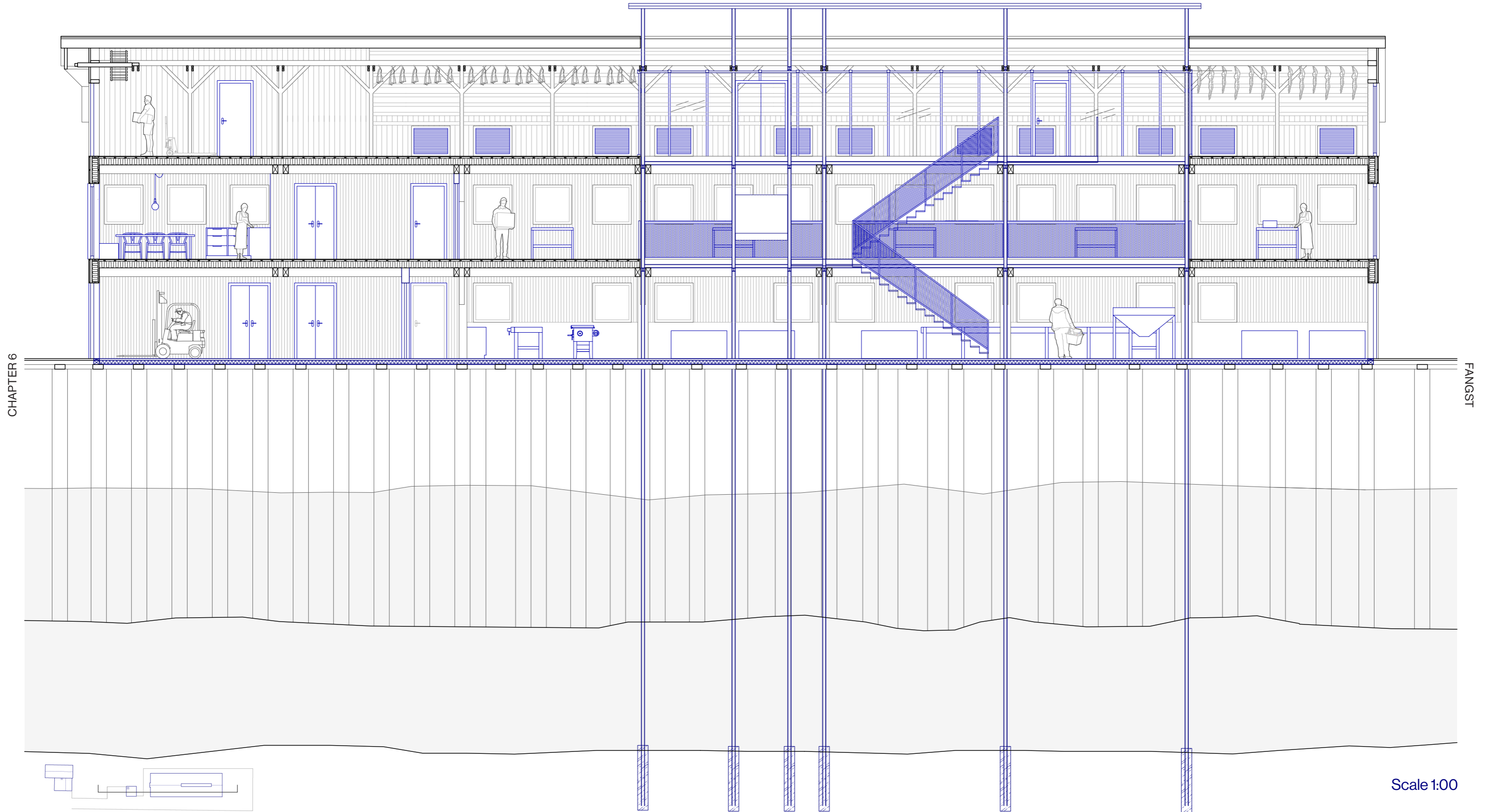
Scale 1:00

**MODEL PHOTO  
DRYING LOFT**





# LONGITUDINAL SECTION



CHAPTER 6

FANGST

Scale 1:00

# MODEL PHOTOS

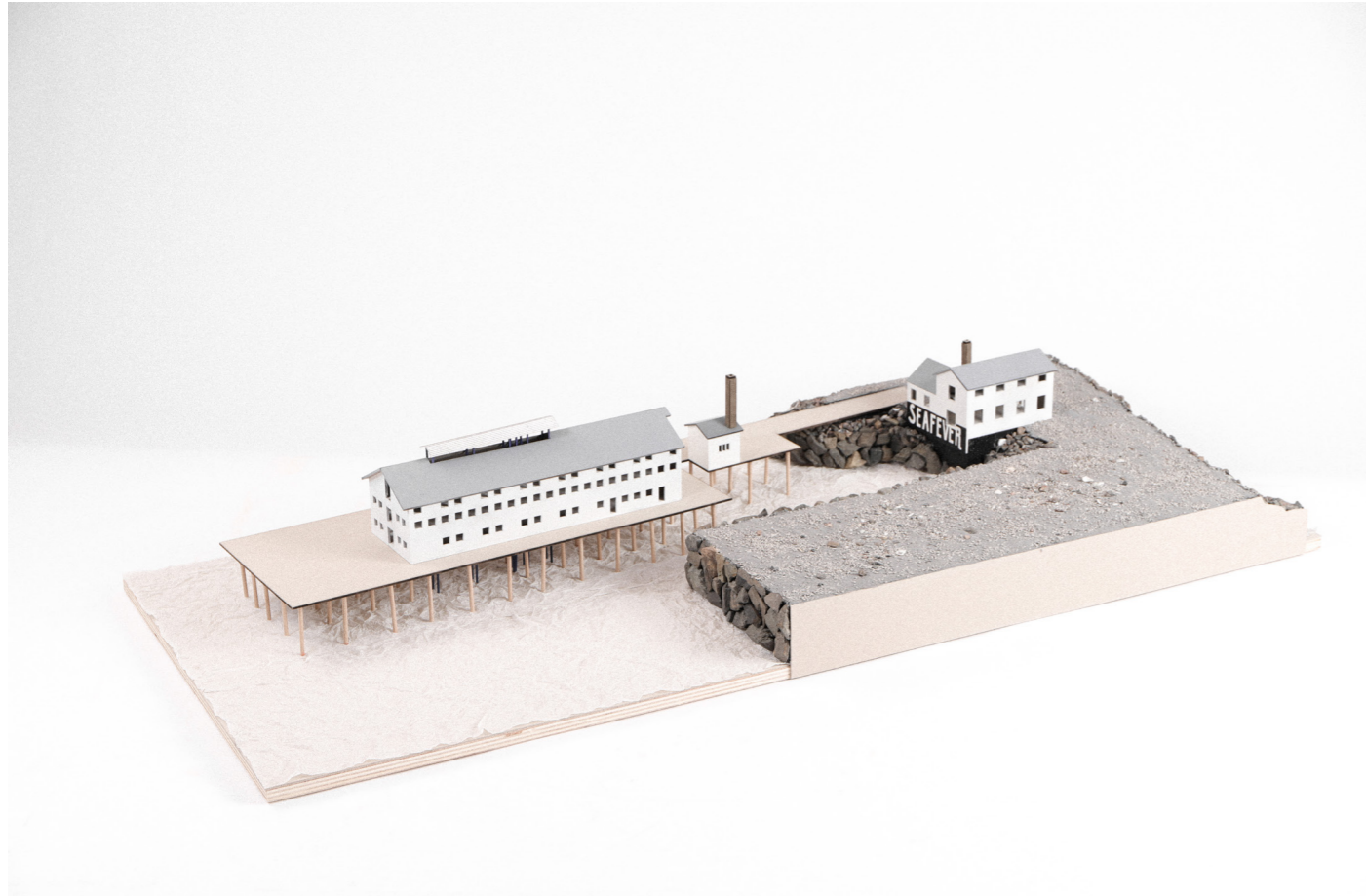
CHAPTER 6



FANGST

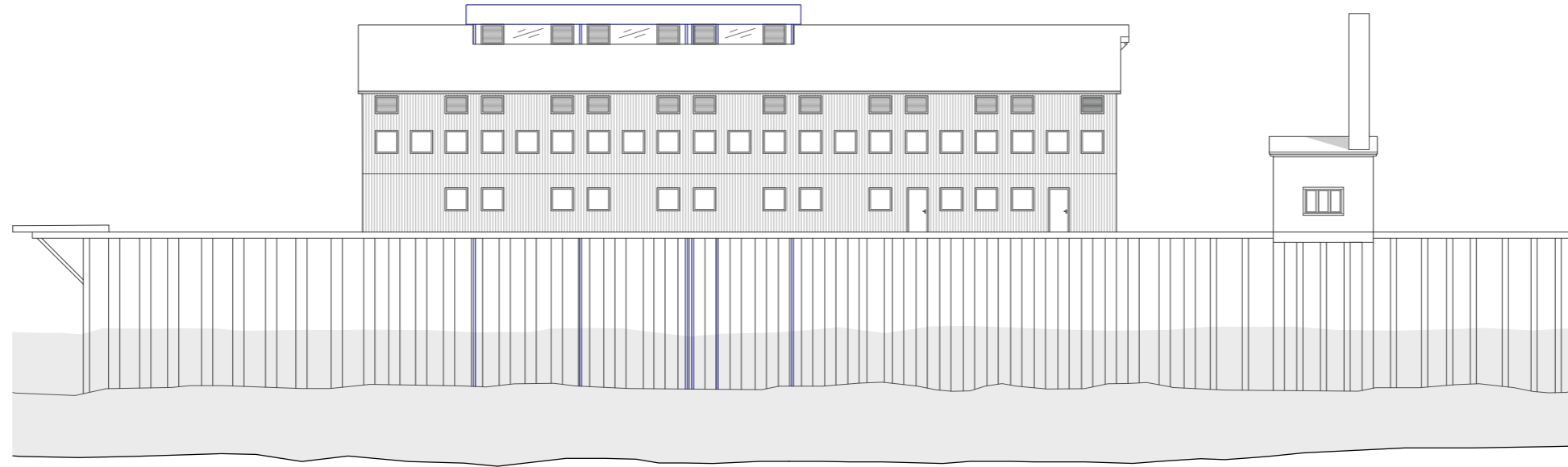
# MODEL PHOTOS

CHAPTER 6

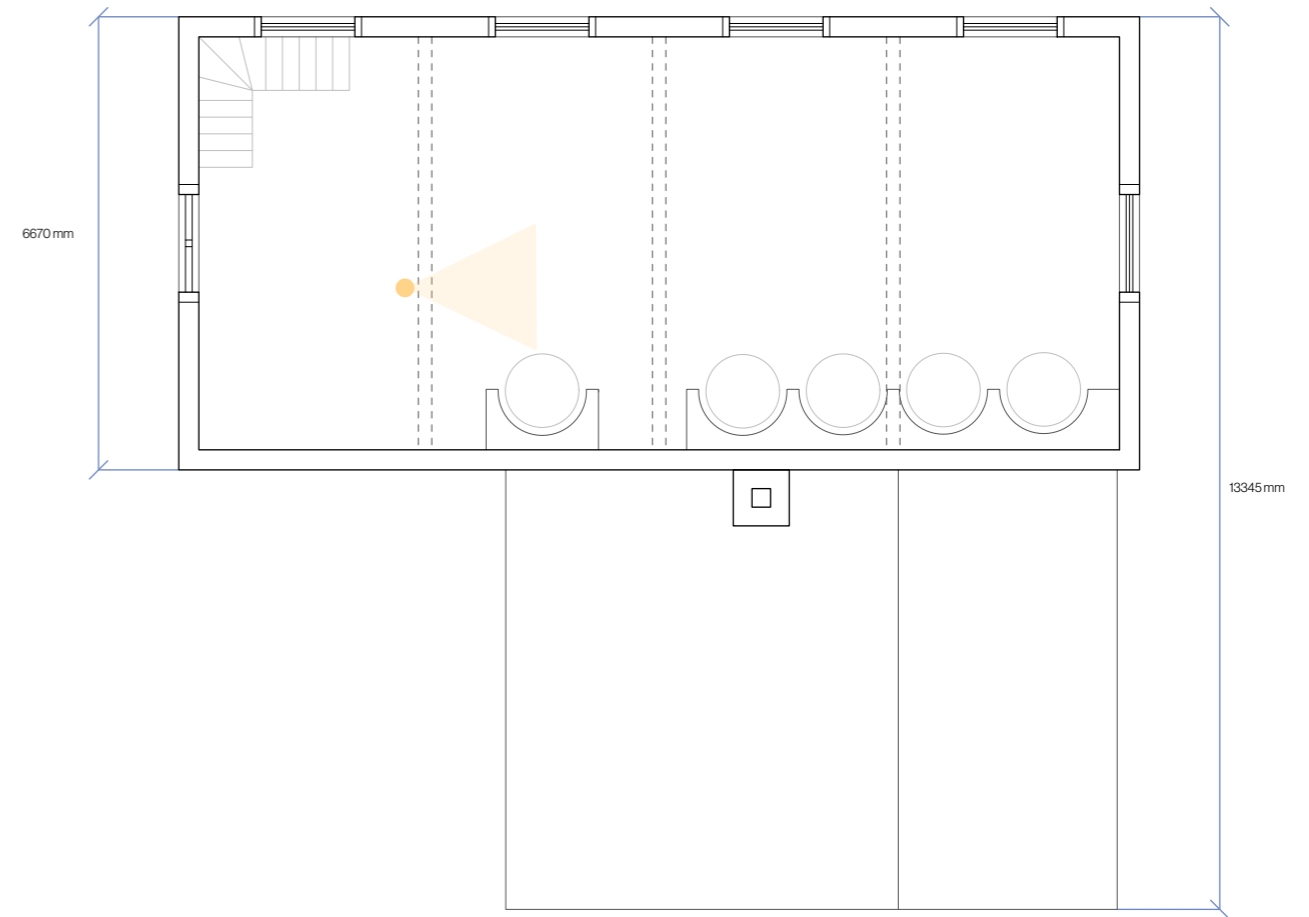
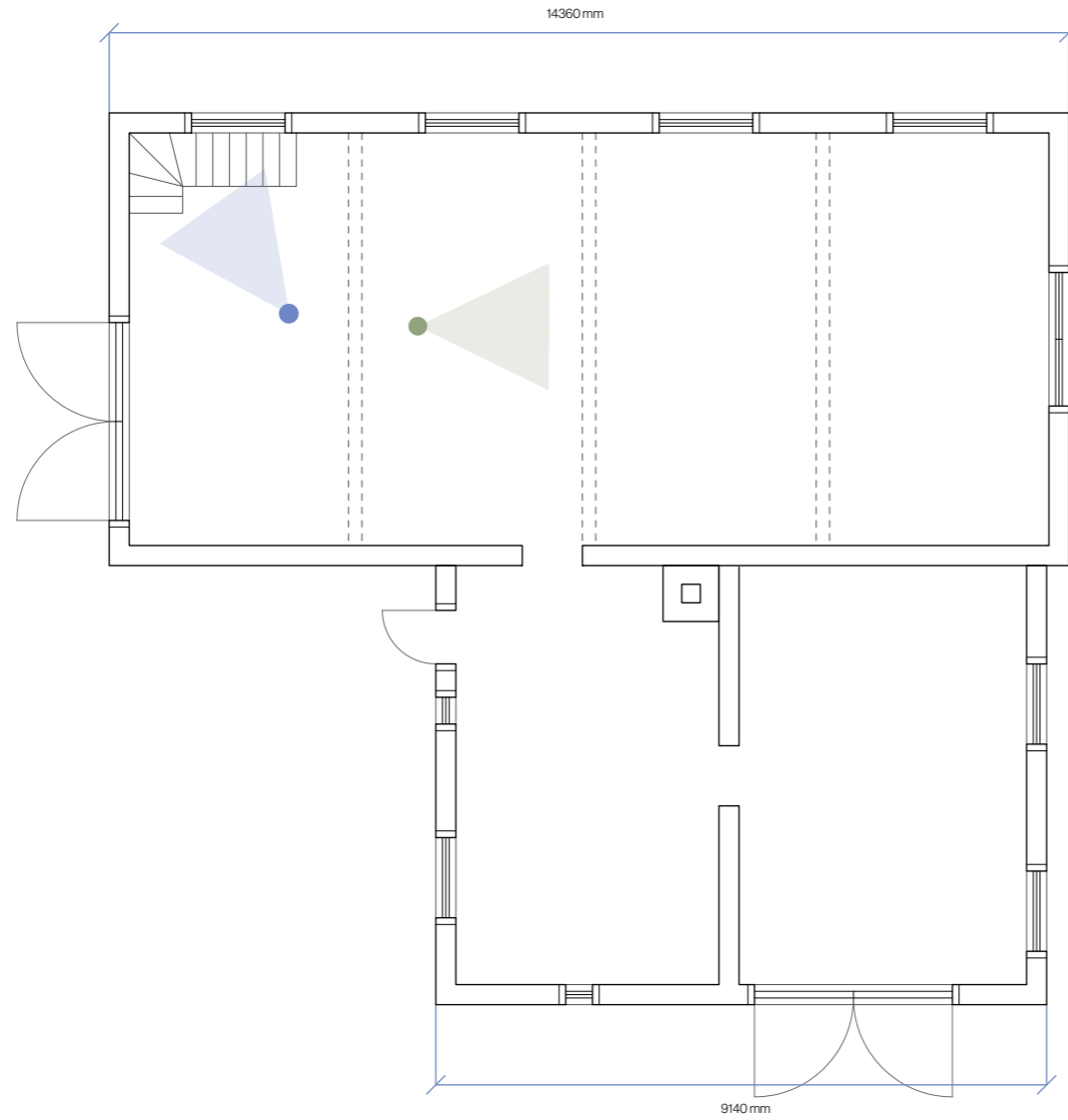


FANGST

# FACADE NORTH/SOUTH

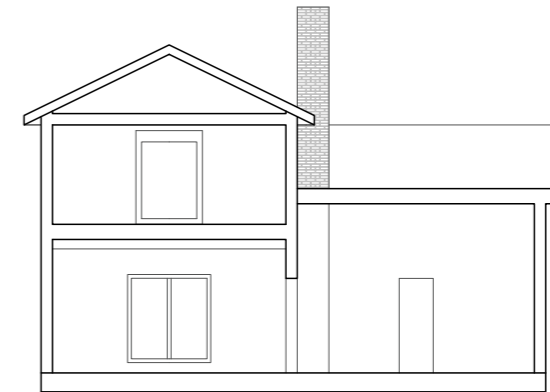


# SEA FEVER



# SEA FEVER

CHAPTER 6



FANGST

# SEAWEED BATH

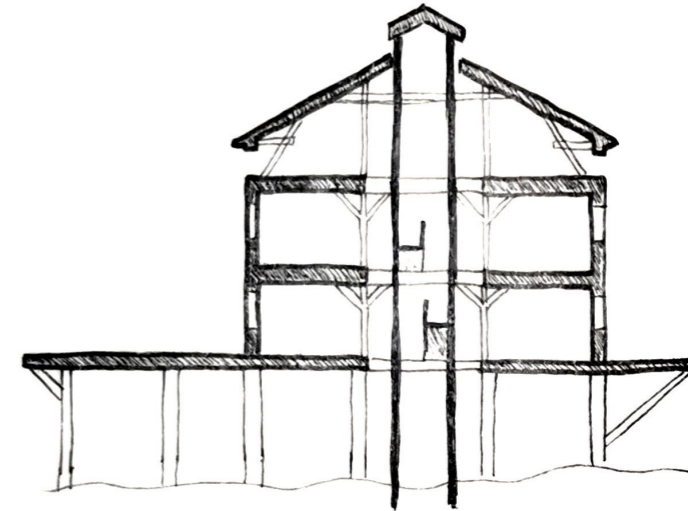
CHAPTER 6



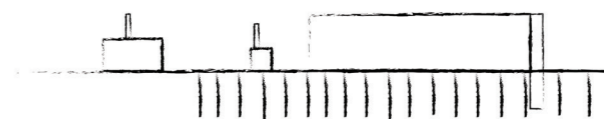
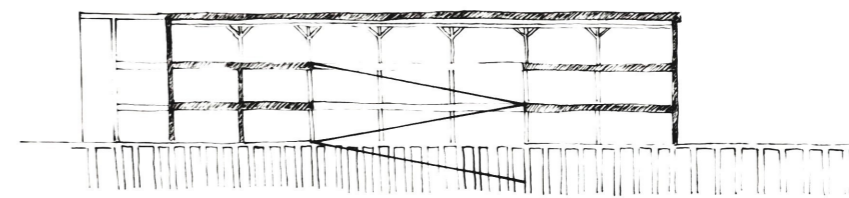
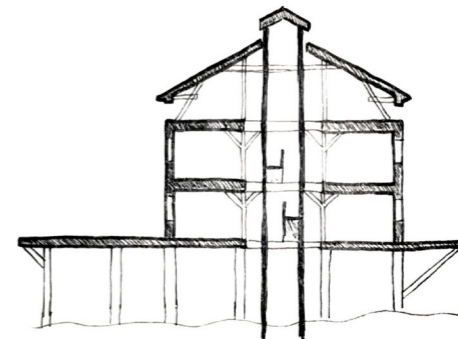
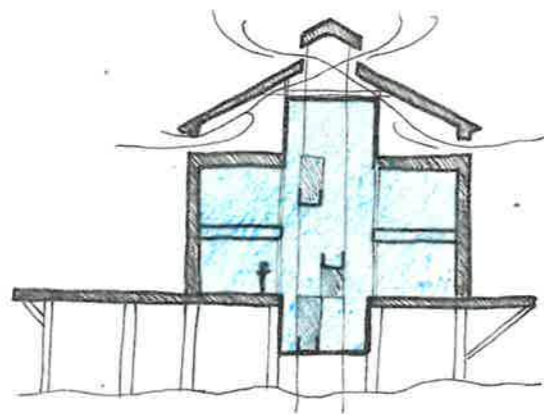
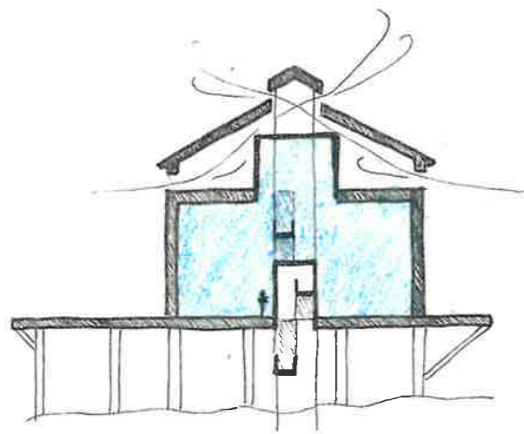
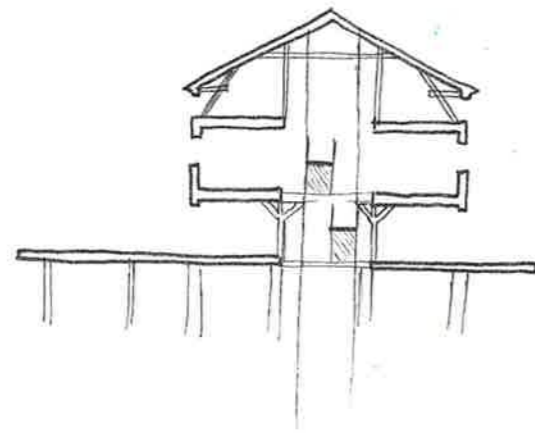
FANGST

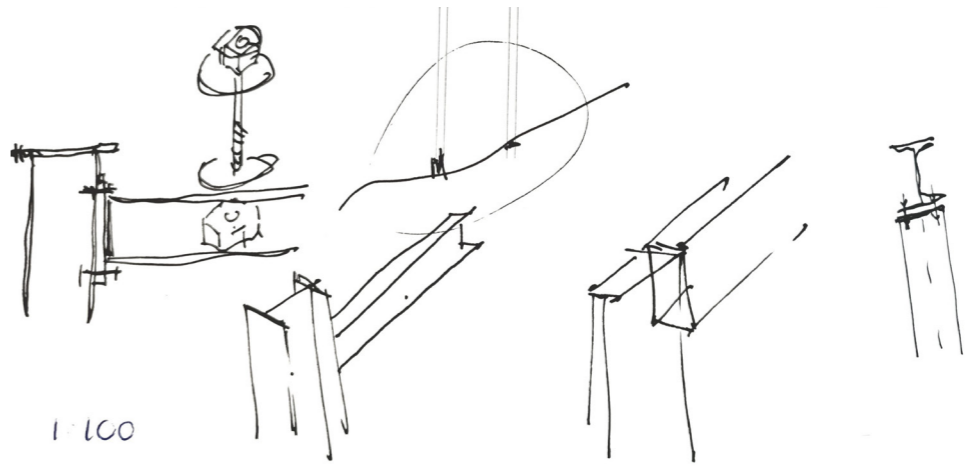
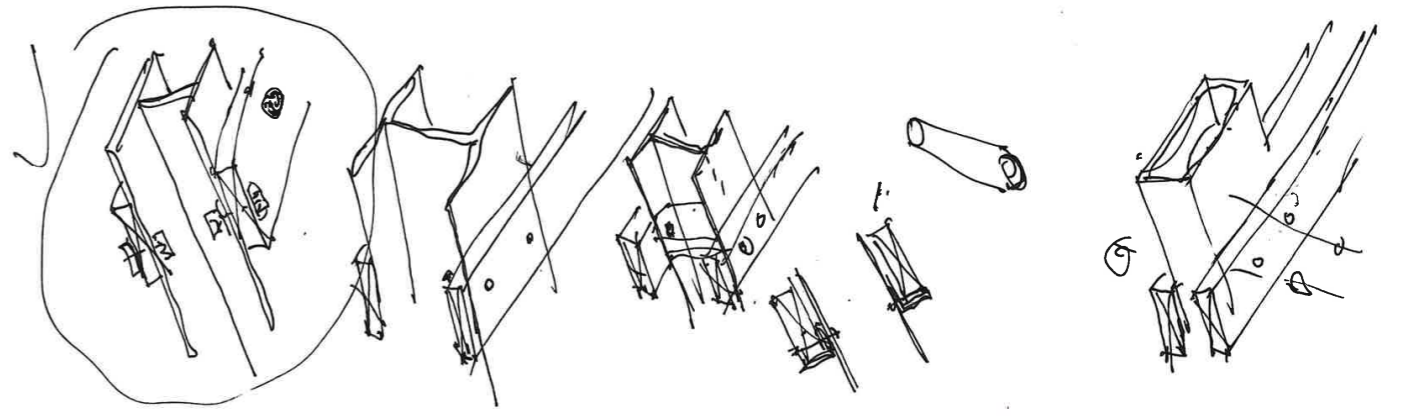
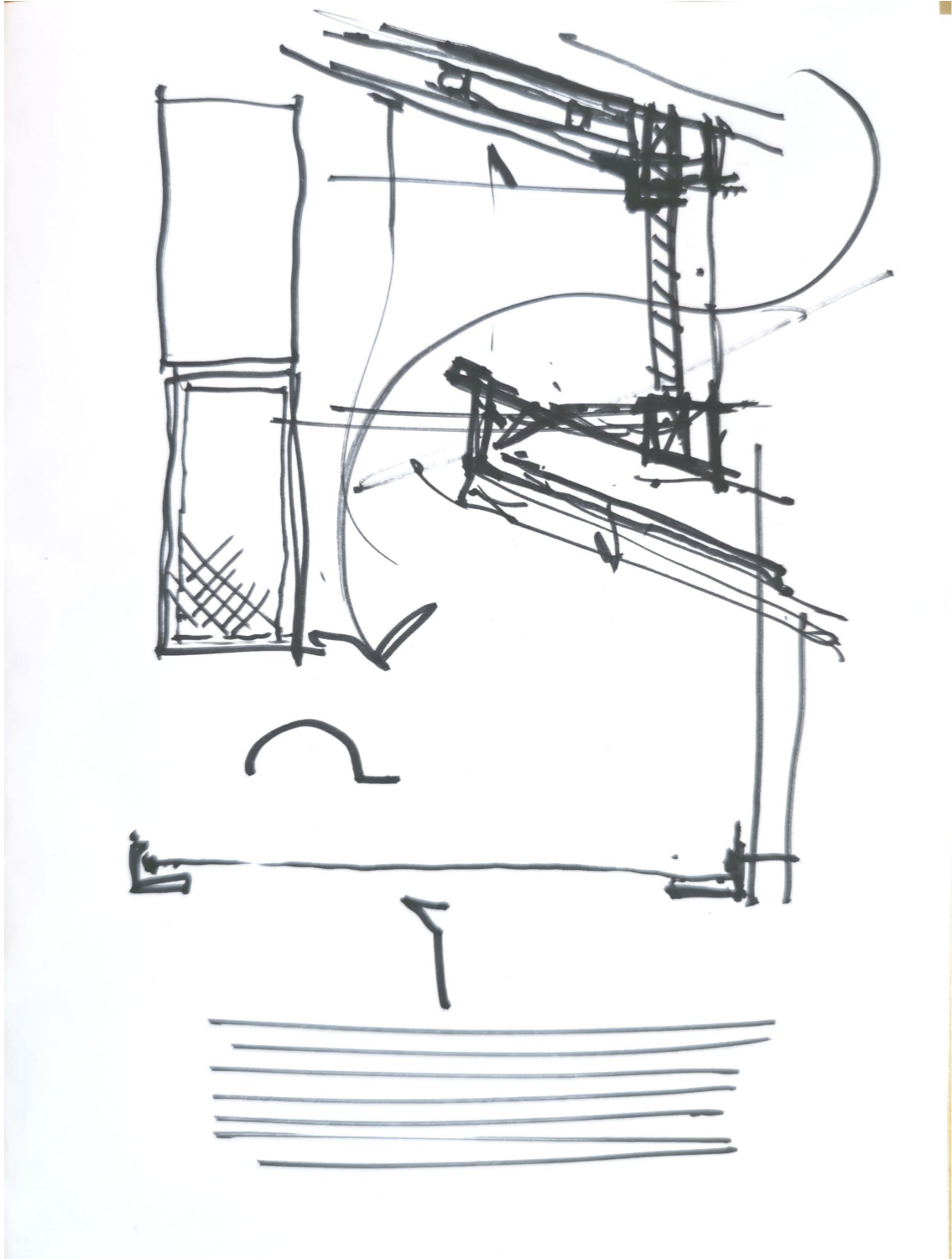
Chapter 7:

## PROCESS MATERIAL

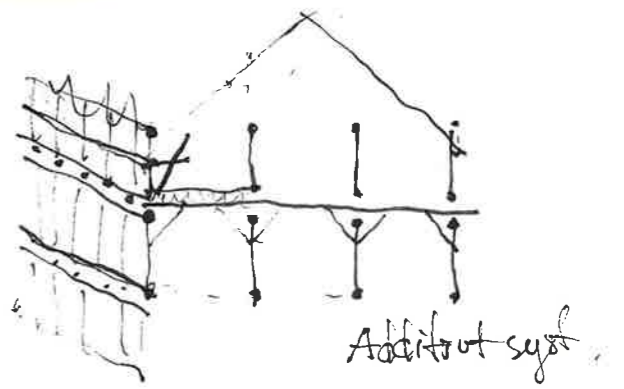


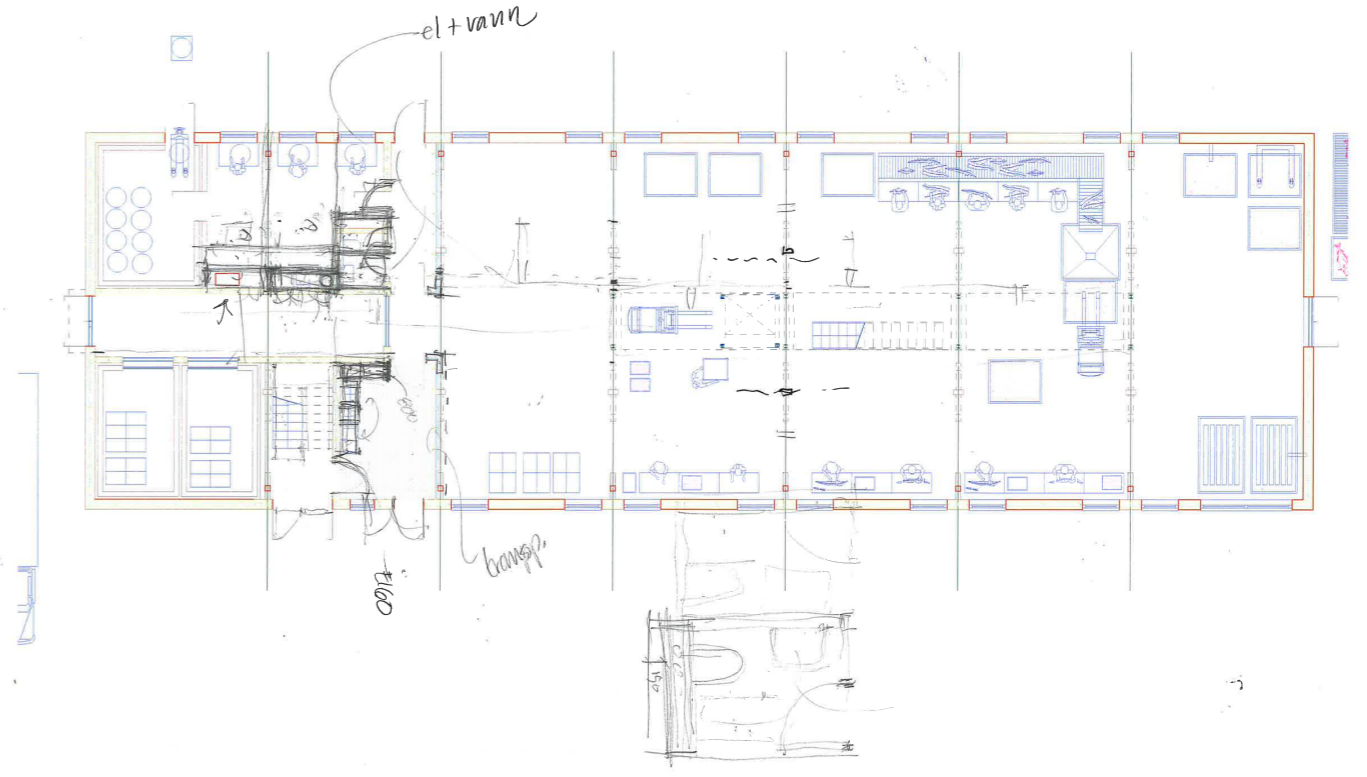
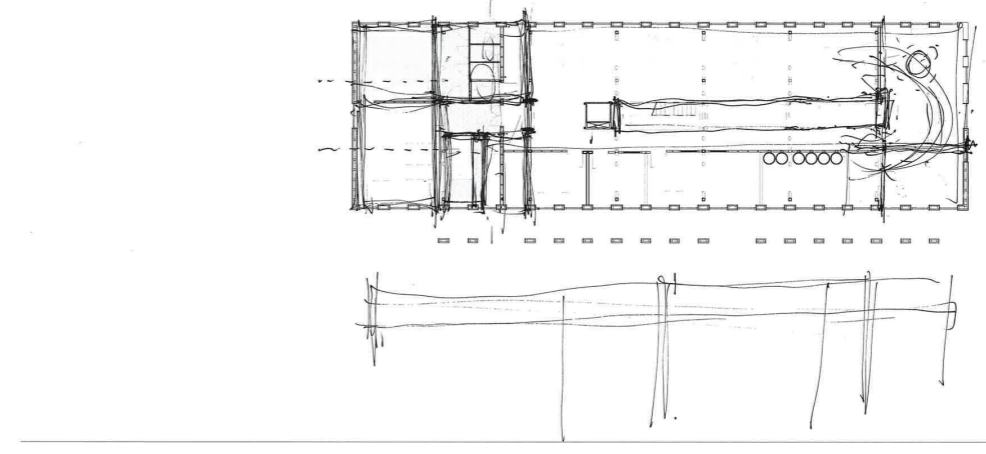
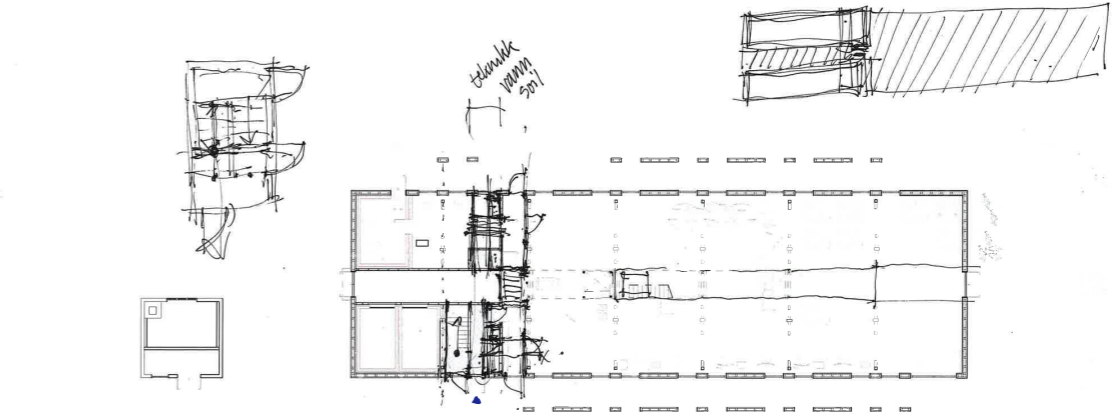
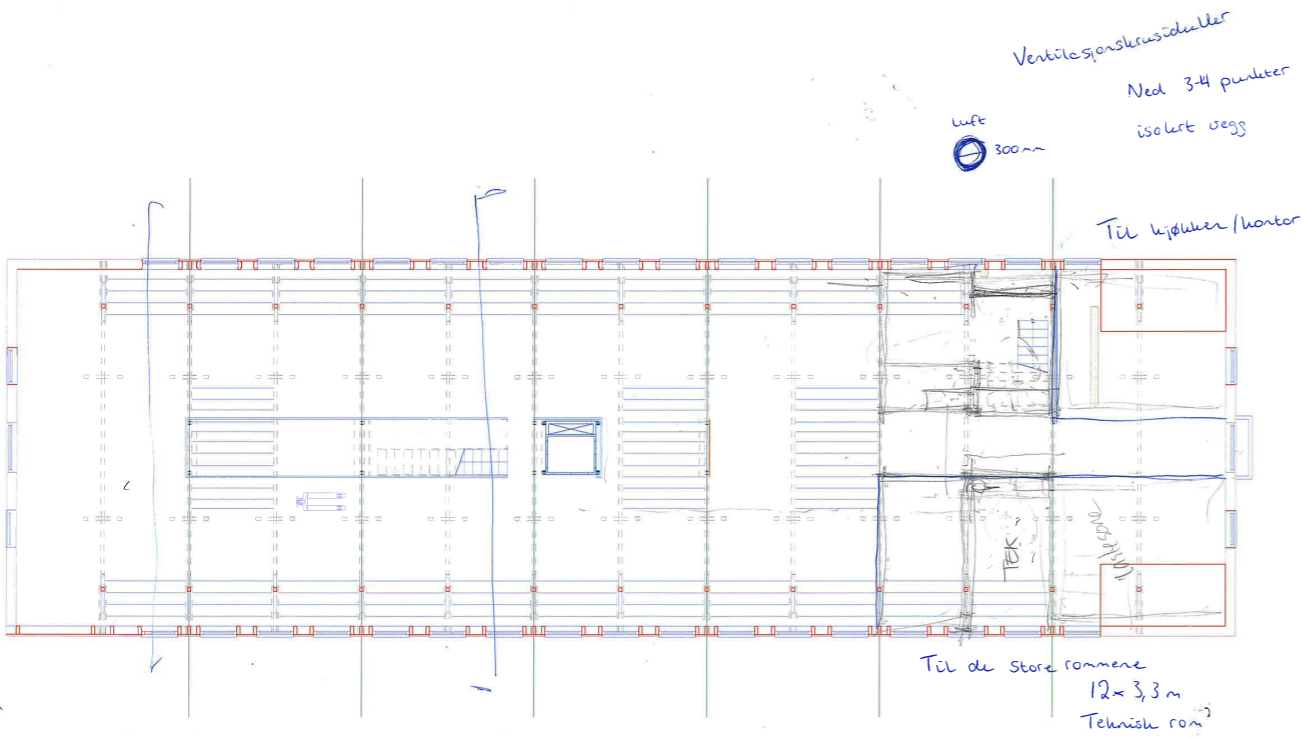
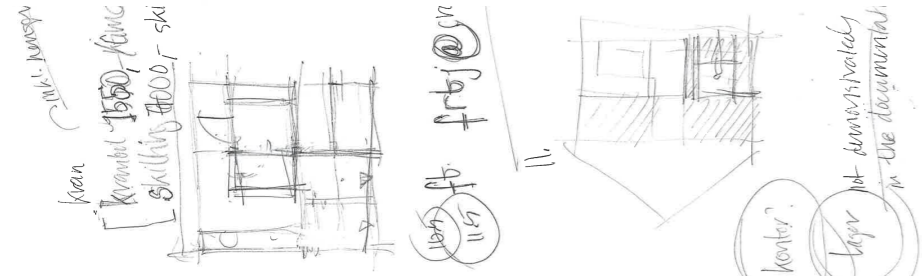
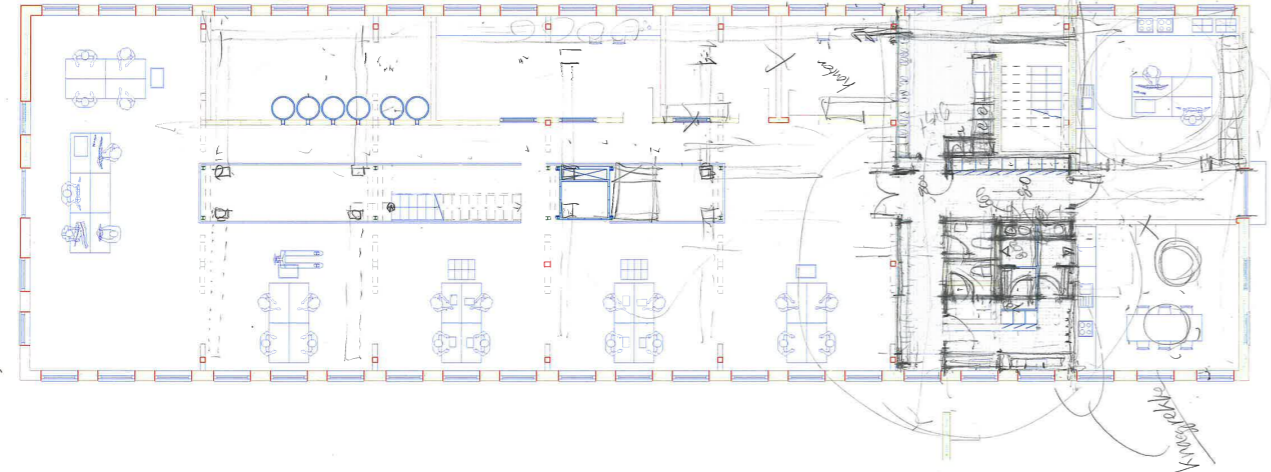


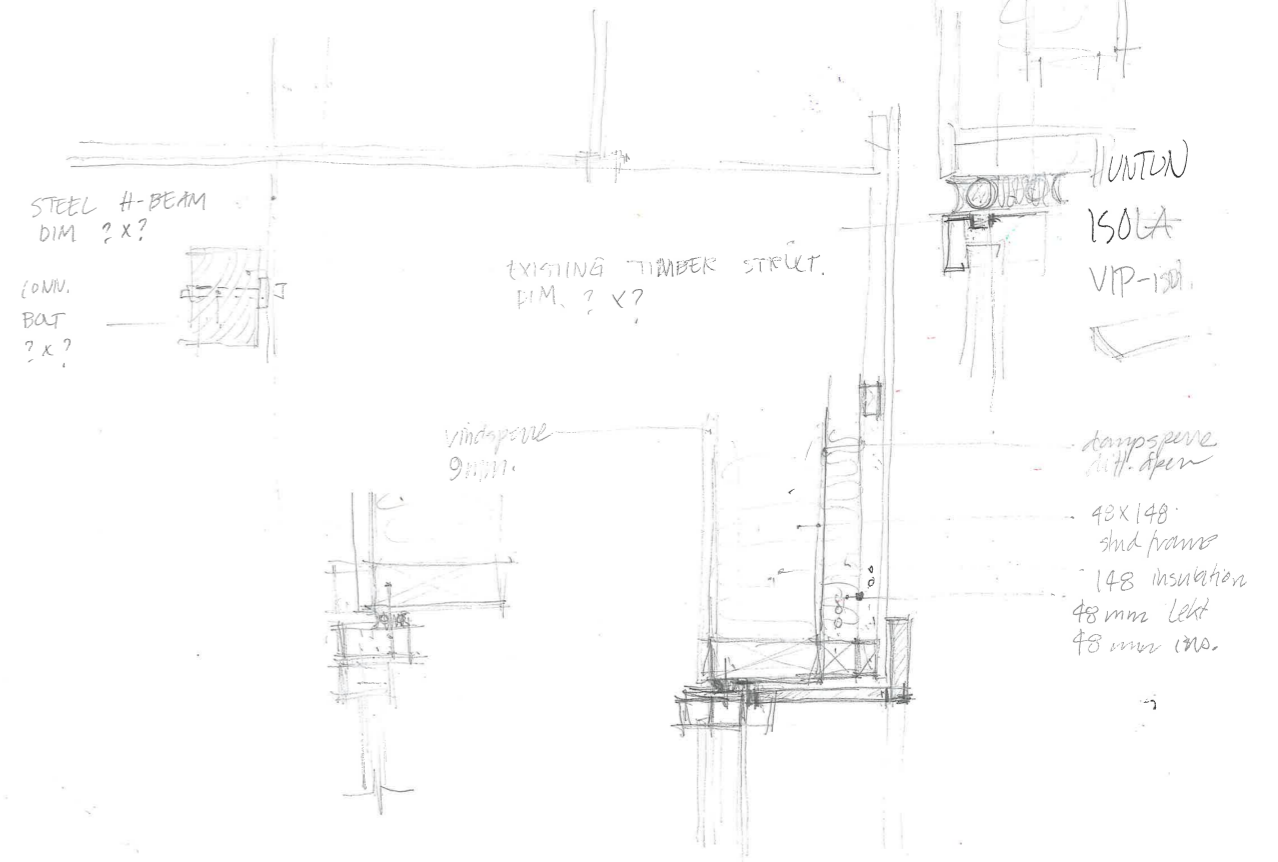
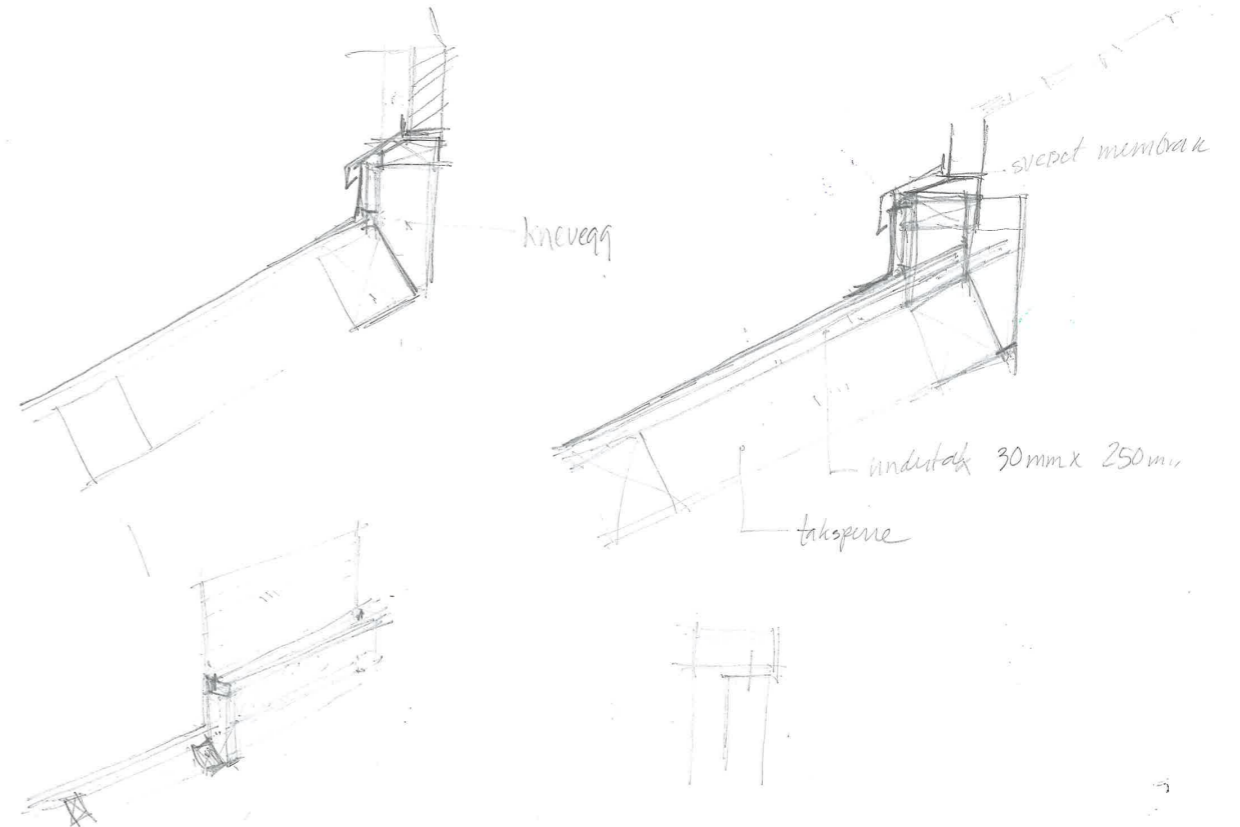
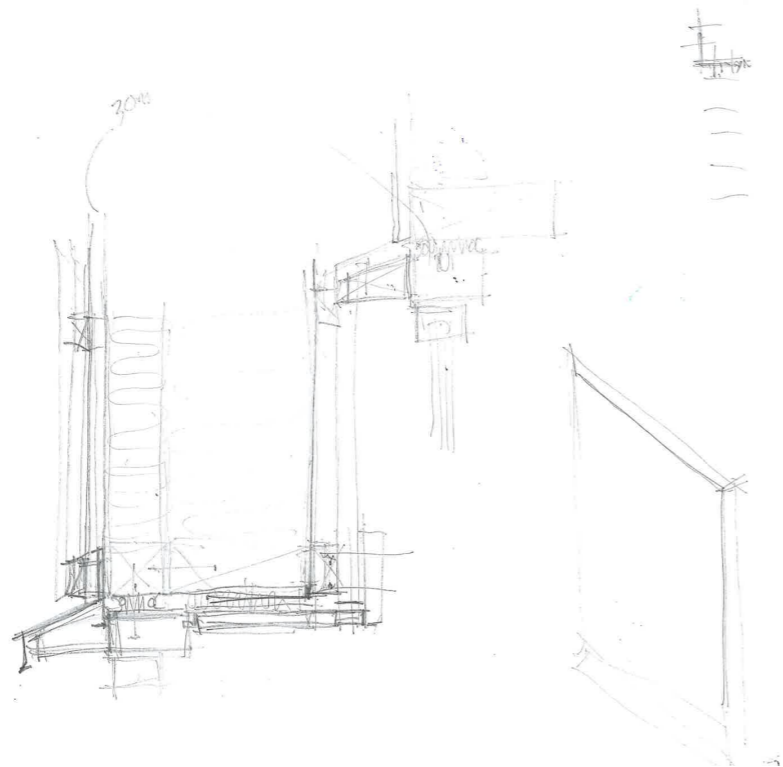
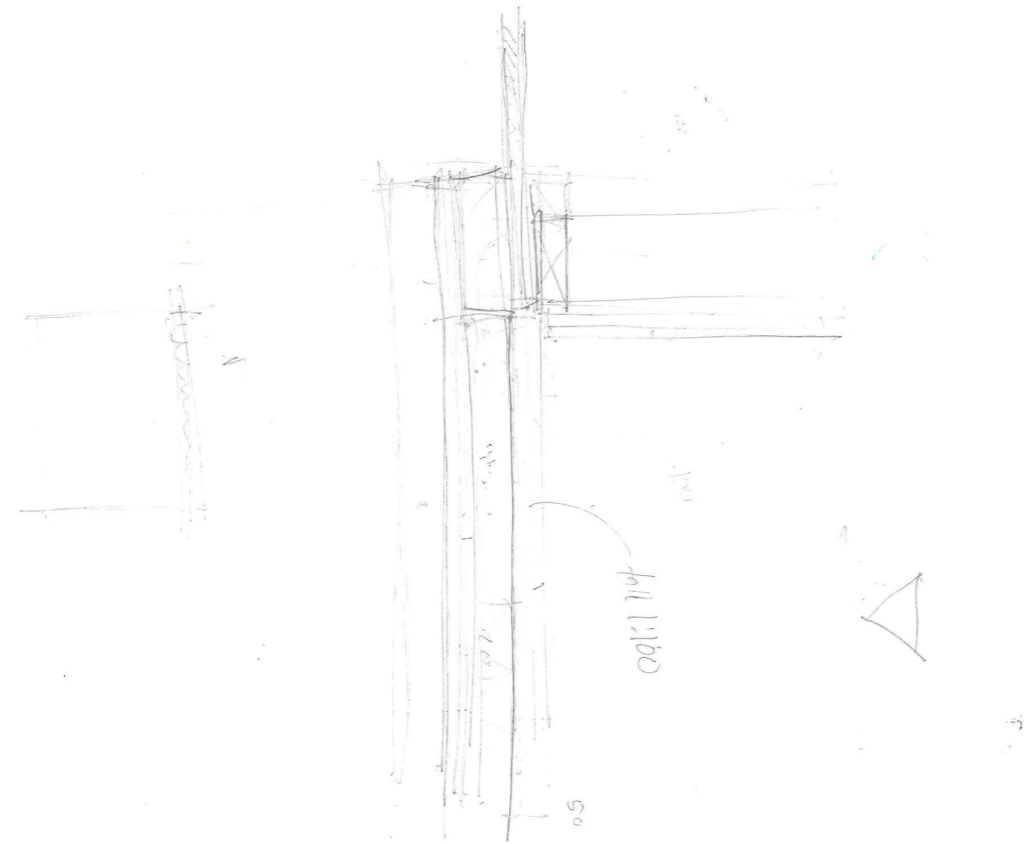


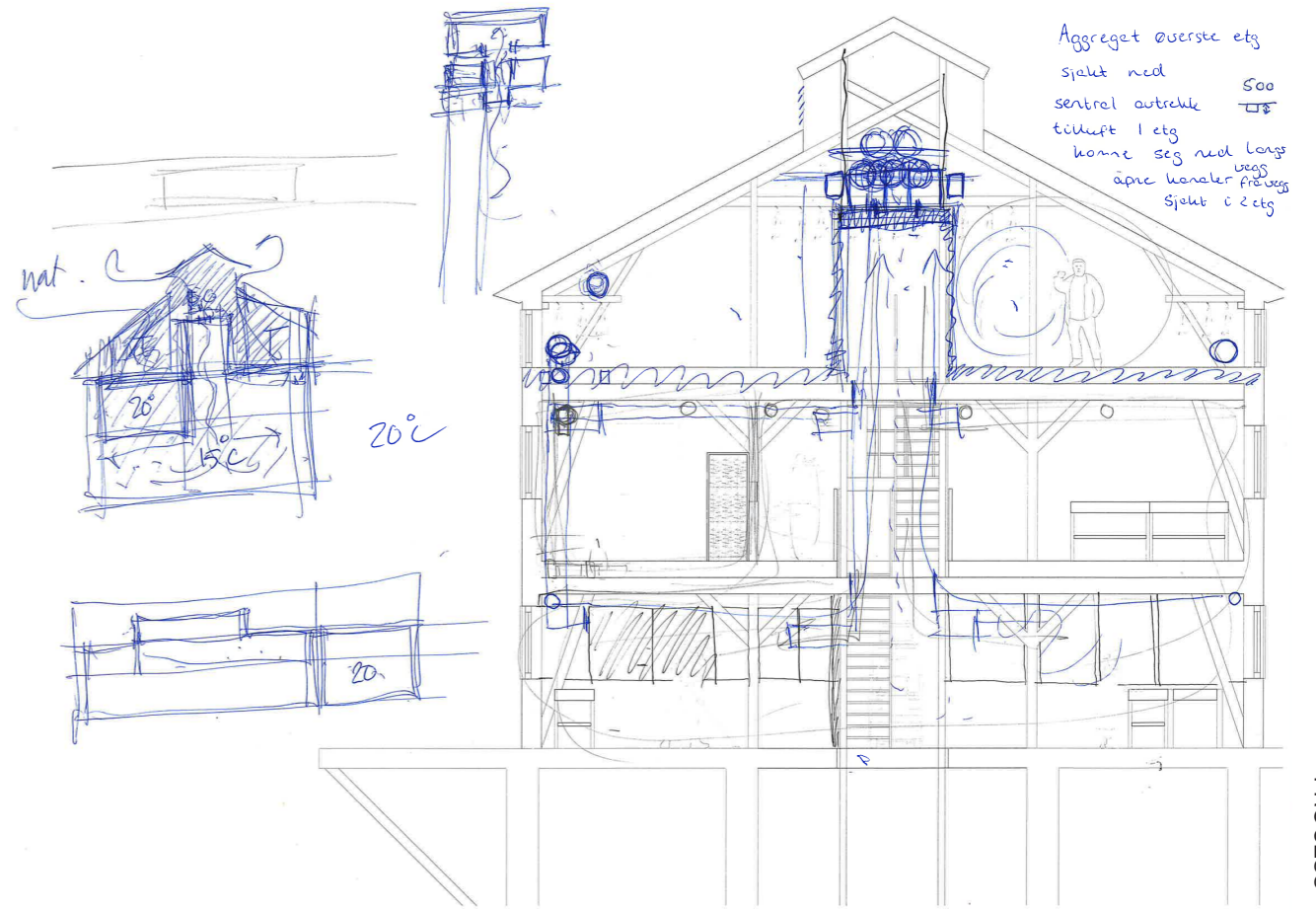
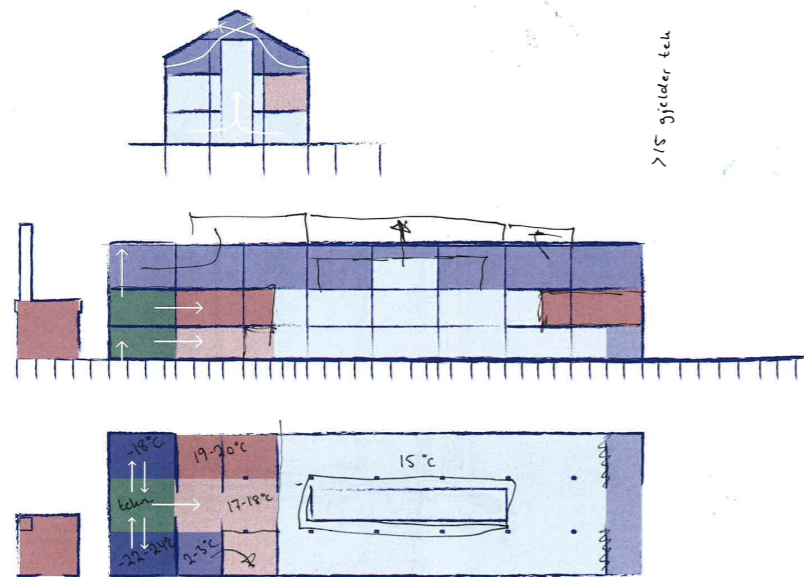
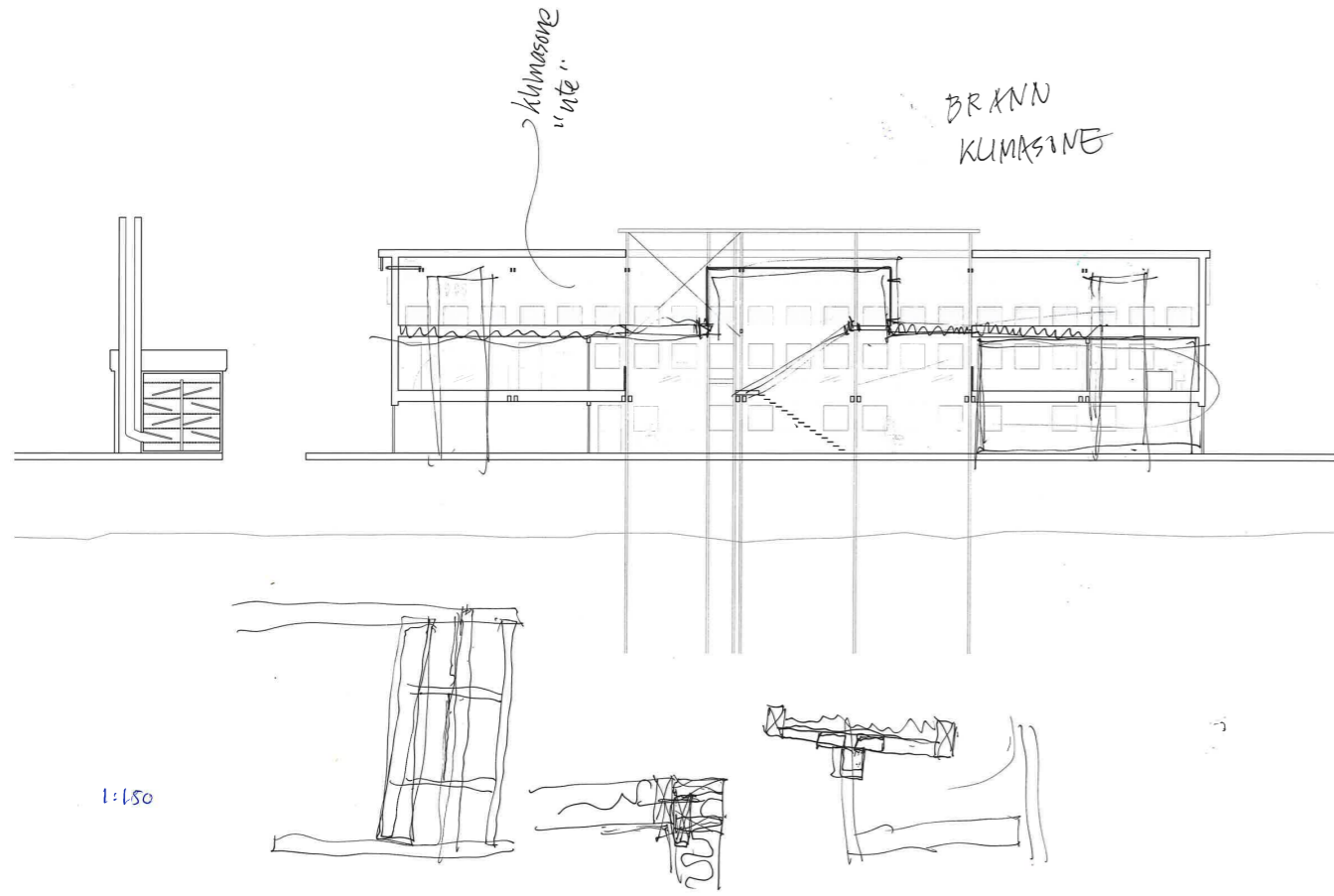


1:100  
 Eldre bindingsverk  
 Tegne systemet  
 Bolking









## LITERATURE LIST

Abdulkader, S. & Nielsen, M. M. (2022). Previous prediploma collaboration. AHO. Oslo.

Balsvik, Randi Rønning. (2001). Arbeiderhistorie. Kystkvinner i Nord: Liv-arbeid-organisering: [https://www.arbark.no/eldok/Arbeiderhistorie2001\\_8.pdf](https://www.arbark.no/eldok/Arbeiderhistorie2001_8.pdf)

Balsvik, Randi Rønning. (2007). Vardø : grensepost og fiskevær 1850-1950. Vardø kommune.

Blix, A. (2022). Notheng, Kystens katedraler. Museumsforlaget. Trondheim.

Daouli, Maria. (2018). Trålernes leveringsplikt, en legitim ordning? Norges Arktiske Universitet. Tromsø: <https://munin.uit.no/bitstream/handle/10037/19271/thesis.pdf?sequence=2&isAllowed=y>

Degnarain, Nishan. (2020). Ocean Crops: Is This The Next Frontier For Agriculture?. Forbes: <https://www.forbes.com/sites/nishandegnarain/2020/07/29/ocean-crops-is-this-the-next-frontier-for-agriculture/>

Ellefsen, K. O. & Lundevall, T. (2017). Fiskevær, Myre på Yttersida. Pax Forlag A/S. Oslo.

Furuly, Jan Gunnar. (2022). I generasjoner har Øst-Finnmark elsket Russland. Nå blir nedlagte bomberom gravd frem igjen. Aftenposten: <https://www.aftenposten.no/norge/i/47gQpa/i-generasjoner-har-oest-finnmark-elsket-russland-naa-blir-nedlagte-bomberom-gravd-frem-igjen>

Fiskedirektoratet. (2023). Fiskere, fartøy og tillatelser: <https://www.fiskeridir.no/Yrkesfiske/Tall-og-analyse/Fiskere-fartoy-og-tillatelser>

Hallenstvedt, Abraham. (2020). Trål i Store norske leksikon på snl.no: <https://snl.no/tr%C3%A5l>

Hallenstvedt, A. & Dørum, K. (2021). Norsk fiskerihistorie i Store norske leksikon på snl.no: [https://snl.no/Norsk\\_fiskerihistorie](https://snl.no/Norsk_fiskerihistorie)

Havforskningsinstituttet. (2021). Oppvekstområder: <https://www.hi.no/hi/radgivning/marine-naturverdier-og-tiltak-i-kystsonen/marint-biologisk-mangfold/oppvekstomrad-er>

Havforskningsinstituttet. Nagelsen, V. (2021). Dyrking av tare påvirker miljøet mindre enn fiskeoppdrett: <https://www.hi.no/hi/nyheter/2021/juni/dyrking-av-tare-pavirker-miljoet-mindre-enn-fiskeoppdrett>

Henriksen, E. & Nyrud, T. (2021). Bedre likestilling i fiskerierne: Momenter til strategier for likestilling i fiskerienes fangstledd. Nofima.

James, P. & Wang X. (2020). Kelp farming: a great opportunity for northern Norway and the world. The Fish Site: [https://thefishsite.com/articles/kelp-farming-a-great-opportunity-for-northern-norway-and-the-world?fbclid=IwAR0j660jVoku54KI5oEefoZDZgNi-uXu\\_ZaO5G-M3BvbrDTnIVpFh-QmXA](https://thefishsite.com/articles/kelp-farming-a-great-opportunity-for-northern-norway-and-the-world?fbclid=IwAR0j660jVoku54KI5oEefoZDZgNi-uXu_ZaO5G-M3BvbrDTnIVpFh-QmXA)

Kalstad, Johan Albert. (1982). Kystsamisk bosetning. Ottar 4, Tromsø

Kruse, Jan Espen. (2019). Russland vil gjengjelde for bygging av ny radar i Vardø. NRK: <https://www.nrk.no/urix/russland-vil-gjengjelde-for-bygging-av-ny-radar-i-var-do-1.14562948>

Kystopprøret. (2018). KYSTOPPRØRET 2017.

Larsen, Janike Kampevold. Digital lecture at Oslo School of Architecture and Design, 2.23.2021

Larsen, J. K. & Wang, H. H. (2021). Resource Atlas for the Anthropocene. AHO. Oslo.

Lawrence, Don. (2017). Husene som våknet fra koma. Arkitektur N: <https://arkitektur-n.no/artikler/husene-som-vaknet-fra-koma>

Lofoten Blue Harvest. <https://lofotenblueharvest.com/nb/produksjon>

Lofoten Seaweed. A foragers guide. <https://lofotenseaweed.no>

Mann, K. H. (1973). Seaweeds – their productivity and strategy for growth. *Science* 182 (4116): 975–981.

Menon Economics. (2021). VARANGER = UTVIKLING, En mulighetsstudie av samfunns- og næringsutvikling i Nord-Varanger: <https://www.menon.no/wp-content/uploads/2021/135-Varanger-Utvikling.pdf>

Methi, H., Cahoon, N. & Wolfsberger, A. (2020). Nordnorsk kunstnersenter. Svolvær.

Morrison, A., Larsen, J. K. and Hemmersam, P. (2019). Future North - Vardø. OCULS. Oslo.

Nilsen, Øystein. (2003). Varangerhalvøya nasjonalpark og lokale samiske interesser. Fylkesmannen i Finnmark: [https://www.statsforvalteren.no/siteassets/utgatt/fm-finnmark/dokument-fmfi/miljovern/rapportserie/2003\\_6-ku-lokale-samiske-interesser-varangerhalvoya.pdf](https://www.statsforvalteren.no/siteassets/utgatt/fm-finnmark/dokument-fmfi/miljovern/rapportserie/2003_6-ku-lokale-samiske-interesser-varangerhalvoya.pdf)

Nilsson, Anna. (2017). Seaweed an unexploited nutritional source with potential in human food and animal feed industry: <https://lup.lub.lu.se/luur/download?func=downloadFile&recordId=8925300&fileId=8925303>

Nofima. (2022). Verdt å vite om fiskekvoter: <https://nofima.no/fakta/verdt-a-vite-om-fiskekvoter/>

Nofima. (2022). Verdt å vite om tare til mat: <https://nofima.no/fakta/verdt-a-vite-om-tare-til-mat/#ib-toc-anchor-0>

Norderhaug, K. M., Hansen, P. K., Fredriksen, S., Grøsvik, B. E., Naustvoll, L. J., Steen, H. & Moy, F. (2021). Miljøpåvirkning fra dyrking av makroalger- Risikovurdering for norske farvann. Rapport fra havforskningen 2021-24. Havforskningsinstituttet.

Polar algae. (2019). Polar Algae: A new macroalgae industry in Finnmark. SINTEF: <https://www.sintef.no/contentassets/3c34a269a8a242f68197876fdee61295/presentations/21-haukeland-polaralgae-sig-seaweed-2019.pdf>

Shephard, Lotte. (2019). Folkets hav?. *Ren Mat*: <https://www.renmat.no/artikler/2019/folkets-hav?fbclid=IwAR2REsfMQEIQ44Ic6o7qBzt83lwe8Ln-VUPv-6Ld0ZjiwerRK6vQgHcMGJzE>

Snekkestad, P. & Olsrud, L. (2022). Den Nordnorske fiskarbonden. Forenkla Forlag. Bodø.

SSB. (2022). Kommuneareal Vardø: <https://www.ssb.no/kommuneareal/vardo>

Stamnes, G. C. & Nielsen, M. M. (2021) Urban Preservation - Vardø. AHO. Oslo.

Strand, Øystein Bolset. (2014). Trålfisket i norsk fiskerinæring 1945-1960. Universitetet i Bergen: <https://bora.uib.no/bora-xmlui/bitstream/handle/1956/8278/119570342.pdf?sequence=1>

Svane, Terje Cock. (2022). Havnebyen og de utenlandske trålerne. Et forum for lokalhistorie: <https://nordkapp.club/2020/06/06/havnebyen-og-tralerne/>

Varanger Museum IKS. (2021). Pomorene - En kort innføring om Pomorene, handelen i nord og andre forhold i den nordlige Norge og Russland fra vikingtid til pomorhandelens slutt. Vardø.

Varanger Museum IKS and Vardø Restored AS. (2016). Kulturminneplan 2019-2029. Vardø Kommune.

Vardø Restored AS. (2021). <http://vardorestored.com/about-us/>

Vibe, Cecilia Marina. (2020). Seaweed in Norway: Towards a social-ecological understanding of management and ecosystem service benefits. UIO: [https://www.duo.uio.no/bitstream/handle/10852/79250/VIBE\\_Thesis2020.pdf?sequence=1&isAllowed=y](https://www.duo.uio.no/bitstream/handle/10852/79250/VIBE_Thesis2020.pdf?sequence=1&isAllowed=y)

Vik, Sidsel. (2022). Vil bli størst i Europa på tang og tare. NRK: [https://www.nrk.no/tromsogfinnmark/ny-satsing\\_norwegian-seaweed-association-skal-gjore-mat-fra-norsk-tang-og-tare-storst-i-europa-1.15819629](https://www.nrk.no/tromsogfinnmark/ny-satsing_norwegian-seaweed-association-skal-gjore-mat-fra-norsk-tang-og-tare-storst-i-europa-1.15819629)

UN. (2022). Livet i havet: [https://www.fn.no/om-fn/fns-baerekraftsmaal/livet-i-havet#\\_hva-gjr-norge](https://www.fn.no/om-fn/fns-baerekraftsmaal/livet-i-havet#_hva-gjr-norge)

Øverland, Margareth. (2021). <https://www.foodsofnorway.net/key-research/biomass/macroalgae>

## PERSONAL CONTACT

Kystopprøret (<https://www.kystopproret.no/>)

Institutt for bioteknologi og matvitenskap ( emneansvarlig turid.rustad@ntnu.no)

Alex Johansen (fiskemottak med fokus på snegler, skalldyr etc)

Fiskeridirektoratet

Svein Harald Holmen (fisher)

Viktor Hansen

Janike Kampevoll Larsen

Caroline Haukeland, Polar algae <https://www.polaralgae.no/about-us>

## Endnotes

1 Svein Harald Holmen, Marie Mork Nielsen & Gustav Cederblad Stamnes, interview, 4.16.2021, Vardø.





