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aemulatio as a method for adaptive reuse*

Lina Svantesson
Master Thesis
Before and after Building
Architectural Experimentation
2024

Chalmers School of Architecture
Department of Architecture &
Civil Engineering

Supervisor Sara Olsson
Examiner Daniel Norell

*of a 20th century granary

“Watch an old building with an anxious care; guard it as best you may, and at any cost, from every influence of dilapidation. Count its stones as you would jewels of a crown; set watches about it as if at the gates of a besieged city; bind it together with iron where it loosens; stay it with timber where it declines; do not care about the unsightliness of the aid; better a crutch than a lost limb; and do this tenderly and reverently, and continually . . .”

From “The Seven Lamps of Architecture”
John Ruskin 1849 pp. 205-206

Master Thesis

Thesis title	Aemulatio as a Method for Adaptive Reuse
Student	Lina Svantesson
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Examiner	Daniel Norell



Abstract

Changes in agricultural practices over the past century in Sweden have rendered many granaries, once considered status symbols, as obsolete figures in the landscape. The construction sector plays a significant role in the current environmentally unsustainable resource consumption rate. Taking care of what has already been built is one way towards a more sustainable practice, both for environmental and cultural heritage reasons. Granaries hold a narrative of past agricultural and building practices, and as they were built to store many tons of grain, they often have sturdy constructions which could potentially last a long time. This thesis project explores how vocabulary borrowed from art can guide the process of the adaptive reuse of a disused granary into a brewing collective.

Adaptive reuse is discussed through two intersecting approaches; the concept of different stages of copying, based on the logic of ‘aemulatio’ as described by Plevoets and Van Cleempoel in the book “Adaptive Reuse of the Built Heritage” (2019) and the danish architect Nicolai Bo Andersen’s “Arkitekturens transformation - fem metoder” (2015). Both methods entail making alterations

through interpreting the existing, and thereby nuances the long-standing approach of having additions contrast with the existing.

The aim of using aemulatio as a method is not to revisit the past, but rather to revitalize the existing and intensify its qualities. Following the logic of aemulatio, the transformation both blurs the distinction between existing and new, as well as introduces new materials and forms. Using Andersen’s method, the granary is understood through different perspectives; through a technical, historical and experiential lens. The alterations are examined in different scales through abstracting the existing to digital models, copies, from the granary’s silhouette in the landscape, to portraying details.

The result is not a definitive answer to how the granary should best be transformed but rather an exploration of a process. Within this thesis, adaptive reuse is explored in a rural setting, but aims to describe a method which could be further applicable.

Keywords: Adaptive Reuse, Aemulatio, Copy

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1. Introduction

Adaptive reuse is the act of making alterations to an existing building or structure to suit a new or continued function. The driving forces behind the reuse of existing buildings can include practical, cultural, or sustainability considerations. The introduction of a new function and the continued use of a building can increase the likelihood of its maintenance, serving as a way to ensure a future for buildings that may not be highly valued as monuments but still hold significance in preserving cultural heritage by reflecting past customs and daily life.

The discussion on what to do with existing buildings in Europe has gone from a rather polarized debate on restoration versus conservation of churches and other monuments of considered importance in the 19th century to a diverse array of approaches and opinions on adaptive reuse today, encompassing a wide range of buildings, including mundane structures that may not have been highly valued before. Today, the numerous approaches to adaptive reuse deal with questions such as whether the additions should be readable, and if yes, how; should there be contrast between new and old, in material or form, or rather a blending of time, or when making a building functional, e.g., insulating it, what compromises must be made; what is considered most important to preserve. (Plevoets & Van Cleempoel, 2019)

This thesis explores the relationship between the existing and alterations through examining two intersecting methods. The two methods are the

term *aemulatio*, the act of learning from the existing by copying it to be able to critically improve it, as described in the book *Adaptive Reuse of the Built Heritage* by Plevoets and Van Cleempoel from 2019 and the contemporary danish architect Nicolai Bo Andersen's text *Arkitekturens tranformation - fem metoder* from 2015. Andersen advocates for site-specific transformations, through working with modification, approximation, connection and reinterpretation, aiming for a blend of old and new. Andersen proposes a technical, historical, and experiential understanding of the existing and working in different scales; from what he calls landscape, to still life, to portrait.

The larger context of this thesis is the Swedish countryside, more specifically the flatlands of Marstallen in Uppland, where there are plenty of disused and decaying buildings, many of the due to changes and the ever ongoing size rationalization in the agricultural practice. One specific granary is explored for adaptive reuse. The building is chosen for two reasons: firstly, there are many examples of disused granaries due to the shift in grain storage practices for small farms, from the village, to local cooperatives, and eventually to silos in larger localities. Secondly, these granaries were built to hold tons of grain, which means they have sturdy load-bearing constructions and can potentially last a long time. The new proposed function for the granary is a brewing collective, to introduce a place for community in the countryside and to explore adapting the building in to something semi-public.

Barn in ruin, Marstallen 2024 - A

A



Thesis Question

Following the logic of aemulatio, how can the historical, technical and experiential qualities of a timber frame granary be intensified while adapting it for a new purpose through reuse?

and

How can these qualities be assessed through the concept of landscape, still life and portrait, and how can this be used to inform the intervention?

Aim & Delimitations

The aim of this thesis is to explore a method and process for working with adaptive reuse. In this thesis specifically in a rural context, but with a method which could be further applicable to other contexts. The thesis aims to create an example of how an existing building can be understood through different lenses as a base for interventions.

The thesis project will not be focused on mere preservation nor on a complete renovation, rather opting to use the existing as a stepping stone for

a speculative adaptive reuse project. The act of adaptive reuse takes sustainability into account, but the project does not go into depth about sustainable materials and construction details. The thesis project will have a program for a function, but this is neither the focus of nor explored in depth within the project.

The result is not a definite answer to how the granary should best be transformed, but rather an exercise in how adaptive reuse can be approached through using a specific vocabulary.

Method

The project is divided into three phases: Understanding, investigations and design proposal. The process is iterative, which means going forth and back between the phases.

Understanding the existing building and its context is the first phase. This involves a understanding of the building through a technical, historical and experiential perspective across scales spanning from its place in the landscape to its timber joints, through photographs, digital models and drawings. After this, an intention for the transformation is set.

In the second phase, the information from the previous phase is synthesised in to sketches on a proposal for a transformation in the scale of the *landscape, still life and portrait*. A new function for the building is decided during this phase. The different perspectives on the building is explored in digital models and drawings. These follow the logic of the set intention from the previous phase.

Lastly, a design proposal is developed. This synthesises the different perspectives and shows the proposal in drawings, images and digital models.

Reading Instructions

The thesis is split into three main parts. Beginning with an introduction to the subject and project, providing a background on why this project is chosen.

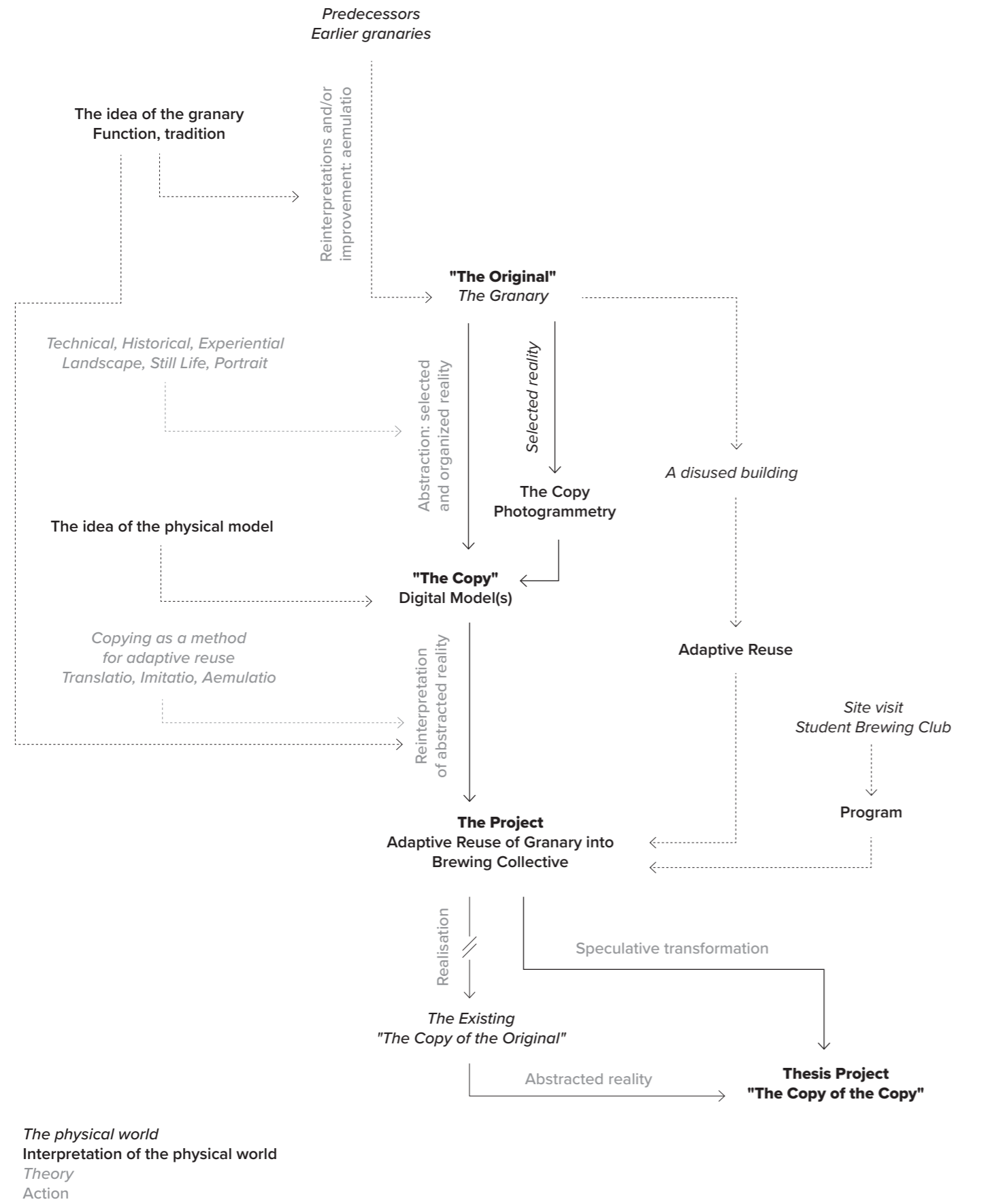
The second part is a theoretical framework, presenting references as a backdrop for how the project is worked with.

The final part presents the project itself, from the context to the design proposal and a concluding reflection.

Legend for understanding drawings:

■ Existing ■ New

Working with Copies



Still life of abstracted digital copies of the granary - A

A





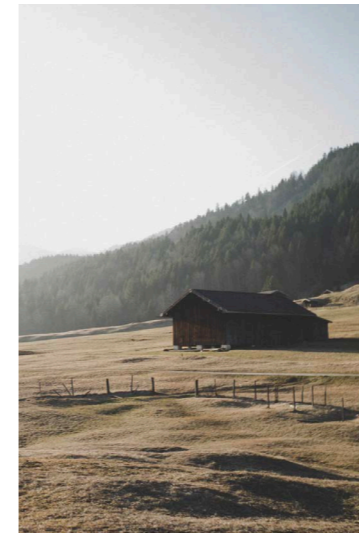
Adaptive Reuse of the Built Heritage:
Concepts and Cases of an Emerging Discipline
Bie Plevoets & Koenraad Van Cleempoel, 2019

Overview of the history of adaptive reuse and discussing the concept of aemulatio



Arkitekturs transformation - fem metoder
Nicolai Bo Andersen, in the book
"Om Byggningskulturens Transformation", 2015

Description of one approach to transformation, advocating for a sort of blend of new and old



Ett öppet fönster mot landsbygden
Ida Nilsson, Article, 2020

Contemporary Ideas of the Countryside



Context

Assesed through personal communication during site visit and historical photographs

History of area and overview of agricultural practice

Alinder, 1922

New Function for the granary

Based on the history of the building and the opportunity to test new concepts
Old function: Used in the agricultural production as storage of grain
New function: A brewing collective with a gathering space

Project

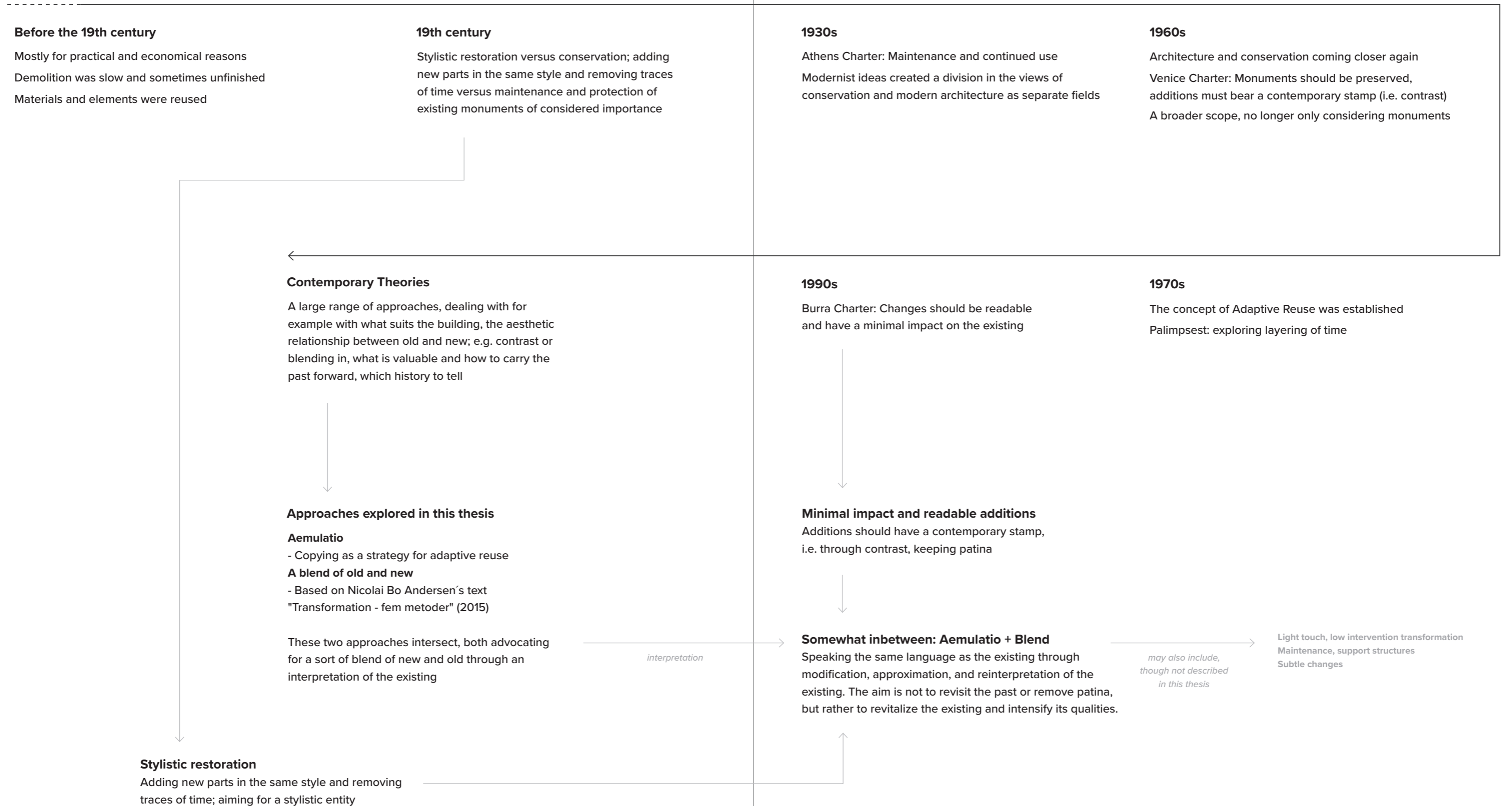
Adaptive Reuse of the granary

Intention for transformation

Subjective interpretation of existing

A Brief Timeline of Adaptive Reuse

Based on the book "Adaptive Reuse of the Built Heritage" by Plevoets & Van Cleempoel (2019)



Aemulatio: Copying as a Strategy for Adaptive Reuse

Copying is a well-known concept within art and has been valued throughout history as a means both to learn from precursors and to explore the relationship between *the model* and *the copy*.

Copying can be done in various ways and with varying degrees of creative freedom. Following are definitions of three steps of copying within art, and how they can relate to architecture, based on the architect and writer Fred Scott's book "On Altering Architecture" from 2008 referred to in Plevoets and Van Cleempoel's book "Adaptive Reuse of the Built Heritage". The steps are intersecting and have been interpreted differently through time.

Translatio

In art, *translatio* implies to follow in the footsteps of the model, with similarity as the goal. When interpreted very literally, parallels can be drawn to stylistic restoration; not introducing new materials or new formal elements, but might include removing later alterations or reassembling the existing. However, as Scott puts it, *translatio* implies an act of creatively translating the model to the copy, i.e., translating an existing building into the present.

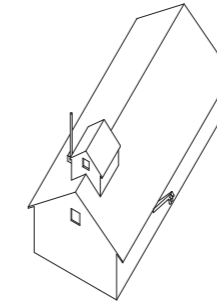
Imitatio

In art, *imitatio* implies a freer copy than *translatio*, allowing adaptations such as reframing and adding information, aiming at equality with the model rather than similarity. In architecture, this can mean a more creative and selective restoration of the model, such as only reconstructing parts of the existing to better suit a new programme.

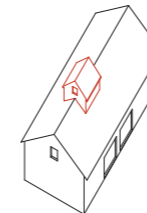
Aemulatio

In art, implies to improve upon the model. The process still begins with translation, which is necessary for understanding the model. Then, imitate the model until mastering it. At last, one can interpret the original freely and even adapt it critically to improve it. In architecture, this can mean innovative imitation beyond preservation to revival. This contrasts with the long-standing approach within architecture of a clear contrast between old and new in order to make it readable. Instead, a blending of new and old is proposed, but through a close understanding of the existing. This can mean introducing new elements and materials, but allowing it to blend in with the existing, through e.g. following the logic of the existing. (Scott, 2008, referred to in Plevoets & Van Cleempoel, 2019, pp. 31-35)

Plevoets and Van Cleempoel take Caruso St John's interventions in the art museum Tate Britain in London from 2014 as an example of *aemulatio*, where they reference the existing materials, proportions, and decoration through adding new elements. One example of this is a new spiral staircase, placed in the middle of a rotunda to enhance its shape. Another example is the addition of tables and chairs, which are contemporary interpretations of existing British Arts and Crafts furniture. (Plevoets & Van Cleempoel, 2019, pp. 31-35) The architects, Caruso St John, describes the alterations as meeting of different layers of time existing in their own way. Caruso St John state on their web page that "the project seeks to heal the damage done to the building over generations, to blur the abrupt edits between work from different periods and, ultimately, to make a new and richer whole." (Caruso St John Architects, n.d.)

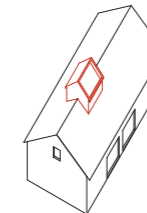


The original
A precursor to be copied
An elevatortower on a nearby barn



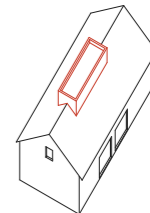
Translatio
follow in the footsteps of the original
aiming at similarity

in architecture:
aiming for a stylistic entity
no new materials or formal elements later
An elevatortower on the granary



Imitatio
adaptations, e.g. reframing and additions
aiming at equality

in architecture:
a creative and selective restoration reconstructing parts of the existing
A skylight imitating an elevatortower



Aemulatio
learning from the original
aiming at improvement

in architecture:
approximation and reinterpretation
intensify qualities of the existing
A skylight reinterpreting an elevatortower

Arkitekturens transformation - fem metoder, N.B Andersen, 2015

In his text on the transformation of architecture, Nicolai Bo Andersen describes five methods which can be applied at different phases of a design process. They are to be used to ensure that a building's preservation-worthy qualities, or character traits are not lost. Andersen writes that in a way, all architectural interventions can be considered to be transformation, since there is always something there from before which the architecture changes and to which one can relate to.

In general, the text advocates for an integration of transformation and restoration into the field of architecture

as a whole. When working with the five methods, the goal is a blend of old and new without oversimplification. This includes modification, approximation, connection and reinterpretation of the existing. Andersen advocates for site-specific considerations with extra attention to materials.

The five methods can all be applied to the same project, as they deal with different aspects and phases of a project. Two of the five methods are described in the following pages. The terms are translated from Danish and not the original definitions used, meaning they have been interpreted by the author.

pp. 15-16

Technical, historical, experiential
understand the existing through different lenses

pp. 17-18

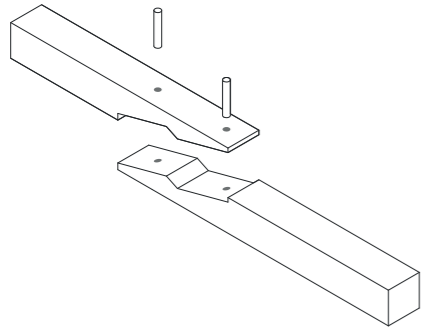
Landscape, still life, portrait
draw in different scales, discover different aspects

Skin, meat, bone
the layers of a building

Blik, kast, projekt
phases of a project

Subtract, reconstruct, repair, reform, add
acts of transforming

A



Technical

An understanding of how the building was constructed, with which materials and how they are joined together.

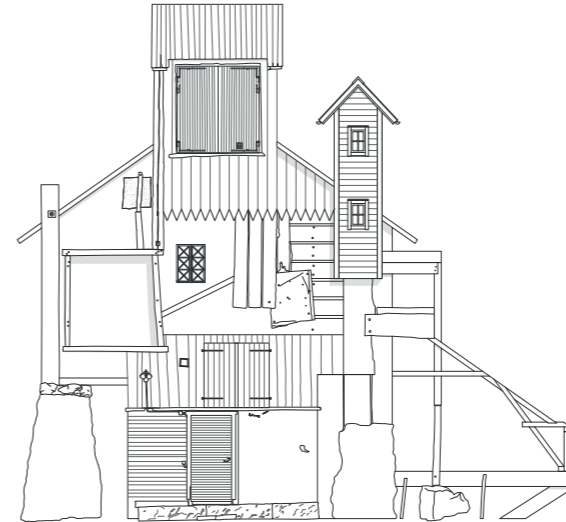
B



Historical

The building as part of its broader historical context, including its usage and why it was constructed the way it is.

C



Experiential

The building as a sensory experience; such as shapes, colour, material qualities, spatial atmospheres, proportions, light and shadow.

Technical, historical, experiential

The existing should be understood through different lenses: both as material and technique, as a component of a broader historical context, and as a direct sensory experience. Andersen's suggests considering one issue at a time, and then synthesizing them to a coherent whole. This approach aims for a balance of technology; without disregarding poetic elements, history; avoiding mere nostalgia, and phenomenology; enhancing the understanding of technology. (Andersen, 2015)

Joint in granary - A

Previous use - B

Still life of material and details - C

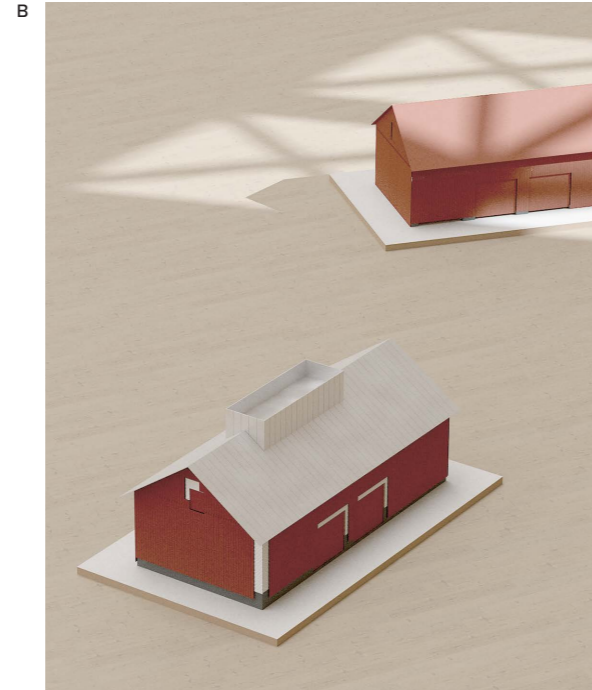


Landscape

a view or picture of the countryside, or the art of making such pictures (Cambridge Dictionary).

Relation between the building and the larger context; urban or landscape, e.g. in 1:500.

Altering the silhouette



Still Life

a painting or drawing of an arrangement of objects that do not move, such as flowers or fruit (Cambridge Dictionary).

Shows composition, how details are arranged together, the shapes and spaces inbetween and the atmosphere. Shows building volume, room and construction, e.g. in 1:50.

Altering the composition and space



Portrait

a painting, photograph, or drawing of a person (Cambridge Dictionary).

Shows characteristic details and material qualities e.g. in 1:5.

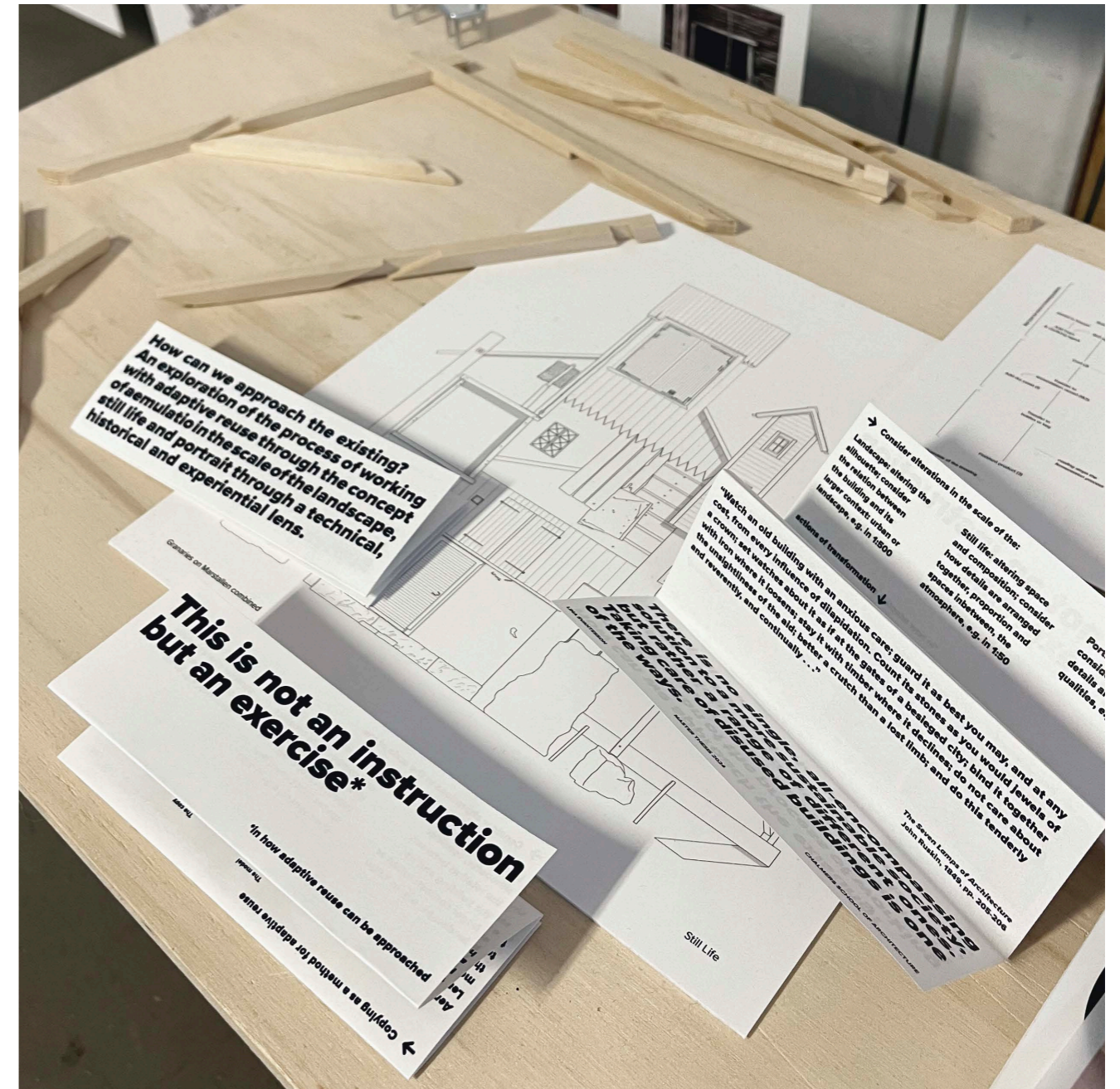
Altering the detail

Landscape, still life, portrait

Landscape, still life, and portrait painting represent three distinct focuses within painting that address different questions. The concept of describing different scales with these terms are borrowed from the scenographer Robert Wilson's book "Portrait, Still Life, Landscape" from 1994. Andersen means that different scales not only play a role in the representation, but also in the creation, of architecture. The chosen scales depends on the project, but through switching between scales, different aspects of a building

should be tried out simultaneously. (Andersen, 2015) This may sound obvious, but compare it to zooming in and out in one 3D-model containing everything, all at once.

Alterations are examined in different scales through abstracting the existing to different digital models, from the landscape, in which the building volume is altered, to still life, in which the facade and interior composition is altered, to portrait, which deals with the alteration of details.



A

Developing a process

Based on the before mentioned theories, a process for working with the existing was outlined. Using aemulatio as the overall method and exploring this in the scale of the landscape, still life and portrait through uncovering, framing, layering and filling the existing. This was concluded in a pamphlet for the final exhibition on Chalmers in June 2024.

How can we approach the existing? An exploration of the process of working with adaptive reuse through the concept of aemulatio in the scale of the landscape, still life and portrait through a technical, historical and experiential lens.

→ Copying as a method for adaptive reuse

Aemulatio

Learn from the existing; reinterpret motifs and approximate what is already there; do not aim to revisit the past but to intensify qualities of the existing through alterations

How to assess qualities ↓

The model



Las Meninas, Velázquez, 1656

The copy



Las Meninas, Picasso after Velázquez, 1957

Understand the building as:

Material and technique: a composition of material and detail; how was the building constructed, with which materials and how are they joined together?

A part of a broader historical context: why was the building constructed and in which context, what was it used for and why was it disused?

A direct sensory experience: through proportion, material qualities, light, shadow. What specific elements creates the spatial atmosphere?

and →

*in how adaptive reuse can be approached

This is not an instruction* but an exercise

→ Consider alterations in the scale of the:

Landscape: altering the silhouette; consider the relation between the building and its larger context: urban or landscape, e.g. in 1:500

Still life: altering space and composition; consider how details are arranged together, proportion and spaces inbetween, the atmosphere, e.g. in 1:50

Portrait: altering the detail; consider characteristic details and material qualities, e.g. in 1:5

actions of transformation ↓

uncover

the structure: show how it is built; create an understanding of how to take care of it

frame

characteristic details: even the most mundane; create a still life to take care of

layer

existing openings; take care of windows and doors instead of replacing them; layer material and time

fill

mend gaps; intensify through filling them with new material

“Watch an old building with an anxious care; guard it as best you may, and at any cost, from every influence of dilapidation. Count its stones as you would jewels of a crown; set watches about it as if at the gates of a besieged city; bind it together with iron where it loosens; stay it with timber where it declines; do not care about the unsightliness of the aid; better a crutch than a lost limb; and do this tenderly and reverently, and continually . . .”

The Seven Lamps of Architecture
John Ruskin, 1849, pp. 205-206

There is no single, all-encompassing solution to a more sustainable society, but rather a range of different ones. Taking care of disused buildings is one of the ways.

LINA SVANTESSON

MASTER THESIS 2024

CHALMERS SCHOOL OF ARCHITECTURE

Student Village, pihlmann architects, 2017, Aarhus

A farm from the 17th century was transformed into a place for a small community of students, with apartments and shared spaces. The layout of the added buildings follows the logic of the old farm. The outdoor spaces are inspired by traditional Danish villages. (pihlmann architects, n.d)

Transformation strategies

- Reinterpretation of historical layout, composition in landscape, spaces inbetween, facade, structure, materials
- Subtracting to create views
- Adding roof, insulation and new buildings
- Restoring the existing timber structure

Ejderstad Haubarg, Andersen, NB, 2023, Kongens Lyngby

The project is a new structure added to Frilandsmuseet in Kongens Lyngby. The added structure interpretes the existing structure, an "Ejderstedgård"; through the large roof, the entrance, the alcove and the sky light.

Ejderstad Haubarg is research project conducted through Det Kongelige Akademi, and was built by architecture students. (Nicolai Bo Andersen Arkitekt, n.d)

Transformation strategies

- Reinterpretation of existing shape using a new material
- Referencing qualities which the existing has, such as the skylight.

6. Context

Today 15 percent of the people in Sweden lives on what is defined as the countryside. 200 years ago, it was 90 percent. (SCB, 2015) In an article in the newspaper Mitt i Stockholm, one can read about people who started to work from home during the pandemic, and moved from Stockholm to Enköping and the adjacent countryside. 2856 people moved to the municipality of Enköping in 2020, a municipality with 46 240 inhabitants. The article describes the closeness to bigger cities, nature and a demand for larger housing as possible reasons, as well as the “small town charm”. People count on continuing working from home most of their time, only going in to their office a couple of days a week. Enköping, being close to Stockholm, Västerås and Uppsala, is then a good alternative. (Gustafsson, 2021)

In the article “Flykten från storstäderna under pandemin – global förändring eller kortvarig trend?”, a researcher in cultural geography, problematises this view on the trend. He says that it is too early to be sure of who is moving and why, since we do not have all the data yet, and questions the statement of it being people who work from home that makes up the big part of the people moving. He says “It’s a small privileged group that has this opportunity. It could just as easily be about people who have lost their jobs and can’t afford to stay in the city with their high mortgages.” (Backlund and Botsjö, 2021) Numbers from 2015 shows that people moving out from the cities in favour of smaller cities or the countryside was a trend already before the pandemic. These numbers also show that Enköping had the highest percentage population increase in the countryside near the central town in Uppsala county. (SCB, 2018)

The countryside and its future has become a much discussed subject in political debates and within the field of architecture. In her text “Ett öppet fönster mot landsbygden”, Ida Nilsson identifies three ideas about the countryside that are presented in the contemporary research debate on the subject:

The Post-Productive Countryside

This idea aims to understand the role of the countryside in a world that has become more globalized, and moves the traditional view of the countryside as a place for agricultural production to a destination for tourism and recreation. Here Nilsson describes the major estate reforms (Enskiftet and Laga skifte) which merged the farmers’ lands to larger fields, leading to both a higher production and a contribution to the industrialization, but also broke up villages, fragmented communities and led to a higher share of privatization of the fields and forest. This also led to a view of the countryside as mainly being a producer of raw materials and food. Later in the 20th century, the large scale agricultural production was no longer as profitable (due to globalisation) and was also started to be problematised because of its environmental impact. Within the post-productive idea, the countryside is now viewed

as a place for tourism and recreation, mainly for the increasingly economically strong middle class and their holiday homes. This idea risks commercializing the countryside and as a result overlooking the needs of the people living there all year.

The Urbanised Countryside

Within this idea, the countryside is not viewed as something with a function in itself, but as something that serves the cities. The worth of the rural areas here is defined by their closeness to urbanised areas. But, instead of viewing this as a fact, Nilsson writes that researchers are looking for other ways of describing the countryside and its diversity and unique conditions.

The Neo-Productive countryside

Within this idea, the countryside is once again viewed as a place for production. This time as a resource for the transition to renewable energy sources, and as a material bank for wood and other natural resources. Without relating to the culture and the people who live at these places, this idea carries the risk of the countryside being exploited. This goes especially in the northern parts of Sweden, through for example expansion of mines, where the local inhabitants will not get a part of the financial returns other than in perhaps tax revenues and job opportunities. But within this idea there are also other perspectives, such as the view on the countryside as a place which offers opportunities for increased self-sufficiency and improved living environments. Unlike the other ideas, this perspective challenges consumerism and considers increased globalization and urbanization harmful to the planet. They see rural areas as an overlooked resource where genuine transformation can occur if we move beyond conventional norms. (Nilsson, 2020)

According to the feasibility study “Arkitektens roll på landsbygden” this is something that can be possible in the countryside, because of its lack of strong market forces, which means lower land prices and access to existing buildings. This creates opportunities for test beds and can enable good living possibilities for people who would otherwise struggle to enter the housing market and introduce a variety of alternative living environments. In the study, Hagelberg stresses the importance of local initiatives, not exploiting farmland and using what we have already built. They also discuss different alternatives to commercial developers, such as “Byggemenskaper”. Byggemenskaper refers to a collaborative housing model where individuals or families come together to plan, design, and often build their homes, sharing common spaces and resources.

Architects can be a part of this development by, amongst other things, visualising these futures and initiatives. (Hagelberg, et al 2019)



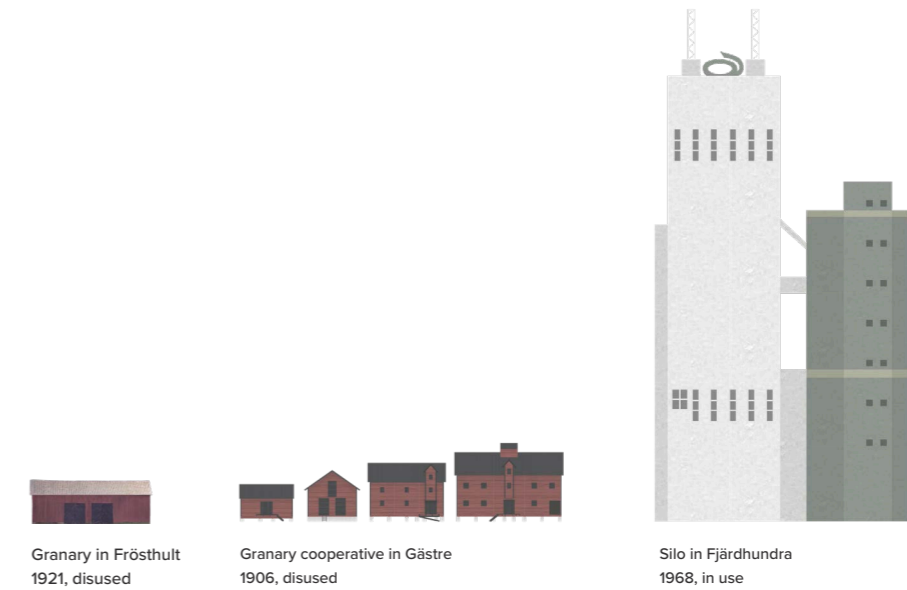


0 1 km

The Plain Marstallen

In the flat landscape of western Uppland, what was once a seabed is now fertile farmland. The plain land Marstallen is characterized by its vastness, with the horizon interrupted only by the beginning of the forest and the structures used for agriculture; the silo and elevator towers. Historically, the area around Enköping was considered a forested region (*skogsbygd*) which during the 19th century also supplied the fishing population with timber for house constructions. (Werne, 2017, p. 377)

Marstallen is divided among 24 villages, including Gästre and Frösthult. Gästre, with 54 inhabitants, consists of farms and single family homes. The closest locality is Fjärdhundra, located four kilometres away while the larger town of Enköping is 17 kilometres south. A railway connecting Enköping and Heby was constructed in 1906, with a station in Gästre, along with a granary for the farmers' cooperative Centralföreningen.



Because of this, including having a dairy and a store, some predicted Gästre would become the central village in the area. But when a new central station was to be placed further away in the village Forsby, a farmer was concerned that fertile would be disrupted, leading to the station being placed in the then almost non-existent village Fjärdhundra instead.

Fjärdhundra then grew over the decades; stores, a doctors office, a bank, a fire station and a school were established, later also a library, apartment houses and villas. The railway eventually closed in 1959, and followed did the store, dairy and granary in Gästre. A large silo was built in Fjärdhundra in 1968 and is still in use today. Fjärdhundra has just over 900 inhabitants today, and approximately 2,590 live in the surrounding countryside. It is situated on the National Road 70, and within commuting distance to major cities like Stockholm, Uppsala, and Västerås. (Enköpings kommun, 2016)

A



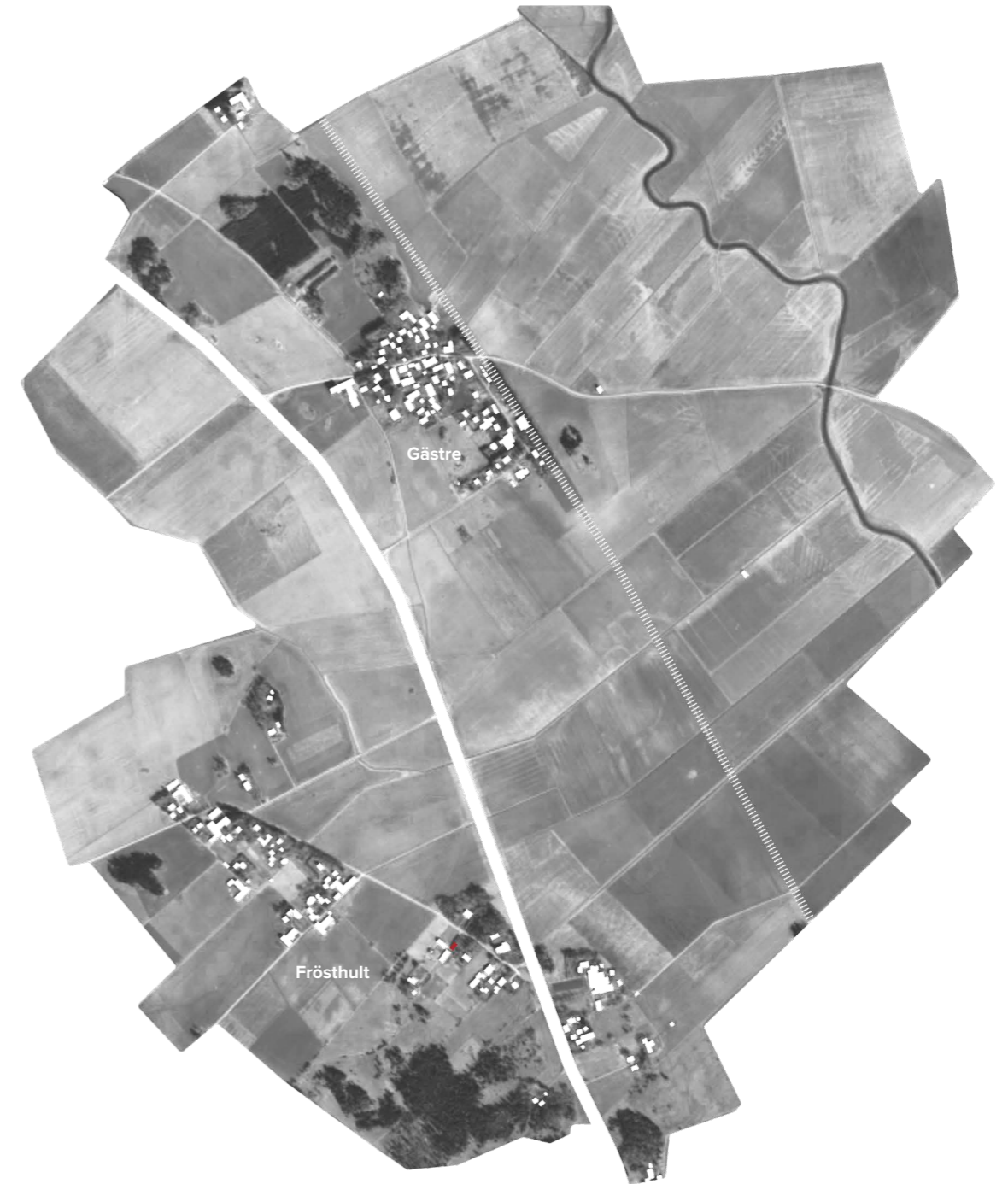
Elevator towers have commonly been added onto existing barns since the second half of the 20th century. Their function is to facilitate the drying and storage of large volumes of grain, by transporting it within the farm. These additions are typically constructed in wood, with wood or corrugated sheet metal as facade materials. Within the area, a radius of ten kilometres from the granary, there are predominantly wood panel or sheet metal, painted Falu red, with some examples of unpainted corrugated metal. The design of elevator towers mimics that of small houses, with gable roofs and the facade material.

Elevator towers
on Marstallen - A

Overlay of ortophoto - B
from 1960 and 2023

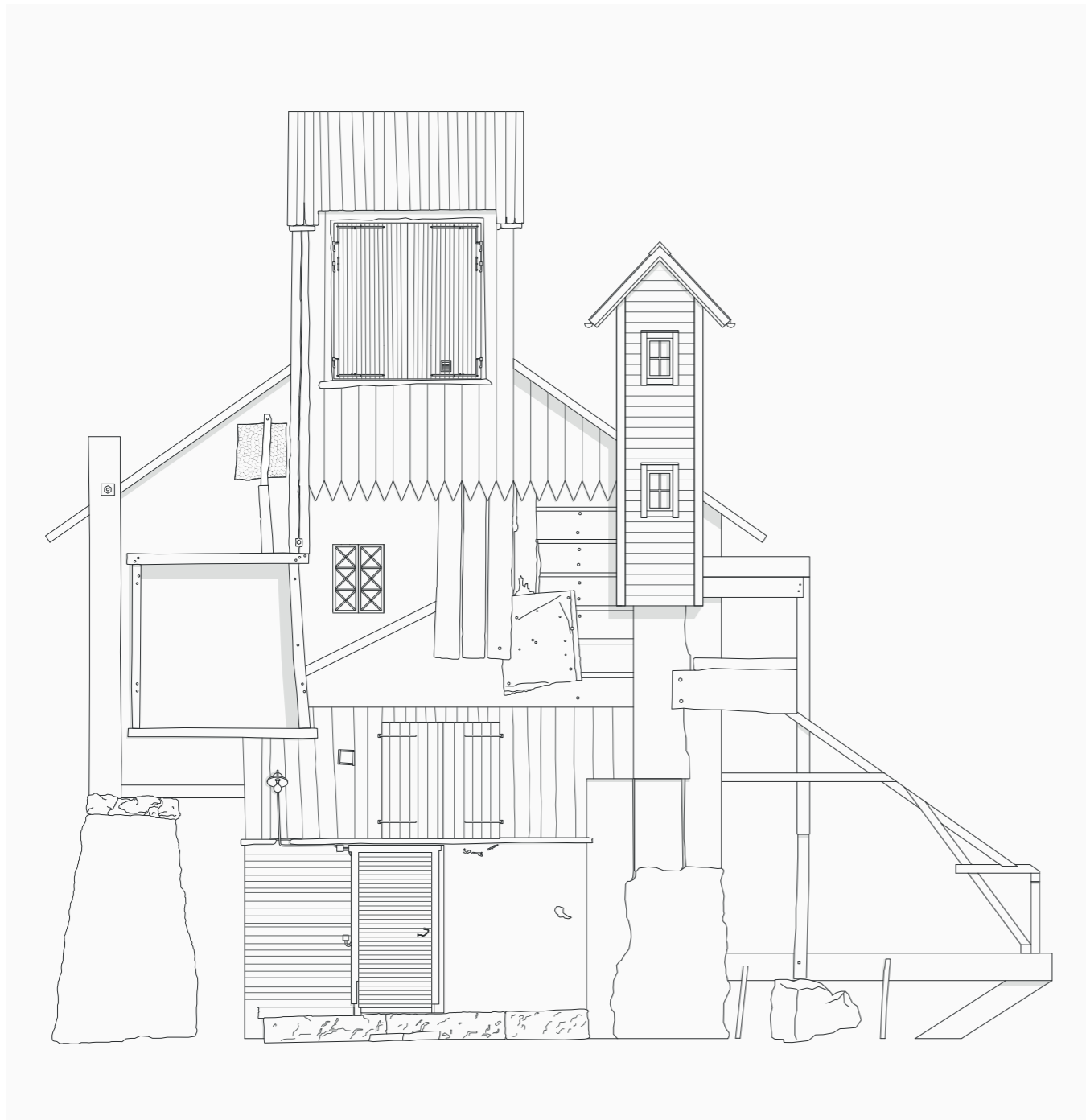
4. Context

B

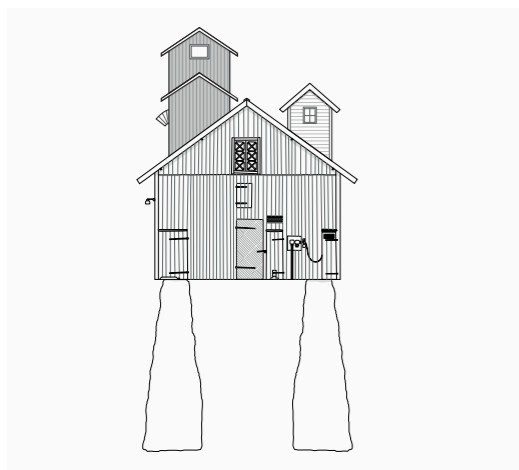


4. Context

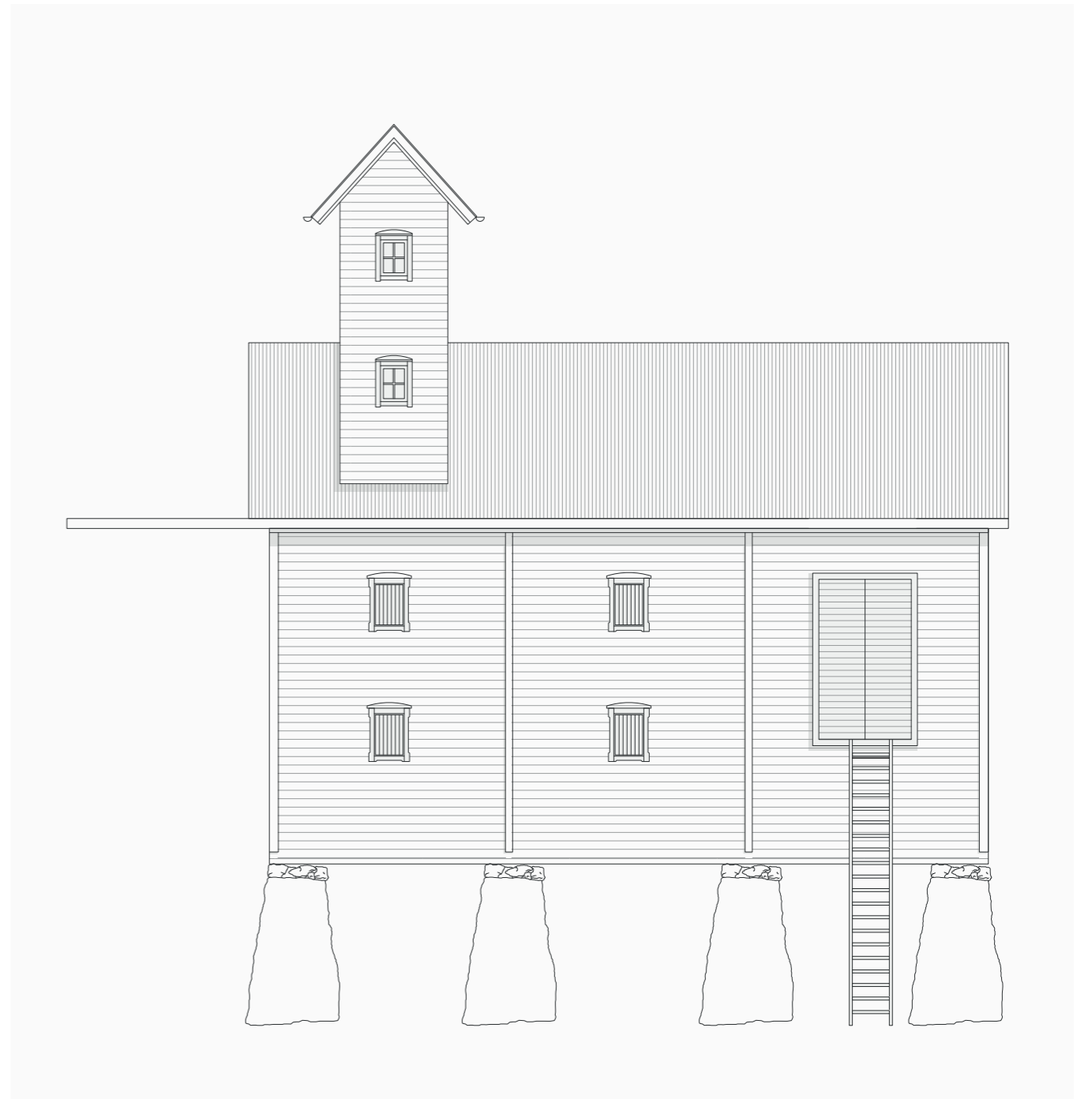
A



B



C





The village Frösthult

Frösthult centres around a church built in the 1300s and is split in two by the national road 70. The village also has also a community centre (*bygdegård*), farms and rental apartments. During the time the railway was operating, a store and a school was operating here. In 2000, the Frösthult district, including Gästre, had 253 inhabitants. (Enköpings kommun, 2016)

A



A

A



The Granary

The following information was gathered during site visits conducted in January and March 2024, through conversations with the owner of the farm.

The granary in Frösthult was constructed around the same time as the farm to which it belongs, in the early 1920s. The buildings lack documentation in drawings; instead, they are described in a short text outlining their functions and main dimensions. In the 1960s, the granary was already too small to store the grain produced on the farm. Instead, the grain was temporarily stored in wagons on the first floor and then driven to the silo in Fjärdhundra. Many of the surrounding farms faced the same problem of the original granaries being too small. This was usually solved by building an elevator tower on a larger barn, transforming it to store grain, leaving the original granary disused or adapting it to other functions.

The plan of the granary is simple, composed of an 18x9 metre quadrangular shape in two stories. One third of the building has a cast-in-place concrete floor, while the remaining two thirds are open to the ground with cast-in-place concrete plinths for

the pillars. The load-bearing structure is made up of a timber post-and-beam construction, known as "stolpverk" in Swedish. The square beams and columns all have the same dimensions and are notched to fit together, with the joints being reinforced with nails and in some cases iron fittings. The large open space on the second floor was where the grain was dried and stored, initially in large jute sacks and later in the 1950s freely; blown up in a pipe to the second floor, then shovelled around to dry. On the ground floor, wagons and wood were stored.

There are only two windows in the entire building, located on each gable of the second floor. However, light also enters through gaps between the facade panels.

Overall, the timber load-bearing structure is in good shape. The building has two problems which might be a threat to its continuity; one aspect is that it lacks a function and secondly the pillars are slowly sinking into the ground. It also lacks insulation and daylight, and the roof tiles need yearly inspections to prevent water leaks. The Falu red facade panel needs to be repainted approximately every ten years.

Second floor - A
March 2024

West facade - B
March 2024

5. The Granary

B



5. The Granary

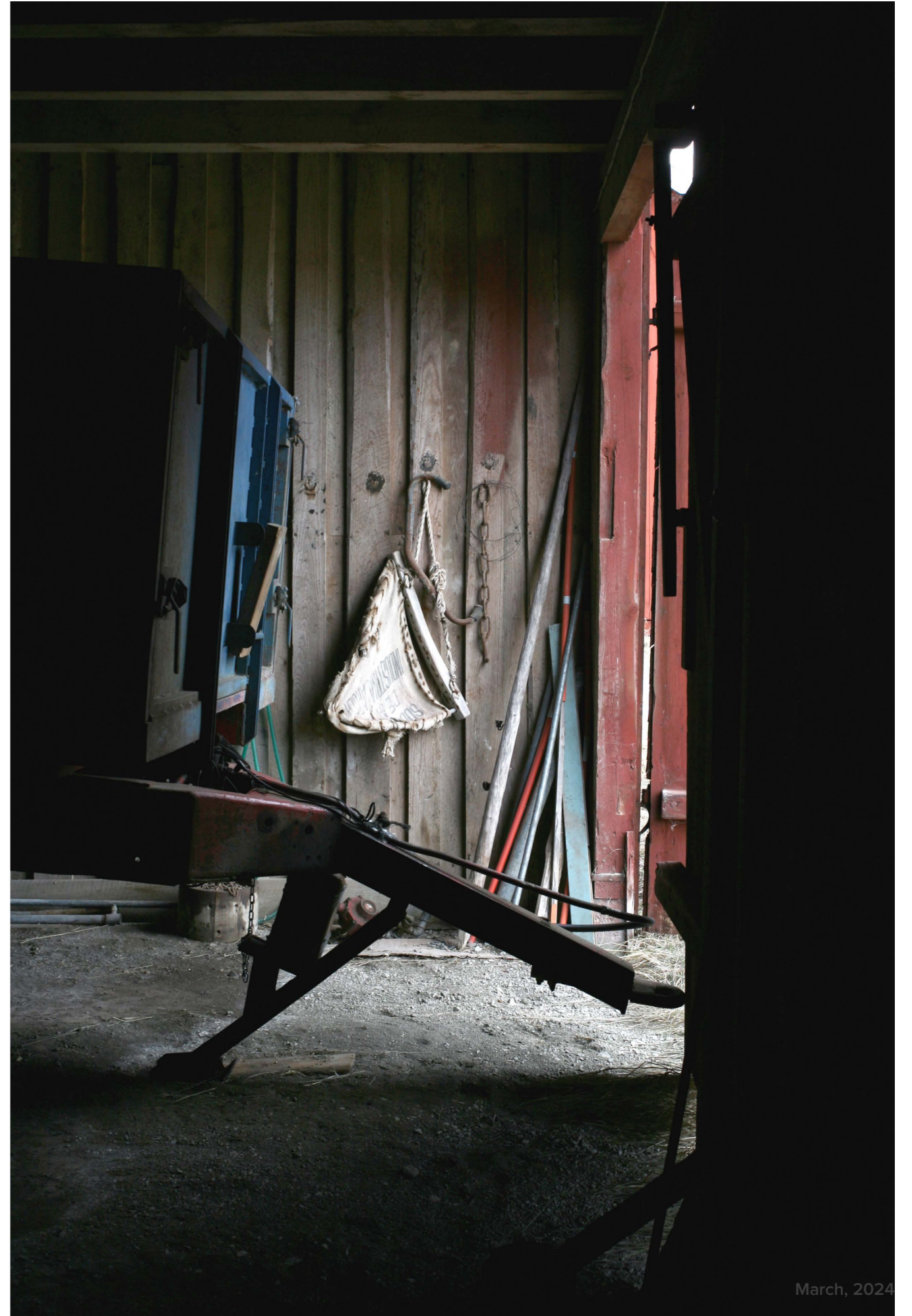
A



Still life, stair, March 2024 - A

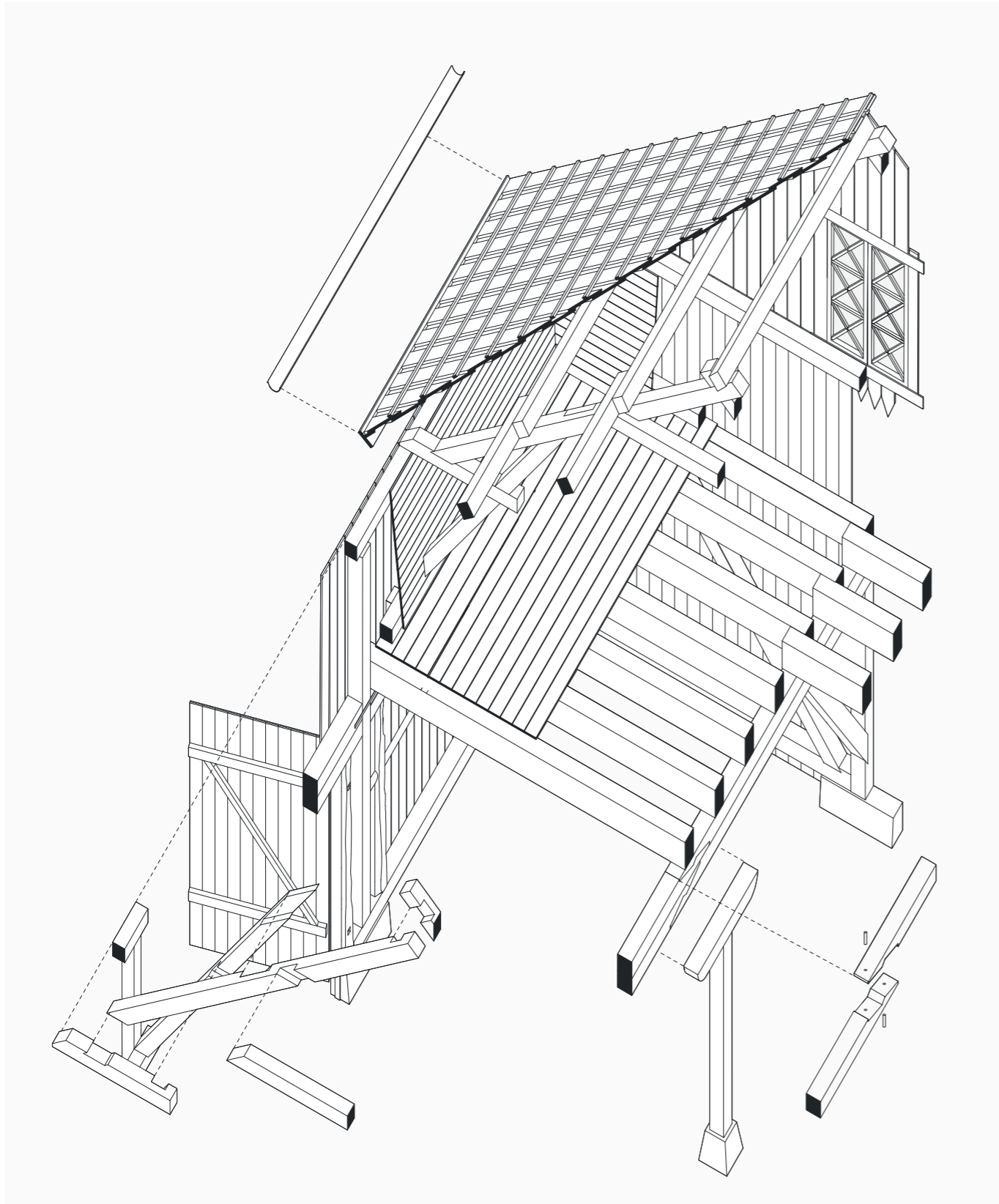
Still life, first floor, March 2024 - B

B



March, 2024

A



Foundation: Concrete plinth, 1/3 concrete floor
 Structure: 1st floor: post and beam
 2nd floor: Timber frame (stolpverk)
 External surface: Hanging vertical wood panel treated with falu red paint, drip edge
 Internal surface: Horizontal timber panel, untreated or treated with pigmented linseed oil
 Roof shape: Pitched

Roof lining: Terracotta tile
 Windows: x2, with muntins
 Doors: x6, Industrial, wood, treated with tar
 Filigree construction, primary construction + cladding, supporting planks, double beams, wooden joints

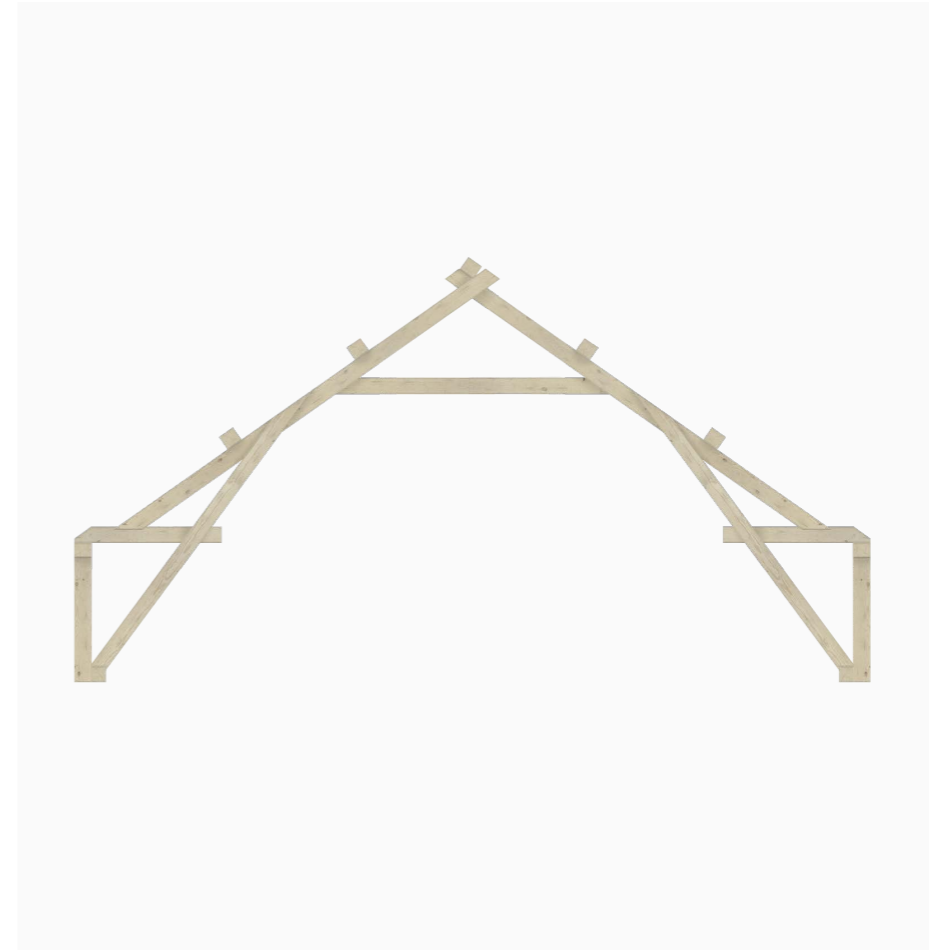
Technical still life, 1:50 - A

Portrait of timber frame - B

Portrait of joint - C

5. The Granary

B



C



I. Alterations follow the logic of *aemulatio* through interpretations of form, material, or function, as well as technical, historical, or experiential considerations.

II. Alterations intensify existing qualities or are necessary for the new function.

III. Alterations are considered in the scale of the landscape, the still life, and the portrait.

IIII. Alterations are made through uncovering, framing, layering and filling the existing.

IIIII. Alterations should preserve and promote the visibility of the timber frame structure.

A

Intention for Transformation

Both Andersen's text on transformation and the notion of *Aemulatio* is understood as a thoughtful blend of new and old within this thesis. When using the logic of *aemulatio*, copying, learning and interpreting the existing, the selection might be subjective depending on the observer and what they take notice of. Are all parts of history valued the same, from the time the building was constructed to any additions? What is considered to be the original?

Applying the logic of *aemulatio*, the granary is altered through reinterpreting it and other granaries on the plain of Marstallen. *Aemulatio* is described as improving upon the original, but since what is considered improvement is so highly subjective, this is understood as intensifying qualities of the existing within this thesis.

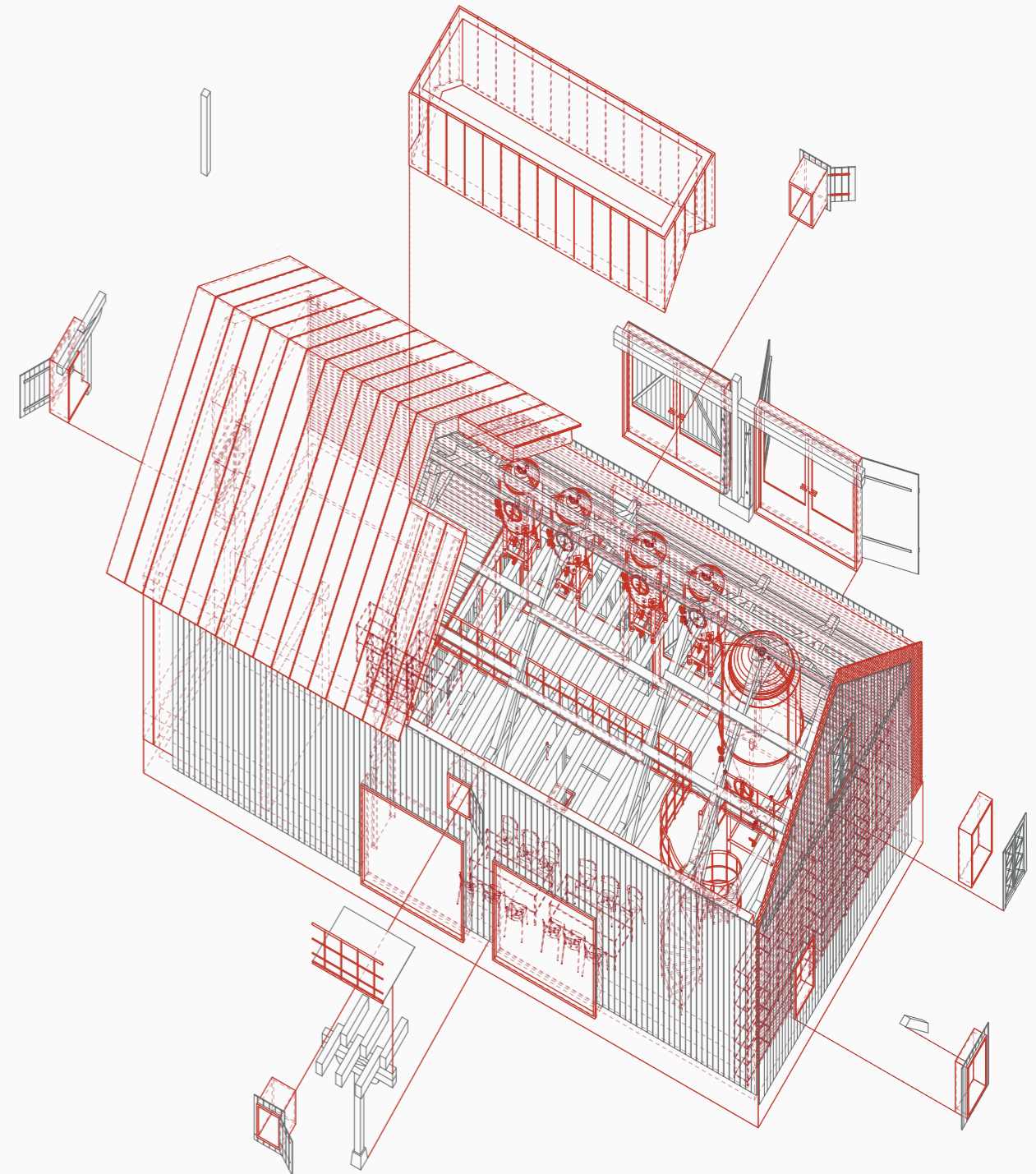
As a result of understanding the building through the technical, historical and experiential lens, the timber frame construction is used as a deciding factor in the project. Its visibility and preservation is prioritized, since it both showcases a traditional building technique, traces of human hand in its joints, and plays a significant part in the experience of the upper floor.

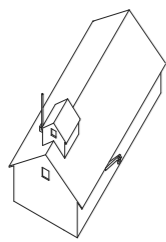
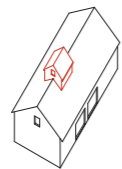
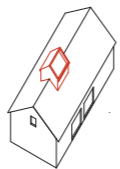
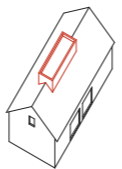
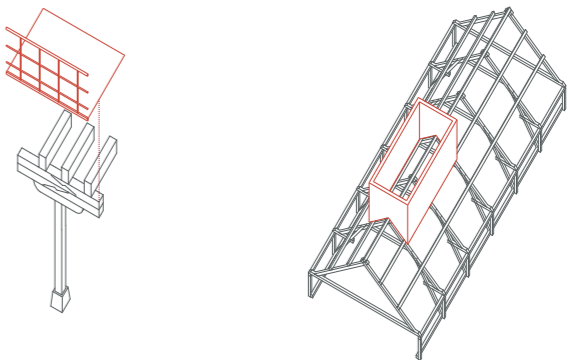

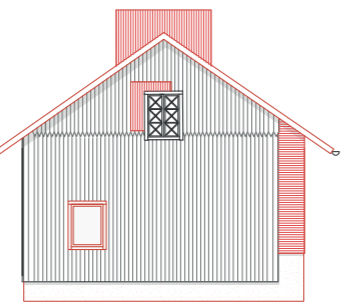
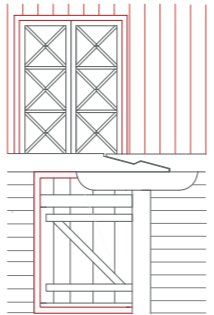
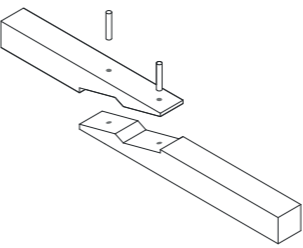
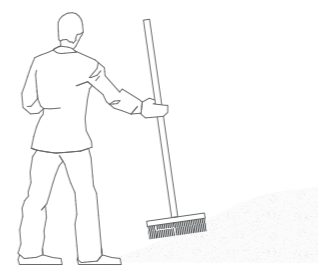
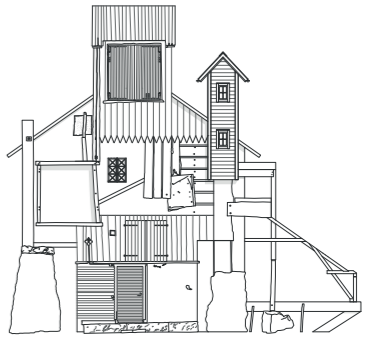
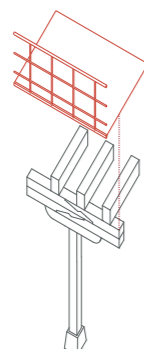
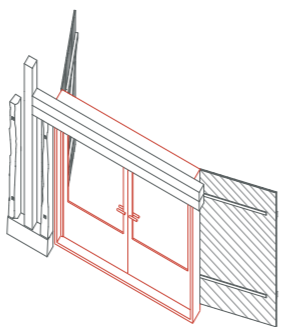
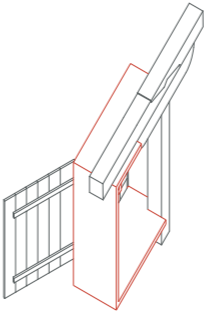
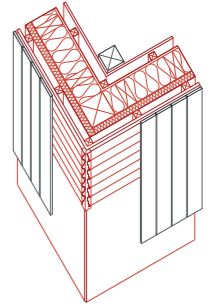
The space on the upper floor is also characterized by its two gable windows, offering light but no actual views of the plain. Since the granary was built to store many tons of grain, the wooden construction is sturdy and still in good shape today. The alterations solves basic problems identified at the site visit; the pillar and plinths are slowly sinking in to ground, and to suit the new proposed program, the building is in need of daylight and insulation.

Intention - A

Overview of alterations - B

B



<p>Theory</p>						
	<p><i>The original</i> A precursor to be copied An elevator tower on a nearby barn</p>	<p><i>Translatio</i> follow in the footsteps of the original aiming at similarity in architecture: aiming for a stylistic entity no new materials or formal elements later An elevator tower on the granary</p>	<p><i>Imitatio</i> adaptations, e.g. reframing and additions aiming at equality in architecture: a creative and selective restoration reconstructing parts of the existing A skylight imitating an elevator tower</p>	<p><i>Aemulatio</i> learning from the original aiming at improvement in architecture: approximation and reinterpretation intensify qualities of the existing A skylight reinterpreting an elevator tower</p>	<p><i>Blend</i> A blend of old and new without oversimplification. This includes modification, approximation, connection and reinterpretation of the existing. Site-specific considerations with extra attention to materials. Within this thesis, blending is understood as allowing additions with new materials and shapes, as long as they follow the logic of the existing structure. For instance, considering the granary's visible wood construction and raw, replaceable surface finishes, the introduction of a material like steel aligns with the existing logic, as steel can also provide visible finishes and speaks the same utilitarian language as the untreated wood.</p>	
<p>Lenses</p>						
	<p><i>Landscape</i></p>	<p><i>Still Life</i></p>	<p><i>Portrait</i></p>	<p><i>Technical</i></p>	<p><i>Historical</i></p>	<p><i>Experiential</i></p>
<p>Intention</p>	<p><i>Landscape</i> Bring in light through altering the silhouette of the building through interpreting other additions in the village: elevator towers</p>	<p><i>Still Life</i> An outward insulation means having to expand the facade, the new corners are filled with corrugated metal sheets found on site; creating a collaged facade.</p>	<p><i>Portrait</i> Characteristic details are enhanced, the timber frame through the skylight and uncovering and framing parts.</p>	<p><i>Technical</i> The preservation and visibility of the timber frame (<i>stolpverk</i>) is prioritized.</p>	<p><i>Historical</i> The new program, a brewing collective, is based on the buildings historical use for grain and production.</p>	<p><i>Experiential</i> The church-like atmosphere created by the high ceiling and the few windows is intensified by opening up between the floors and the addition of a skylight. The patina of existing materials is preserved.</p>
<p>Actions</p>	 <p><i>Uncover</i></p>	 <p><i>Layer</i></p>	 <p><i>Frame</i></p>	 <p><i>Fill</i></p>		



A

5. The New Function: A Brewery Collective

The proposed programme for the granary is a brewing collective, to further build on the historical use of the building for production of food and to propose a space for community in the countryside.

A site visit to Kristianiastudentenes Haandbryggerlaug, a student brewing club in Oslo, was conducted to access a basic understanding of the beer brewing process, as well as the space and equipment needed. The club have two rooms for the production, as well as a cold storage room for the finished beer and a room for gathering. The first room is a storage with shelves, a freezer and refrigerators. The second room has a brewing system, a floor drain and a dish washer.

The fermentation vessels, both at room temperature and in refrigerators, as well as the space required for operating the brewing system, takes up the most space. Approximately three times the space of the brewing system is needed around it, for lifting, stirring and transferring the beer.

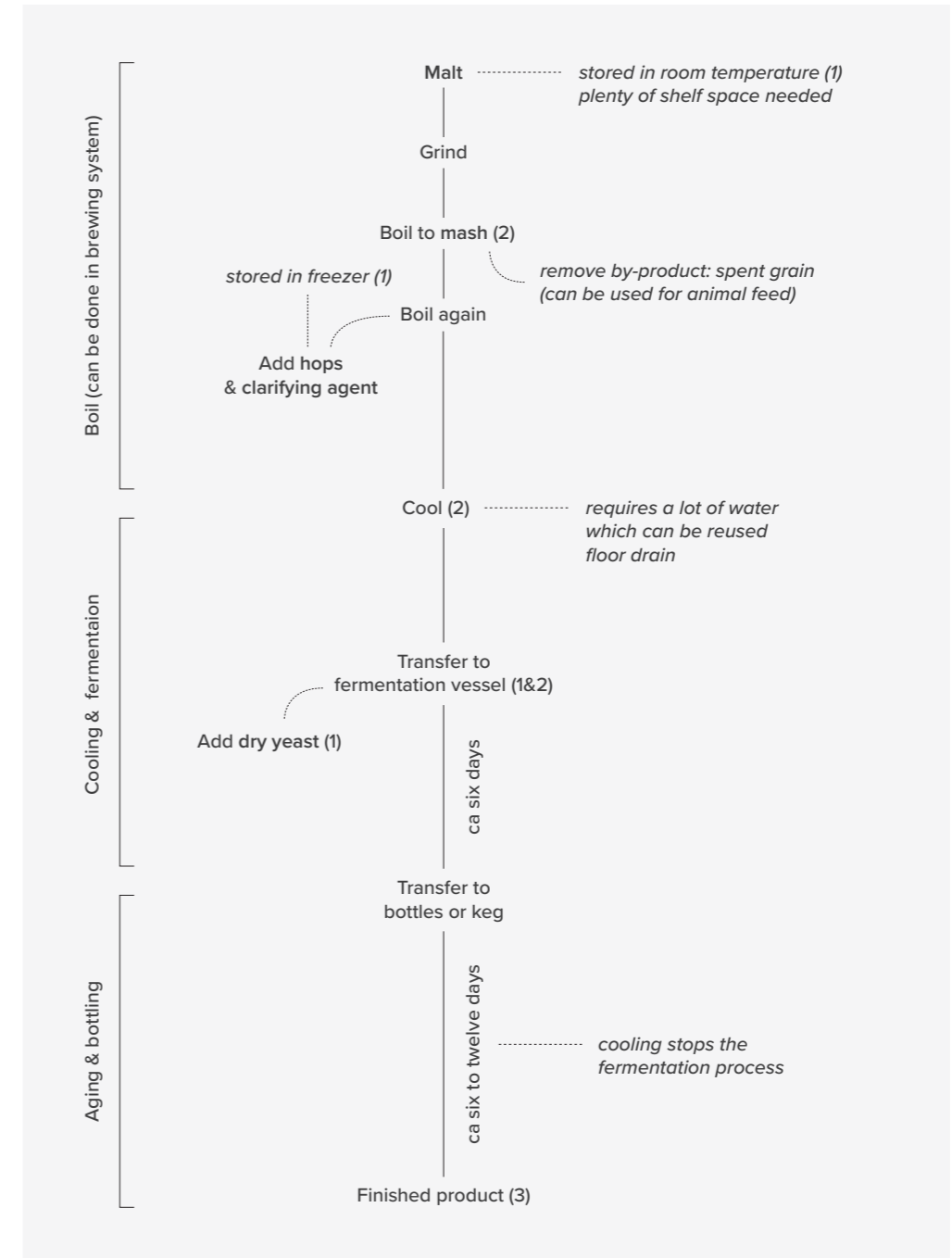
Student Brewing Club in Oslo - A

Simplified overview of the brewing process
Based on site visit
Differs from beer to beer - B

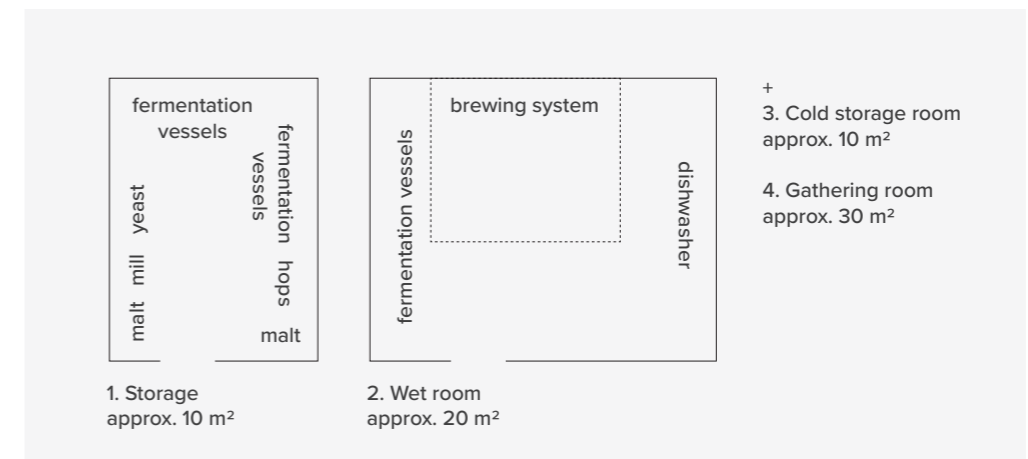
Schematic plans from site visit to brewing club - C

7. New Function

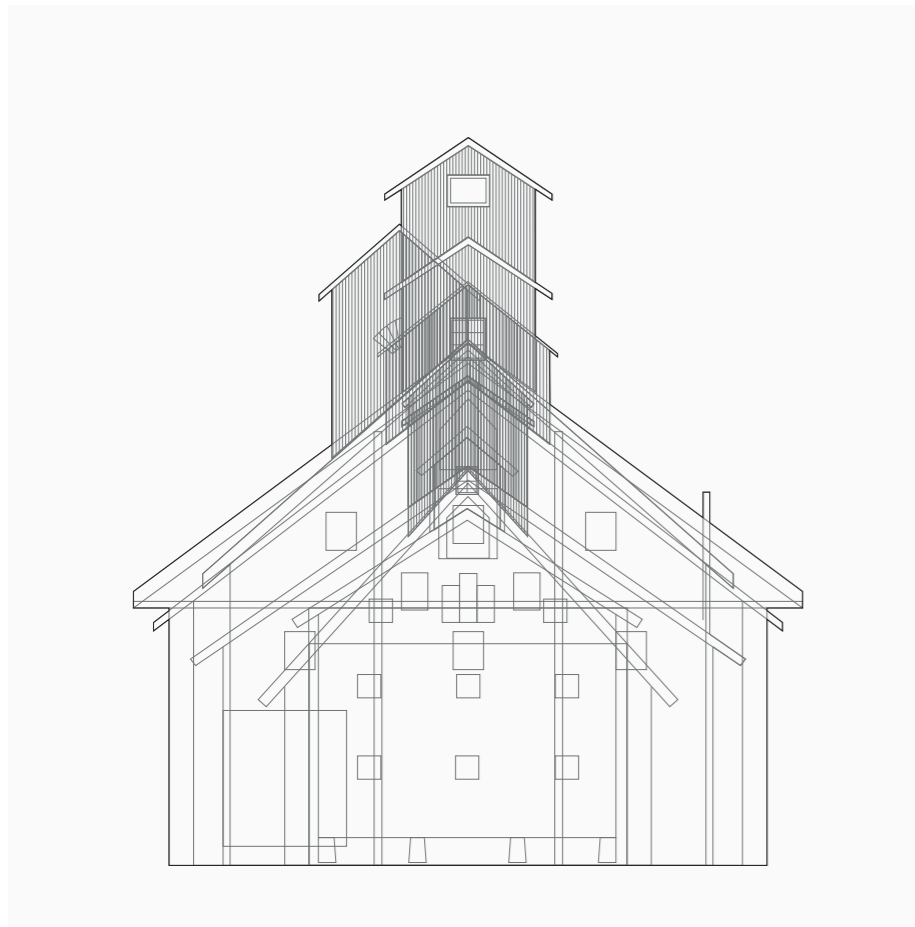
B



C



7. New Function



A

Landscape: Altering the Silhouette

The question of how to bring daylight to the second floor of the granary led to a consideration of altering the building's silhouette, as the two gables already have the building's only windows, and the low walls on the long side transition to the roof after just one meter.

By using the method of solving a design problem through looking through different lenses, an examination was conducted on how other additions to buildings in the village had been dealt with

through the times, looking through the historical lens. While there were no dormers, nearly every other farm had at least one addition of an elevator tower.

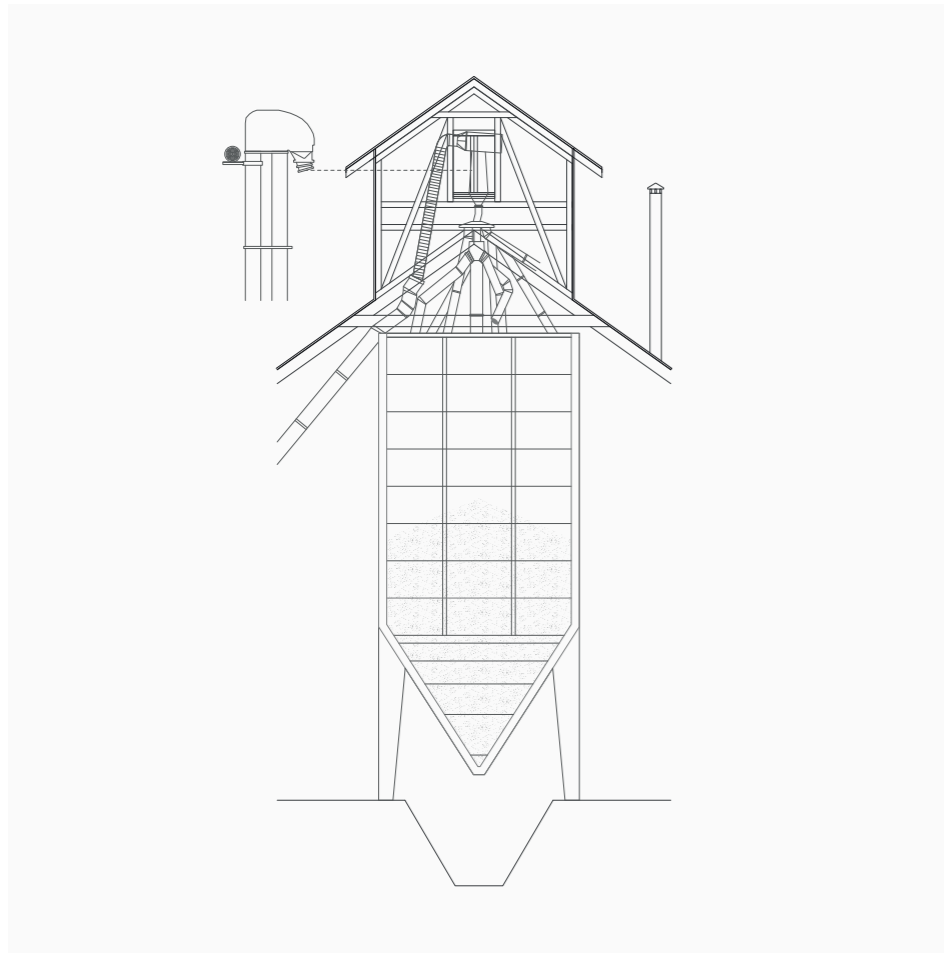
By reinterpreting the elevator tower, a new roof lantern is proposed to bring in light to the granary. This is based on the logic of *Aemulatio* and the investigation was conducted in the scale of the *Landscape*; the silhouette in volume studies.

Elevator towers - A
on Marstallen

Digital volume models
of elevator towers and
altered silhouette

B





A



One elevator tower in the village was examined in more detail and documented in a principle section; studying how a structure could be added onto a similar timber frame; the technical lens.

Elevator towers are have commonly been added onto existing barns since the second half of the 20th century. Their function is to facilitate the drying and storage of large volumes of grain, by transporting

it within the farm. These additions are typically constructed in wood, with wood or corrugated sheet metal as facade materials. Within the area, a radius of ten kilometres from the granary, there are predominantly Falu red wood panel or Falu red sheet metal, with some examples of unpainted corrugated metal. The design of elevator towers mimics that of small houses, with gable roofs and the facade material.

Section - A

Elevator tower - B

Elevator system - C

B

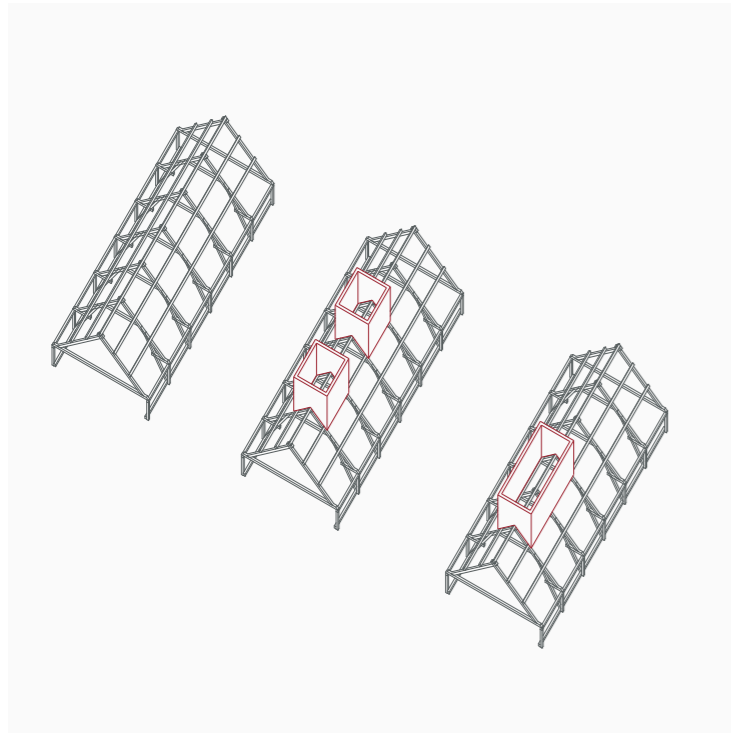


C





A



B

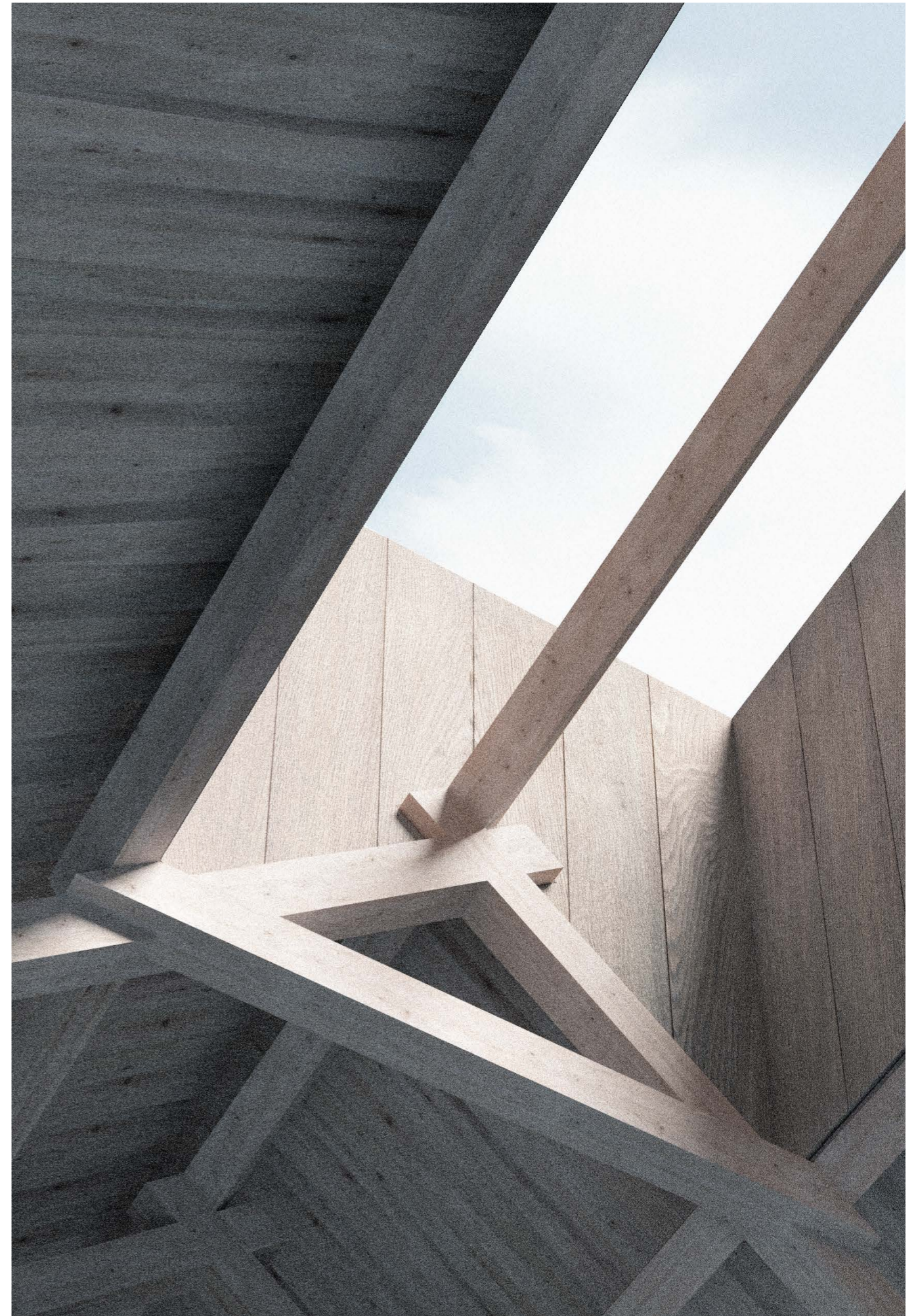
Considering the experiential lens, how daylight falls inside the building is explored. By following the intention of not altering the timber frame, the roof lantern is placed on top of it, and by removing the ceiling behind it, the timber frame is *uncovered*. The inside of the roof lantern is clad with removed floor planks.

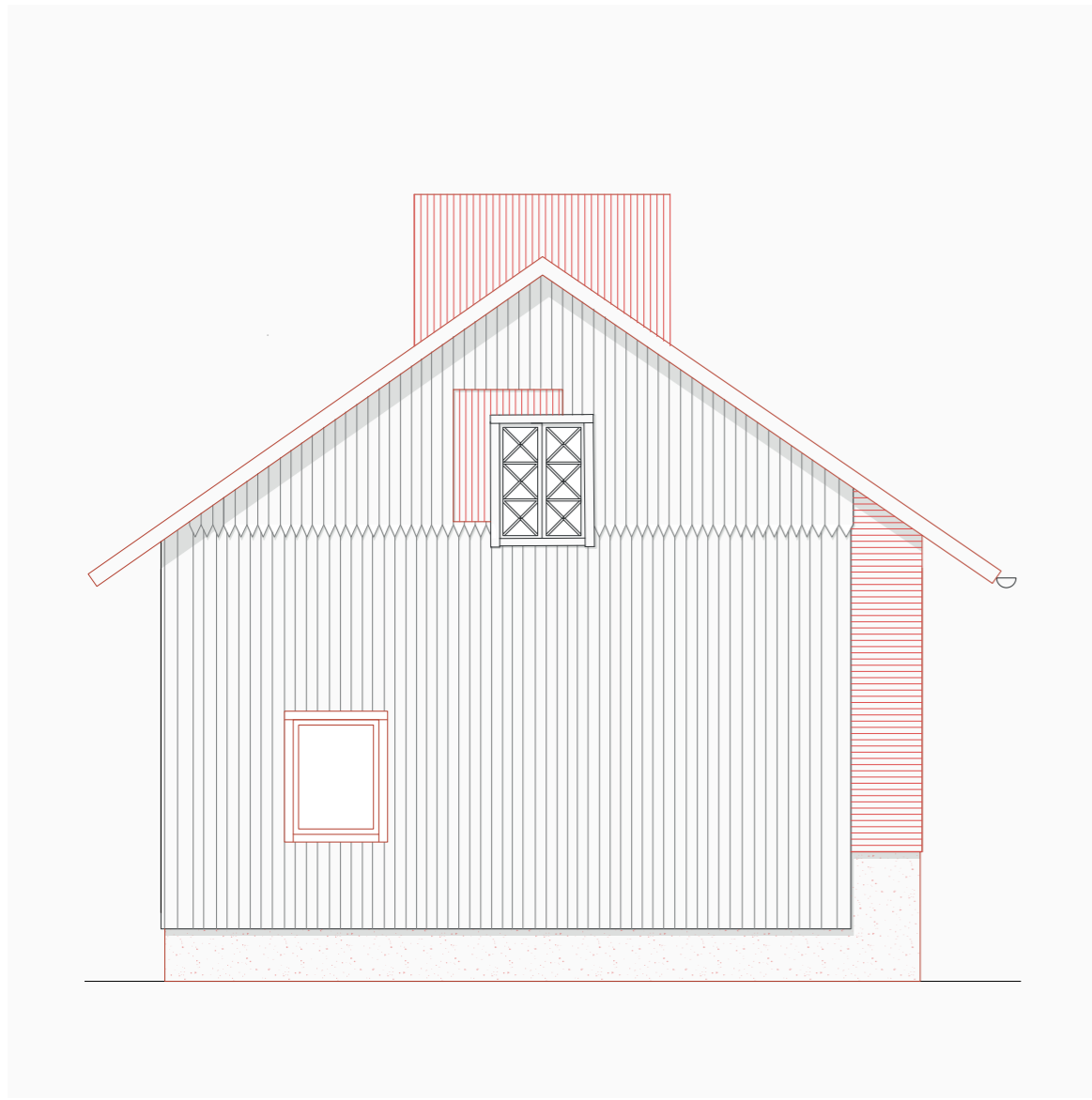
Digital model - A

Roof lantern on timber frame - B

Uncovered timber frame - C

B





A

Still Life: Altering the Composition and Space

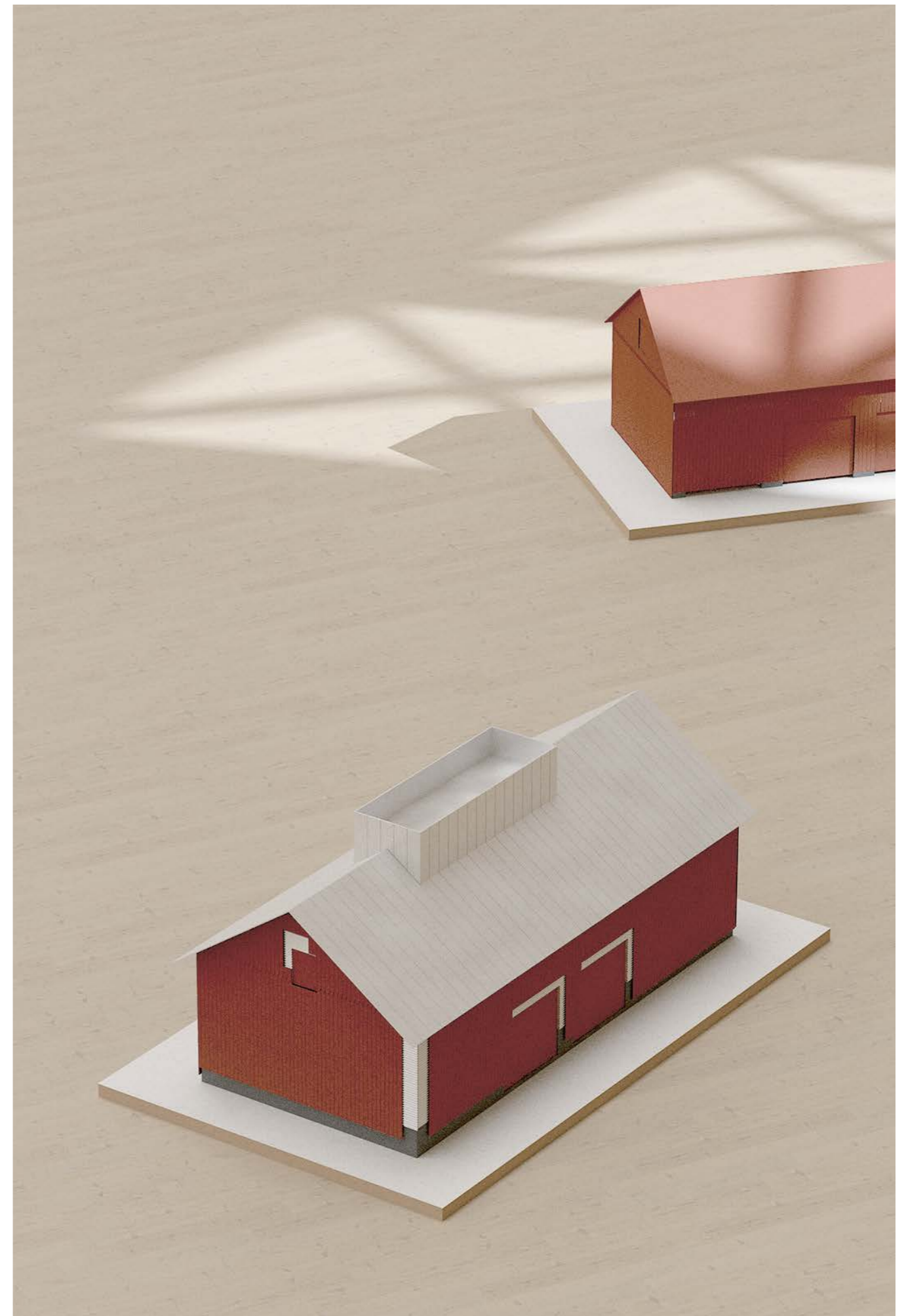
In the scale of the still life, insulation was considered, and the decision was made in accordance with the intention of preserving the visibility of the timber frame. An inward insulation would mean covering parts of the timber frame, and an outward insulation means having to expand the facade. The facade consists of vertical wooden panels, and is

free-standing from the timber frame. Expanding it means having to add facade material. This is made through an interpretation of a metal mending from a neighbouring granary. The facade is moved upwards, and the traces of the window and gate openings are mended with metal, as well as the new corners.

Altered facade - A

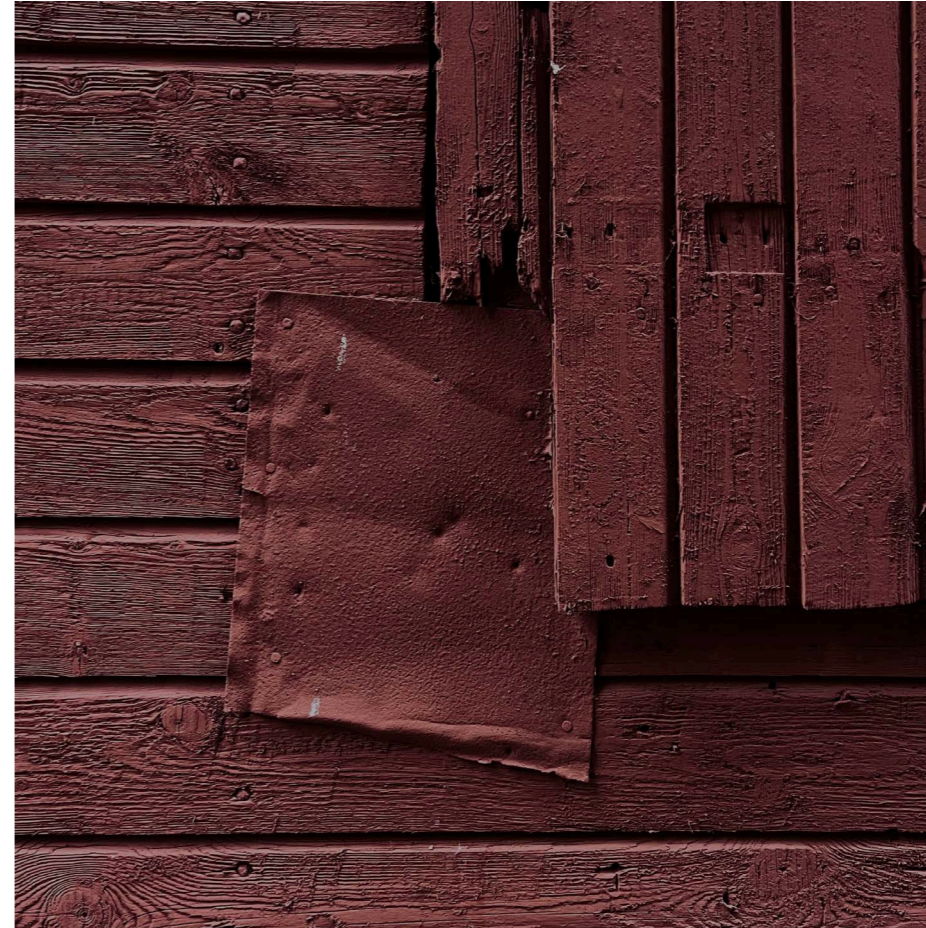
Digital model - B

B

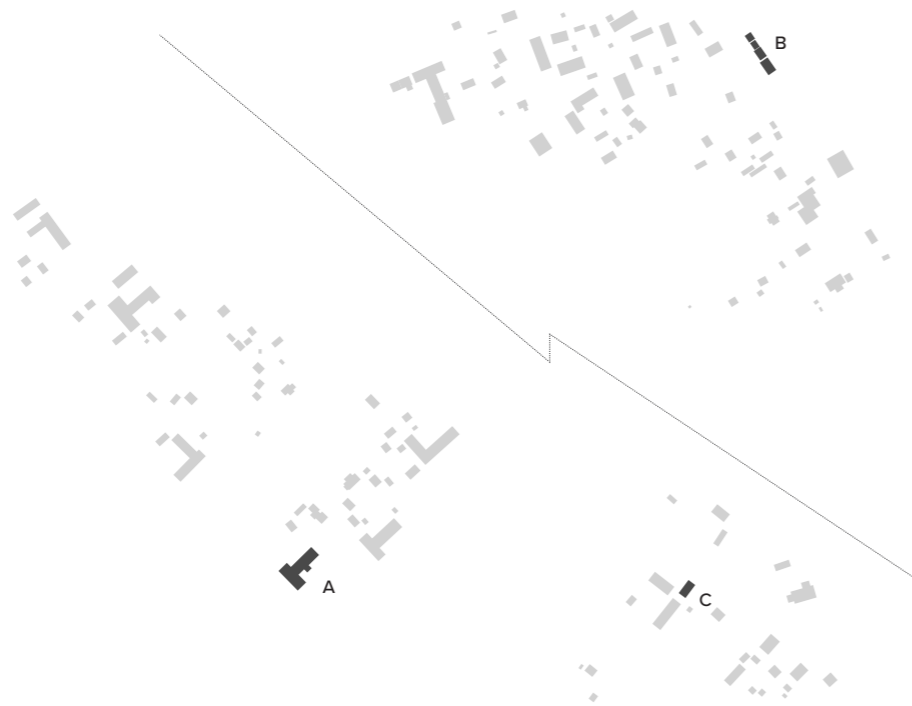




A



B

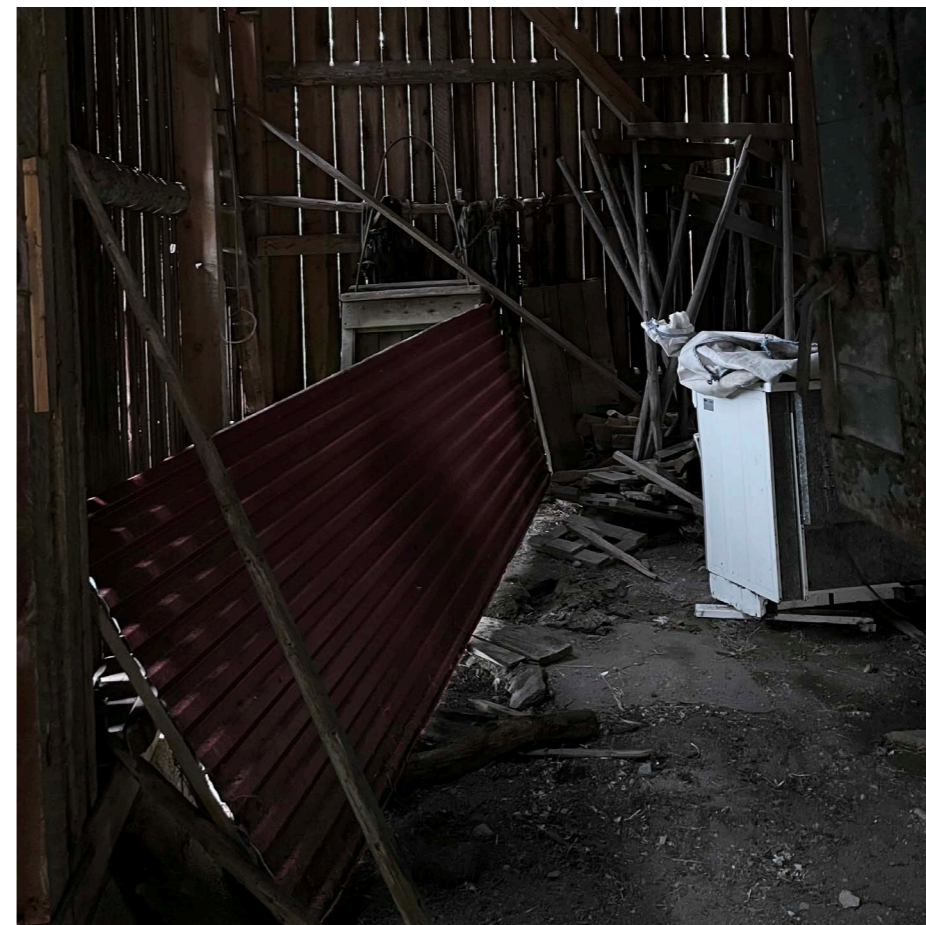


The new facade composition follows the logic found on a neighbouring facade, a collage of materials. The sheet metal used to fill the holes in the facade was found on site, in the granary.

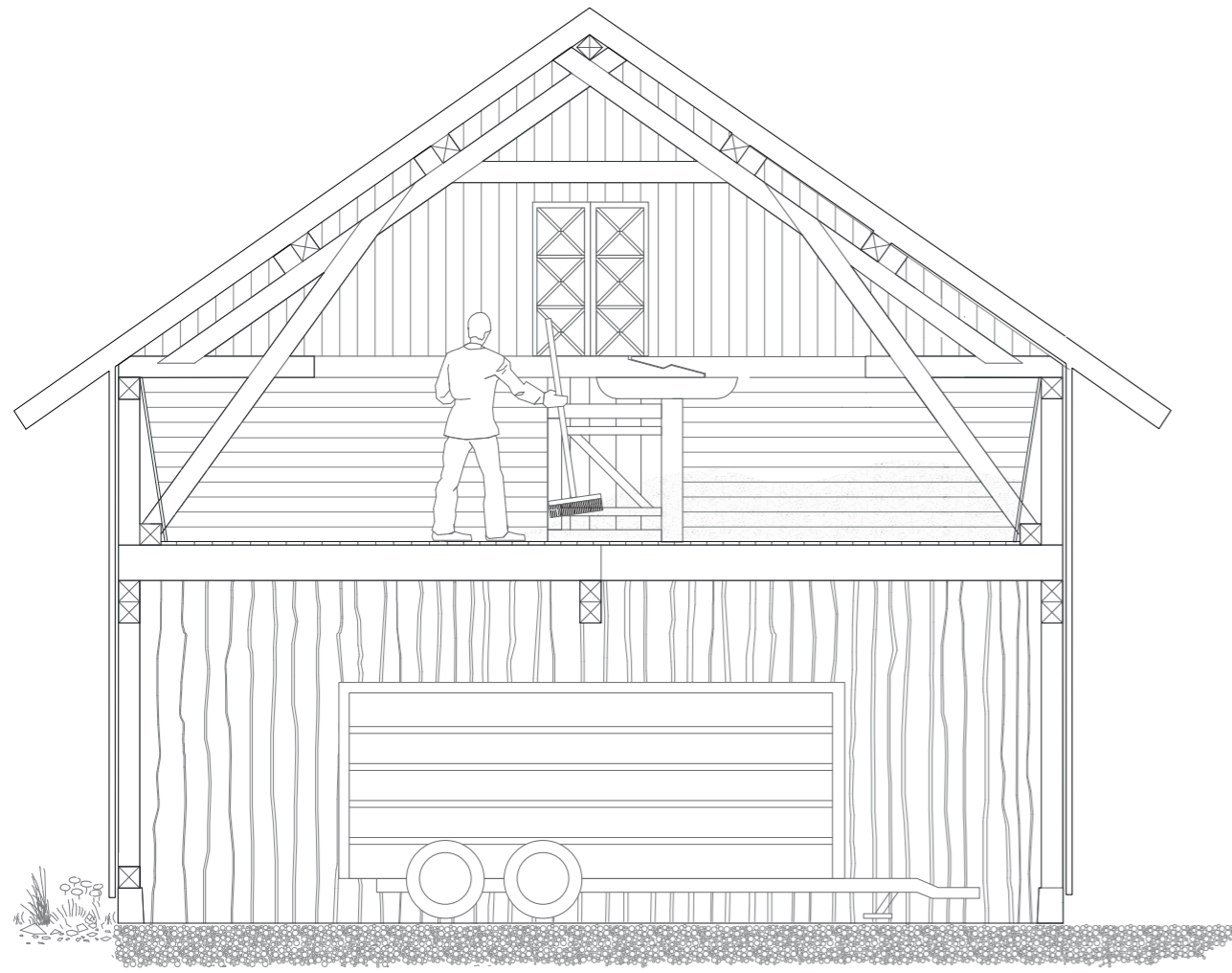
Collaged facade in Frösthult - A

Metal mending on granary in Gästre - B

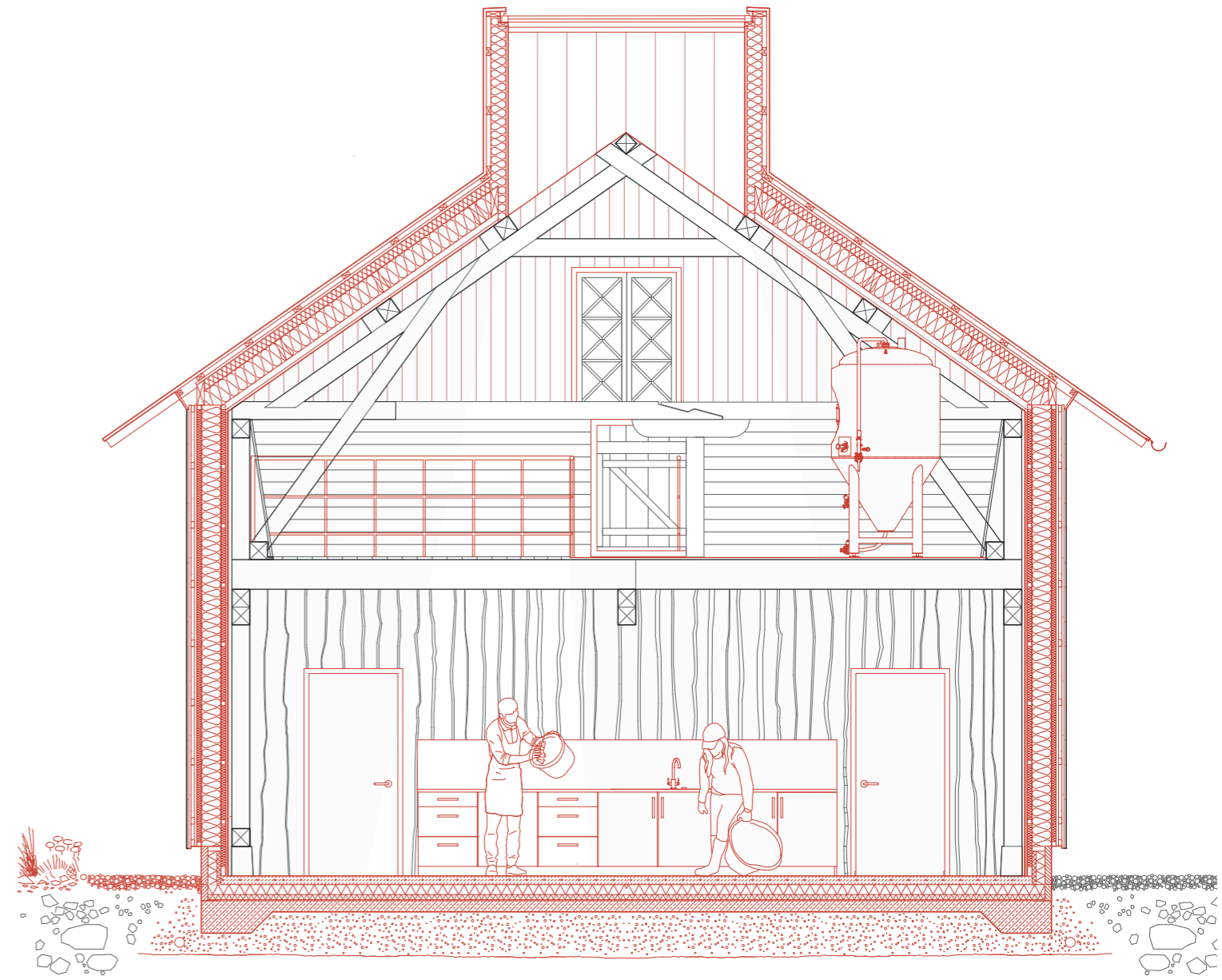
Sheet metal found on site - C



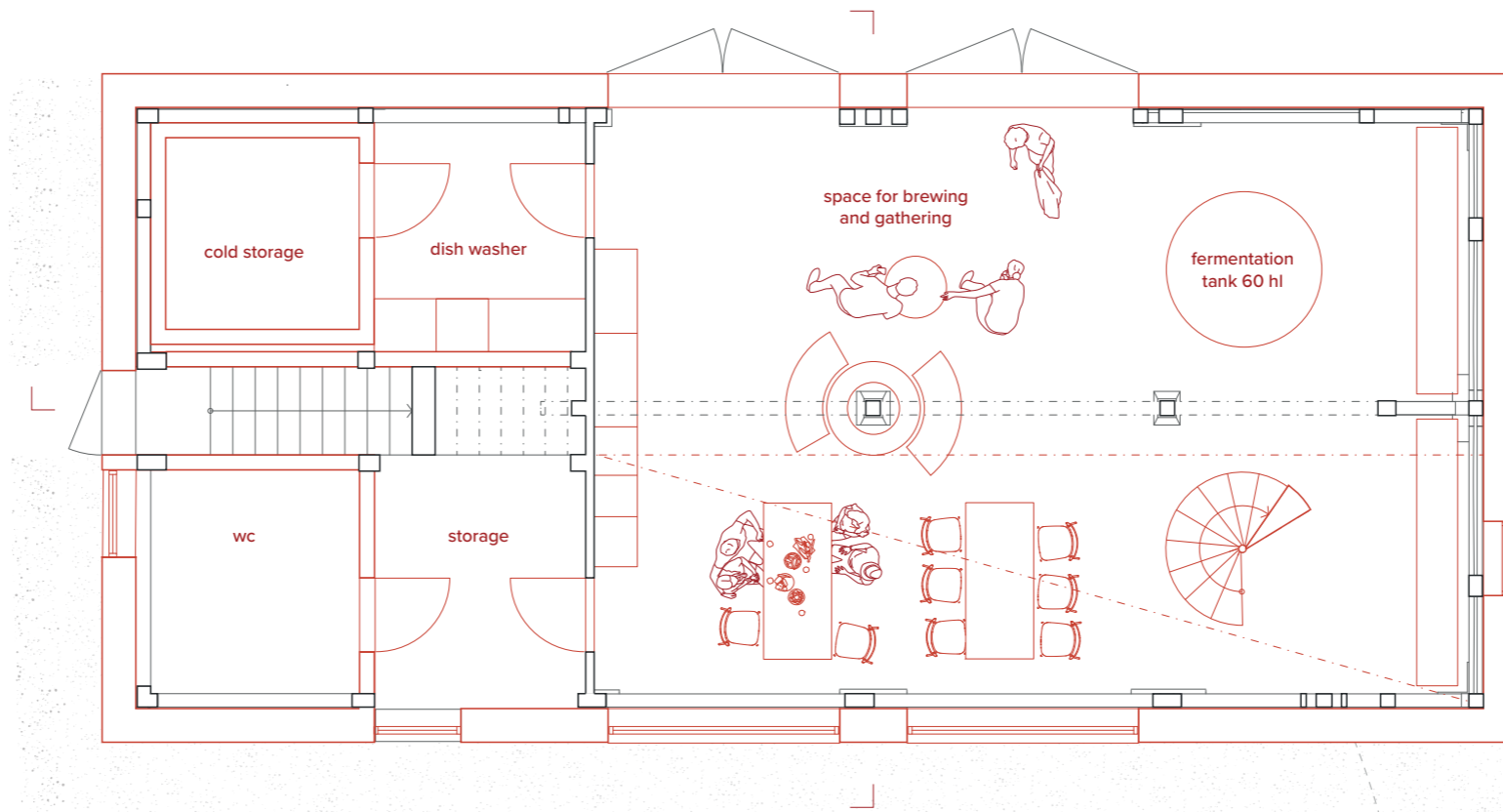
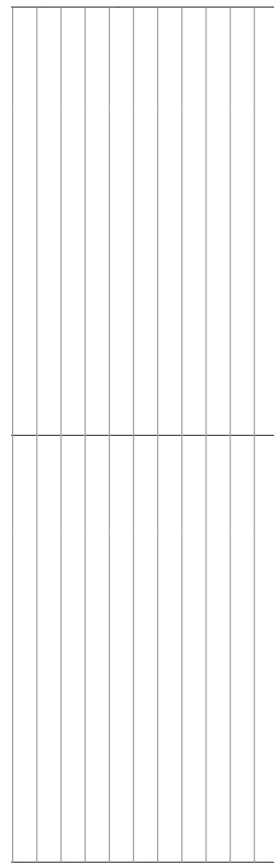
C

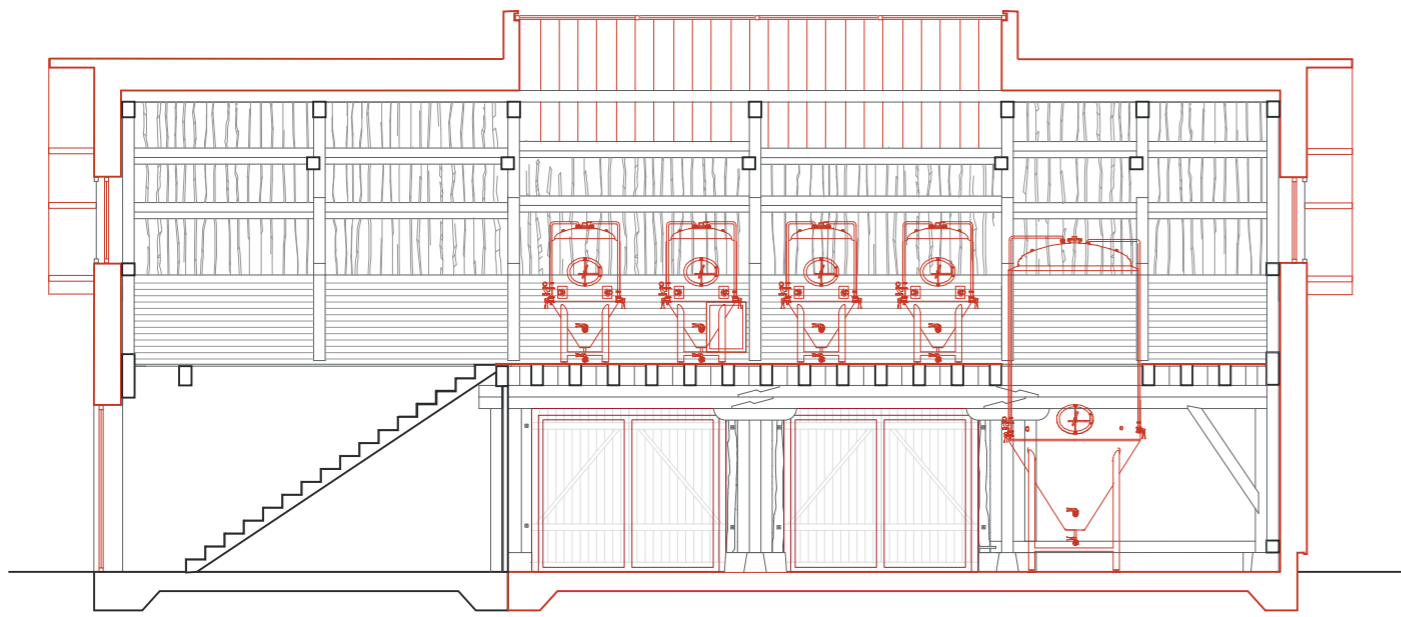


Section of granary, previous use

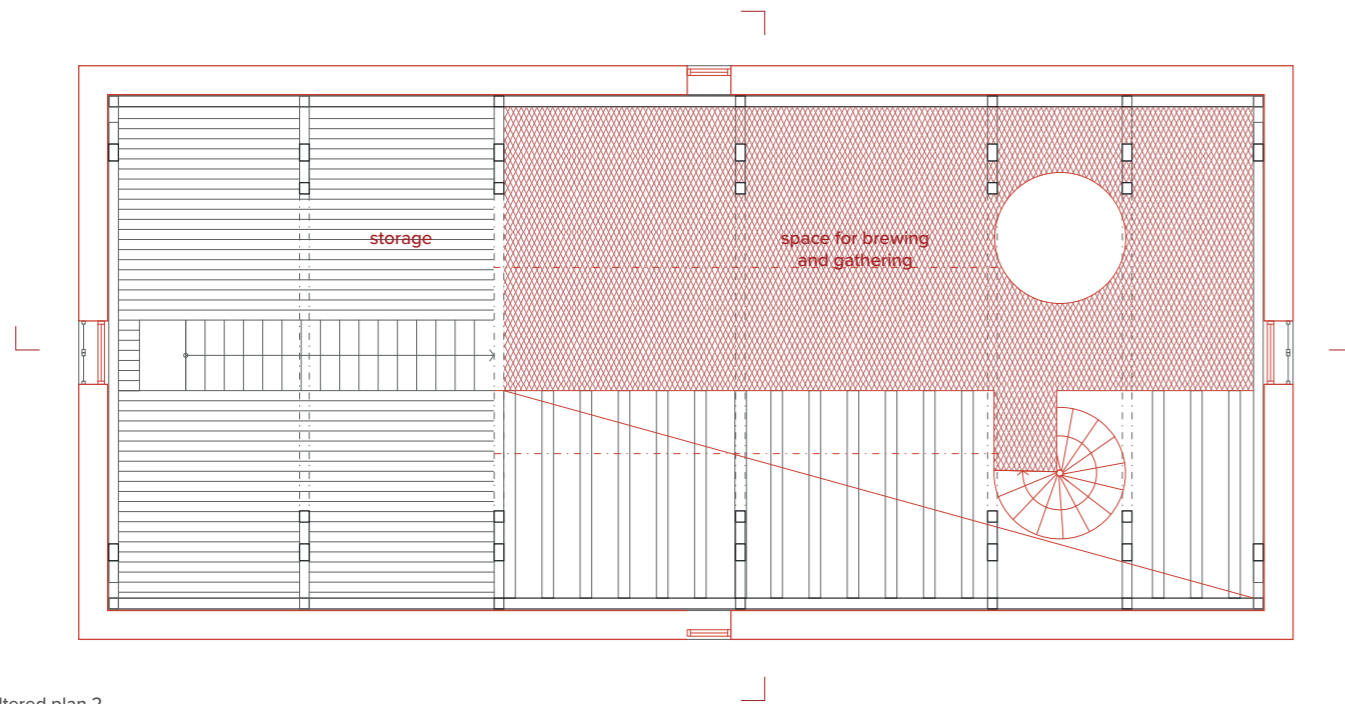


Altered section





Altered longitudinal section

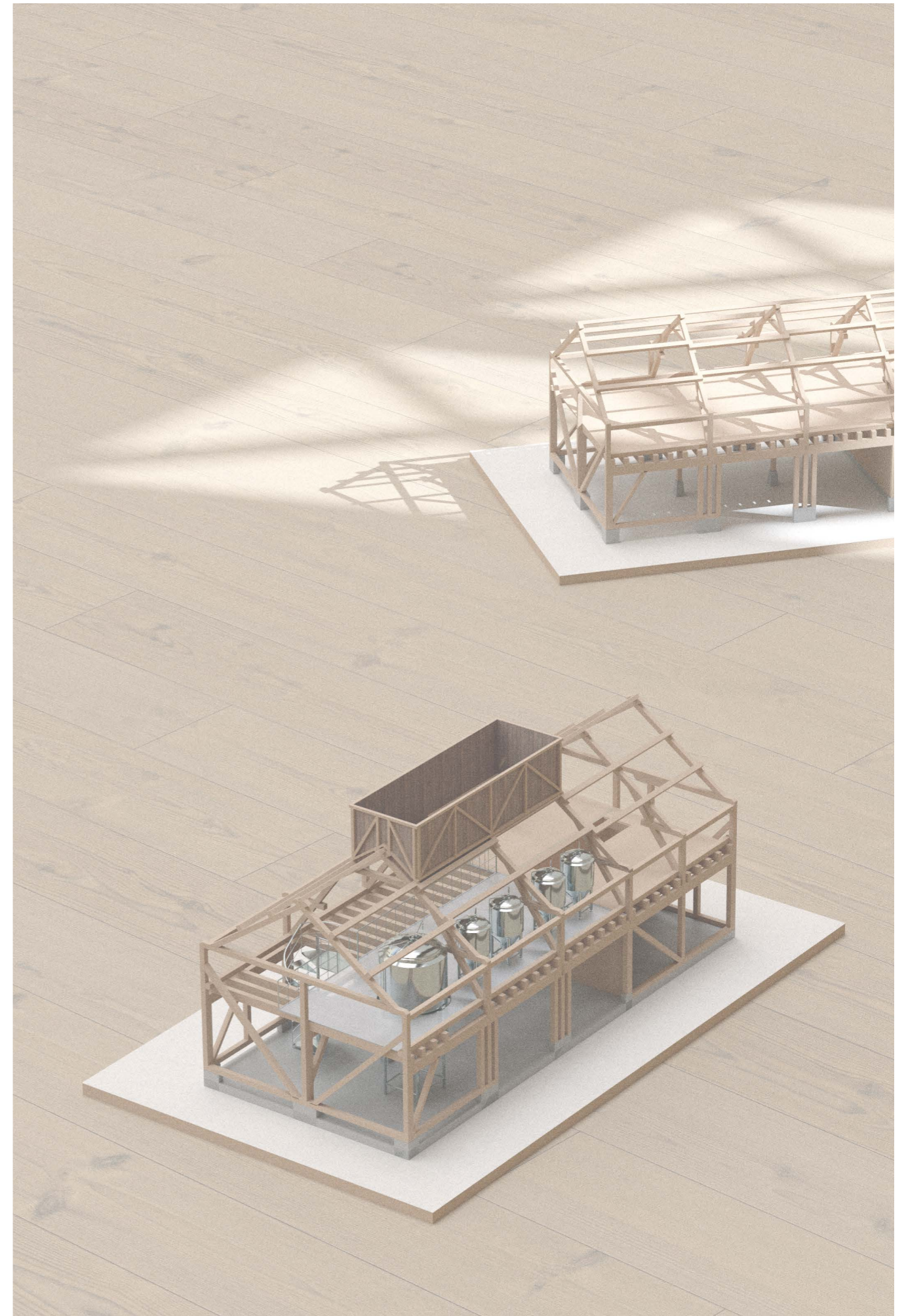


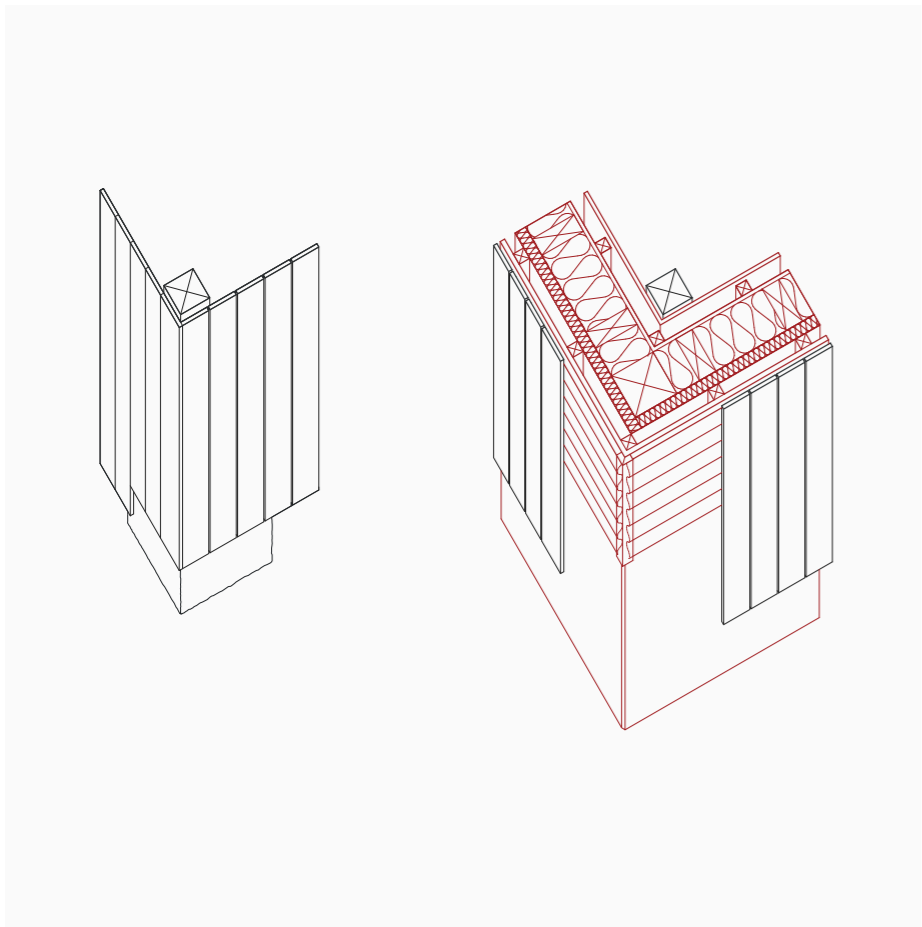
Altered plan 2

0 1 2 m

Digital model before and after - A

A





A

Portrait: Altering the Detail

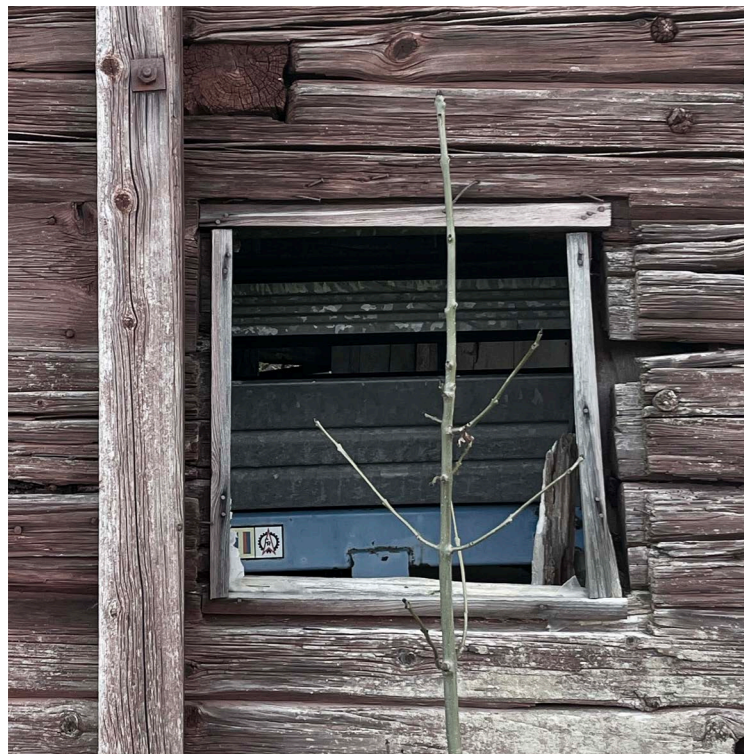
The scale of the portrait deals with the alterations of details. To the new corner, a reinterpretation of corner stones on surrounding granaries and the concrete corner plinth on the existing granary is proposed; a raised concrete base.

Altered corner - A

Digital model - B

B





A



B



The altered details speaks the same language as the existing: simple and straight forward with raw finishes and simple decor. The originals used in the process of aemulatio for the details were a wooden frame found on an disused building on site, a corner stone on a neighbouring granary and the existing corner plinth in the granary.

Frame on disused barn at site - A

Corner stone in Frösthult - B

Concrete plinth on granary - C

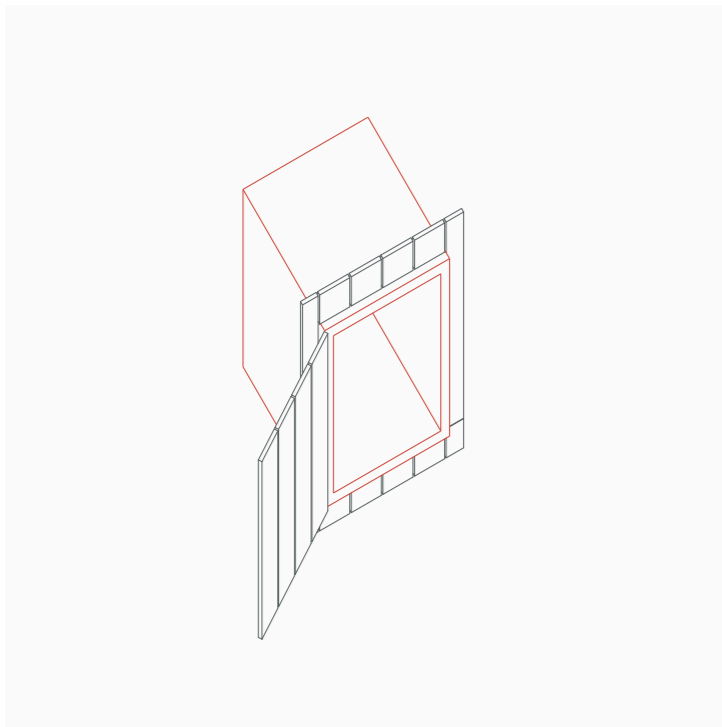
8. Portrait: Altering the Detail



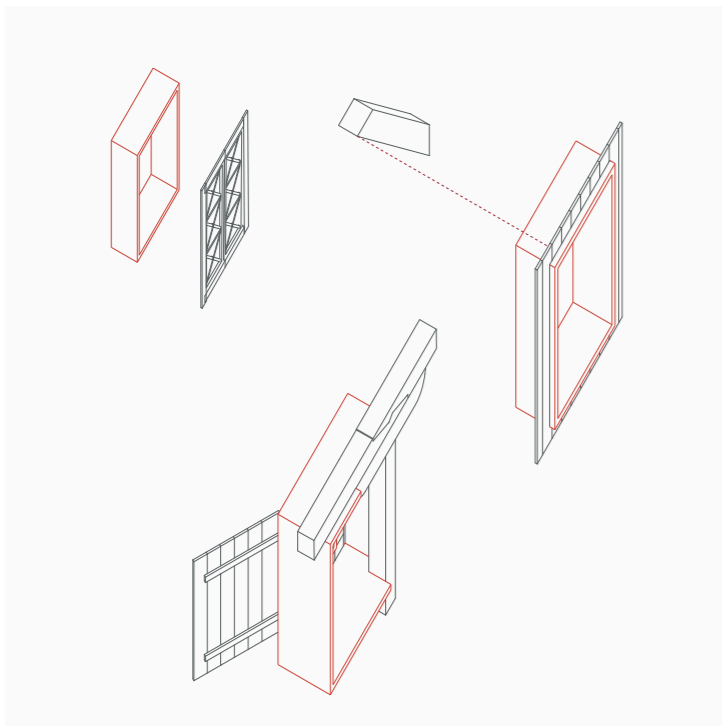
C

8. Portrait: Altering the Detail

A



B



Simple wooden frames and extra glass are added on the inside of existing windows and hatches, hatches where grain used to be blown up through pipes.

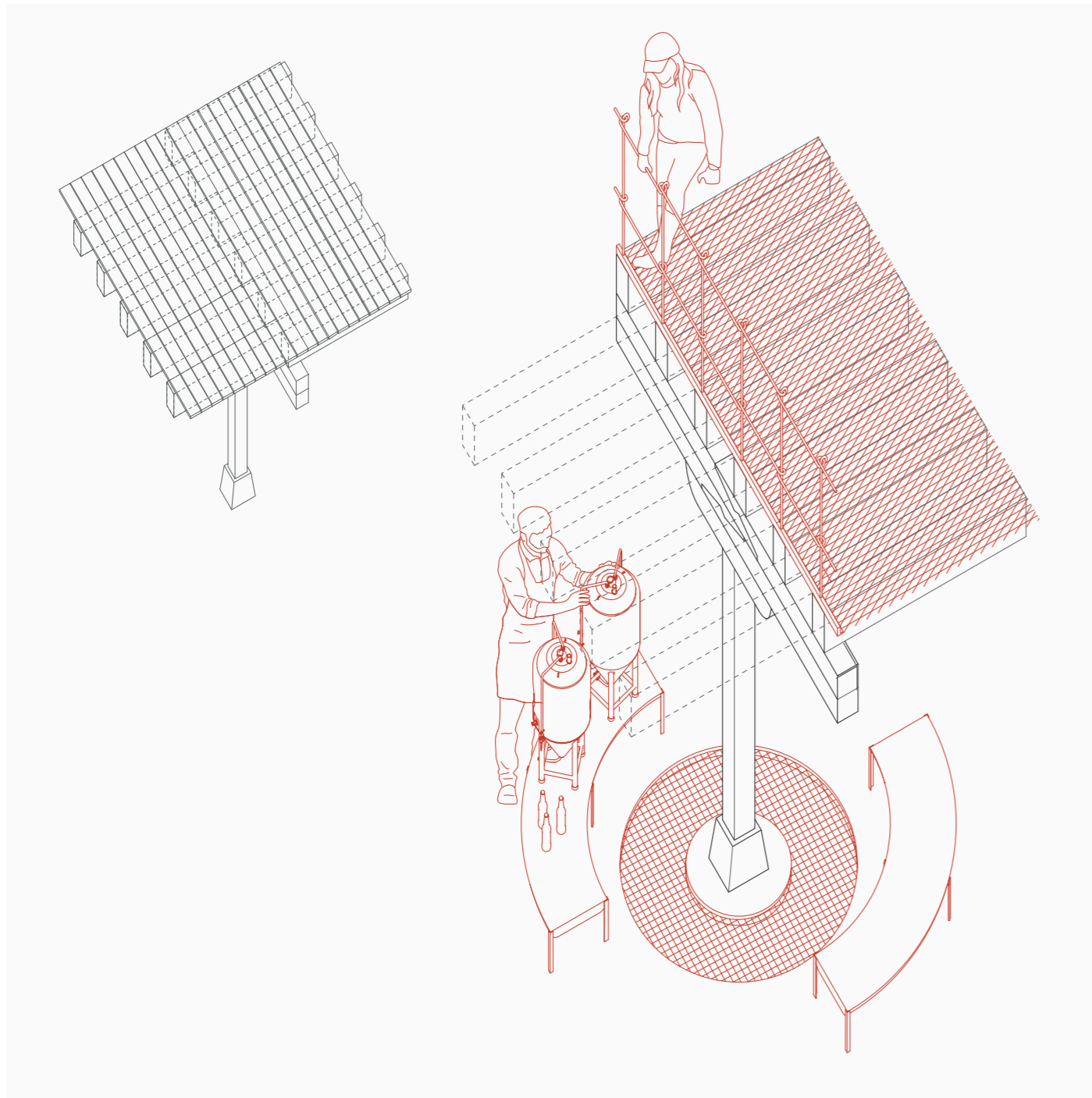
Frame - A

Frame / layer - B

Frame - C

C





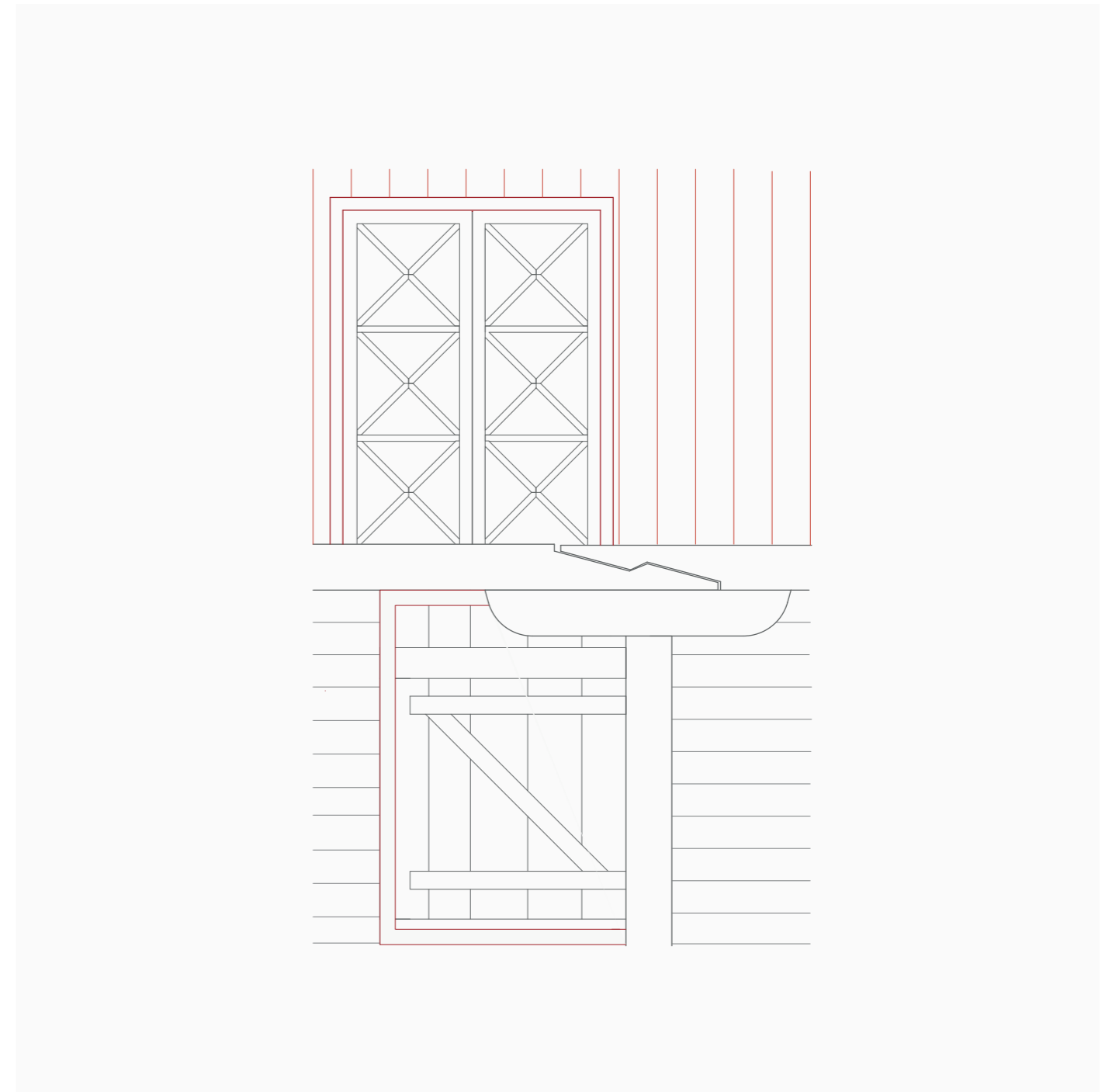
A

The timber frame is uncovered by removing material to intensify characteristic details. The removed floor planks are used to clad the inside of the roof lantern.

Uncovered and framed pillar - A

Uncovered and framed structure and windows - B

8. Portrait: Altering the Detail

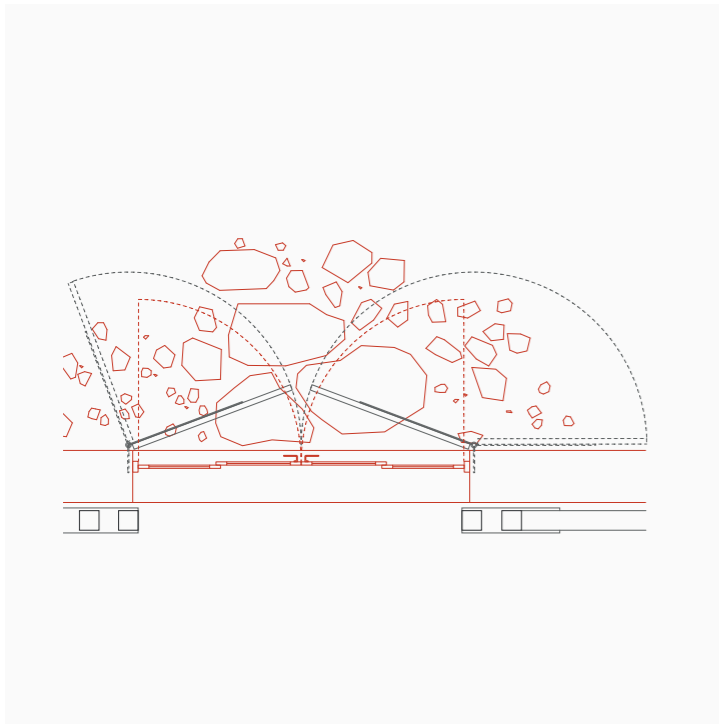


B

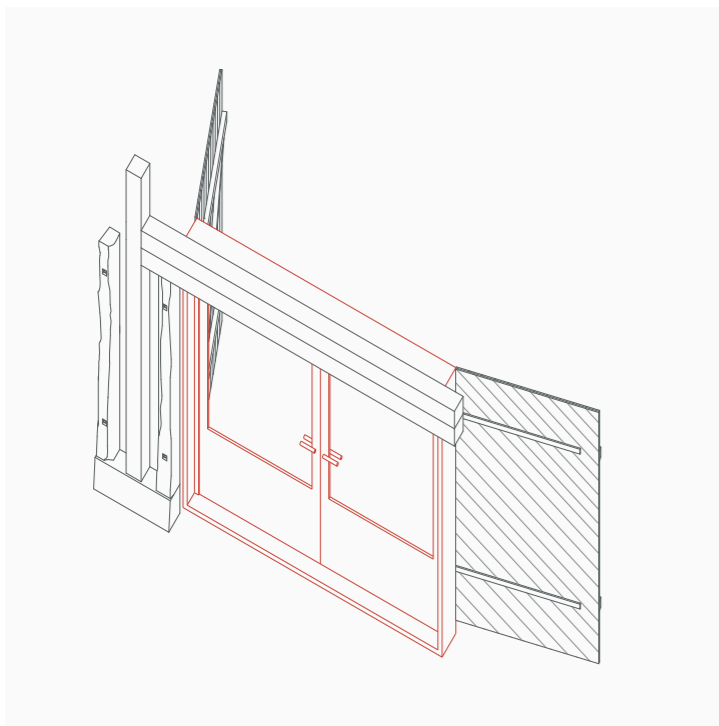
Landscape, aemulatio

8. Portrait: Altering the Detail

A



B



The interior space is now characterized by its new sky light, the original patina on the wooden structure, and the added technical equipment needed for the brewery. The added metal surfaces speaks the same utilitarian language as the raw wood, surfaces which are optimized for the work to

be done there, the metal being easy to disinfect for the brewing.

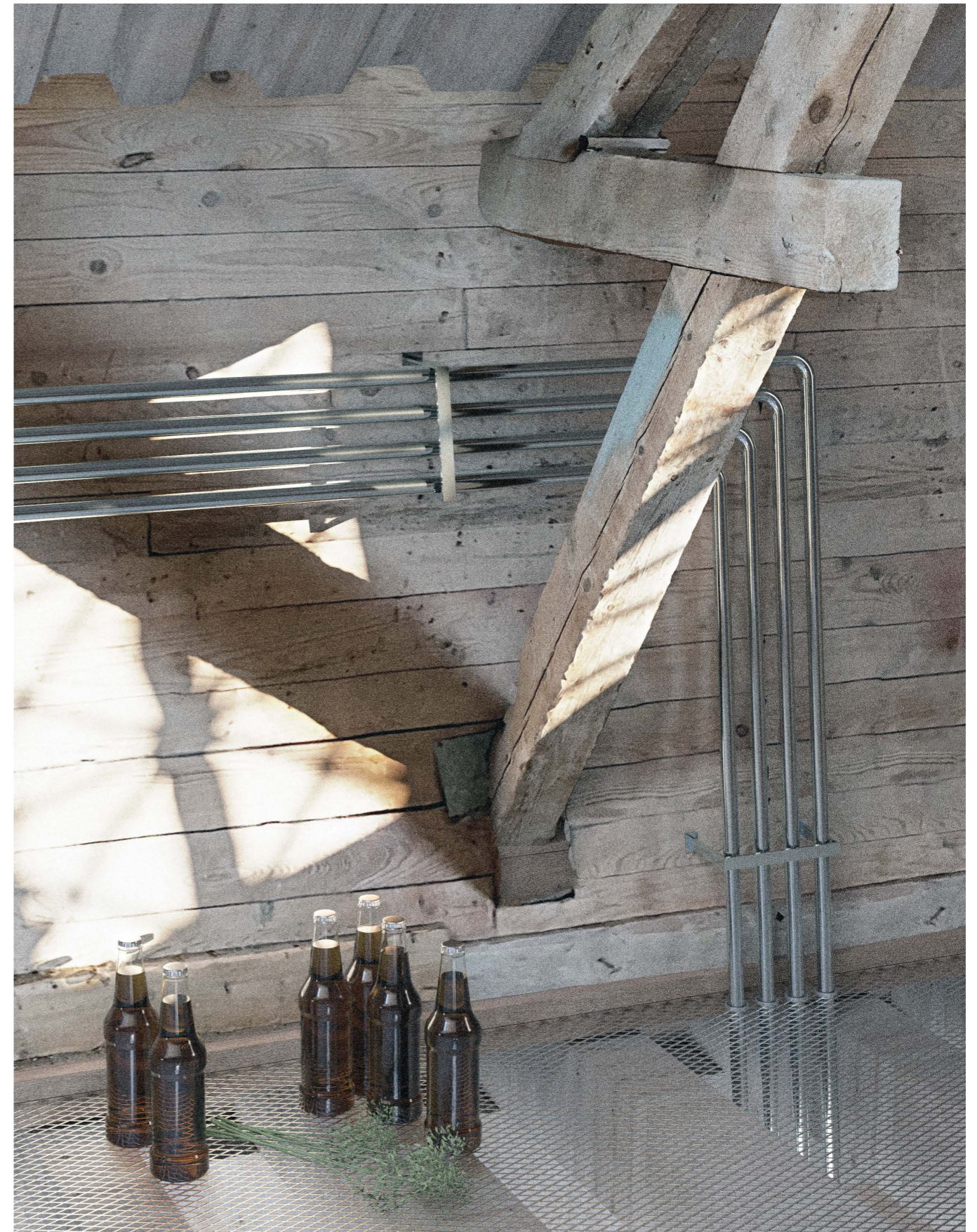
The large front gates are layered with doors, keeping them as found while improving the building's insulation

Layered door - A

Layered door - B

Layered material - C

C



Reflection

There is nothing permanent except change.

This thesis explores the process of revitalizing a disused building into the present time rather than freezing it as a monument. The project becomes a practice in dealing with the vocabulary of adaptive reuse and how it can guide the process. Exploring the concept of *aemulatio* requires a thorough understanding of the building to be able to copy and improve upon it. By a close understanding of the existing, one can let it guide the transformation, identifying its potential and how its qualities could be intensified, drawing upon what is already there. To achieve this, the building is documented at the scale of the landscape, the still life and the portrait, and through a technical, historical and experiential lens. The process of zooming in and out and abstracting it through different lenses reveals different aspects of the existing and is also used in the design process.

Working with the existing also involves simplifying, abstracting and choosing parts of reality, whether through photogrammetry, physical models or digital models. How existing buildings are documented and depicted may influence what is retained throughout the process of transformation. Working in a cleaned-up 3D model based on archival drawings rather than based on site visits can influence the design process in another way than for example sketching in a model based on photogrammetry. Working with digital models has its advantages; it allows for quick testing of various ideas. However, it lacks the valuable process of working with materiality, which physical models can provide, though any patina would also then be a replica of the original. The digital models have the advantage of being compatible with photogrammetry, which can convey traces of time and irregularities.

Working with the term *aemulatio* involves a subjective interpretation of what is considered to be improvements.

It involves reinterpretation—what part of history or the building is considered to be the original, and what how far can the copy deviate from it, and still be considered a copy? Setting an intention can guide this, such as prioritizing the preservation and visibility of the timber framework over other parts, like the facade. Allowing new additions to both blend in with the existing and stand in contrast creates a new entity. The result, the design, is not a definitive answer to how this building should best be transformed but rather an exercise in how adaptive reuse can be approached.

The initial stage of mapping the building took up a significant part of the process, though all parts of the mapping might not be immediately apparent in the design. However, it served as a valuable exercise in understanding the building and determining what was to be done and in setting the intention for the transformation. Working with *aemulatio* sometimes felt close to working with a stylistic restoration. But though *aemulatio* can be understood as *building in the same style as*; it is rather understood as a looser interpretation of the existing and what could enhance it rather than exact copies, and one can choose to work with similar materials, details or silhouettes but having other aspects in contrast with the existing. It also is not used with the aim to revisit the past, but rather to revitalize the existing and intensify its qualities. Therefore, *aemulatio* can be seen as a method which mediates between a stylistic renovation and exclusively using contrast in the relationship between the existing and additions.

This thesis should not be read as an argumentation for a sole use of *aemulatio* as a method when approaching the existing, in many cases other approaches might be more suitable; such as readable additions, ruination or solely maintenance. It rather aims at nuancing the discussion of the aesthetic relationship between additions and the existing and letting the specific building guide the process.



Exhibition at Chalmers in June 2024

Student Background

M.SC Architecture and Urban Design

Chalmers University of Technology
Gothenburg 2022-2024
Matter Space Structure II, 2023
Material and Detail, 2022

Exchange Semester

Lisbon School of Architecture
Lisbon, Portugal 2021

Visual Communication

HDK-Valand Academy of Art and Design
Gothenburg 2020

B.SC Architecture

Lund School of Architecture
Lund 2016-2019

Internships

White Arkitekter. Gothenburg 2022
Ortner & Ortner Baukunst. Cologne 2021

Thank you,

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Publications

Andersen, NB. (2015). *Arkitekturens transformation – fem metoder*. in C Harlang and A Algreen-Petersen (red), Om bygningskulturens transformation. GEKKO Publishing, Kbh., pp. 72-87.

Nilsson, I. (2020). *Ett öppet fönster mot landsbygden*. PLAN, (Höst), 60–66. <https://urn.kb.se/resolve?urn=urn:nbn:se:bth-20524>. Accessed 19 October 2023

Plevoets, B., & Van Cleempoel, K. (2019). *Adaptive Reuse of the Built Heritage: Concepts and Cases of an Emerging Discipline*. Taylor & Francis Group.

Ruskin, J. (2000). *Seven lamps of architecture*. Electric Book Company.

Werne, F. (2017). *Böndernas bygge: traditionellt byggnadsskick på landsbygden i Sverige*. Arkitektur & Kultur.

Digital

Botsjö, M., & Backlund, J. (2021, April 27). *Flykten från storstäderna under pandemin – global förändring eller kortvarig trend?* Dagens Nyheter. <https://www.dn.se/ekonomi/flykten-fran-storstaderna-under-pandemin-global-forandring-eller-kortvarig-trend/>

Cambridge Dictionary. (n.d.). *Cambridge Free English Dictionary and Thesaurus*. Cambridge Dictionary. Retrieved October 22, 2023, from <https://dictionary.cambridge.org/dictionary/>

Caruso St John Architects. (n.d.). *Tate Britain | Projects*. Caruso St John Architects. Retrieved April 29, 2024, from <https://carusostjohn.com/projects/transforming-tate-britain/#more>

Enköpings kommun. (2016, April 26). *Ortsanalys Fjärdhundra.indd. Enköping växer*. Retrieved October 22, 2023, from <https://vaxer.enkoping.se/download/18.46005e3916d6204e61e5049f/1569589720903/Ortsanalys%20Fj%C3%A4rdhundra.pdf>

Gustafsson, F. (2021, March 5). *Hemmajobbande stockholmare flyttar till Enköping*. Mitt I. Retrieved October 23, 2023, from <https://www.mitti.se/nyheter/hemmajobbande-stockholmare-flyttar-till-enkoping-6.27.6384.ccc67b7d0b>

Hagelberg, L., Henriksson, P., & Lindberg, J. (2019, March 9). *Arkitektens roll på landsbygden - en förstudie om urban norm och rurala alternativ*. Liljewall. Retrieved October 9, 2023, from https://www.liljewall.se/_files/ugd/f1209c_d47b1725bc7644ea935cc48ce8d66822.pdf

Nicolai Bo Andersen Arkitekt. (n.d.). *Ejdersted Haubarg*. Retrieved April 26, 2024, from <http://www.nicolaibo.dk/EjderstedHaubarg.html>

pihlmann architects. (n.d.). *Student Village*. Retrieved April 26, 2024, from <https://www.pihlmann.dk/student-village>

Statistiska Centralbyrån. (2015, March 3). *Statistikskolan: Urbanisering – från land till stad*. SCB. Retrieved October 23, 2023, from <https://www.scb.se/hitta-statistik/artiklar/2015/Urbanisering--fran-land-till-stad/>

Statistiska Centralbyrån. (2018, June 4). *Befolkningen ökar svagt på landsbygden*. SCB. Retrieved October 23, 2023, from <https://www.scb.se/hitta-statistik/artiklar/2018/befolkningen-okar-svagt-pa-landsbygden/>

Images

Figure 1. *Utsikt över Mälby i Frösthult från kyrktornet. (1922)* Alinder, J. [Photograph] Digitalt Museum. <https://digitaltmuseum.org/021016830964/malby-frosthult-fran-kyrktornet>



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Lina Svantesson
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Chalmers School of Architecture
Department of Architecture &
Civil Engineering