Censors booklet

Transforming the unity barn

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1908

Introduction

The unity barn is a building typology in Norway, which was invented and improved during the industrial revolution from 1840-1920. It is characterized by its red color and size; the unity barn was the most important production building on any farm for a long time.

It was more like a machine than a building- in the sense that you fed it raw materials (hay) and got refined materials back (meat and milk) with a minimum of effort. The building technique that made the unity barn possible was a sophisticated play with materials and forces through a skeletal building system– also allowing for expansions and changes.

Nevertheless, as rationalization of farming continued through the 19th century, the unity barn was not adaptable to accommodate new heavy machinery and more specialized farming techniques.
New production buildings appeared and the unity barn became redundant.

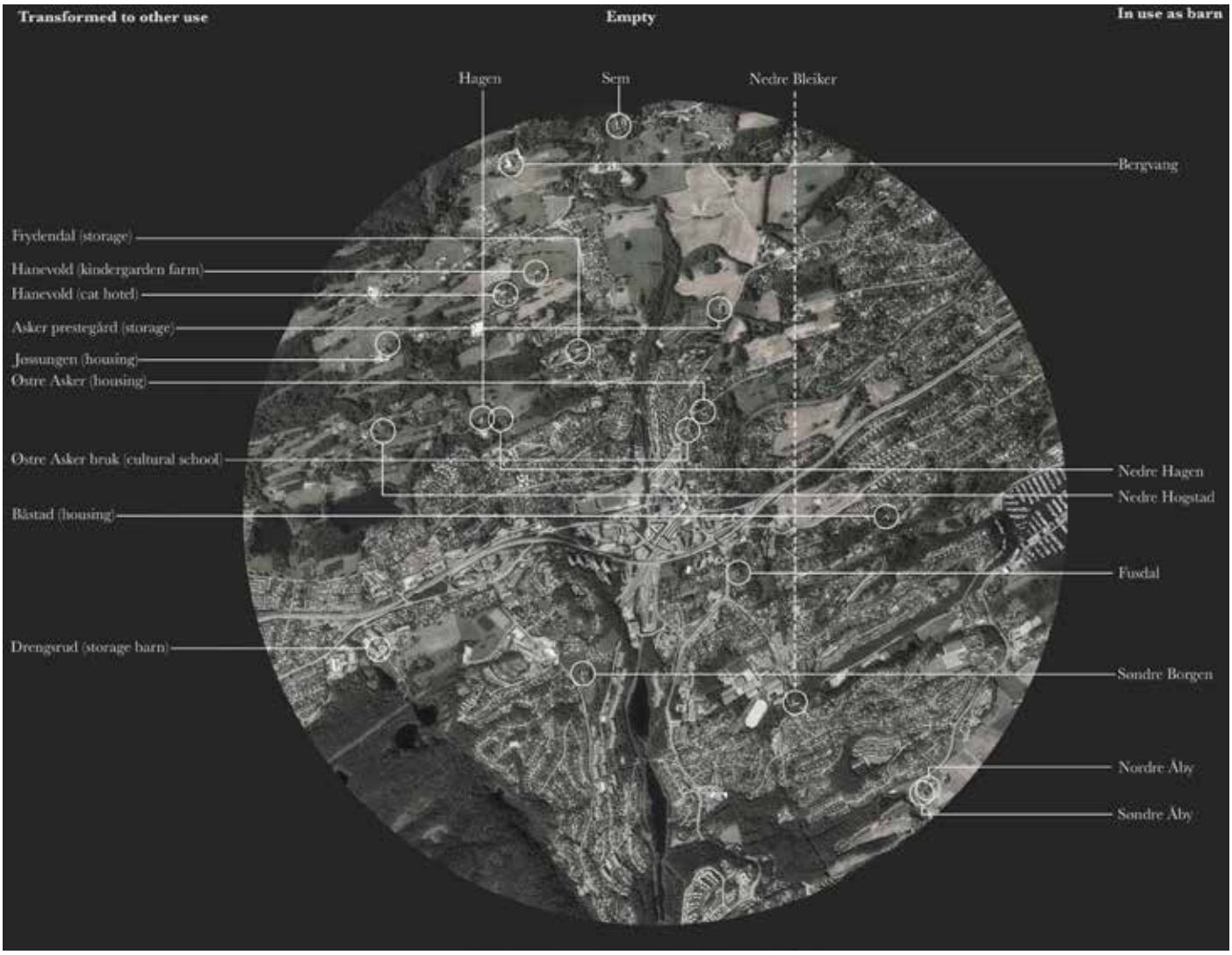
As the urban fabric expanded after 2nd WW in order to serve an increasing population, much valuable farmland has been redeveloped with other land uses, but in many cases the farmhouses and barns are still standing.

Currently, there are an estimated 100 000 empty barns in Norway. According to SSB there is currently 170 000 agricultural properties, and only 40 000 full time farmers. What to do with all the empty barns is still an open question.

In search of an empty unity barn

After locating all unity barns within a radius of 2,5 km around Asker city center, I went to find out what the majority of them were being used for.

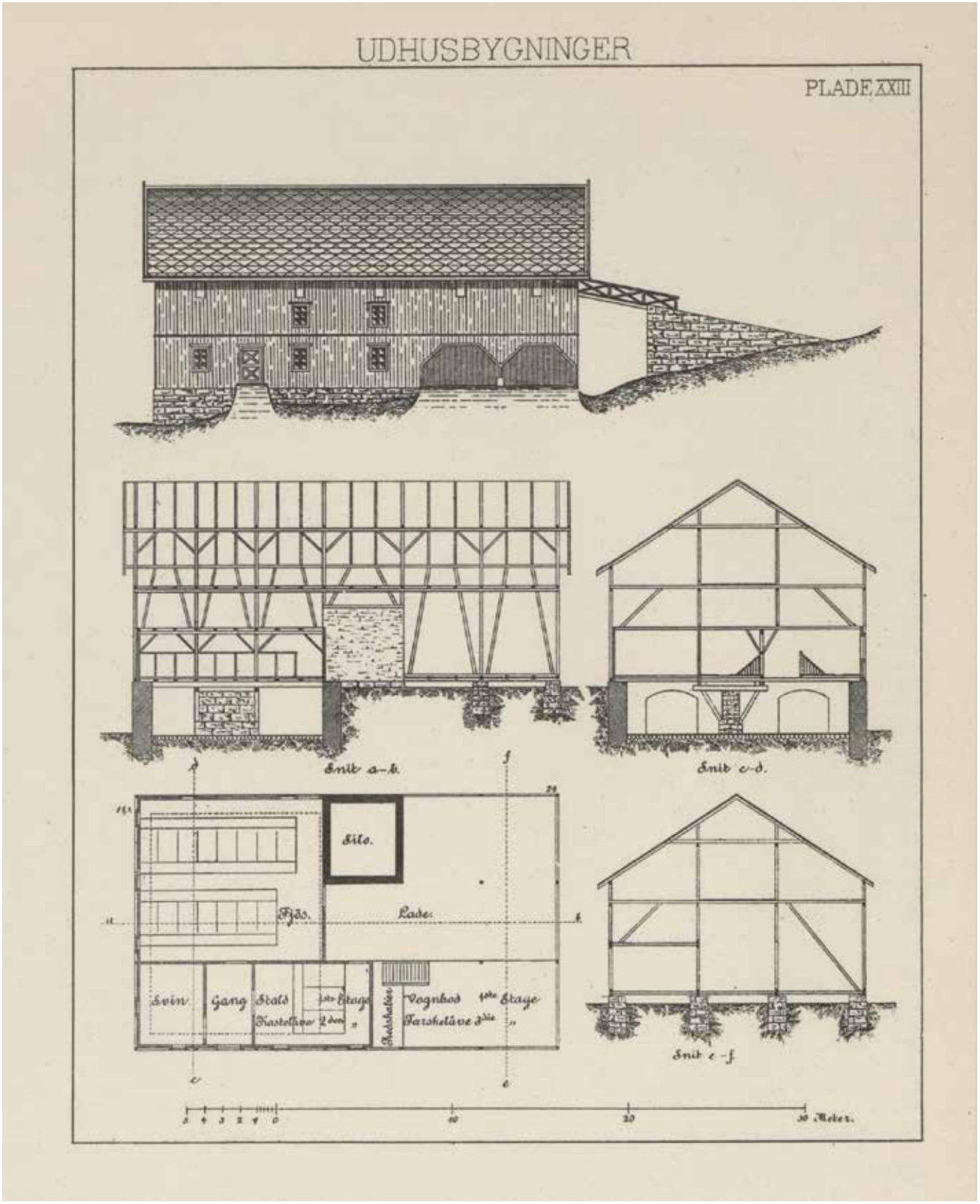
I found the barn at Nedre Bleiker gård to be representative as a unity barn, but also one that is relatively big - being able to accomodate a variety of programs.


Transformed to other use
Empty
In use as barn
Hagen
Sem
Nedre Bleiker
Bergvang
Frydendal (storage)
Hanevold (kindergarden farm)
Hanevold (cat hotel)
Asker prestegård (storage)
Jessungen (housing)
Østre Asker (housing)
Østre Asker bruk (cultural school)
Nedre Hagen
Nedre Hogstad
Båstad (housing)
Fusdal
Drengsrud (storage barn)
Søndre Borgen
Nordre Åby
Søndre Åby

Thesis

I want to investigate the possibility of transforming a unity barn.
How do I retain spatial and historical qualities of the unity barn while meeting the demands of an insulated and light modern building?
Is it possible to translate the functional and structural properties of the barn into something new?

I want to take an experimental approach to my research - everything may not work perfectly. Hopefully some of my findings will be useful for similar transformations of other barns in the future.
In order to test my thesis I have found a unity barn at Nedre Bleiker gård in Asker that is abandoned and located in a suburban area experiencing densification and growth.



Type drawings. Gudbrand Tandberg, 1895

The unity barn typology

The unity barn was introduced in the middle of the 18th century and 50 years later it was quite common throughout Norway. Even the remote and less profitable farms adapted to this new invention eventually.

The unity barn takes advantage of three basic principals in its design; gravity, air and water.
I believe the agricultural engineers started by investigating the barn in section, how they use gravity could be an advantage rather than a burden.

The horse was the strong working force at the farm, used for bringing the grass from the fields into the barn.
The main consept of the unity barn is the introduction of the barn bridge that leads up to an indoor drive bridge rising over the story used as hay storage. The hay was fed to the animals through the winter so the barn needed to have plenty of space for this function. To ensure that the hay would not rot this part of the barn had to be airy and dark. Wood boards with small glitches in between made the upper part of the barn airy while protecting the grass from direct sunlight.

One story down the engineers placed cowsheds, stables, pigpens or sheep sheds. This part of the building was often exposed to moisture because of the animals and therefor would have to be built in a non-organic material like brick, concrete or stone in order not to rot. At the very bottom of the section the dropping pit was placed, so it would be easy to collect and store the animal stool and use it as fertilizer on the fields next spring. This story was made in concrete or stone. The cellar produced a considerable amount of heat due to the natural fermentation process. The heat would go up and help keep the barn warm throughout the winter.

It all starts by bringing the hay in at the top and moving it down through the section.

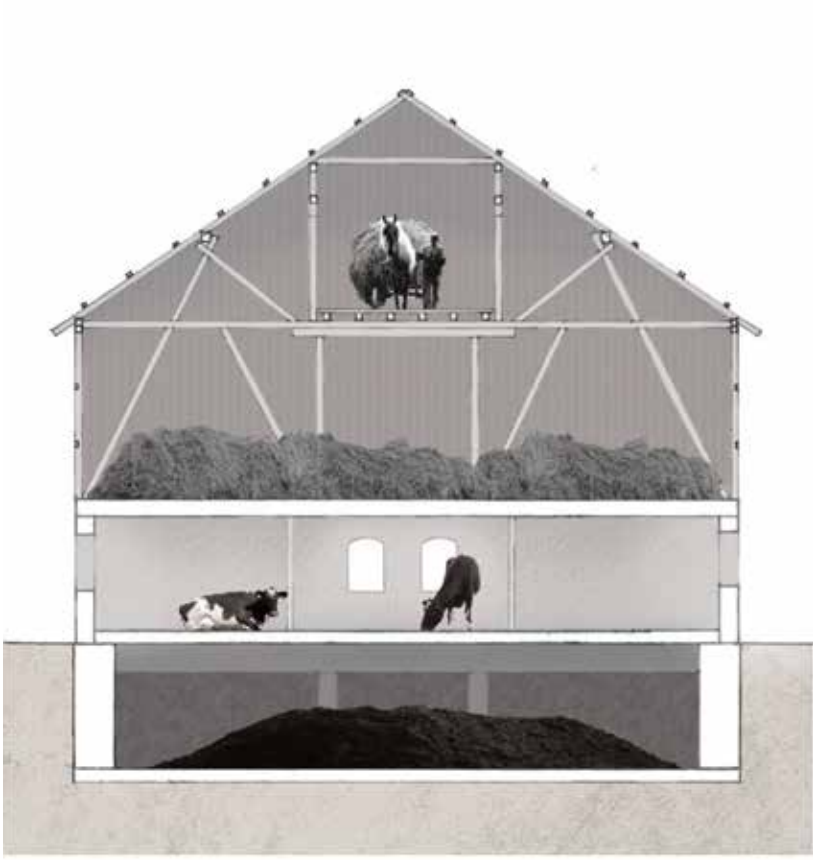


Illustration from the master thesis by Kine Hammer Hansen and Ida Waagø, 2012

Small unity barn at Senja. (from Norges Låver p. 76)

Sveitserstil/Sveitserrøst

The building system Sveitserrøst is parallel to the style term Sveitserstil that originated from Germany and Switzerland. As the size of the crops grew substantially around 1850 the barns had to become bigger. Earlier log based structures then was replaced by this new construction system both in barns and houses.

The new building system is an additive one, which easily could be expanded, compared with the old log-based building.
The main structural difference between the new building system and the old one is how the forces are brought down. The old traditional houses led the forces directly from the roof to the wall, while the new system brought down the forces inside the house through the raft frame (takstolen) and down through the posts in the driving bridge as well as through the walls. There was according to Godal approximately 50 years of trial and error before the new building system had found its proper form – this happened around 1910.

Examples of sveitserrøst

Sveitserrøst is all about how to carry the roof. The most common system is roof rafters (taksperrer) carried by collar beams (takstoler). Roof poles (takstolper) that are being stabilized sideways by two small strouts (koppbånd) carried the collar beams. Timbered poles stabilized by diagonal bracing make up the walls.

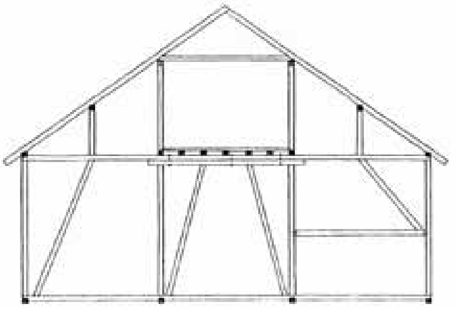


Fig 104
Sveitserlåve med fire takstolar, to på kvar side av mønet. Dømet er frå Hjelmingen, Halden kommune

III Store hus får to takstolar på kvar side. Av desse er det to variantar, ein har to ståande (loddrette) takstolar og ein har ein ståande og ein felt (som ligg i ca 45°).

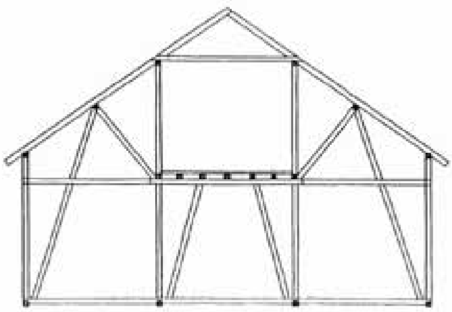
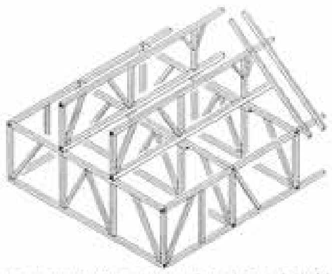
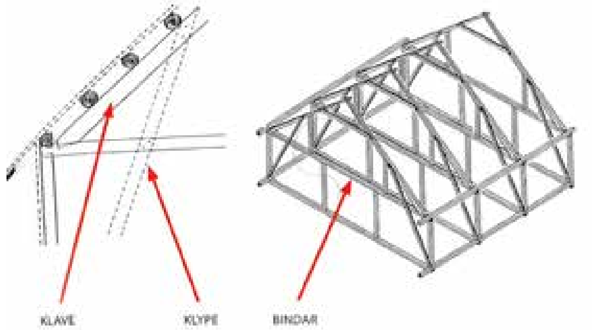


Fig 105
Sveitserlåve med to takstolar på kvar side. Her er dei ytre takstolane «felt». Låven har senka køyring. Dømet er frå Nordre Moer, Ås kommune





Different types of sveitserrøst. Jon Godal. 2009

Values

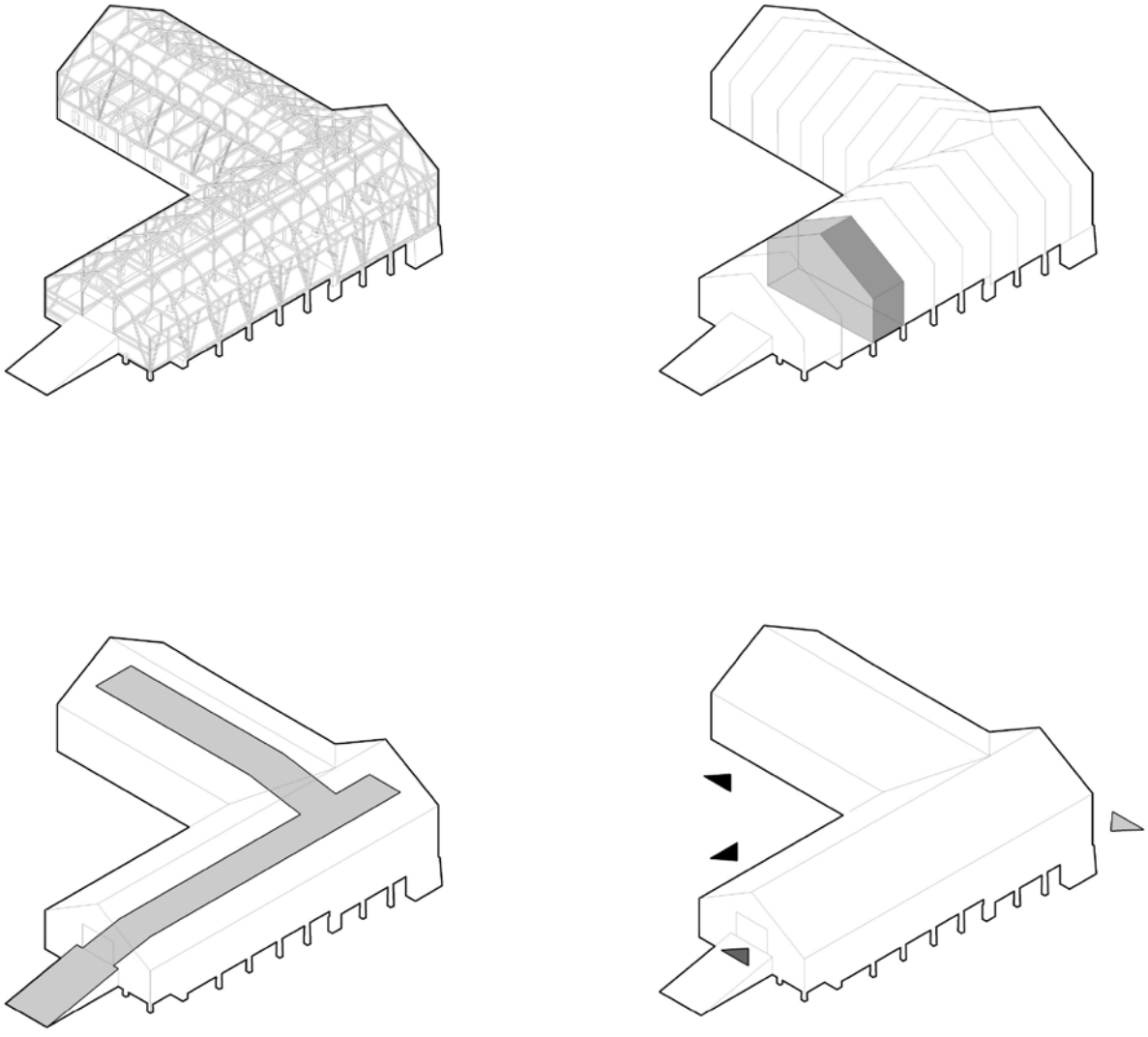
In order to be able to do a transformation of any kind it is necessary to establish a set of values. In the case of the unity barn there are several approaches to be taken for establishing values. These three are the most common.

The unity barn as a symbol – the huge red building envelope is how this building is perceived from the outside. If this is the core value it's possible to rebuild the whole barn as long as it appears as the same old red barn. This is the most common approach when transforming a unity barn.

The unity barn as nostalgia – fragments of moments and impressions. A piece of old wood, the light streaming through the cladding of the barn, a piece of old equipment. Keeping some authentic reliques from the old barn through a transformation can be enough.

The unity barn in relation to the tun and its surroundings – the barn is a piece in relation to other buildings like the farmhouse, the tun and the fields surrounding it. This is a more holistic way of viewing the barn.

The unity barn in relation to its construction and its building tradition – this approach is more concerned with the spatiallity and constructive potential of the barn. If this is the core value for the transformation the DNA of the building is the way it is built. The fact that 50 years of trial and error was needed before the unity barn found its optimal construction is fascinating – especially for us living in a time where everything happens so fast. This is the main approach I have chosen to work with in my diploma.



A diagram showing the logic behind the unity barn at Nedre Bleiker, Asker.

Nedre Bleiker gård, Asker

The unity barn I have chosen to work with uses a combination of the building techniques mentioned above. It is located in Asker, a suburban town 25 minutes drive from Oslo.

The barn itself has been abandoned for 50 years. Despite some damages due to roof leakage the building is in surprisingly good condition.

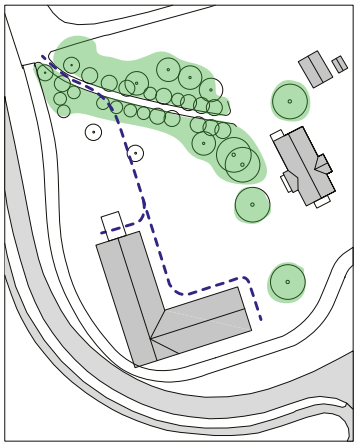
I presume in my answer that the few pieces of damaged wood can be changed.

Today the barn and the tun appears completely overgrown.

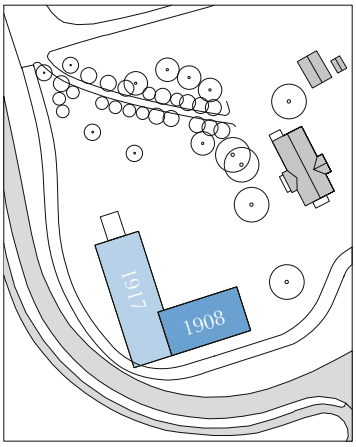
Context

I am not so concerned of the context as my proposal is meant to be a general answer to transformation of a unity barn. Still noise, sun, entrances and terrain levels are taking into account when programming the barn.

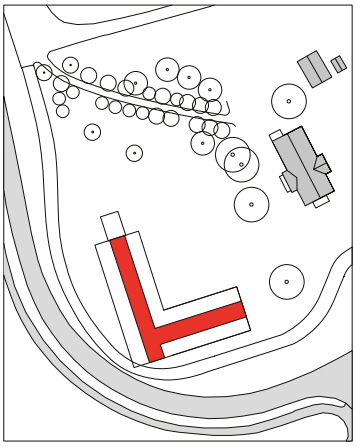
The barn was built in two stages as shown in the diagram.



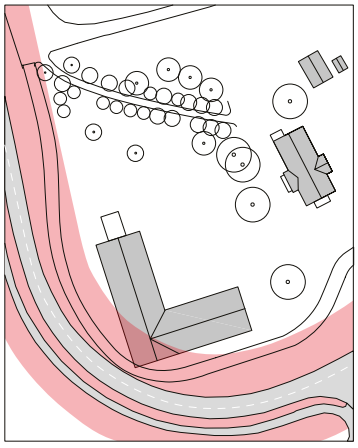
PEDESTRIAN ENTRANCE PATH



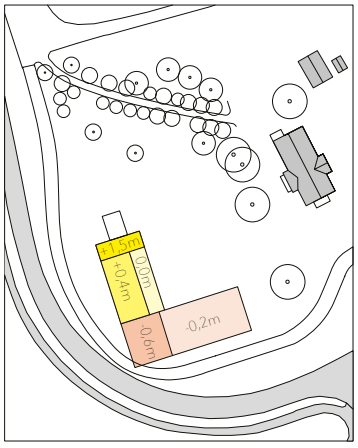
OLD/NEW PART OF BARN



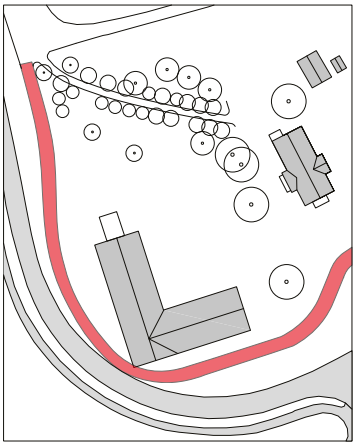
BARN BRIDGE



20 METER ZONE FROM
COUNTY ROAD



GROUND FLOOR
LEVELS IN BARN



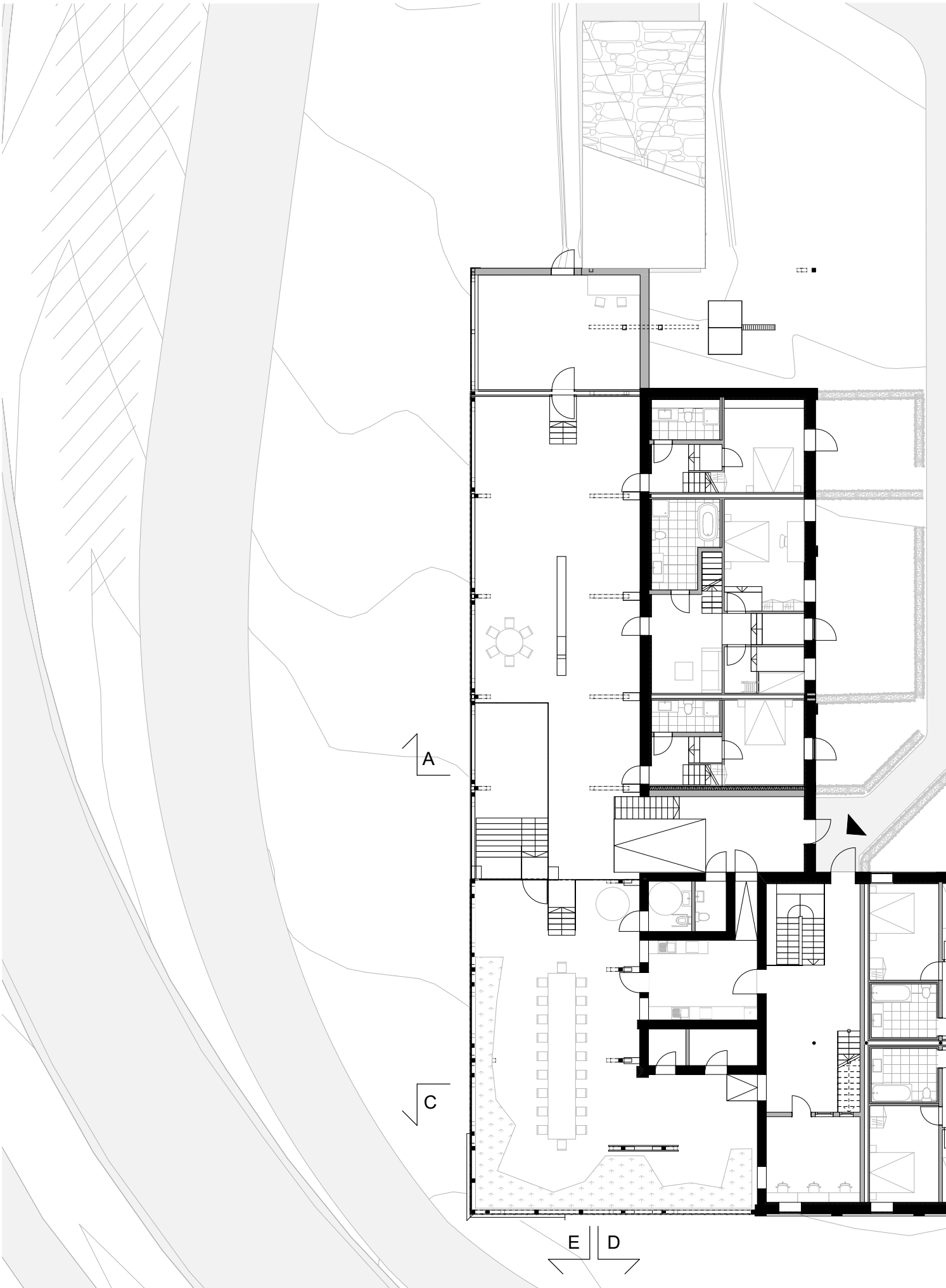
ENTRANCE ROAD

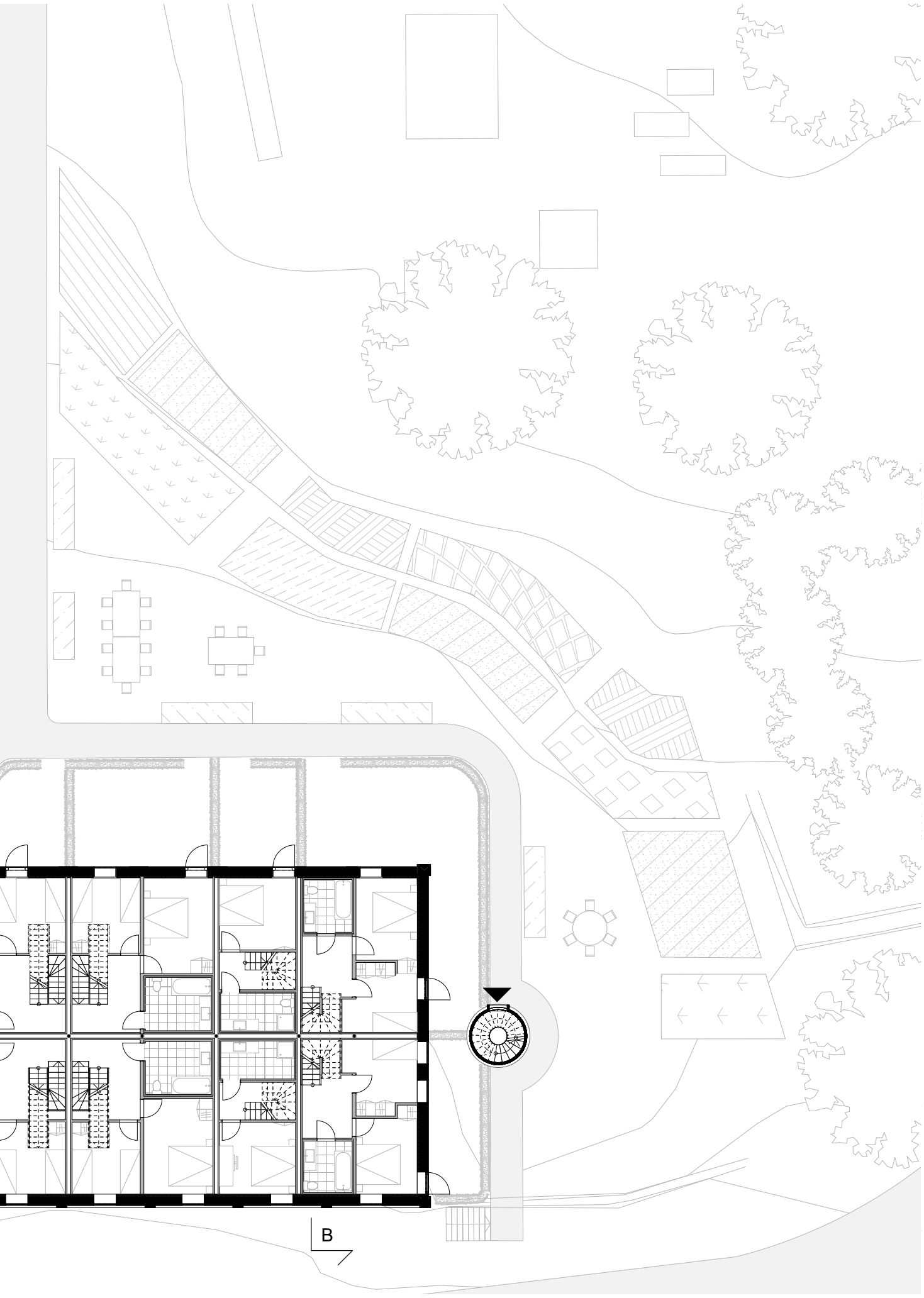
Program

The program was not the driving force for my investigation. After trying different programs I concluded that a housing program with relatively small apartments and big common rooms would justify the integrity of the barn according to my set of values.

I wanted the two big common spaces to be in juxtaposition with each other; one non-climatized dim space (culture) with an introvert character as close to the original space as possible in relation to a light climatized and active space (green house) programmed with a kitchen and an interior garden.


Garden/
growing/
play
Housing
Non-climatized/
culture
Housing
Housing
Climatized-
'Green house' /
common


A
C
E
D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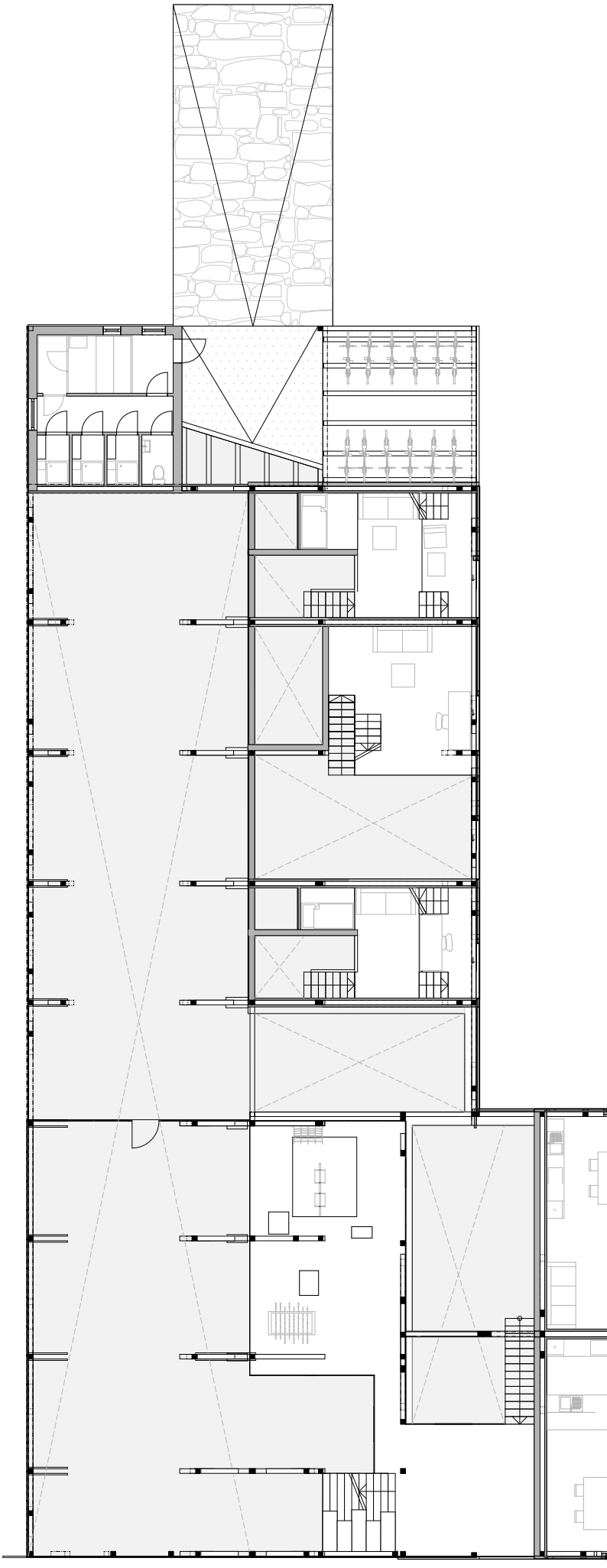
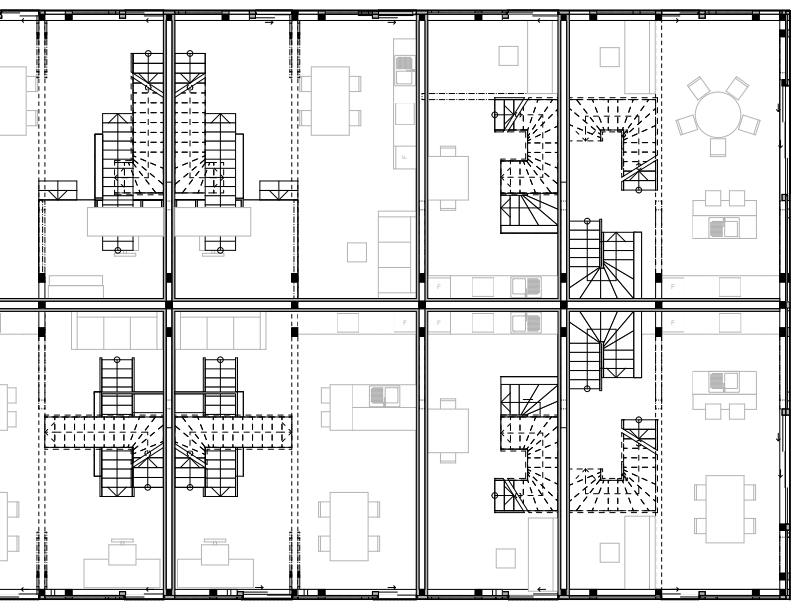
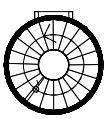
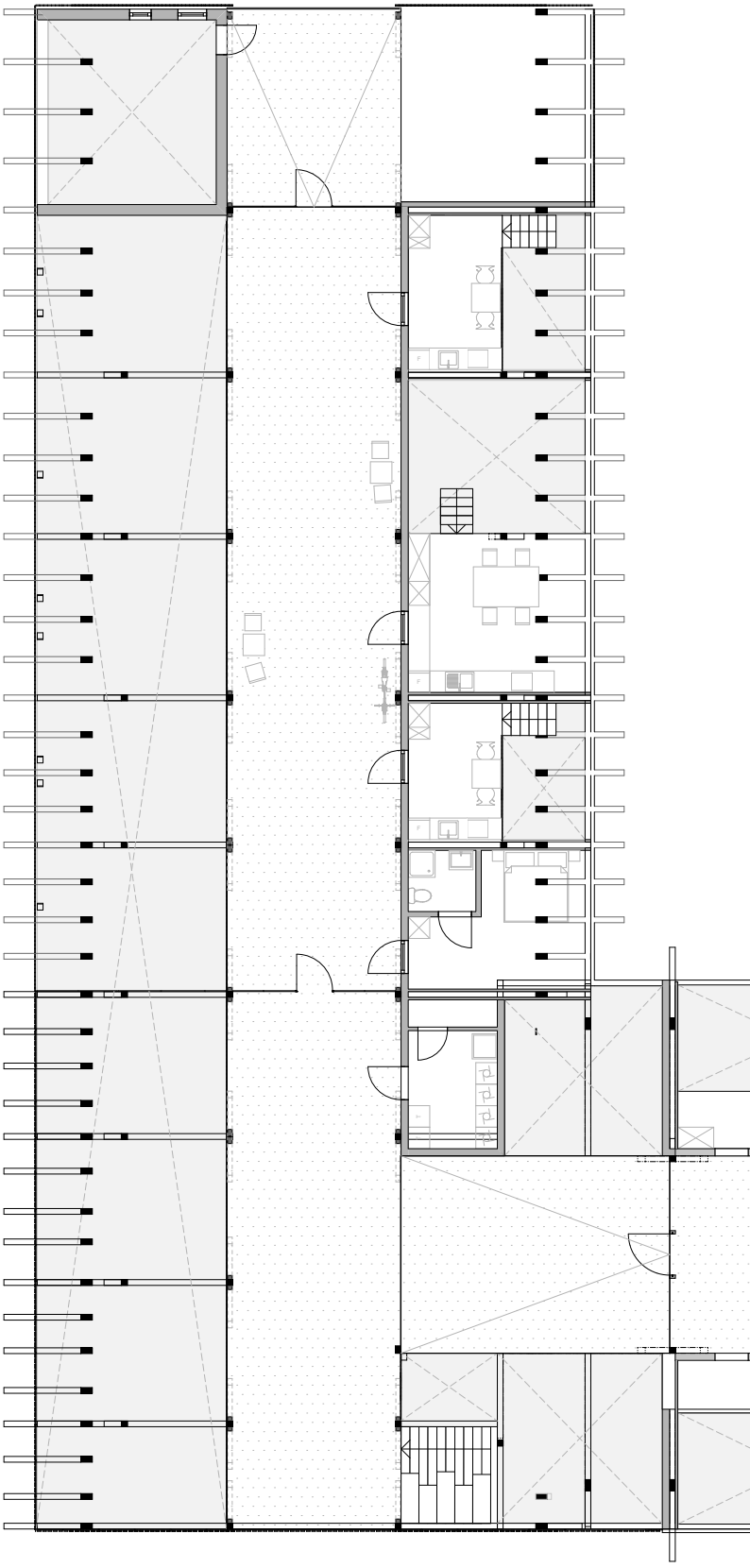
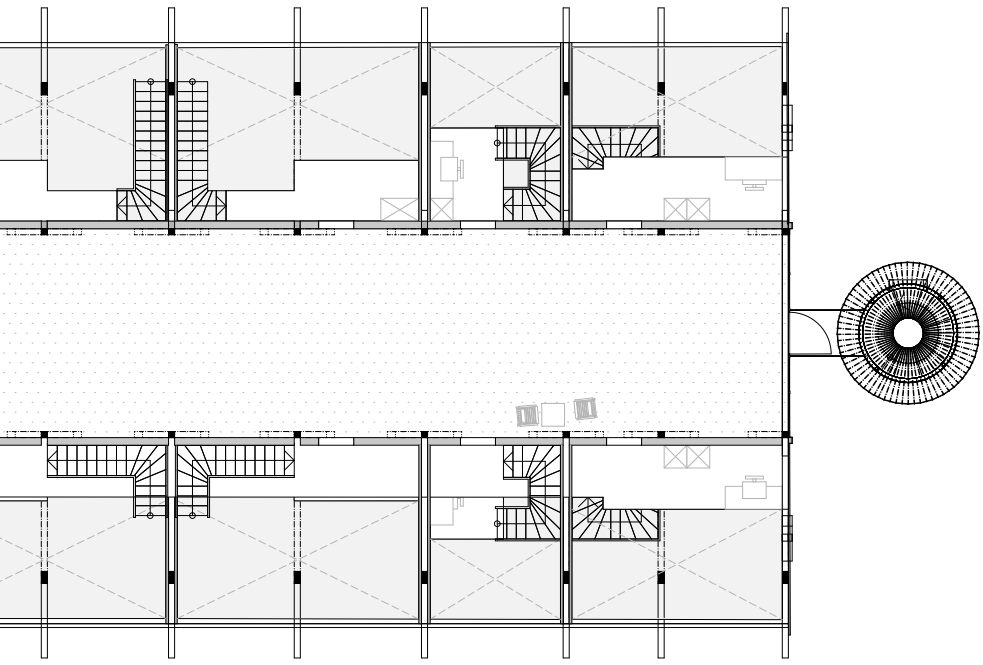
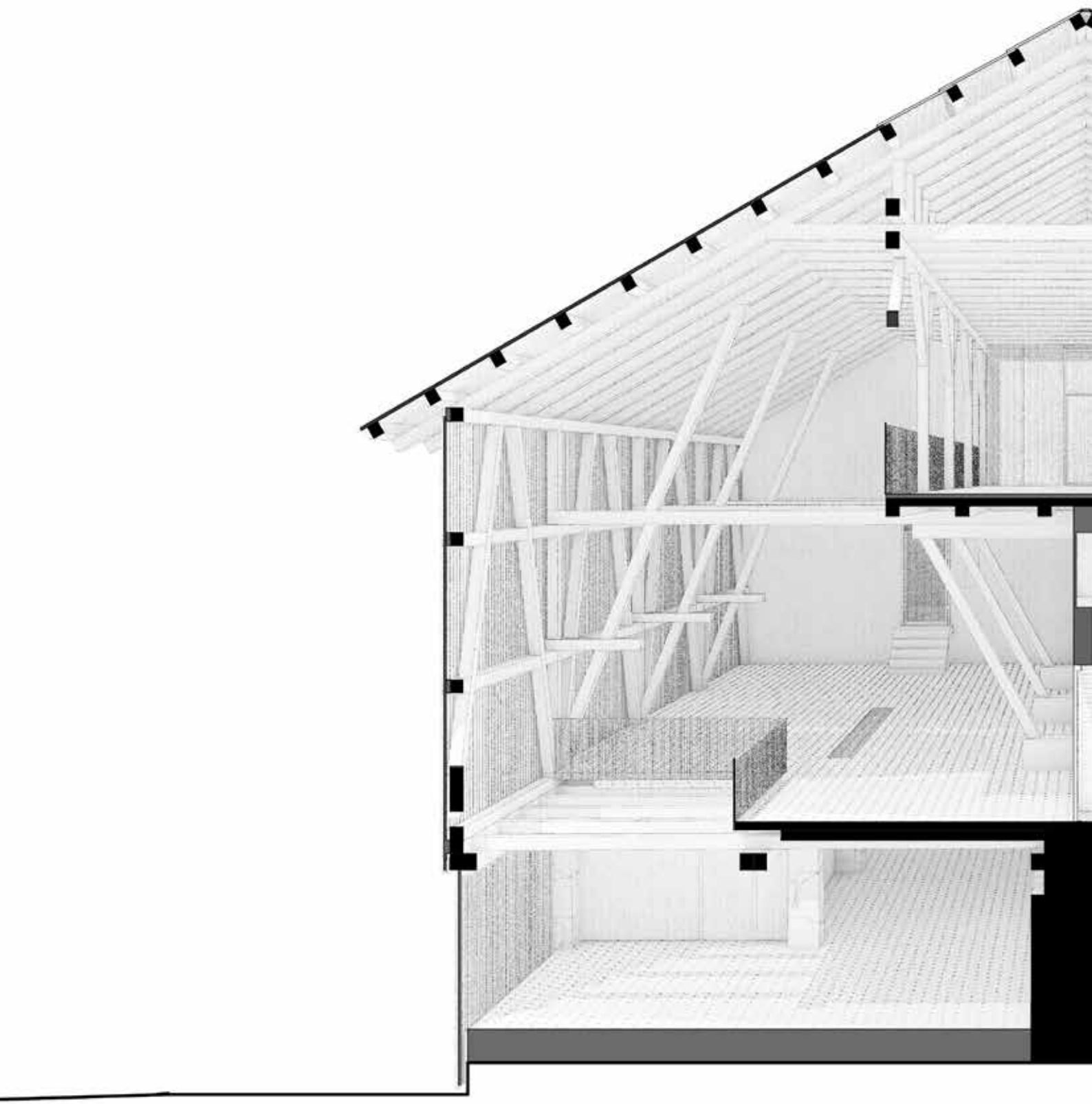


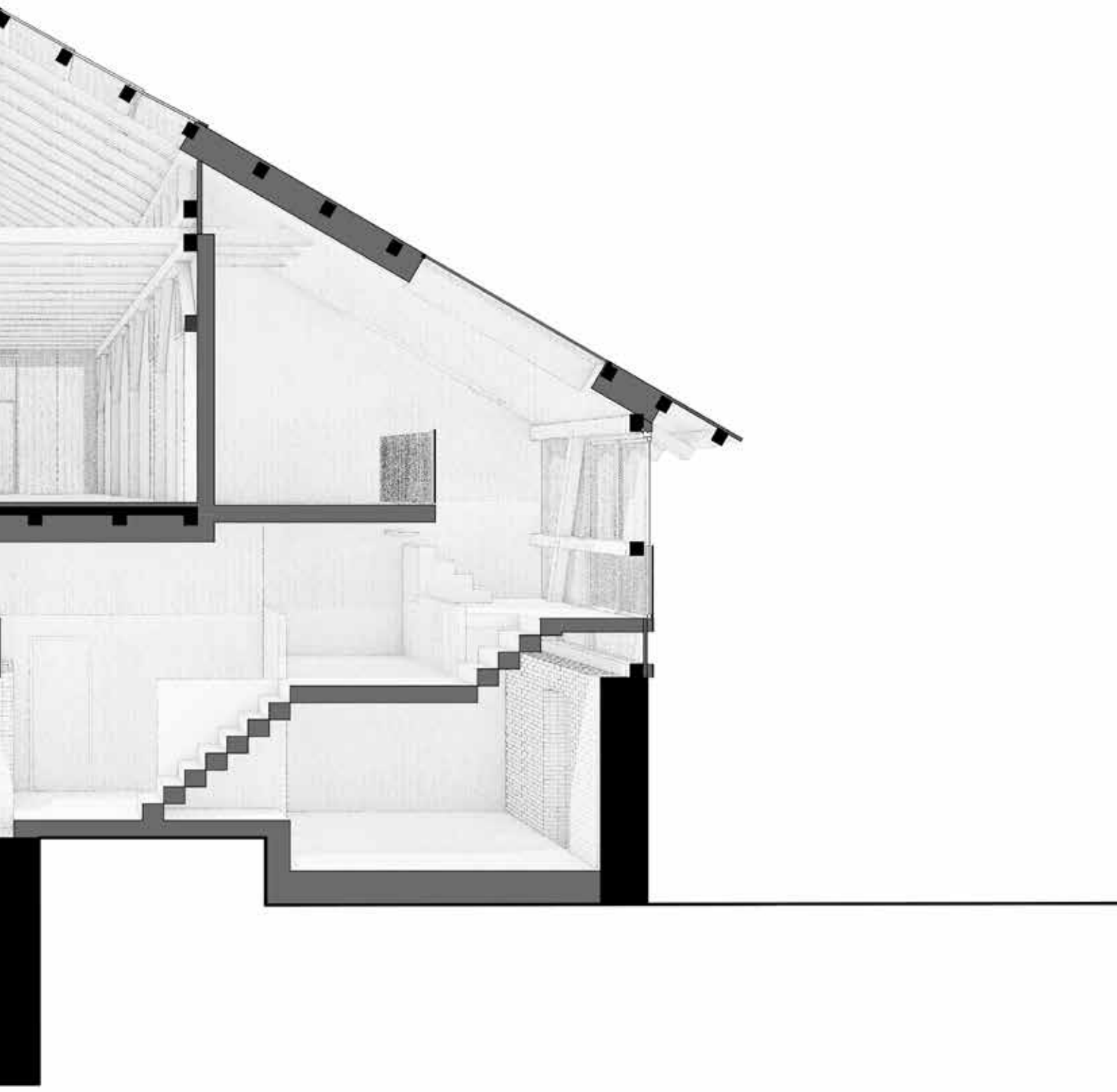




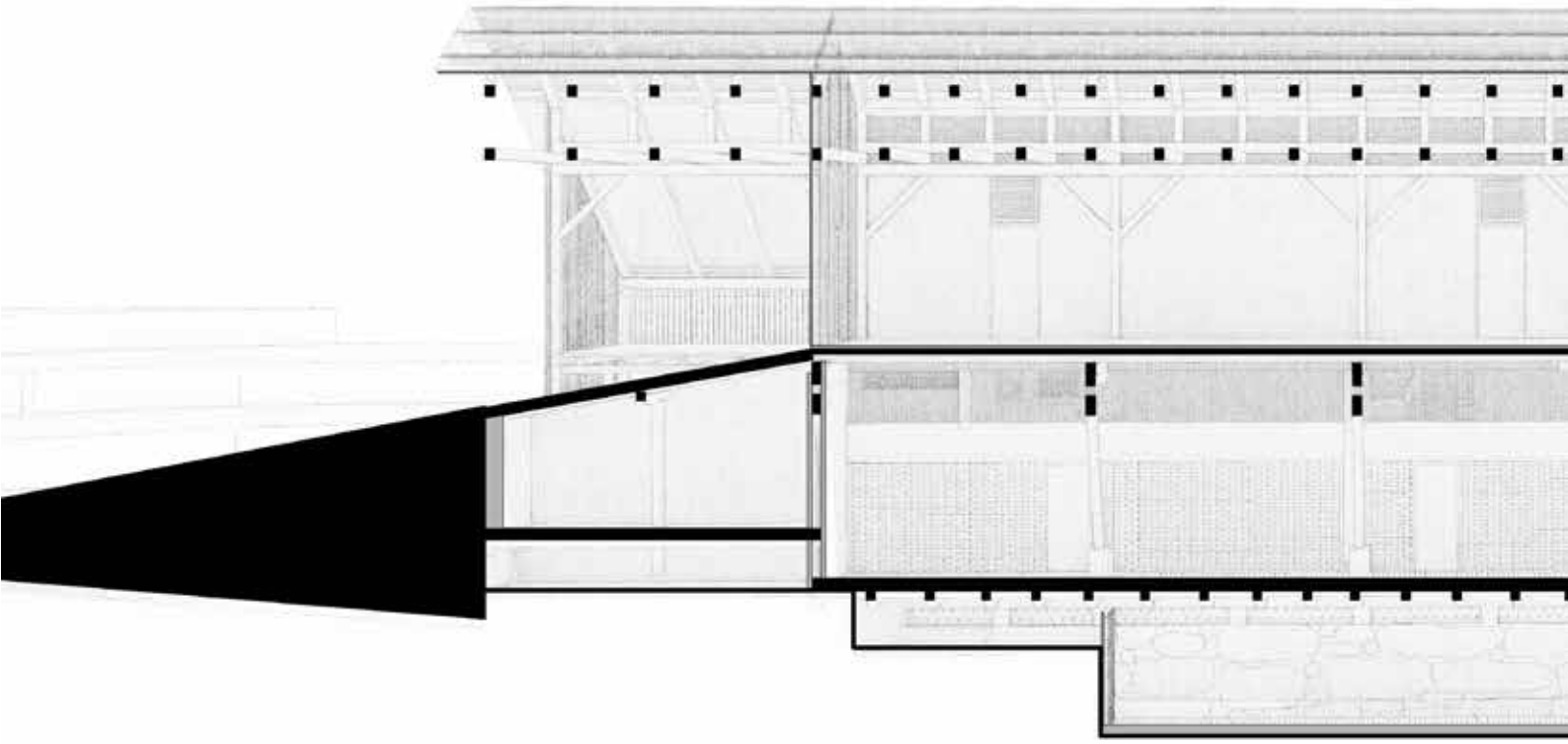


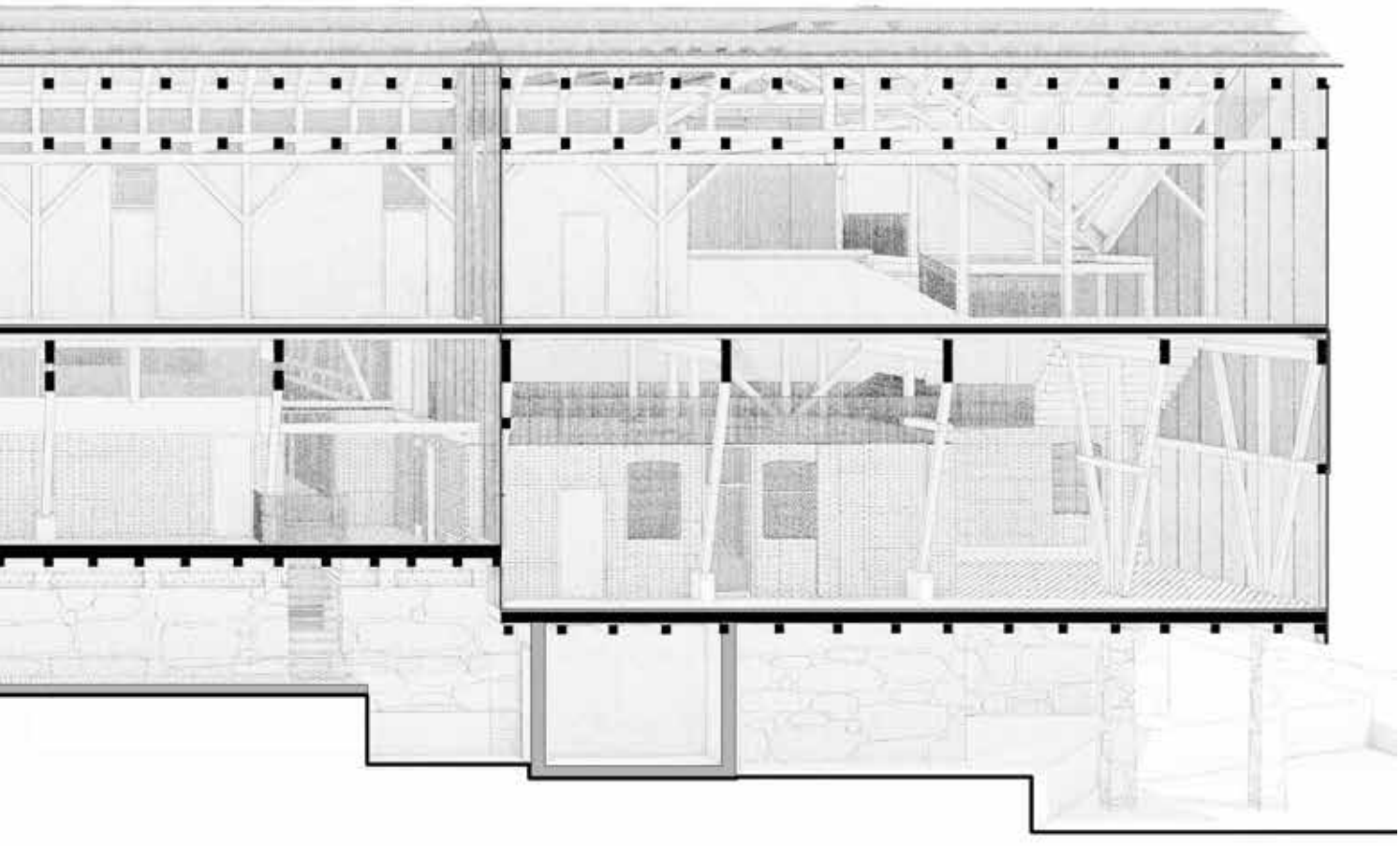




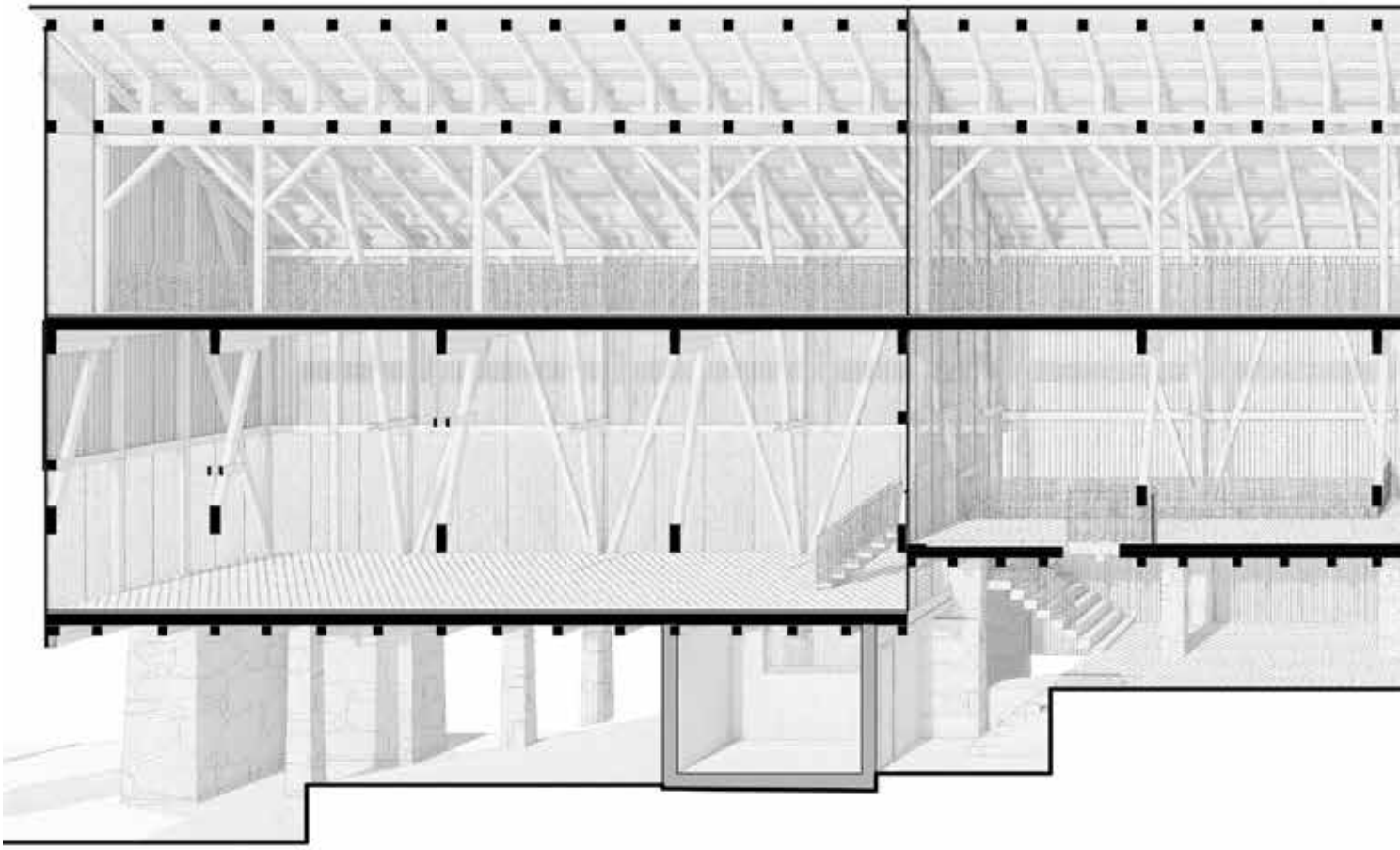


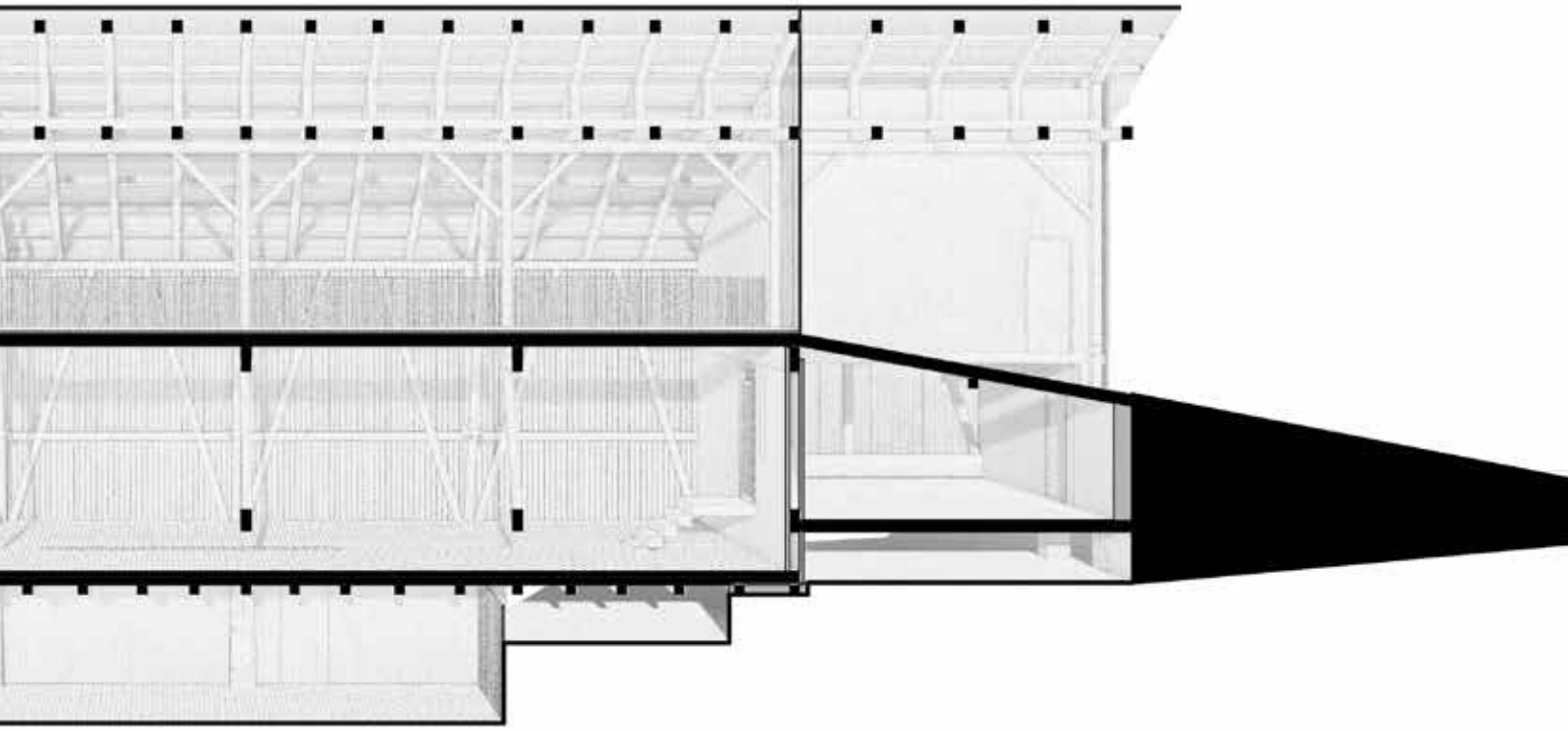
Section A





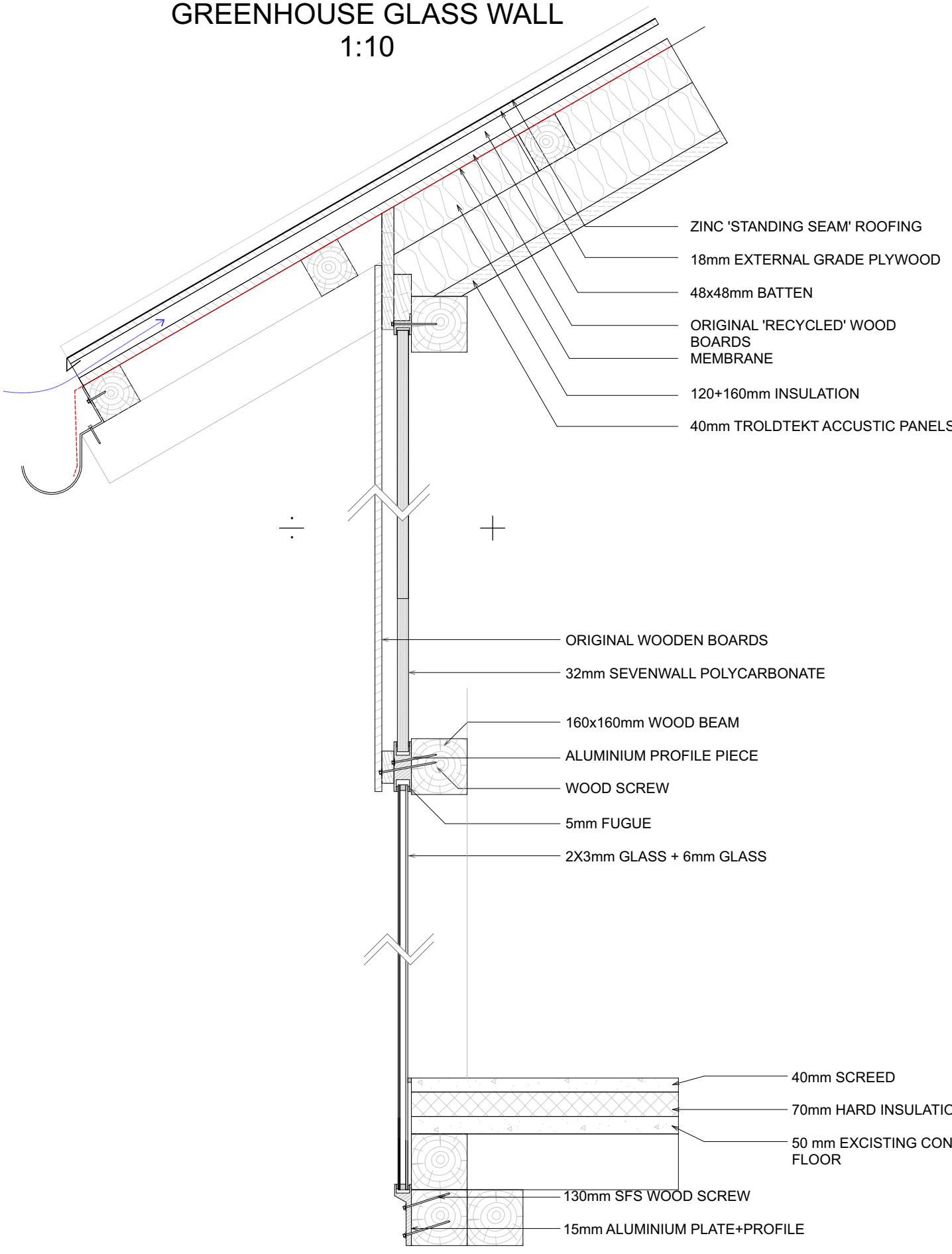
Section D





Section E

ROOF
+
GREENHOUSE GLASS WALL
1:10



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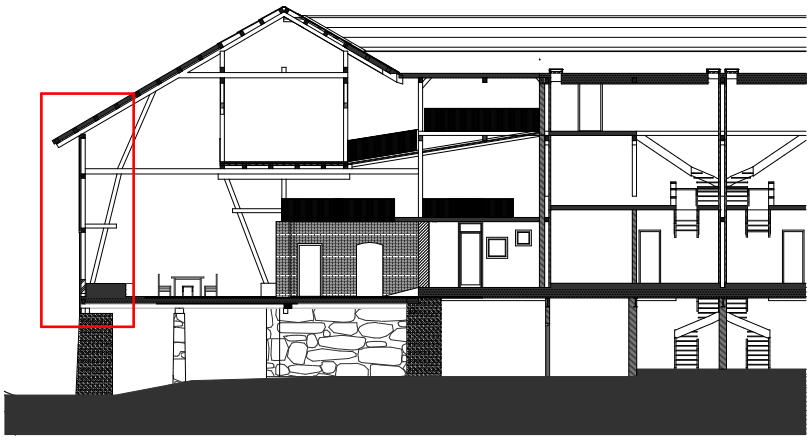

ON

CRETE