NUUK CORRECTIONAL INSTITUTION

a re-introduction of an original idea

MASTER THESIS
Architectural design
Architecture, Design and Media Technology
Aalborg University

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MA4-ARK20
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Ill. 1

SUBJECTIVE APPROACH

As coming architectural engineers and writers of this project we found it important to shortly introduce our personal views on architecture, views that will be apparent through the process of the project and are in line with the themes chosen.

Key to our education and also our idea of architectural work is the concept of the intergrated design process. Architecture is not only a matter of visual aesthetics, making something look good for the sake of looking good. In reality many factors also affect the immediate appearance, like the aesthetics within structure and construction, energy and climatics etc. These factors should not be seen as limitations, but should be processed in order to inform the design and in the end form a holistic project.

It is our belief that architecture should not be an isolated object, but should relate to its surroundings. Considerations for scales; how they interact, are integrated, depend and affect each other is important and should be a part of any architectural project. Architecture is indirect communication, the architecture should tell the tale of the specific context in which it is placed and in order to do so, an understanding of the site, its rhythm and atmosphere, the users, their needs and lifestyle, the culture and the history are essential for the creation of meaningful architecture. Architecture should be built *in* nature, not *on* it.

When saying that architecture is indirect communication we also say that architecture in our minds should contain something more, it is not only something to look at, but something to look with. A building should consist of many layers, some immediately visible to the viewer and some to be discovered along the way by the user. Architecture is deeply related to time and always changes with it making time an essential consideration to be adressed as well. By considering the affects of time early in the process, time can become contributing instead of counteracting. We want to create architecture with quality at this particular time, through time and with time.

SYNOPSIS

This master thesis concerns the design for a new and larger correctional institution in Nuuk, Greenland based on a competition brief made by the Danish Prison Service in 2009.
This report is a presentation of a thorough analysis, an integrated design process and the final building design.

The project aims to fulfill an intention of promoting the original idea of the correctional institution, the intention of resocialisation, by respecting the local culture and the climate in order to improve the conditions for the staff, the current inmates, the inmates to come, the community and the surroundings. In this the central question is raised: What is punishment? The answer is clear: The frames are not the punishment, the confinement is! The frames should support the intention of the stay, not work against it.

And so three different architectures have been brought to focus; artic architecture, restorative architecture and additive architecture. With the point of departure in these 3 themes the project demonstrates the creation of a prefabricated, adjustable building system. A system accommodating the character of the arctic landscape, the changing population of inmates and also the present and future needs of the institution in an attempt to maintain architectural value over time and support resocialisation.

PROJECT TITLE
NUUK CORRECTIONAL INSTITUTION

SUBTITLE
Adjustable Architecture

MASTER THESIS
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PREFACE

ADJUSTABLE ARCHITECTURE IN AN ARCTIC CONTEXT

the correctional institution as a topic

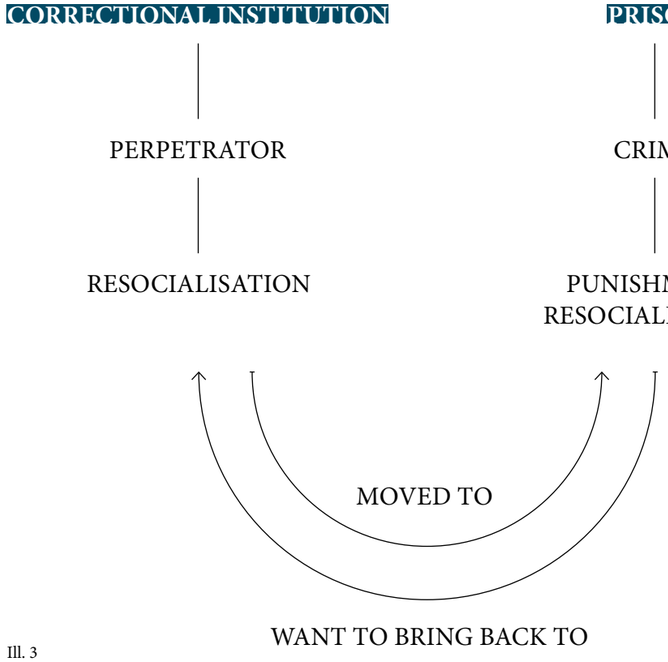
When researching for a topic for our master thesis, we followed an interest we both share; to inhabit. It was clear though that it should not be 'to inhabit' in the typical way, meaning not in a typical house in an well known context - we wanted to explore an unknown field for us. 'To inhabit' should be understood as the place you stay, where you have your bed and toothbrush, this is not necessarily connected to the understanding of 'to dwell'. That together with the knowledge of rising social problems in Greenland and their need for a new correctional institution were the preliminaries of this project. An interesting and relevant discussion which also questions; what is punishment? The physical surroundings, established in the architecture or the actual situation - the loss of freedom? This is a project concerning the creation of a place to be, where nobody has chosen to be.

The creation of the project is moving in a tension field, where there are arguments from different sides; from the inmates, from the staff, from the relatives, from the victims, from the society ect. Most people, with maybe a few exceptions, have an opinion about the question; what is punishment? In relation to the development of the project, we are led to the point, where it is important to present our opinions, therefore this specific question is the stepping stone for the project.

Then what is punishment? To explore this field we visited The State Prison Østjylland as a starting point, where head of department, Flemming la Cour showed us around the prison. Even though this place is furnished properly and everyone has his own room, there was no doubt that this was not a hotel. The present, modern expression could not hide the notion that this was a prison, a place that deprives the freedom. Strict rules control the daily life and the only place where inmates could have a little privacy is in the cell wherein they are locked 9,5 hours a day. The cell is the inmate's temporary 'home'. Therefore the loss of freedom is the punishment, not the physical surroundings - nor the architecture.

The correctional institution is similar to a prison in that relation - it deprives the freedom. The correctional institution has the main intention of correcting people. It is based on resocialisation and perpetrator principles, an intention that puts forward the sense of meaningfulness both for the inmates and the society afterwards. If the institution does not correct the inmates somehow what is the purpose then?

Ill. 2



Ill. 3

In relation to this the subject restorative architecture is raised and the effects of light, view, tactility, movement and a feeling of safety are obvious to incorporate. If the architecture affects the inmates somehow, of course in a positive way, maybe it will reduce violence and frustrations? We are not able to involve and affect the whole spectra of the social aspects in this project, but with the tools we have at our disposal within the "walls", we will aim to make the architecture respond to the term of resocialisation.

In March we visited the existing correctional institution in Nuuk ourselves. One thing was not to be overlooked; the load factor was higher than the physical frames were intended for. A situation which entailed frustration among the inmates. Furthermore the number of people who are sentenced to placement in a correctional institution is rising. [Nyborg Lauritsen 2011] As a way of accommodating the intention of one room per inmate and the rising number of placements in correctional institutions additive architecture or adjustability can be a tool for bettering the situation.

Greenland is a land breathing with nature! A dramatic landscape is to be found here, where many places are impassable, untouched and undeveloped by man. When we build we occupy land, and when looking for suitable places to build in this type of landscape, in Greenland, a certain care must be taken. Therefore the arctic landscape and architecture is important. We believe that a strong relationship between what is built and the landscape is especially important in the sense of obtaining significant architecture. The site is what should inform the development of the architecture. Let it flow through, inform and be a part of the architecture.

TECTONICS AS A FOCAL POINT

"The art of detailing is really the joining of materials, elements, components, and building parts in a functional and aesthetic manner." Marco Frascari [Frascari 1984, pp 02]

When talking about architecture the joining of shaped elements is unavoidable, thereby the detail. The details give character to the building in the same way words give character to a narrative. [Frascari, 1984] The additive tale that this project is going to develop is irresolvable connected to the joints of elements and details. However, joints do not only act in the internal building structure, but also in the joining between landscape and building - in the narrative about meeting points and connections. The design solution is tectonic, in the aim of solving the tale of the additive architecture in a functional and aesthetic manner which corresponds to the arctic and the restorative architecture.

ADJUSTABLE ARCHITECTURE

This project raises a lot of questions and asks for a broad discussion, not only concerning an architectural design of a new correctional institution. This project will only handle a few of these questions. However, one thing is sure; the architecture has to be flexible in terms of being able to adjust to the arctic climate and landscape, the changing population in the correctional institution and to the inmates and his/her well-being, resulting in some kind of adjustability in the structural system as well. It has to be adjustable architecture.

PRECONDITIONS

The project is based on a competition brief made by The Danish Prison Service (Kriminalforsorgen) in 2009, which states some criterias for the project, most importantly:

+ *Room for 76 inmates.*
+ *The correctional institution should be divided into three departments; a closed department, an open department and a department for re-entering the society. They have different security levels, where the closed department should be encircled by a perimeter security - a wall.*
+ *Opportunities for flexibility in correlation with inmate population.*
+ *Sectioning of the inmates should be possible.*
+ *There should be a high uniformity in the buildings between the different departments.*
+ *The institutional expression must be toned down. It should be a light and open environment, which may support the idea of a course of treatment.*
+ *Building structure, aesthetics and materials should reflect the culture and tradition in Greenland.*
+ *A high degree of connection between indoor and outdoor environments together with access to outdoor areas from the living-units.*
+ *Common facilities and spare time activities both indoor and outdoor should be integrated in the building together with employment opportunities.*

METHOD

IN THE FIELD BETWEEN ENGINEERS AND ARCHITECTS
a bottom-up approach

To create a design proposal for a correctional institution, in a land which is represented by an untouched landscape - a land where nature is an ingrained part of every human, several studies must be made, in numerous scales and fields. This project will introduce three central architectures; arctic, restorative and additive, in the pursuit of a thorough analysis to create the basis for the following design process and final design.

EXPLORING THROUGH PRESENCE
Adapting the architecture into the landscape so they together in their interaction enhance each other, has to be done with a specific carefulness and sensitiveness. In relation to the personal views described the architecture should relate to its surroundings so understanding the site, its rhythms and atmospheres, is essential. To obtain knowledge of the characteristics of a site the Norwegian architect Christian Norberg-Schulz's approach to a site is used. Inspired by his site analysis based on a phenomenological understanding, it is obvious that a place has to be explored and experienced through our own body. Therefore, with the site analysis as a guideline, the studies concerning the place will be practiced on the specific place; an outskirt area, north of Nuuk.

EXPERIENCING THROUGH ALREADY BUILT ARCHITECTURE
The project embraces adjustable architecture covering arctic architecture, restorative architecture and additive architecture. To produce knowledge of architecture in these different fields case studies are used as a method of identifying the specific means and architectures relevant according to its field. Vita Riis is used as a guideline for the studies and the cases will be placed along with the presentation of the three architectures mentioned and analysed according to primary focus points within each architecture.

IN THE FIELD BETWEEN ENGINEERS AND ARCHITECTS
To cover the two competencies; engineer and architect and to obtain a merging of these, the project is based on a bottom-up approach, where certain parameters influence the form and the aesthetics of the architecture. It is a method in line with the integrated design process and the iterative process.

Over the last decades a change in the method and mindset of architects and engineers has appeared. There has been a shift of focus in contemporary architecture; a move away from aesthetics as the primary parameter to performance parameters, meaning structure, construction, economy and environment etc. Use of materials has become a crucial concern resulting in increased interest and use of new materials and methods and of how to use traditional materials more intelligently. This change of focus, the move from one principle to another was sort of a backlash to postmodernism and not something that happened from one day to the other, it developed through time parallel to the technological and social development. The two principles are described as the top-down and the bottom-up approaches and are also outlined by Gilles Deleuze as the aesthetic outlook and the structural outlook. Within the top-down/aesthetic outlook, also the postmodern approach, the architect is the primary creator and the engineer is the one who makes the ideas of the architect possible. Form is imposed on building materials and appearance is considered to a higher extent than performance. Within the bottom-up/structural outlook, called the "new materialist" approach, the role of the architect has changed. "The architectural engineer" is now the one who controls and informs the design, the processes and the performance of the building. Form is now allowed to emerge according to the programmatic requirements. The material expressions are important; the material informs the architecture and not the other way around. [Leach 2012]

In reality architecture cannot be described as black or white as these two principles. They are overall methods, so choosing to address architecture through a bottom-up approach, like in this project, does not mean that aesthetics will be forgotten! Aesthetics is vital in creating good architecture. In this project there will be focus on both structure and aesthetics, architectural details and materialism; texture, color, construction. The bottom-up approach embraces considerations about the landscape and climate and furthermore the well-being and safety.

These three categories;

+ *Landscape and climate*
+ *Well-being and safety*
+ *Construction and details*

are those who will inform the architecture in the design process and together they encompass the aesthetics. Every category has subthemes according to aesthetics, functionality and expression, together they all inform the design and are finally expressed in the design proposal, a correctional institution in Nuuk.

SCOPE

EMBRACING CONSTRUCTION, CLIMATE CONSIDERATIONS AND AESTHETICS.
by developing a masterplan and a detailed living unit

The project will demonstrate being in the field between engineering and architecture and will therefore manage climate and constructive considerations embraced by an aesthetic understanding. As decribed in the preface, the focal point of this project is tectonic, therefore energy calculations will not be handled. Principles regarding overall energy concerns will be intergrated though.

This is a project handling a site area of 12,2 hectare and a building size of approximately 8000 m^2, thus the project will be restricted to developing an overall masterplan for the institution and its organisation, and the design and detailing of the living units including the cells.

This project will not handle the economic frames given for the project.

The discussion about what a correctional institution should and should not be, is a broad societal debate. What punishment is, based on a subjective viewpoint, will be handled in this project, and will serve as a basis for an understanding of the specific task. An increase of inmates in the existing institution dramatically lowers the quality and atmosphere of the place making the load factor a problem not to be ignored when thinking of durable architecture for a correctional institution. The project will concern the development of a design proposal for a new correctional institution based on a reintroduction of some of its original thoughts, resocialisation in particular.

READING GUIDE

ILLUSTRATING AN INTEGRATED DESIGN PROCESS
how to read this report

The integrated design process is an iterative process always moving back and forth where many parameters will be developed simultaneously. The process will spread out in many directions, some of them not visible in the final design, but all of them important in the process of developing architecture.
This master thesis is an example of such a process and even though the design process was not a linear process, the report will show some linearity in order to enhances the understanding of the project.

The report is divided into three main parts.
Part one contains a general introduction to Greenland and the correctional institution. It also contains a thorough analysis of the three archtiectures chosen, arctic, restorative and additive, ending up in recapitulation of all important parameters to include in the design and an architectural vision.
Part two illustrates the design process divided into 4 themes covering the different scales, layers and elements of the design.
Part three presents the final design in drawings and illustrations.
Last an appendix contain various studies and calculations produced in the course of the development of the design.

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GREENLAND

THE WORLDS BIGGEST ISLAND

The scenery of Greenland is one of the most unique and spectacular in the world with its snow, ice, fiords and fells, but this is also the reason why the population of Greenland has some of the toughest living conditions in the world. Most of the country is covered with ice and it is only possible to live along the coasts. The first Inuits came to Greenland from Canada and the traditional Inuit culture was a culture of sealers, whalers and hunters. They followed the animals during the summer months and then took permanent residence during the winter. It was a collectivist culture based on sharing and self-sufficiency and the religion was therefore centered around the fear of a bad hunt or catch, which could have fatal consequences for the entire community. [Krogh Andersen 2008] [Augustesen 2011] [denstoredanske.dk 2009-2013 (1)]

Greenland is a country of opposites. There is the wild, untameable nature on one hand and the modern city on the other. There are traditions and modern life, rich and poor, Greenlanders and Danes. [Krogh Andersen 2008] [Augustesen 2011] [denstoredanske.dk 2009-2013 (2)]

The following will introduce the history, culture and nature of the country where the project will take place - Greenland, the world's biggest island.

Ill. 4

GREENLAND TOTAL
37,7 km² per person

ICE FREE AREA
7,15 km² per person

PEOPLE PER KM²
DENMARK
130

PEOPLE PER KM²
GREENLAND
0,03

POPULATION **DENSITY**
Greenland

DENSITY COMPARISON
Greenland vs. Denmark

Ill. 5

The first Inuits immigrated from Canada	2500 BC
The forefathers of the present population of Greenlanders immigrated	Year 900
The seas around Greenland are popular whaling waters for Europeans	16th century
Hans Egede arrived in Greenland do missionary work	1721
Hans Egede founded the colony of Godt Håb (today Nuuk)	1728
The Danish state declares monopoly on all trade in Greenland	1774
Local councils inspired by Danish city councils were enforced to divide profits and settle arguments. They consisted of Danish officials and Greenlandic members	1856
The Greenland Law – 2 country councils were founded in Greenland to attend to the contact with the Danish authorities	1908
Greenland became a part of the Danish rule	1921
The German occupation of Denmark, Greenland on their own	1940, April 9th
The Greenland Treaty, USA receives the right to found military bases in Greenland if they agree to assist Greenland during the 2nd World War	1941
Denmark was freed and the connections between Denmark and Greenland was restored	1945
"Den store grønlandskommision" – "The big Greenland commission", G-50, was formed to raise the living standards in Greenland	1948
The Danish trade monopoly was dissolved	1950
"Grønlands tekniske organisation" – " The Techinical organisation of Greenland", GTO, is formed	1950
Greenland is no longer a Danish colony, but becomes a danish county and an equal part of the Danish realm	1953
By changes in the Danish constitution, Greenland is integrated in Denmark. Two members of the Danish parliament must be chosen in Greenland	1953
Legalisation of alcohol sale	1954
The ministry of Greenland and the first Greenlandic party were founded	1955
G-60, a continuation of the G-50 plan	1960's
The Birthplace criterion was carried	1964
Denmark and thereby also Greenland joined EF (later EU)	1971
The Home Rule committee is formed	1973
A Home Rule government is introduced	1979, May 1st
Greenland gets their own flag	1985
Greenland obtains Self-Rule	2009, June 21st

[Krogh Andersen 2008] [Augustesen 2011] [denstoredanske.dk 2009-2013 (1 - 3)]

GREENLAND

DEVELOPMENT THROUGH TIME

Since 1728 Greenland has been a part of the danish empire, which through time has created tensions especially from a Greenlanders point of view.
Denmark introduced rules and regulations, which should develop Greenland into a modern society fast. Cities can develop fast, people cannot - and that fact became visible. The result is disturbing! - massive social problems, violence and crime. A tendency which seems not to have reached its final point yet.

The seas around Greenland were popular to Europeans during the 16th century and within this period of time the original Inuit culture started to change as the Inuits were influenced by Europeans with whom they traded. In 1728 Hans Egede founded the colony of Godt Håb (today Nuuk) and began the colonisation of Greenland. Many Inuits took up permanent residence near the trading stations which made them more vulnerable to bad hunts and catches as they now depended on the population of animals in their area. The move also resulted in rising social distinctions amongst the people. Hans Egede was a missionary and because of his work many Inuits were baptised and slowly started to move further away from the old culture and religion. Climate changes resulted in fewer seals, but more fish and the previous sealers then became fishermen. Also breeding of sheep started to expand in the south of Greenland and mining appeared. [Krogh Andersen 2008, Augustesen 2011, denstoredanske.dk 2009-2013 (1)]

In the first half of the 20th century the relations between Greenland and Denmark grew as Denmark showed a rising interest in Greenland. The intention was that Greenland should not remain a colony, but should in time slowly obtain self-rule with help from Denmark. Due to the German occupation of Denmark during the Second World War all connections to Denmark were cut and Greenland were on their own. They established cooperation with USA in order to receive supplies and protection from them and USA were allowed to found several military bases in Greenland as it was a strategic important location between Greenland and the European fronts. With the presence of and the cooperation with the Americans Greenlanders were introduced to the modern world and the economy was blooming due to the rising export of cryolite, fish and lamb. [Augustesen 2011]

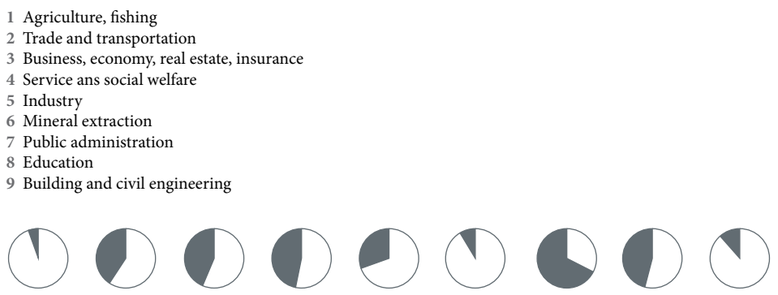
With the end of the Second World War in 1945 the connection between Greenland and Denmark was restored and in 1948 the Big Greenland Commission started working toward raising the living standards in Greenland to Danish levels with the socalled G-50 plan. In order to do this the Danish trade monopoly which had existed since 1774 was dissolved so Greenland could gain more economical contributors. It was necessary to get people to move from the villages to the cities in order to secure better housing and raise the education level. Docks, roads, power stations, waterworks, workshops, schools, hospitals and houses, mainly block housing, were built and it created a need for qualified workers, which were brought in from Denmark. This created problems for the Greenlanders, the Danes took over all the work, while they stood on the sideline watching. The Greenlanders had a hard time keeping up with all the changes in the 50's and 60's and there seemed to be no consideration from the Danes for the human consequences of changing a whole culture and society. The material development continued to gain speed while the human development could not keep up. This together with the legalisation of alcohol sale created massive social problems with increasing violence and crime. [Augustesen 2011, denstoredanske.dk 2009-2013 (1)]

In the 60's and 70's young Greenlanders started to get politically involved and in spite of the initiatives of the G-50 plan the Greenlandic politicians were still missing equality between Greenland and Denmark. The birthplace criterion introduced in 1964 was supposed to secure more equality between Greenlanders and minimise the social distinctions, but it did not change the distinctions between Danes and Greenlanders. Danes still had much higher wages and the Greenlanders were disappointed. The relationship between Denmark and Greenland started to change, and the Greenlandic politicians started working towards secession. They felt that equal rights were a lost cause, that Danes would never see Greenlanders as equals, and the people now wanted a say in the future of Greenland. A Home Rule committee was formed in order to bring back some of the areas of responsibility to the Greenlandic politicians and in 1979 the committee achieved Home Rule in Greenland. Greenland was still a part of the Danish realm and received financial aid called the block grant from Denmark. Denmark continued to manage the Greenlandic economy, even the funds that Greenland received and Denmark also kept the ownership of the Greenlandic underground. [Augustesen 2011] [denstoredanske.dk 2009-2013 (1)] Through the 70's Greenland took over more and more important areas of responsibility, parts of the economy and with that the block grant from Denmark rose. In the 80's Greenland had an economical crisis, no one had an overview over the financial situation in Greenland and the different government agencies accused each other of having the responsibility. They managed to borrow money to get by and it resulted in a government change which led to changes in society as well. The Greenlandic language was reinstated in the educational system as main teaching language and Danish as first foreign language. The language battle had been going on for many years. A long the way the Greenlanders discovered that it was an issue only to be able to speak Greenlandic, as all further education were in foreign languages, so they chose a middle road with both Danish and Greenlandic. [Augustesen 2011]

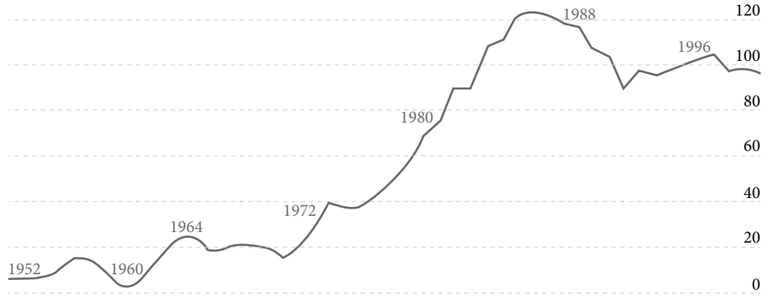
In the 90's Greenland started betting on mining and tourism as sources of income, but it turned out to be less of a success than hoped. They still battled great social problems, especially child neglect, incest and a very high suicide rate, most of these were caused by extensive alcohol abuse. With an election in 1999 Greenland worked towards more independence from Denmark and in 2009 Greenland obtained self-rule. This meant that they gained control over all areas of responsibility and also the future incomes from raw materials in the Greenlandic underground. The block grant from Denmark was reduced and frozen, they were not 100% independent, but closer. [Augustesen 2011]

Through time there have been many disagreements between Denmark and Greenland, a tense relationship, which still seems to be present. The only thing that really prevents total independence for Greenland is their economy and their continuous lack of responsibility towards managing it. Fishery has been the backbone of the Greenlandic economy for most of the 21st century, but it still cannot reach the levels required to carry the entire economy. Therefore the economy of Greenland is now depending on what may be hiding in the underground. There are several factors for the Greenlanders to take into account when embarking on the mining adventure and there are a lot of disagreements among the population. Many are afraid that the mining industry will have damaging consequences on the environment and possible oil-spills can damage the entire ecosystem. On the other hand there are still a lot of problem areas within the society that could benefit from the money made on mining. The social problems caused by alcohol abuse are still very distinct and widespread, so are problems with sexual offences and high suicide rates, but also problems regarding the differences between rich and poor are becoming even more evident. In the villages there are poor opportunities for proper education, work etc. which again causes many social problems connected to the villages. What to do about the villages is a very emotional subject because they are considered to be the original Greenland, with their old-fashioned lifestyle, and a big part of the culture, something that should be respected and preserved. The big cities, where the biggest are Nuuk (capital), Ilulissat and Sisimiut, are characterised by a modern western lifestyle much like Denmark. There are better opportunities for both work and education and better housing possibilities. [Krogh Andersen 2008] [Augustesen 2011] [denstoredanske.dk 2009-2013 (2)]

POPULATION BY **GENDER**
POPULATION BY **AGE**



OCCUPATION BY THE LOCAL POPULATION



SUICIDE RATE

Ill. 6

Inhabitants in Nuuk **15.496**
Nuuk is the capital of Greenland

BUILDING MAP OF NUUK 1:350.000
Ill. 7














Ill. 8

GREENLAND IN PICTURES

When arriving in Greenland, and Nuuk, first you are overwhelmed by the breath-taking spectacle of the natural surroundings. Everywhere it is clear that everything is subordinated to the landscape, nature decides, nature directs. Life is dependant on and led in close connection to nature, not as much in the bigger cities like Nuuk as in the small villages, but still. All land is everybody's land.
After a while the isolation that this astonishing, rough nature causes hits you, there are no roads connecting the cities, there is nowhere to go, unless you have a plane ticket or a boat. But this is life here, you live where you are and occasionally smaller trips alternates the everyday life.

In general Greenland is a country of contrasts, conflicts and contradictions, for good or bad, this is especially visible in Nuuk. Nuuk is a modern city of Western standard with all that this entails. Walking around the city you slowly discover these contrasts, the visible and not so visible, both within society, culture, the surroundings and life in general. The more obvious contrasts relate to the surroundigns and the climate, but when you go deeper (stay longer) you start to realise the contrasts within, some of them are fundamental for the life and existence of people in Greenland.

WARM	><	**COLD**
MODERN	><	**OLD**
PROGRESS	><	**STANDSTILL**
ABANDONED	><	**INHABITED**
NEGLECTED	><	**WELL-KEPT**
HISTORY	><	**FUTURE**
RICH	><	**POOR**
GREENLANDER	>< MIX ><	**DANE**
POSSIBILITIES	><	**LIMITATIONS**
UNIQUE	><	**IMITATION**
SOLIDARITY	><	**DIVISIONS**
EXTRAVERSION	><	**RETICENCE**
NATIVE	><	**IMMIGRANTS**
SETTLED	><	**CONFUSED**
GOODWILL	><	**SCEPTICISM**

SUB-RECAPITULATION

By this chapter; 'Greenland', it was the intention to emphasise the cultural history of Greenland. A history which is still connected to some of the social problems that Greenland is dealing with today. The social problems can be seen in the high number of placements in correctional institutions, which will be described in the following chapter.

CONTENTS

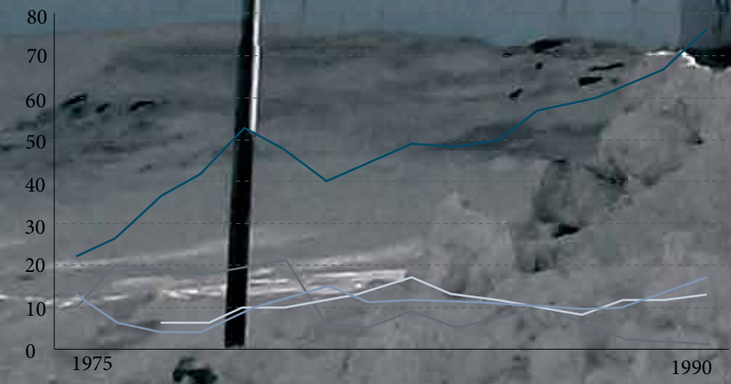
THE CORRECTIONAL INSTITUTION

AN IDEA BASED ON THE WORLD'S BEST CRIMINAL LAW

"Convicted in the correctional institutions in Greenland should be cut off from opportunities for participating in the surrounding society as little as possible. Employment and activities in the spare time happen outside the correctional institution as far as possible. Inmates in closed and semi-closed departments however, cannot leave the correctional institution during the day for work, education or for participating in for example abuse treatment. Therefore the correctional institutions should provide treatment and employment in working hours and spare time." **[www.kriminalforsorgen.dk, 2013] (Translated from Danish to English)**

This was the original intention. The following will treat the correctional institution, its intention and its challenges, and question the quote above.

Ill. 9



AVERAGE NUMBER OF DEATINED PER MONTH
Correctional institutions in Greenland
Youth departments
Herstedvester
Placement at private homes

Ill. 10

INSTRUCTION - THE FIRST 'PENAL CODE PARAGRAPH' 1782

Mainly an instruction to traders and whalers on how they should behave. Secondly on how foreigners should behave. The instruction was based on affectionate and peaceable relations to the local population. Thus different rules for Greenlanders, 'mixes', Greenlanders married with Danes and foreigners.

Municipality council consisting of people chosen by the Greenlanders occur. 1908

Administrative reform resulted in authorities related to conviction being delegated to the newly established district council. 1925

THE LEGAL EXPEDITION 1948

The legal expedition was dispatched by the Danish Prime Minister based on an increasing criticism of the state of the law. The Greenlanders questioned the fairness of having specific rules for Greenlanders, when Danes in Greenland were under Danish law. For Danes crime rarely had consequences.

THE FIRST CRIMINAL LAW 1954

On the basis of the legal expedition the first criminal law in Greenland became effective. It was based on the tradition of individual treatment of offences - the perpetrator principle. Furthermore the law had the intention to exclude offenders as little as possible from the society. It was called the best criminal law in the world.

The first place for detention was established for six convicts. 1956

The first Greenlander was placed in Herstedvester, Denmark. 1957

THE FIRST CORRECTIONAL INSTITUTION 1963

An amendment provided the opportunity for being sentenced to a placement in a correctional institution. The intention was that the correctional institution should not be a closed prison, but a place where convicted could live and in shorter periods be, and if necessary be isolated from the society. The confinement was introduced.

A new correctional institution with 18 rooms (6 rooms for a closed department, 12 rooms for an open department) was built in Nuuk and replaced the old one. From the start the correctional institution had a load factor over 100%. 1967

Questioning the efficiency of the criminal law in relation to the growing crime in the society. 1974

The Prison Service had the following institutions at their disposal: Nuuk (correctional institution): 18 rooms, Nuuk (youth department): 10 rooms, Sisimiut (youth department): 6 rooms, Aasiaat (detention): 8 rooms and Qaqortoq (detention): 8 rooms 1975

Modifications in the criminal law led to the law being approximated the one in Denmark. The idea of the perpetrator principle became restricted, so did the resocialisation. The maximum length of dated placements were 10 years, but in cases of particularly dangerous offences it was possible to sentence indefinite placements in a correctional institution. If offenders were ill-suited for placement in a correctional institution they were transferd to Herstedvester. 1978

THE HUGE CONFINEMENT IN GREENLAND 1980's

Expansion of the correctional institution in Nuuk to 60 rooms. 1992

A serious increase in the number of placements in correctional institutions. 2000's

[Nyborg Lauritsen 2011]

THE CORRECTIONAL INSTITUTION

INTENTIONS FOR A NON-CRIMINAL LIFE AFTER CONFINEMENT

The social problems, violence and crime,
which seems to be the result
of the fast developed society,
can in some cases lead to a placement
in a correctional institution.

A placement where the correctional institution
denies freedom.

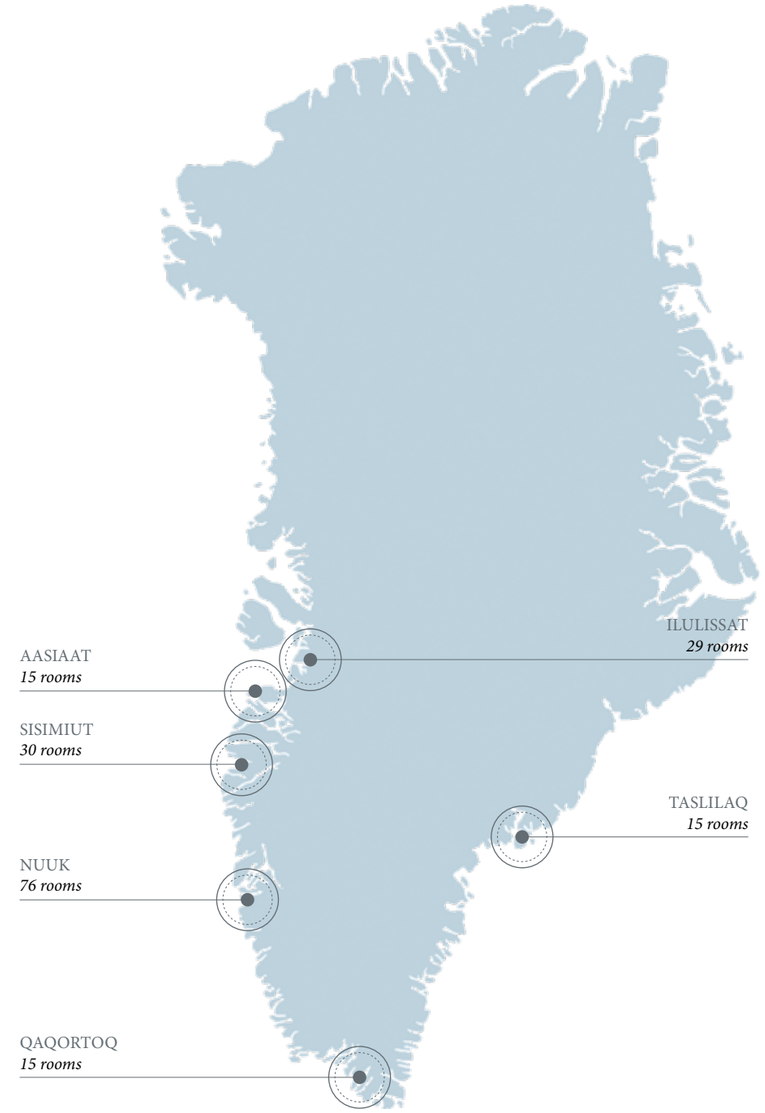
The correctional institution is not a prison - or that was at any rate the intention. In 1954 the first criminal law in Greenland was introduced, a law called the best criminal act in the world - a criminal act instead of a penal code, with the intention; not to punish, but instead to help those getting into trouble. It was based on the meaning of resocialisation and perpetrator principles, where an individual and future-oriented treatment was crucial in the court proceedings. In 1963 a change in the criminal act permitted placement in open correctional institutions. Opposite prisons, the correctional institutions should be open and instead of excluding the inmates from the society, they integrated them as much as possible. The Greenlander endures confinement badly; they were used to a society with small communities where everyone knew each other and kept an eye on each other. They were used to the nature - the open landscape. Therefore they were often released before time. This was one of the main reasons for implementing correctional institutions instead of prisons. Those convicted for particularly grievous offences were sent to Herstedvester Prison in Denmark - another country with another culture. [Nyborg Lauritsen 2011]

According to the new criminal act of 1963, the correctional institution is obligated to prepare the inmates for a future life without crime and limit the disadvantages that follow a confinement. It should support in relation to job opportunities, education, treatment of abuse problems, social and personal conditions. Detained and convicted persons are placed in different parts of the correctional institution. Those who are detained are not allowed to leave the correctional institution, only convicted can get permission to obtain leave. Inmates who are confined should be employed inside the correctional institution, and thereby attain a more meaningful existence. [Nyborg Lauritsen 2011]

Meaningfulness seems important, not only to endure the confinement, but also to identify oneself in an environment where every known relation is cut off, prevented by a locked door. Suddenly the confinement has an intention, besides serving a kind of consequence for the crime committed; it prepares the inmate for a future life without crime. Resocialisation is what should prevent the damaging effects that prisons entail. A beautiful thought, where the correctional institution becomes a help instead of a punishment. But is this the real picture of the correctional institution or just an illusion hiding the same issues that a prison contains? The fact is that even though the intentions are good other factors, the facilities especially, are not capable of supporting the intentions of resocialisation and becomes a hindrance.

Even though Greenland escaped the institutionalisation in Europe, which started around 1600, they have over a few years caught up with and passed Western Europe in the number of confinements.

The total amount of rooms for inmates are 180 rooms distributed in different cities, and this is a country of only 57000 citizens!
[Nyborg Lauritsen 2011]



Ill. 11

EXPERIENCING THE CORRECTIONAL INSTITUTION

When we visited the existing correctional institution in Nuuk, it was clear that the buildings are permeated by the rough function they contain. Small rooms and worn down facilities are the reality, the frames wherein the inmates have their daily life. One said, when we were talking in the visitor room; 'I like this room, because of the view to the sea'. It was clear that the long hallways, with the six square meter room and the dark common space at the end were not that inspiring. The staff seemed encouraged, but the physical frames of the correctional institution stopped them in their ideas and initiatives. When walking around a picture of the daily life in the institution appeared; some were playing cards in a room where the air was thick of smoke, others were watching television and the rest were primarily sleeping. An inactivity caused by the lack of activities. The picture was that today looks just like yesterday.

When experiencing the correctional institution the feeling of a 'family' atmosphere was consistent and suggestive. No walls enclosed the buildings and some inmates were allowed to go by themselves from one building to another crossing a public road. It is freedom under responsibility, and if one should break the rules, the loss of liberty will be enhanced. Nuuk is at some point a 'prison' in itself. You can only escape the city by boat or plane, resulting in very few running away, and if they do, they often come back by themselves the next day.

A NEED FOR RESOCIALISATION

From 2000 - 2009 there was an increase in the number of criminals who were convicted to placement in the correctional institutions in Greenland. During the same period the number of reports to the police fell. A direction which is alarming - the Greenlanders have become dependant on the functions that the correctional institution has obtained in the society; a place for attaining revenge and a place for the proletariat - the surplus population. A pattern the prisons also have obtained. The majority in the correctional institutions are people from the lower social classes and they might just be those who need resocialisation most of all - a guide to get back on the right track. But this original idea, the resocialisation, is almost non-existent in the correctional institution today. In Nuuk only 1/3 of the inmates have obtained leave in 2010, while only 1/5 have jobs in the city and 1/5 was occupied in the correctional institution [Nyborg Lauritsen 2011]. This is not because of missing enthusiasm from the staff, but caused by the buildings containing the correctional institution together with a social lack of responsibility. However, this testifies to a non-resocialisation process, a situation where the actual crime has become the essential instead of the original perpetrator principle. [Nyborg Lauritsen 2011]

The meaningfulness is thereby gone for most of the inmates; what should motivate them to a more law-abiding behaviour has gone. At best, the inmates will after release maintain their existing poverty, but in most cases they will be released even more poor and excluded from the society than they were before their confinement; they do not have a job, a home or money. Maybe that is why more than half of the inmates released are found guilty in new crimes during the first five years after being released - the correctional institution is an offender-school. This is also a critique point, which argues the failure of prisons. The critique also emphasises that prisons do not reduce crime, but instead fabricate new criminals indirectly. [Nyborg Lauritsen 2011]

The original intention of the open correctional institution has failed compared to its original principles, the resocialisation. This issue can be caused by two things, the physical frames of the existing correctional institution and a social lack of responsibility within society in terms of giving the inmates a second chance. The last point is not a task for this project, while the first states what this project is about; creating a new correctional institution, where the architecture invites to resocialisation. If the act of the confinement is backward oriented, to make the confinement meaningful, not only for the inmate, but also for the society the resocialisation and the non-crime future is important - a re-introduction of the original idea for the correctional institution is needed.

NEW WALLS

The new correctional institution will not only contain open departments, but also one closed. Thereby it will be divided into three departments; one closed encircled by a wall, one open captured by a fence and one re-entry into the society department, which will be placed outside the fence. Therefore the new correctional institution will in the closed department move closely to what we know as prisons, while the two other departments will contain less loss of freedom, in terms of leave and work in the city. However, this do not erase the intention of architecture promoting resocialisation.

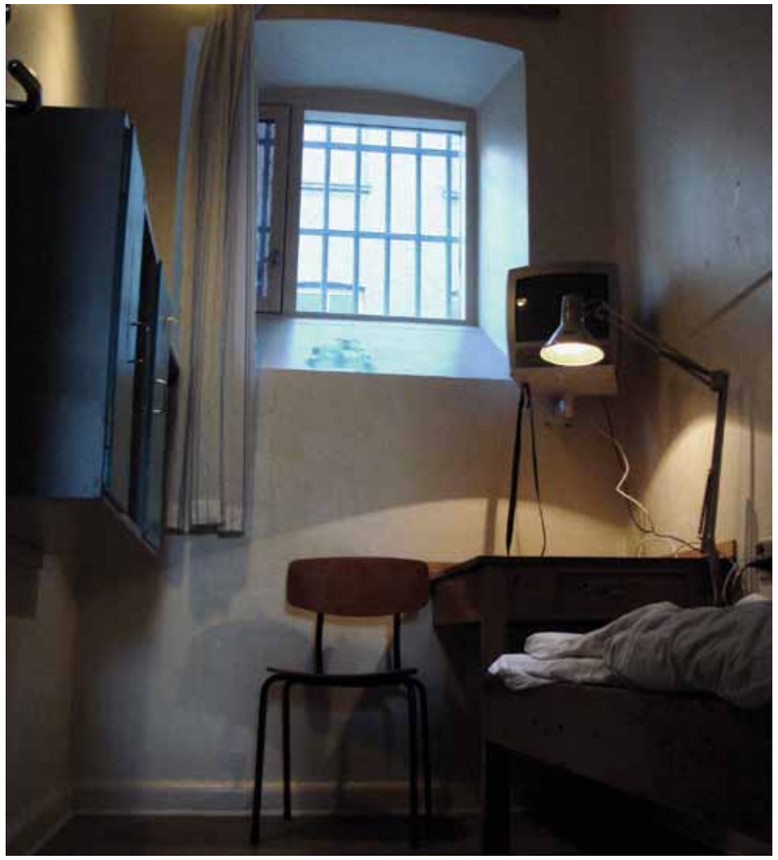
Ill. 12

NUMBER OF PLACED IN CORRECTIONAL INSTITUTIONS
Greenland

OFFENCES AGAINST LIFE AND LIMB
DK vs Greenland

SEXUAL OFFENCES
DK vs Greenland

Ill. 13



Ill. 14

A PICTURE OF THE TARGET GROUPS

INMATES AND STAFF

The primary target group is the inmates. They eat there, sleep there, live there. This is their temporary stay.

The challenge concerning the primary target group is that no one is in the correctional instititon by choice - everone is placed involuntary, and would probably prefer to be somewhere else.

Still this is also a working place, so the staff will naturally be considered.

THE INMATES

The inmates all have different backgrounds, have committed different crimes and are from different age groups, but still a picture is emerging. The majority of the inmates belongs to the proletariat; people who do not own anything. Most of them worked as unskilled workers or were out of work before they were confined. Concurrently a lot of them were living alone. The main part are detained or convicted for offences against life and limb and sexual offences. Most of the inmates are men, but over the last years there have been an increase in the number of convicted women. [Nyborg Lauritsen 2011]

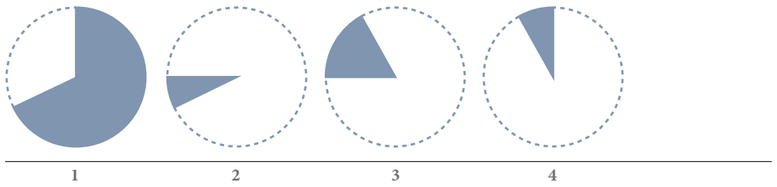
In Greenland the placement in an correctional institution happens in the hometown or as close to the hometown as possible. This strategy is a part of the resocialisation process. When an inmate starts to have leave, it takes place in accustomed surroundings. [Nyborg Lauritsen 2011]

THE STAFF

While the correctional institution has to work as a temporary stay for the inmates, it is at the same time also a working place. In this situation the functionality and organisation of the institution is important.

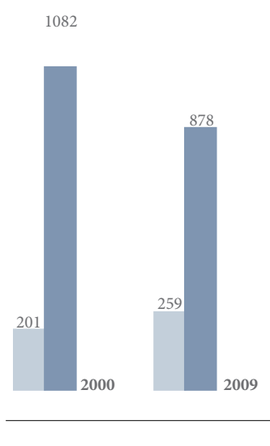
PICTURE AF CELL

The picture is from the now closed down Horsens State Prison. The cells in the existing correctional institution i Nuuk are almost the same size as the cells in Horsens. One more thing they have in common is that none of them have toilet in the cell. Therefore when the inmates are locked in at their cells at night, they have to call for the staff when going to the toilet. An element which are connected to a feeling of unsafety for the staff and at the same time a time-consuming activity. For the inmates the intimate sphere becomes reduced.



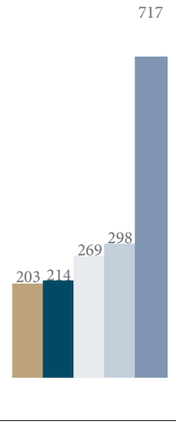
REGISTERED CRIME 2009

1 Offences against property
2 Sexual offences
3 Offences against life and limb
4 Other crime



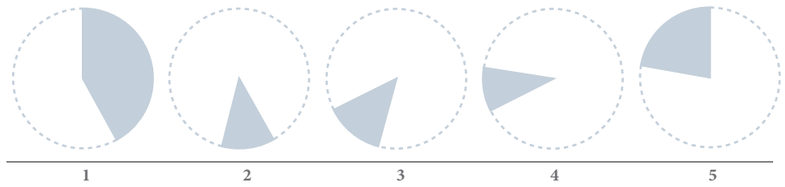
GROUPING OF GENDER WHICH ARE FOUND GUILTY

Women
Men



GROUPING OF AGE WHICH ARE FOUND GUILTY, 2009

15 - 19 years
20 - 24 years
25 - 29 years
30 - 39 years
40 - years

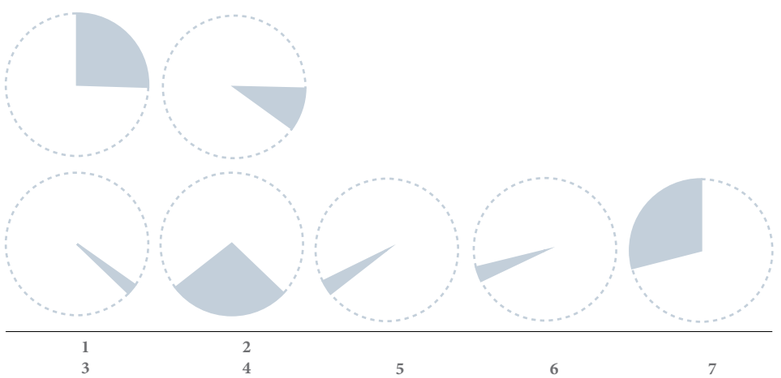


CIVIL STATUS OF INMATES, 2010

1 Single
2 Cohabitee/married
3 Cohabitee/married, with kids
4 Single, with kids
5 Undisclosed

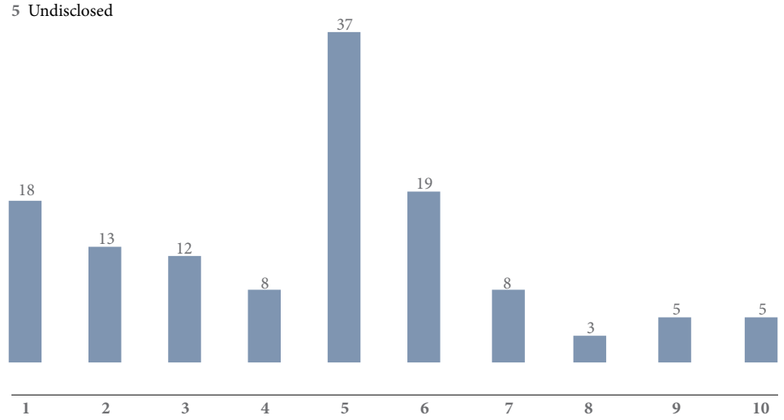
HOUSING CONDITIONS OF INMATES, 2010

1 Own house
2 Live with family
3 Live on institution
4 Without real property
5 Undisclosed



EMPLOYMENT OF INMATES BEFORE CONFINEMENT, 2010

1 Unemployed
2 Retired
3 Under education
4 Unskilled employment
5 Skilled employment
6 Self-employed
7 Undisclosed



LENGHT OF CONFINEMENT, 2010

1 0 - 2 month
2 3 - 5 month
3 6 - 8 month
4 9 - 11 month
5 1 - 2 years
6 3 - 4 years
7 5 years
8 6 years
9 Over 7 years
10 Indefinitely

Ill. 15

CONTENTS

ARCTIC ARCHITECTURE

A LAND BREATHING WITH NATURE

An arctic climate with amazing nature and dramatic landscape is the context for this project.

North of Nuuk, in an outskirt area, at a 12,2 hectare large site, sloping towards the north is where the correctional institution is going to be placed. To understand the context, the specific area, its typography, ground material, texture and atmosphere, the following will introduce an analysis of the Greenlandic building practise through time and a site analysis based on Marit Vagstein's, Norwegian architect, and Christian Norberg-Schulz's, a Norwegian architect and theoretician,[denstoredanske.dk 2009-2013 (3)] phenomenologacal understanding. Furthermore maps will show the typography at the exact site, the accessibility, wind and sun conditions.

Finally this should give an understanding of the context, the frame, for the correctional institution.

Ill. 16

Ill. 17

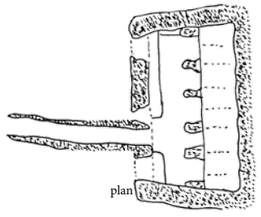
Ill. 18

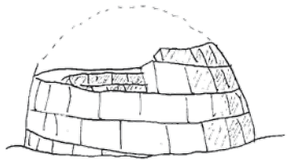

Ill. 15
SITE
Ill. 19

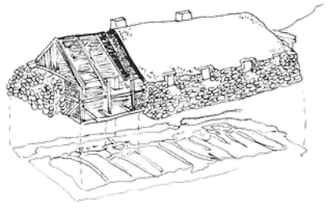
ARCTIC BUILDING PRACTISE

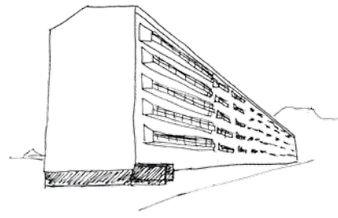
ARCTIC ARCHITECTURE THROUGH TIME

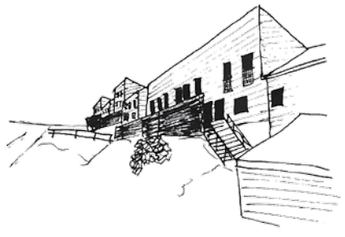
Through time Greenland has moved from being a inuit society, where the daily life concerned the next meal - a society of sealers, whalers and hunters. A people flow towards the cities thinned the villages, and the inuit society became the past. Instead of the free nature and the look to the sea, people were now locked into fast built concrete blocks.
Today arctic architecture seems to reclaim some dignity. New initiatives have given breeding ground for architecture concerning climate conditions and the arctic culture.











1200 UNTIL 1900

THE IGLOO

The earliest Inuit cultures travelled for half of the year. In the summer months they lived in temporary housing. On top of low stonewalls tents were held in place, made of driftwood covered with skin from musk oxen. During the hunting trips in spring some people lived in igloos made of carved ice blocks built up on a circle on top of each other so they form a spiral that tilts towards the middle. [Steenfos & Taggholt 2012] [Madsen 2000]

1200 UNTIL 1930'S

PEAT HOUSES AND COMMUNAL DWELLINGS

In the winter months the Inuits took permanent residence in houses made primarily of peat and stones with roof structures made of driftwood and/or whalebones covered by skin with turf on top. Windows were covered by skin from intestines of seals that were light penetrable and did not ice up. Through time the Inuits started to build their houses together and form communal dwellings with separate niches for each family. These two kinds of peat housing were the most common before and at the beginning of the colonisation. [Steenfos & Taggholt 2012] [Madsen 2000]

1721

THE FIRST HOUSE OF HANS EGEDE

In the beginning of the colonisation Greenlanders continued to live in traditional peat housing while the buildings in the colonies where of European character. The first house of Hans Egede was inspired by a Danish half-timbered house on the inside and by Norwegian building style of the period with walls of turf and stone on the outside. Between 1743 and 1847 the first standard houses were built inspired by the Norwegian "lafte-house", in Denmark the so called "stokværkshus". [Steenfos & Taggholt 2012] [Madsen 2000]

EARLY 20TH CENTURY

STANDARD HOUSING

In the late 19th century and early 20th century timber became more available for the Greenlandic population and they started to imitate the Danish style of building, as timber houses were considered nicer and better than the peat houses. The Greenlanders had a big disadvantage though. They were a culture of self-builders and it was a big change to go from original peat houses to timber houses. They did not have enough, if any, experience with timber constructions, they had no trained workers in the field, no technical guidance and not enough materials available. Therefore their houses had a much lower quality than the Danish timber houses and were not much different than the houses they came from. [Steenfos & Taggholt 2012, Madsen 2000] Through the 1940's and 50's attempts were made to improve the conditions for self-builders, but unsuccessfully. [Madsen 2000]

50'S AND 60'S

BLOCK HOUSING_BLOCK P

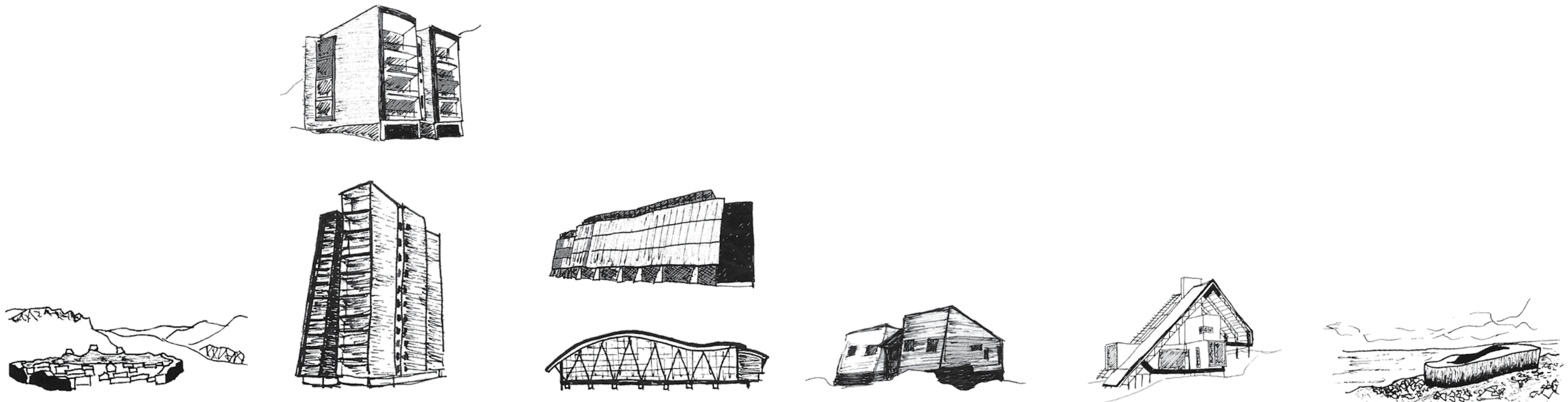
A part of the G-50 plan was to raise living standards and secure better housing. During the 50's and with the foundation of GTO the development of standard housing speeded up and the population was concentrated in fewer, bigger cities. [Augustesen 2011] Due to a desperate need for housing in the 60's GTO built a lot of housing; block housing. Block P and the Blocks at Store Slette built in 1968-1970 in Nuuk were examples of this. They were meant as study examples of concrete technology, to be healthy low-rent standard housing and an attempt to remove the differentiation between housing for immigrants (Danes) and housing for the locals. Modern housing like these building blocks was furthermore a tool to turn the former hunters and fishermen into well-adjusted wage-earners. Despite the "good intentions" the blocks were built with no regard to the Greenlandic way of life and the Greenlandic climate, resulting in massive social problems. [Madsen 2000] [Vindum 2012]

50'S AND 60'S

NEW BLOCK HOUSING_RADIOFJELDET

In the 70's there were not the same urgent need of housing so attempts were made to strengthen and improve multi-storey housing. An example is the row houses at Radiofjeldet in Nuuk from 1971-1979. These houses showed a radical use of footbridges and covered access paths between the buildings in the complex that also served as insulated routes for cables and pipes. The houses were colourful, robust, imaginative and in agreement with the landscape and its typology. The footprint of the buildings were minimised by using a shear wall slenderer than the profile of the house, and subdivisions and displacements of the row houses caused the houses to follow the landscape. Still this type of housing was for the more well-off part of the society.
Today much of the housing from the 60's and 70's suffer from years of neglect and are demolished or undergoing extensive renovation. Some of the renovations still show little consideration for the Greenlandic way of life though. [Vindum 2012]

"[...] you cannot own land in Greenland. All land is everybody's land. This requires that there is someone to regulate how this land is used. That means that you have to have an authorisation to do anything. But on the other hand you also have limitless opportunities to do anything."
[Keiding 2012, pp. 47] (Translated from Danish to English)



Ill. 20

1973

RESOLUTE BAY PROJECT

Through time there has been many well-meaning attempts at a new arctic building style, one of the earliest is the never realised Resolute Bay Project by Ralph Erskine from 1973. Erskine mainly worked with arctic architecture in Canada and Sweden and this project was originally meant for Resolute Bay in Canada, however it deals with the same climatic challenges that are seen in Greenland. He tried to accede to these challenges of the arctic climate by letting it be a contributor to the shape and by creating protection for the inhabitants from it. His main focus was to open up to the sun and turn away from the cold northern winds and the shade. He created an amphitheatre like a complex, a city arranged within an encircling protective form. The city consisted of 1-2 storey buildings surrounded by tall walls of housing units oriented inwards. The project was however still an attempt to satisfy the demands of western lifestyle even though it incorporated some elements from the Inuit way of life. [Vindum 2012]

2000'S

POINT BLOCKS_QUINNGORPUT AND HIGHRISE HOUSING

In Nuuk whole new residential areas arise in the suburb Qinngorput, with different architectural styles and types of housing, such as row-houses, single family housing and apartment buildings. [greenland.com 2013]

Greenland is in general characterised by progress, but also bears the mark of the fact that there is no private property right, which means that the urban spaces are no one's/everyone's property and responsibility; they for the most part lie bare and undeveloped. [Vindum 2012]

1997 AND 2003

KATUAG_CULTURAL HOUSE AND MALIK_PUBLIC SWIMMING POOL

Nature is a big part of Greenlanders consciousness and everyday life and it also plays a big part in the expression of modern architecture in Greenland. Examples are the cultural center Katuaq in Nuuk by schmidt hammer lassen architects and the new public swimming pool Malik, also in Nuuk by Tegnestuen Nuuk and KNR Arkitekter. [greenland.com 2013]

2004

LOW ENERGY BUILDING_SISIMIUT

It seems the most pressing and relevant matters to address within Greenlandic architecture today, besides the lack of applicable urban spaces, are still the challenges caused by the rough climate (and by the future climate changes), by the topography and by the unique daylight conditions. Furthermore how to meet the need for cheap, energy-efficient, good quality housing that can be built over short periods of time and adjusted to the needs of this ever-changing country. [Arnfred 2013, Riis 2013]

2012

POSSIBLE GREENLAND

How to build in Greenland is an ongoing debate in today's media, especially in Denmark and Greenland. With Denmark's contribution to the Venice Biennale 2012 called "Possible Greenland" attention was brought to the debate also outside of Denmark and Greenland.
One of the proposals from the Biennale plays with nature and location of housing on mountainsides especially. The housing system is adaptive to accomodate changing needs. It is like Erskine's a proposal for a new arctic building style within housing created by Tegnestuen Vandkunsten and Qarsoq Tegnestue, and also an example of additive architecture. [Arnfred 2012] [vandkunsten.dk 2012]

FUTURE

VISITOR CENTRE_ILLULISAT AND NATIONAL GALLERY_NUUK

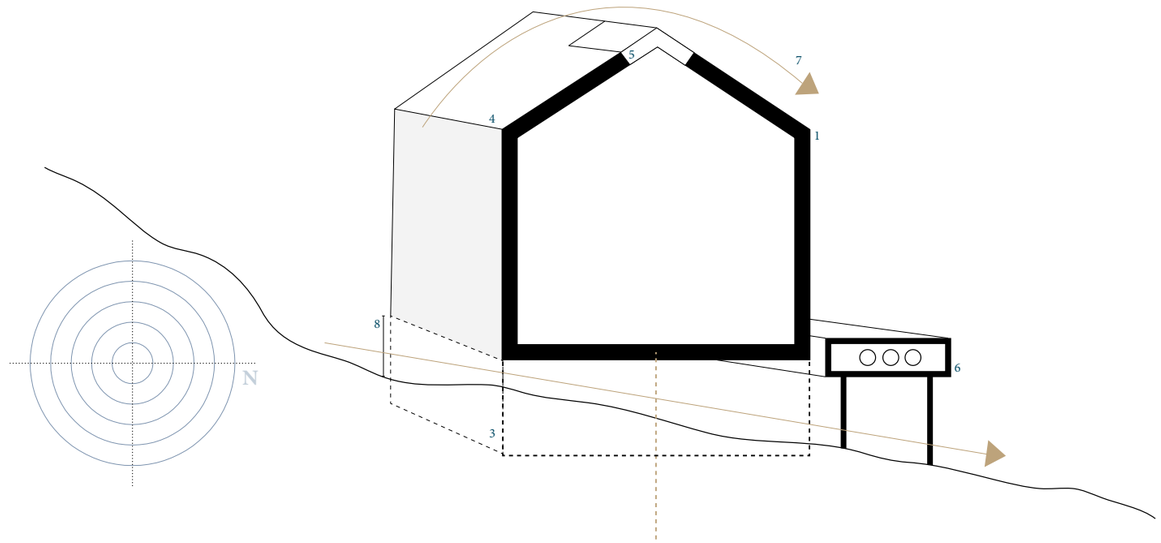
With a rising focus on tourism as a possible source of income for Greenland, new large, prestigious projects are launched, for example a new Visitor Centre in Ilulissat by Peter Zumthor and the National Gallery in Nuuk won by Bjarke Ingels Group. [greenland.com 2013]

Minik Rosing, professor in geology at the University of Copenhagen, expresses the dilemmas within Greenlandic architecture in the quote above. Greenland is a country of endless opportunities and it seems the new tendencies in arctic architecture are expressions of exactly this.

ARCTIC BUILDING PRACTISE

HOW TO BUILD IN AN ARCTIC CLIMATE

From visits at two different architectural firms in Nuuk, Qarsoq Tegnestue and Tegnestuen Nuuk, information and advise about different building techniques were gathered in order to set some guidelines for the development of the design. The following diagram will show a summary of the most important points that will be considered in this project.



Ill. 21

1: ENVELOPE

High insulating building envelope, should aim at a Low Energy class 1 / Energy class 2015.
Thermal bridges are critical to avoid because of the great risk of moisture damages.
Building compact ensures lower energy levels, less surface.

2: MATERIALS

Traditional building materials are timber and wood facing, and by now also concrete. Almost all building materials must be imported.
Concrete for in-situ building is a local building material, but can only be used in the warmer months as the concrete will otherwise not be able to dry. Prefab concrete are transported from Denmark and fit well for the short building period.
Wood can be used all months of the year, weighs less, is easier to transport, but not as durable as concrete.

3: FOUNDATIONS

Foundations should be either a crawlway, a shear wall or a pillar foundation to allow melting water to pass under the building. When bulding on a slope wall foundations or pillar foundations are more suited for great amounts of water.

4: ROOFS

Roof slope of >7 degrees. Roofs should be completely sealed to ensure that snow blows of instead of melting on the roof.
Corners on roofs should be avoided to prevent snow from piling up. No gutters due to great snow loads.

5: SKYLIGHTS

Skylights should always be placed on the ridge of the roof or in the wind direction to enable snow to be blown off.

6: PIPING

Piping is easier to do above ground in insulated channels like pathways because the undergrund is made up of fell. Pathways keep pedestrians above snow and melting water levels.

7: WIND

Main wind directions are north and south. In summer outdoor spaces should be sheltered from cold northen winds, in winter strong winds come from the south and snow gathers on the north side of buildings, minimising “pile up”-places is important.

8: LEVEL

Floor level should be > 400 mm above ground because of snow depths.

THE LANDSCAPE AS A PHENOMENON

LANDSCAPE AND NATURE

The site is an outskirt area about ½ - 1 hours walk from the Nuuk Airport, but the feeling of isolation is unmistakeble and unavoidable . Now and then a plane or a boat passes by, but most of the time the place lies quiet and deserted. From the site grand views unfold north to the landmark of Nuuk, the fell called the "Saddle", and in all other directions as well, and all you see are connected to is the great unspoiled nature. The place is undeveloped and untouched, unknowingly anyway. It is clear that here the landscape is the superior, it sets the frames for both the use and the movement in the area and so, natural paths have slowly been formed simply because there was no other way to move through.

The landscape as a phenomenon is, according to Christian Norberg-Schulz, a constitution of concrete interrelated things equalling the terms space and character. When experiencing the world, it appears to us as a gathering of concrete phenomenons, when dividing the experiences into spaces and characters it becomes possible to understand the experience of the place, since *'a place is a space which has a distinct character'*. [Norberg-Schulz 1984, pp 5] When mentioning this division, it later presupposes a gathering of the two in a qualitative analysis, because the landscape is a total phenomenon which by a reduction to either space or character loses its totality, a perception which relate to the gestalt theory. [Norberg-Schulz 1984]

Where space is related to the mental function of orientation, character is related to identification, two terms which also determine the meaning of belonging, a subject which will be introduced in the chapter 'Restorative Architecture'. Space relates to the things which create the space; landmarks, paths ect., one could say the experience of the concrete shapes. Characters correspond to the basis of the concrete shape, how things are; the colour, the texture ect. The characters of a place are connected to time. In Greenland the daylight changes dramatically over the year, not only caused by the length of day, but also the colour of the ground; in summer a green vegetation and in winter a duvet of white snow. The concrete things create a totality which represents the genius loci of the landscape, thereby the investigation of the place may be the point of departure. [Norberg-Schulz 1984]





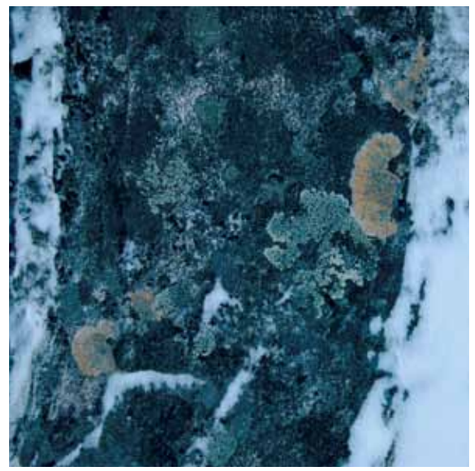












Ill. 22

THE SITE

AN OUTSKIRT AREA, REPRESENTED BY PURE NATURE

Sloping towards the north, tip toeing the sea, expanding the horizon. Untouched. Undeveloped by man. This is the picture of the place, where a new correctional institution will make an appearance.

The site is located north of Nuuk, an outskirt area represented by pure landscape and nature.

The following will present an analysis of the place based on Norberg Schulz's understanding of genius loci, in order to create architecture which respond to the landscape.

GENIUS LOCI

The place is the frame for the architecture. In this case, the place is an outskirt natural landscape north of Nuuk, where no man has yet built. Untouched. Unaffected by mans settlement. A landscape is a multiple collection of layers, where its changeable conditions through time and seasons let us imagine the possibilities for further architecture. Time changes place. [regjeringen.no 1993] But certain characters have durability, this characteristic of a place is what Norberg-Schulz calls genius loci - the specific character of a place, where every place is unique. [Lund 2008] To clarify the genius loci both the human environment and the landscape have to be explored - a notion about architecture and place, which Norberg-Schulz clarifies as our lifeworld. [Nygaard 2011]

In general we may say that man, through his works, expresses the capacity of the landscape. [...] settlements, therefore usually articulate places given by nature [...] [Norberg-Schulz 1974 pp 71]

Landscape and man are interlaced in a mutual narrative. According to architecture, the place is our most important material - by dissolving the place, we at the same time dissolve the architecture, argues Norberg-Schulz. [Lund 2008] He continues and states that shape of architecture may emanate from the landscape character, the place, which emerges as genius loci. [Nygaard 2011] Norberg-Schulz's notion of the close relation between architecture and place seems tempting as a foundation in this project, where an untouched and undeveloped, architectural wise, place is the frame. Therefore a qualitative site analysis developed by Marit Vagstein in collaboration with Christian Norberg-Schulz is used to explore and obtain an understanding of the place, before the architecture occupies it.

QUALITATIVE SITE ANALYSIS

The analysis is based on Norberg-Schulz's phenomenological theory. [regjeringen.no 1993] Phenomenology is the doctrine of the world, as it appears for our consciousness, [Nygaard 2011] the immediate experience of place consisting of things, phenomenons. [Norberg-Schulz 1993] Therefore the objective of the analysis is to describe the surroundings as they actually appear, an understanding of what physically exists, as an interaction of qualities, the non-measurable. The analysis is based on the landscape, in this case a landscape without any man-made work, therefore the qualitative analysis will collect knowledge from the nature and the landscape, to secure that every element according to the nature and landscape are treated. The landscape has to be respected and understood in order to create architecture that responds to or interprets the landscape and maintains the genius loci of the place. [regjeringen.no 1993] Man responds to the characteristics of a place in three fundamental ways:

+ ***ORIENTATION*** in a space, which is related to the horizontal expansion of a space.
+ ***IDENTIFICATION*** with place character, understood as the body's relation to the vertical form of the space, a tension between the earth and sky.
+ ***MEMORY*** of the place characteristics, corresponded by the distinct form of a space.

[regjeringen.no 1993] [Nygaard 2011]

Together they express our relation to the place, not only by using sub-aspects of a place, but by clarifying it as a whole, which Norberg-Schulz states as the gestalt-theory.

Within every condition there are some themes which have to be treated:

+ ***ORIENTATION***
  Concerning the natural and human created areas.
  + Scale in relation to the landscape and man
  + Terrain structure
  + Form of terrain (slope and directions)
  + Barrier (streams, coastline ect.)
  + Edges which form borders, areas and landscape spaces
  + Space connections (roads and arrivals)
  + Landmarks
+ ***IDENTIFICATION***
  Place character.
  + Function of width, form, line of the horizon
  + Sky direction and visibility of the place
  + The light
  + Texture, colour, material
  + Cover of surfaces
  + Ground conditions
+ ***MEMORY***
  Basic forms which characterise the place.
  + Patterns
  + Shapes of space
  + Grouping
  + Memories or values which are connected to the place

[regjeringen.no 1993]

In the following the landscape is analysed according to the analysis method described, based on map material and experiences of the place, as it immediately appears.

SITE ANALYSIS

The site for the new correctional institution is as mentioned sloping towards north in an outskirt area northeast of Nuuk. Every place is characterized by the earth and sky, and their relation. [Norberg-Schulz 1984] These two conditions are determined by subjects such as:

+ WATER; which creates the northern border of the area. According to Norberg-Schulz, the water is substance from which all forms appear. [Norberg-Schulz 1984] It is a structural element that forms both the border to the land as well as the adjoining land.

+ GROUND CONDITIONS; is the format of the ground, which here is described as geological conditions divided into permanent or variable landscapes.

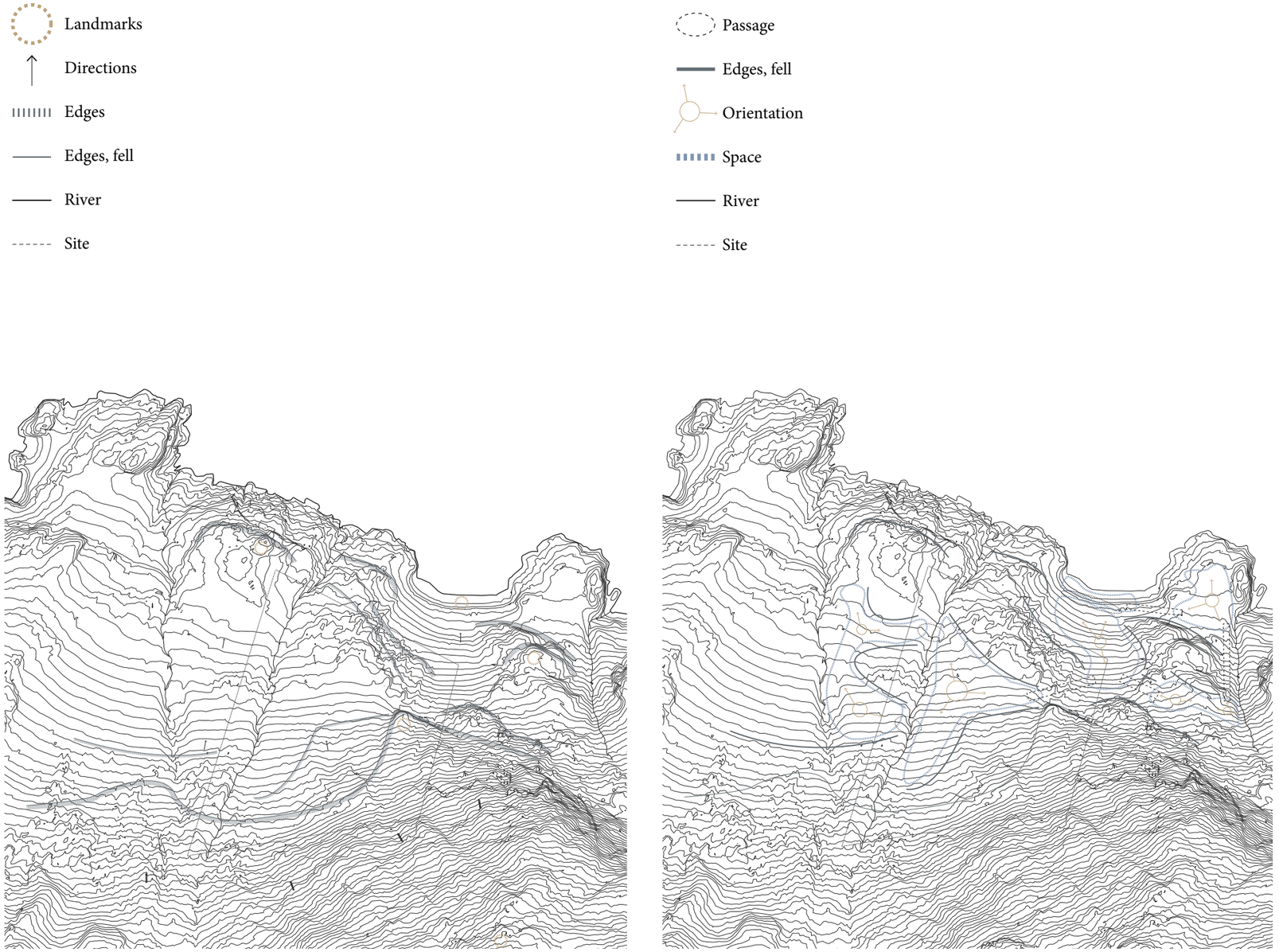
+ TEXTURE AND COLOUR and thereby also vegetation; are decided by the ground conditions.

+ TIME; according to season and day, which makes the elements a part of a living reality.

+ LIGHT; is a general phenomenon, but at the same time the least constant. It changes during the day and during the season - highly related to time.

+ SKY and the experience of it; are dependant on experience of the sky; colour, clouds and light, but also its relation to the ground [Norberg-Schulz 1984]

These shape the understanding of the space, not in a highly scientific manner, but as an experienced exploration of the place. Together they characterise the places and the atmospheres of the spaces - the genius loci.



Ill. 23

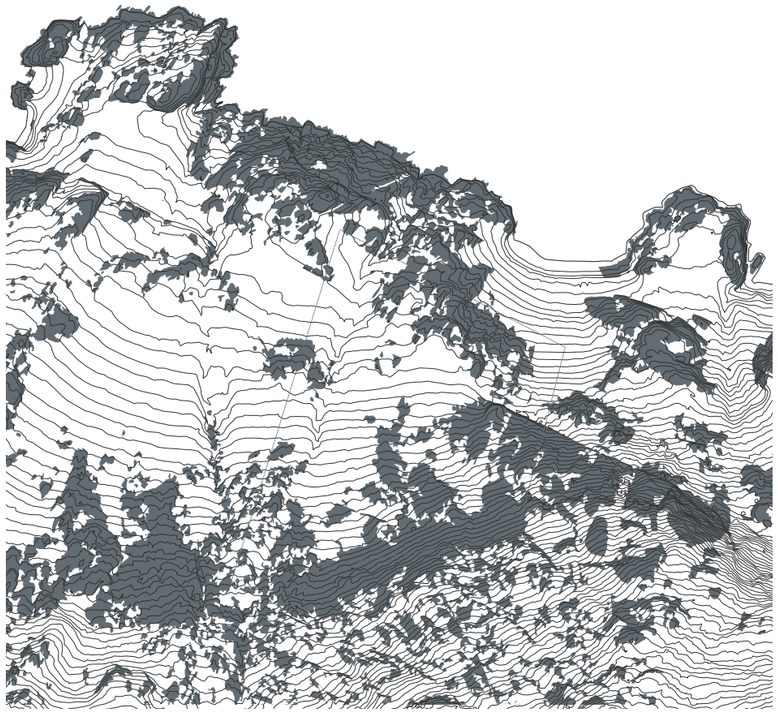
THE ORIENTATION SPACE

The site is surrounded by the edges of the fell and the border of the coastline. The path from where you enter define the experience of the different fells as an edge, the coastline towards north is a permanent border, whereas the rivers crossing the land are variable and highly decided by the season. When arriving from the west, from Nuuk, a high fell rises and screens the space towards south and east.

Ill. 24

THE ORIENTATION SPACE

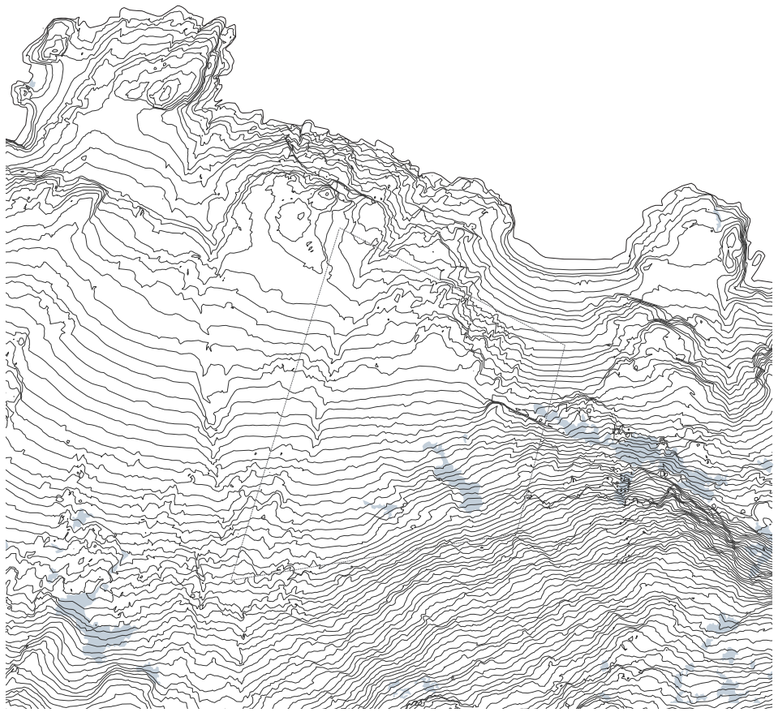
Different spaces with variable characters occur by the shape of the edges and borders. Six different spaces appear and are connected by corridors or passages. The edges are highly related to the geological conditions on the site, these will be explained in the following.



Ill. 25

GEOLOGICAL MAP - FELL AREAS

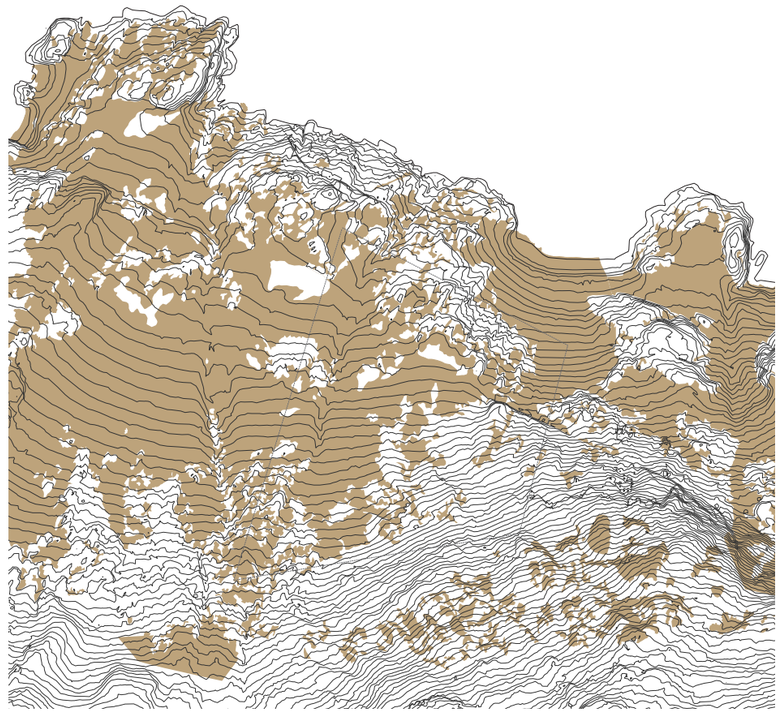
The fell areas are the preferred areas to build on, because of their permanent condition. When building on fell, some of it will be removed to shape the ground for the building to come. On this specific site, the fell is sloping towards north.



Ill. 26

GEOLOGICAL MAP - STONE BLOCKS AREAS

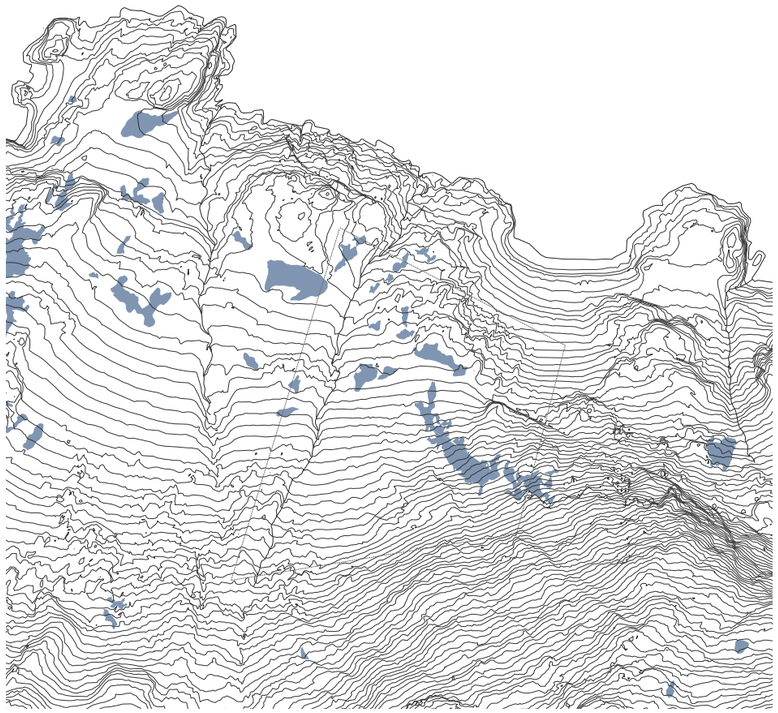
The shape and size of the stone blocks vary together with the degree of their stability. Because of this, these areas are avoided as building plots.



Ill. 27

GEOLOGICAL MAP - LOOSE SOIL AREAS

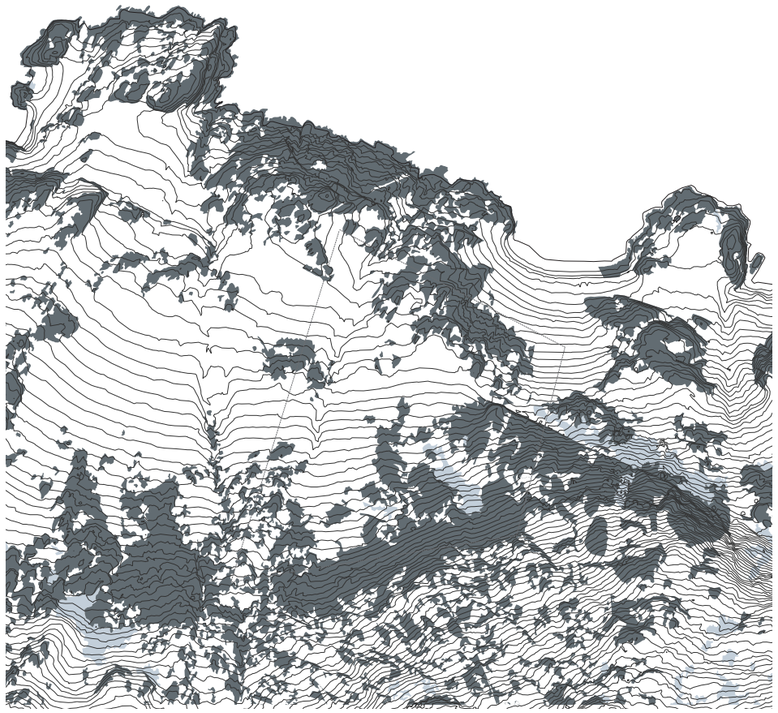
When building on these areas pillar foundations have to be used in order to reach the solid fell underneath, thereby the length of the pillars vary, the same for the extent of the building process. In this case the space, surrounded by the edges of the fell, is loose soil.



Ill. 28

GEOLOGICAL MAP - WETLAND AREAS

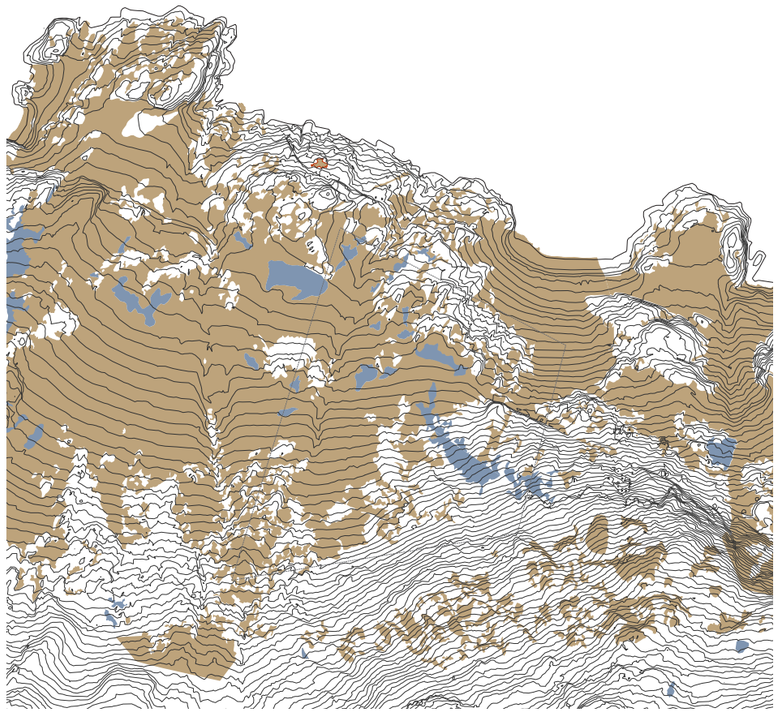
Wetlands are situated different places on the site in connection with the loose soil areas. These contain a more luxuriant vegetation and they can contribute with variation of vegetation in relation to the correctional institution.



Ill. 29

GEOLOGICAL MAP - PERMANENT LANDSCAPE

The map can be related to 'the orientation space' showing the edges of the area. It shows the landscape less affected by changes over time.



Ill. 30

GEOLOGICAL MAP - VARIABLE LANDSCAPE

By comparing the map with 'the orientation space', the space shaped by the edges consists of loose soil, a more variable and less sloping landscape than the fell and stone block landscape.

Turning

Edges, fell

Tension

Horizon

River

Site

Space

Fell

Fell, wall

Edges, fell

River

Site

Landmarks

Orientation, landmarks

Orientation, space

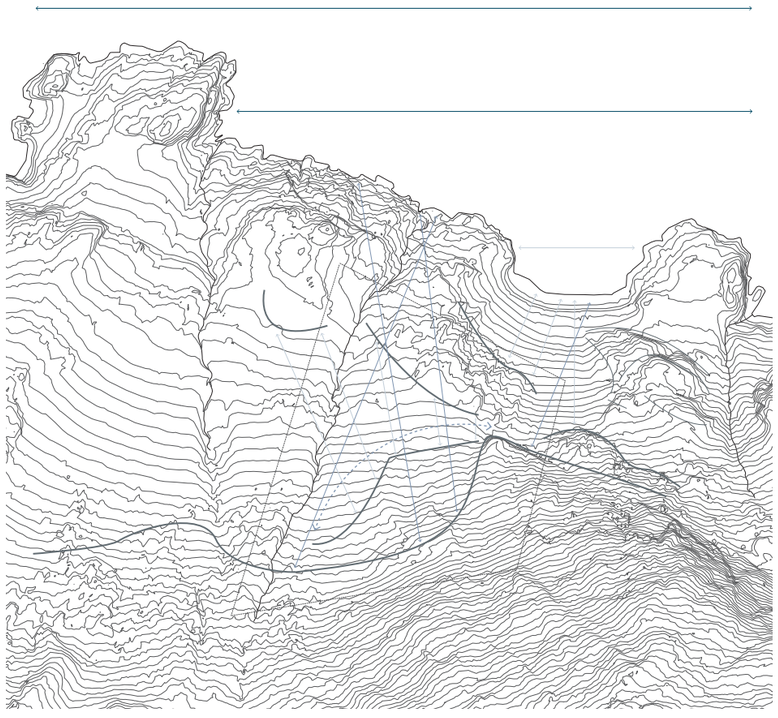
Snow banks

Fell

Snow scooter track

Edge

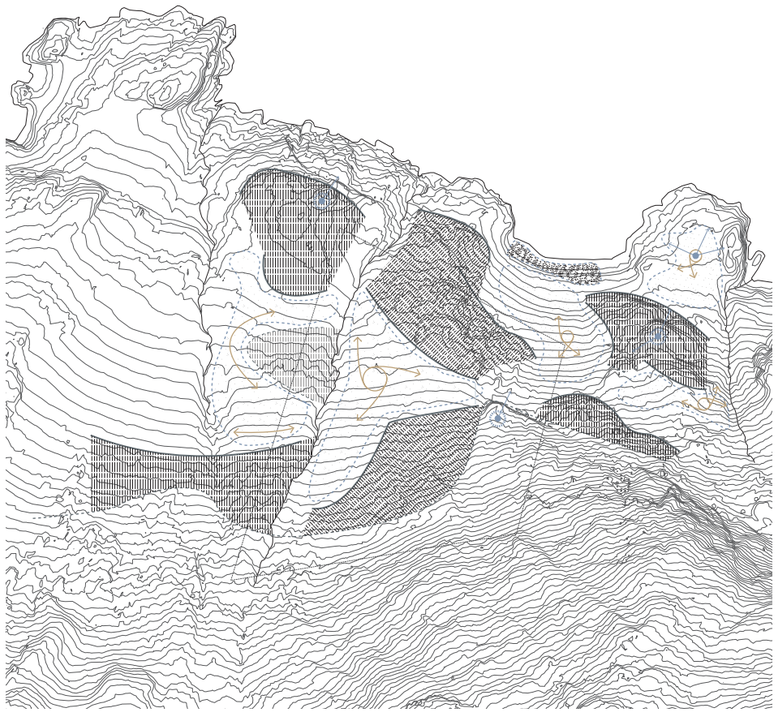
Site



Ill. 31

THE IDENTIFICATION SPACE

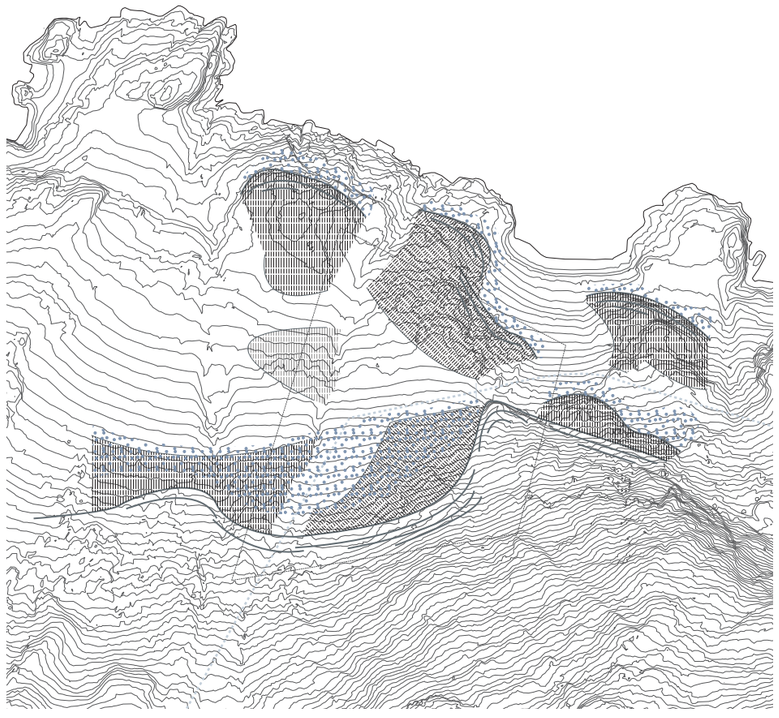
'Being on the earth implies to be under the sky'. *[Norberg-Schulz 1984 pp 39] These two conditions shape the basics for every natural phenomena. [Norberg-Schulz 1984] Thereby the sky is important to the characteristics of a space, an importance which seems clear on this place. In spite of the low sun, the sky is high because of the untouched expanded land. The sky merges with the wide horizon and extends the surface of the land. The fell is rising towards the sky, while the rest of the land is stretching towards the water. Thereby the sky direction is different; when looking towards north the horizon creates a horizontal sky direction, however, the fell rises as a back and creates a vertical sky direction looking towards south. These conditions together with the before mentioned edges and borders create tensions which are shown by arrows on the map.*



Ill. 32

THE IDENTIFICATION SPACE

The place occurs as spaces with different characters and different directions. Different textures and colours indicate the variation in the surface - a patchwork, which to some extent defines the character of the space. [Norberg-Schulz 1984] Greenland is a land where time in relation to seasons has a high influence on the texture and colour; in the summer the rough texture of the fell and stone together with the green, red and brown vegetation appear, and in the winter the landscape changes; a white duvet covers the surface, and only part of the fell and vegetation are visible. The changing of the seasons also change the light, which is experienced. The summer vegetation absorb the light, while the white snow in the winter reflects it. During the day the conditions of the light also change, from orange in the morning to light blue in the middle of the day and after that to violet in the evening. In Greenland they are also blessed with the aurora borealis (northern lights) which throws a green ray over the sky.

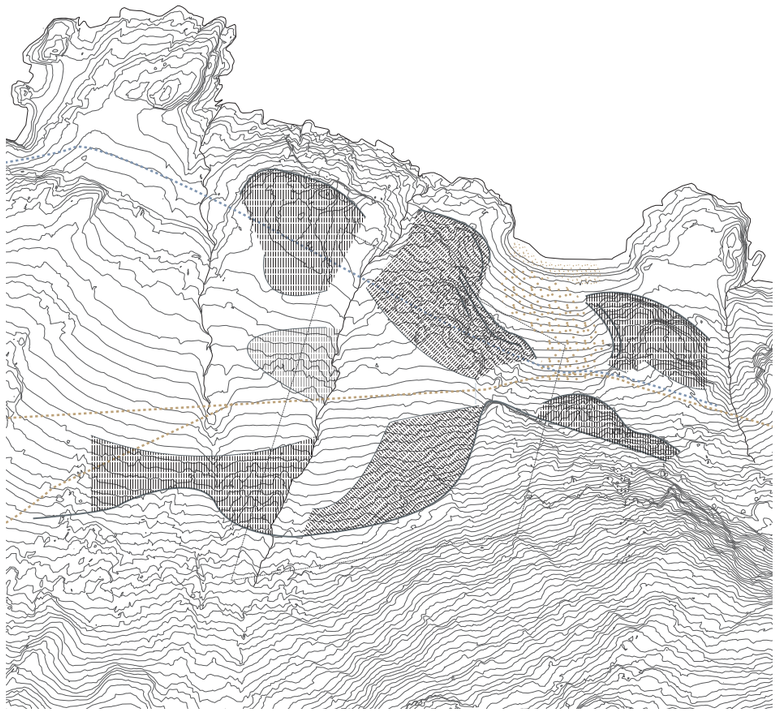


Ill. 33

THE MEMORY SPACE

In the winter traces from snow scooters and skis are the only signs of human presence in the place. The wind which can be very strong in the area creates patterns in the snow and pushes banks of snow on the north side of the edges as soft dunes.

Fell
Edges
Walking path, beach
Walking path
River
Site
Bay
Beach

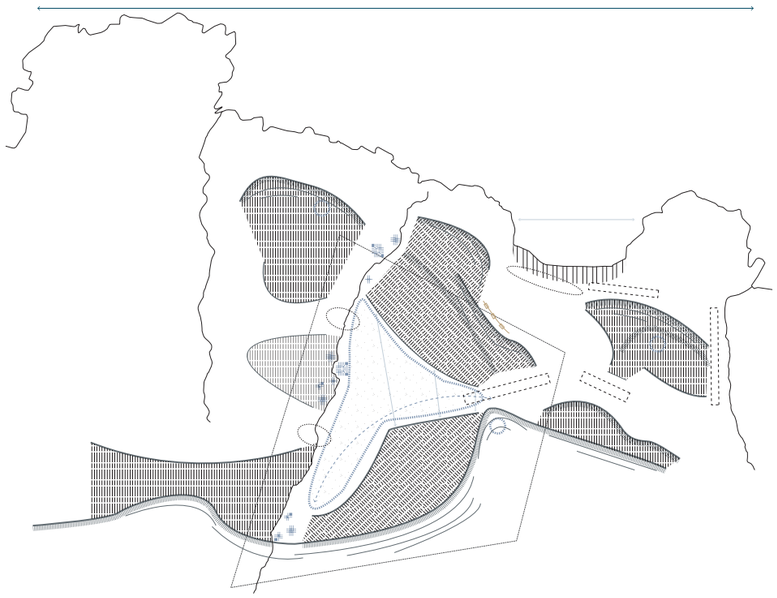


Ill. 34

THE MEMORY SPACE

In the summer trampled down grass mark the paths that people use for walks. The bay and its connected space is often used by people enjoining the long summer evenings.

Fell
Turning
Edge
Edge, fell
River
Site
Landmark
Stoneblocks, river
Beach
Corridor
Passage
Preferred building plot
Shelter
Horizon
Tension



Ill. 35

THE EXPERIENCE OF THE SPACE

The map shows the experience of the place, and is thereby not an exact replication. Edges from the fell create a pocket on the site, which is not sloping as much as the rest of the site. The direction of the space is towards north, the water and the extended horizon. A fell block allows two accesses when arriving from west.

GENIUS LOCI

The earth is a stage! The site will, with the development of the correctional institution, change from a natural landscape to an inhabited landscape. The wide horizon that merges together with the sea, expands the land and connects the ground and sky together, is characteristic for the place. The contrasts between horizontal and vertical are characteristics of the place together with the changing conditions in light, texture and colours. The fell which embraces the place towards south and east is experienced as a wall, surrounding a pocket in the landscape. The narrow corridor leads out to whatever may be on the other side of the fell. This is a place whose scale right now is not related to any architecture, the place is untouched and has by its shapes created spaces where people prefer to stay. Specific landscape structures create landmarks, from where extended views can be explored. These together are the character of the place. The existential purpose for the architecture to come is to respect the place; it has to uncover the potential of the place, respect the character, the genius loci of the place.

Snow banks

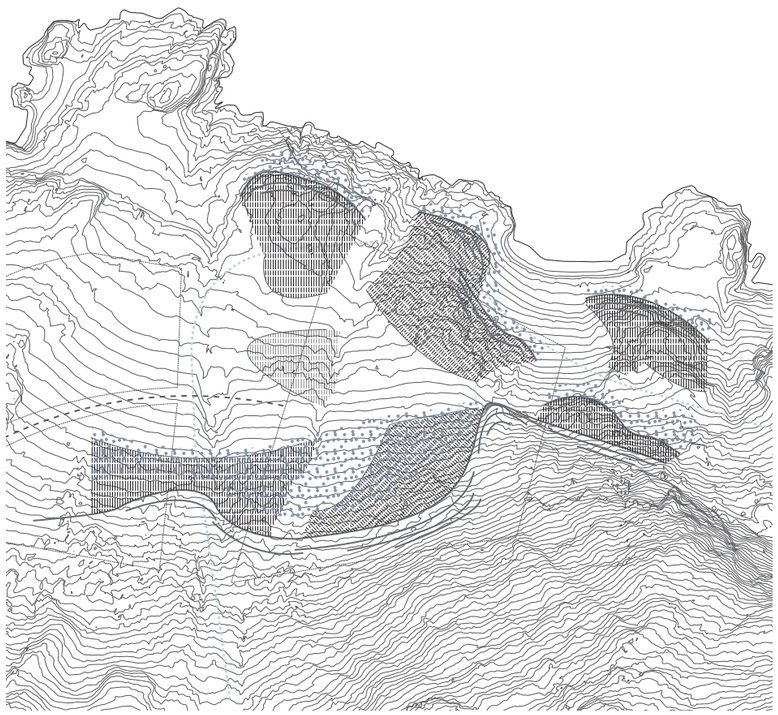
Fell

Snow scooter track

New road

Edge, fell

Site and new building plots



Ill. 36

NEW PATHS_WINTER SITUATION

New paths will be created on the place according to the new programme for the area decided by the municipality. Plots located towards west are going to be office and industry areas.

Bay

Fell

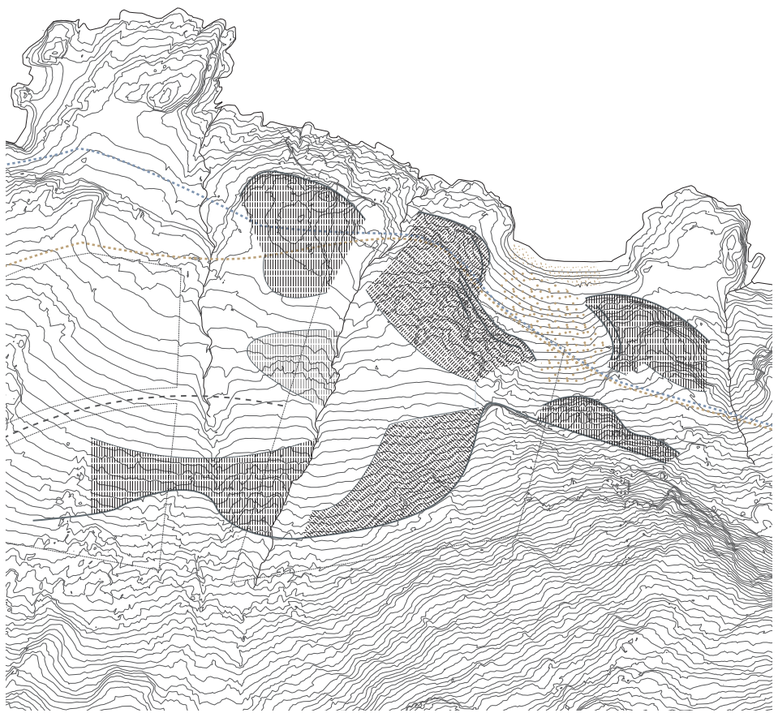
Path

Path

Edge, fell

Site and new building plots

Beach



Ill. 37

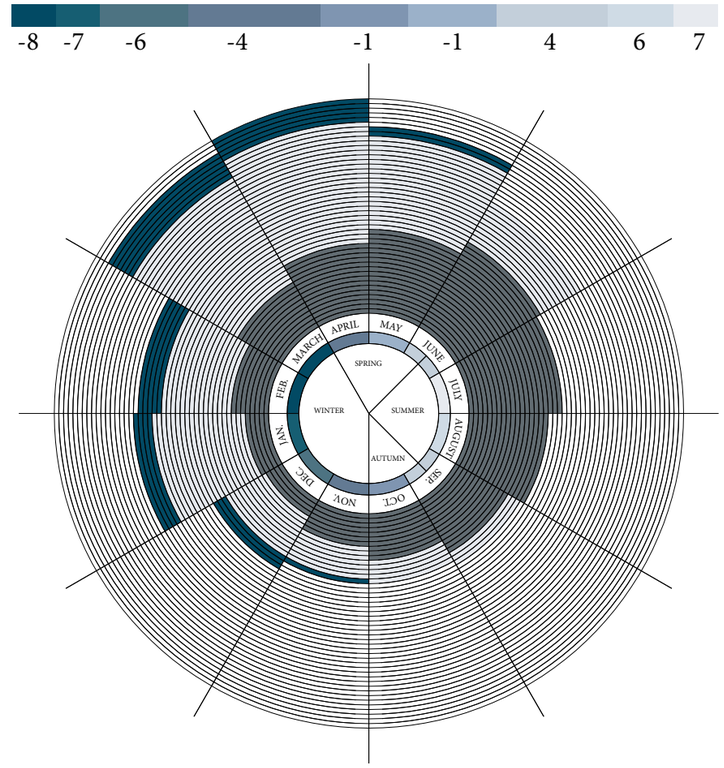
NEW PATHS_SUMMER SITUATION

The map shows the new planned summer paths in the area.

Mean snow loads

Snow loads

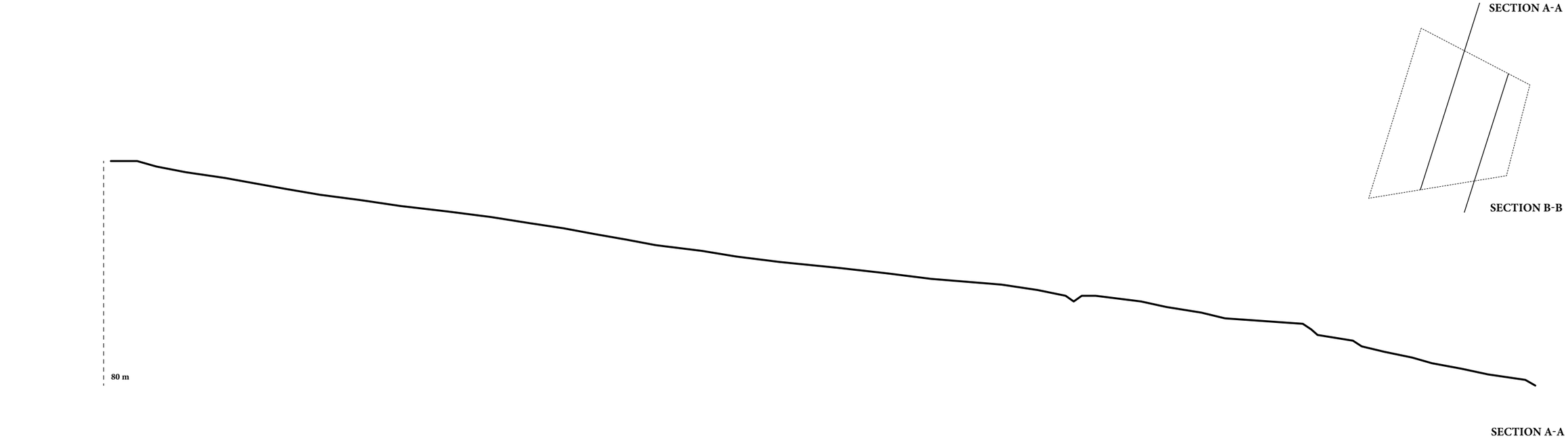
Hours of sun



Ill. 38

SNOW AND SUN

The diagram shows the snow loads and hours of sun in Nuuk.



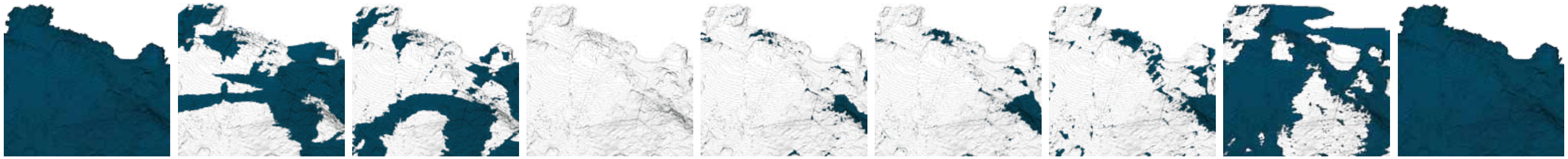
Ill. 39

TERRAIN DIFFERENCES

The sections show the steep inclinations on the site from south towards the water in north.

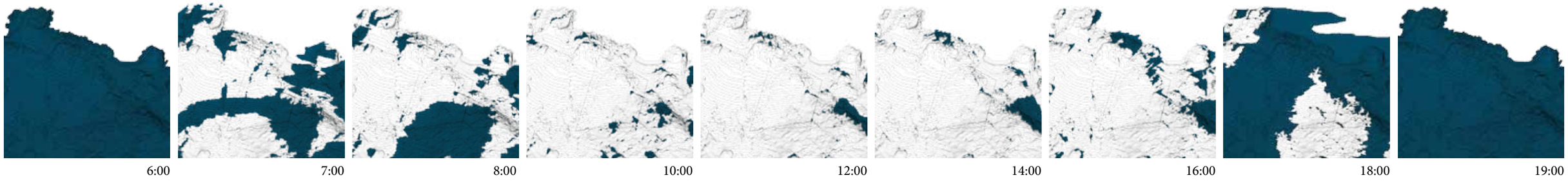
SUN CONDITIONS ON SITE

MARCH 21ST

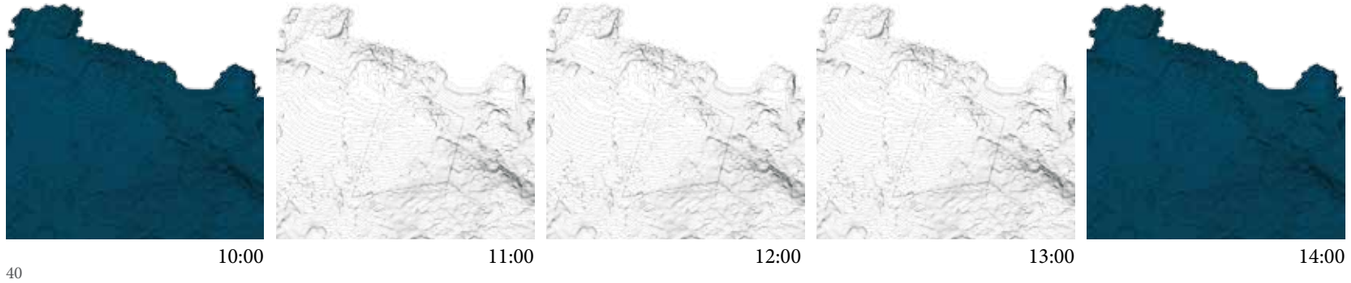


JUNE 21ST

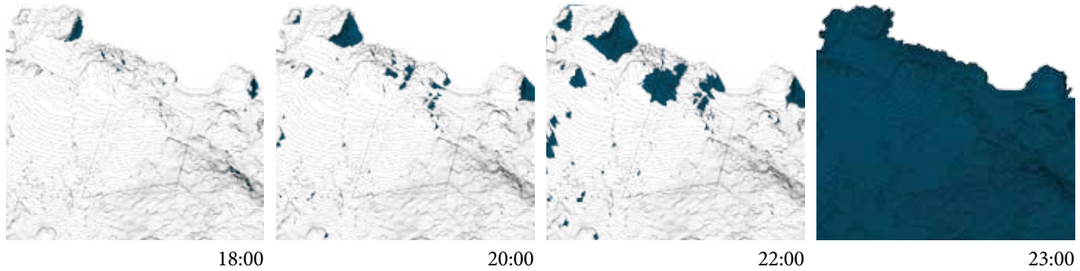
SEPTEMBER 21ST



DECEMBER 21ST



Ill. 40



SUB-RECAPITULATION

This chapter describes the architectural history and states some bulding techniques used in the arctic climate. A history of developments that many Greenlanders had a hard time keeping up with resulting in people feeling a loss of culture, being moved and stuffed into building blocks with no air and space, housing unrecognisable in comparison to what they were used to. [Madsen 2000] [Vindum 2012] This is a land represented by nature and an amazing landscape, the architecture and building techniques have to accommodate this to a much higher extent than can be seen in the housing from the 50's, 60's and 70's, as this is of fundamental importance to the Greenlandic people.

When building in an arctic context many aspects, as this chapter also shows, should be taken into consideration.

Some are climatic considerations:

+ **WIND; The directions of the wind should be considered in order to create shelter in outdoor spaces and around entrances. Also regarding drifting of snow through the landscape, the wind direction is important to minimise places of snow piling up.**
+ **SUN; The sun conditions has a great impact on the site, not because the site lies in shadow from the fell at all times, as the study above shows, but because the lenght of the day varies a lot over the cause of one year. In winter the site is completely surrounded by darkness for most of the day and night, and in summer there is light for almost all 24 hours of the day. The architecture developed should consider this, as it will be perceived in both darkness and light.**
+ **SNOW; In winter the snow changes the landscape and creates a new ground level higher than the one in summer and new lighting conditions aswell because of reflection.**

Some are considerations of characteristics:

CHARACTER OF SPACE;
Many different characteristics of the space have been discussed in the previous. The architecture should pay regard to all of these. The placement and the design of buildings should be related to the soil conditions, the edges, pockets, directions, passages etc. in order to create an architectural composition in harmony with the context.

Ill. 41

Ill. 42

Ill. 43

Ill. 44

Ill. 45

Ill. 51


Ill. 46


Ill. 47


Ill. 48


Ill. 49


Ill. 50

THE NATURE OF MOVEMENTS

CASE STUDY OF THE LOUISIANA MUSEUM OF MODERN ART

Designed by Jørgen Bo and Vilhelm Wohlert in 1958 [louisiana.dk 2013] the Louisiana Museum of modern art is a classic example of architecture developed for and by the landscape in which it is placed. This fact makes Louisisana relevant as a case study in relation to this project as it shows how buildings can be connected in a landscape, here by means of scenic pathways. Everywhere nature is present as an element that enhances and dictates the natural flows of the landscape and thereby also the architecture. The architecture is in its scale adapted into nature instead of being placed on to it.

There is a strong interaction within the museum where pavilions connected by corridors wind through the landscape in a movement through and around natural elements such as trees, slopes and views. The landscape creates the form of the flow and the natural stops along the way, and the movement stages the important views. The architecture is linked to the landscape and grabs on to it with walls, roof and flooring continuing out of the building into the landscape. This creates rooms in the in-between, rooms between inside and outside. The transition is disolved and boundaries are blurred. The many columns in the corridors draw attention away from the glass surfaces to themselves, the glass no longer seems a barrier, even though it does create the physical limit of the room. Paths from the buildings continue out of it and materials used within the building further strengthen the connectivity between building and landscape.

CONTENTS

RESTORATIVE ARCHITECTURE

A TEMPORARY REFUGE

The chapter 'Arctic Architecture' visualises a site characterised by pure nature, beautiful surroundings, which have the potential to become an amazing place to be - an amazing place to live, but is it at all possible to dwell in a correctional institution? The following will study this based on the theory of Christian Norberg-Schulz who understands "to dwell" as something to do with belonging.

Furthermore the notion about restorative architecture will be described. Restorative architecture is based on healing architecture, which was originally developed for hospital buildings. However, depression and anxiety are also parts of the daily life in a correctional institution and therefore the principles of healing architecture in terms of well-being seems useful to the idea of reintroducing the original intention of the correctional institution. Healing architecture is intended for people who are physically ill, therefore in this case we will talk about restorative architecture.

Ill. 52

FJORD CLOSE TO NUUK
silence, water and sky separated by fell.

Ill. 53

THE QUESTION OF BELONGING

'A HOME'?
The cell is the closest the inmates get to a private space. But is the cell a home or is it something else? By the theory of Christian Norberg-Schulz the following will investigate the meaning of to dwell understood as orientation and identification.

BELONGING?
"The word dwelling here means something more than having a roof over our head and a certain number of square meters at our disposal." [Norberg-Schulz 1993, pp 07]

With this, Norberg-Schulz introduces the 'the concept of the dwelling'. He states that a dwelling contains something more, something which cannot be reduced into a geometrical construction, however the original function of the dwelling is as a protector.

Related to the terms space and character in the previous chapter, orientation and identification are the mental functions of those and correspond to the term 'to dwell'. Norberg-Schulz argues that the relationship between human and place has to be meaningful before one can dwell, and to obtain meaningfulness man needs to know where he is in order to orientate himself, and to know how he is in order to identify himself with the place. [Norberg-Schulz 1984][Norberg-Schulz 1993]. Orientating oneself in relation to space by experiencing concrete things is possible in this particular case. Where orientation is related to something more concrete, identification is by Norberg-Schulz described as becoming friends with a specific environment. [Norberg-Schulz 1984] In a Greenlandic context that means to become friends with the snow, the ice and the expanded sea together with the enjoyment of the sound of the creaking snow when walking. With the great importance of nature in Greenland and their cultural inheritance of being whalers, sealers and hunters, it is not unimaginable that a lot of Greenlanders have a close relation to the nature and maybe even identify themselves by it. Further man uses places as references to identify oneself, which often are developed during childhood. Thereby the recognisable can evoke memories, which are connected to something well-known. [Norberg-Schulz 1993]

Orientation, as a function related to man's nature, and identification are the foundations of a sense of belonging. These represent two aspects of man's ability to 'dwell' and both have to be developed in order to obtain a sense of belonging. Norberg-Schulz states; *"Although orientation and identification are aspects of one total relationship, they have a certain independency within the totality. It is evidently possible to orientate oneself without true identification; one gets along without feeling 'at home'."* [Norberg-Schulz 1984, pp 20]

With this in mind we question ourselves if it is at all possible to dwell in a correctional institution. Not every residence building is a dwelling, even though residence buildings have the dwelling as its goal. [Mysite.Pratt.edu 1996] But what about a correctional institution then? In our strongest beliefs no one feels a sense of belonging in a correctional institution. This statement is confirmed by our visit to The State Prison Østjylland, where head of the department, Flemming la Cour, answered this question plain and simple:

"'Do you think any inmates feel at home in the prison?'
'No.'" [Flemming la Cour]

Furthermore Norberg-Schulz presents the dwelling as a small chosen world of our own, a place to be oneself. [Norberg-Schulz 1993] Thereby the potential of 'to dwell' is closely related to 'to choose'. Further Norberg-Schulz argues that true freedom presupposes belonging, which also states that belonging presupposes freedom. [Norberg-Schulz 1984] No one in a correctional institution has chosen this place, the opportunity for freedom of choice disappears with the confinement.

Thereby to dwell in the understanding of Norberg-Schulz in the correctional institution appears impossible. Even though some might identify oneself by nature, in which this institution is placed, one will never feel they belong to the institution because of their confinement.

MEANINGFUL INTENTION
Instead of a place to dwell, the institution becomes a temporary stay, and the cell a temporary refuge, in which an inmate has a small world of his own. However the correctional institution does not have the opportunity to become a place to dwell, it must still take some of the mentioned qualitative aspects about identification into consideration; the idea of the well-known and the relation to the landscape qualified in the site analysis.
Besides that the correctional institution may have a meaningful intention for the society in terms of the correctional development of the inmates. An intention and meaning of the stay, related to the original idea about resocialisation.

RESTORATIVE ARCHITECTURE

IN A CORRECTIONAL INSTITUTION

It is documented that different elements in collaboration with or as a result of architecture influence the way people feel and their ability to heal. Healing architecture is used in different existing hospital buildings to promote the healing process of the patients. [Frandsen et al. 2009]

"Finally, an overall monotony of lighting, a lack of texture, and the eradication of individual detail complete the loss of sense of place."
Juhani Pallasmaa [Wraber 2009, pp. 18]

In the correctional institution people are not physically ill, but they do have problems that need to be addressed and handled, and architecture could support this process. There seems to be some parallels between hospitals and the correctional institution though; they are both total institutions with the main intention of helping people, which must be considered by making the new correctional institution look institutional as little as possible. [Kriminalforsorgen 2009] Therefore, based on healing architecture the following represents different implements which could have the ability to promote resocialisation, to create restorative architecture.

MATERIALITY

The physical part of architecture consists of materials. When thinking of architecture, one cannot ignore the materials, the texture of what is built. One who have understood the importance of materials is Peter Zumthor. In "Thinking Architecture" Zumthor says that materials are not poetic in themselves, but they can obtain poetic quality as architectural objects if the architect is able to give them a specific purpose and expose the essence of them. Architecture is not abstract though, it is very concrete, and so to experience architecture in a concrete way, you must see, feel, hear and smell it. This creates demands for the quality of materials and puts forward the question of what a specific material can mean in this specific architectural context and for the specific user in the correctional institution. [Zumthor 1998]

Zumthor means the roots to architectural understanding originates in each person's architectural experience, in their room, house, street, town, landscape, but also in their biography. These parameters are subjective, which consequently makes each person's approach, opinion and experience towards architecture subjective as well. The experience of different shapes and materials are linked to specific memories, situations and emotions and it can be the smallest things like sounds, images, feeling a certain surface etc. that create an architectural atmosphere. [Zumthor 1998]

Buildings are only accepted by their surroundings if they appeal to the emotions and minds of the beholders, the users, and in order to do this a building should respect and take advantage of the location, the history and the situation that it will be become a part of and in time grow into it naturally. One way to do this is through awareness of materials. With the creation of a relation between surroundings, architecture and the user a natural sense of belonging can be obtained. [Zumthor 1998] Nature is therefore also of great importance.

NATURE

Persons exposed to settings with plants and other natural elements, in contrast to the built environments, have lower levels of fear and anger, and far higher levels of positive feelings. [Ulrich 2002] This states the importance of the presence of nature in architecture according to restorative architecture. In a land like Greenland, where the nature is such a deeply rooted part of life it should be a human right to have view to nature from living spaces, argues Tida Ravn, journalist in Greenland. [Menneskenes land 2006] Studies show that simply by looking at environments dominated by nature recovery from stress can be promoted and have a relaxing and soothing effect. Furthermore it reduces emotions such as fear, anger and sadness [Ulrich 2002] - emotions which are now represented in the existing correctional institution in Nuuk. [Nyborg Lauritsen 2011] The placement of outdoor spaces has a large influence of how often they are used as active spaces. Their success depends on the various space distributions, where opportunities for retirering to segregated places, places for togetherness and places for activities are important. Furthermore water and the sound of water is understood to be attractive elements. [Frandsen et al. 2009] Additionally the presence of nature in indoor environments increases the coherence between nature and architecture. In the existing correctional institution in Nuuk the changes in staff are frequent, an inmate describes:

"I have been here for three months. Maybe 5-6 new have started and the same amount have quit. They are no more than 20-25 years old. How should a person of 20 be able to handle a backer, who has lived in this environment. It is impossible. You end up exploiting their ignorance..." [Nyborg Lauritsen 2011 pp.284] (Translated from Danish to English)

If nature is implemented in the architecture, it could be used, not only to promote positive feelings for the inmates, but also as positive escape pockets for the staff. [Ulrich 2002] There is no doubt that the sometimes hard environment, which is unavoidable in a correctional institution/prison effects the staff too. [Flemming la Cour]

LIGHT

Light has an important influence on the well-being on man as well. Longer stays without daylight seems to have a number of negative effects. The daylight effects the circadian rhythm and studies have shown that the more time spent in light during the day, the better you sleep. [Frandsen et al. 2009] The amount of light and darkness fluctuates during the year with periods characterised by daylight 24 hours per day, and periods shroud in darkness. However, artificial light with a high intensity can be used in the absence of daylight and have the same positive effects. Furthermore daylight, especially morning light, has a positive effect on depressive people. [Frandsen et al. 2009] Annemette Nyborg Lauritsen has experienced the correctional institution from the inside and observed a number of inmates with depressive conditions. [Nyborg Lauritsen 2011] Conditions that can cause aggressive behavior and hinder resocialisation. Placement of light admissions, for example windows, is important in relation to its influence on man; windows facing walls and not allowing light or a view are considered as unattractive as rooms without any windows. Extended views and the ability to see some sky seems to be important to feel well. Not placing bars in front of windows can open up views and tone down the intitutional and enclosed atmosphere. Open and unrestricted views also allows man to orientate himself according to the outer surroundings in relation to time and place. [Frandsen et al. 2009]

MOVEMENT

A feeling of disorientation is evident by our walk around in the State Prison Østjylland - turns and corners, and the lack of windows, especially in the common facilities, makes it hard to navigate in the building. Of course this is not a public building in the sense that it is a place where new people have to be able to navigate around in a unknown plan layout like hospitals for instance. However, it is shown that buildings with a plan arrangement based on parallelism and main orientational directions are easier to orientate in. [Frandsen et al. 2009] Common facilities optimise social interaction among people, which have been shown to reduce fearfulness, anxiety and stress. Furthermore on a low level, it can mirror the life outside the closed environment. [Frandsen et al. 2009] In the new correctional institution self-sufficiency, in the understanding of cooking, washing etc., for the inmates are going to be implemented in the daily life. [Kriminalforsorgen 2009] According to Flemming la Cour, this seems to sustain a relation to the life outside the walls and is maybe a factor in the resocialisation programme. [Flemming la Cour 2013] In relation to the patterns of movement, it seems important to drag common rooms away from high crowded areas and organise them with the opportunity for both privacy and openness, this will reduce the number of passive persons. [Frandsen et al. 2009] In relation to the correctional institution, the common rooms have to be easy accessible for the staff. Corners can be a factor related to insecurity, so erasing corners and "dead spaces" can help to avoid this. According to the space organisation considerations about dynamic security are important. In State Prison Østjylland the barrier between staff and inmates are attempted reduced - the staff is visible in the inmates' department. From the staff-office there is a view over the common spaces and through the corridors from where the inmates have access to their cell - the personal refuge.

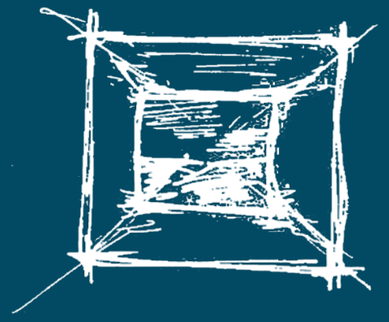
In the Ph.D thesis from Annemette Nyborg Lauritsen, she presents an experience of social hierarchy in the existing correctional institution in Nuuk. [Nyborg Lauritsen 2009] The intention with the new correctional institution is a higher level of sectioning, which also appears in the presentation from Kriminalforsorgen. [Kriminalforsorgen 2009]

"[...] several of the young inmates have been sexually abused themselves. Then at one point there was a young man who had been asked to move department. He totally isolated himself, cried intensely and refused. One of the older inmates talked to him and thereby figured out that the young man had been sexually abused, and that the sex offender was in that department, in which the young man had been asked to move to."
[Nyborg Lauritsen 2011 pp.278] (Translated from Danish to English)

The above quotation is an account from the correctional institution in Nuuk, narrated by an inmate. This states the need for sectioning. Another problem is that some inmates acquire a drug addiction through their stay at the correctional institution. [Nyborg Lauritsen 2011] By sectioning the possibility for serving of the sentence in drug-free departments can occur. It does not seem to be an option to create an environment totally free of drugs, but it can be the choice of the inmates if they will serve in an drug-free environment. [Experiences from visit to the State Prison Østjylland] Also sectioning gives the opportunity to section men from women as there is a history of problems when men and women can have direct contact with one another in the institution.

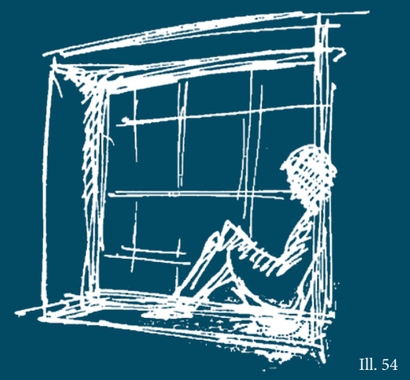
ACOUSTICS

Another factor to consider in relation to resocialisation and a better environment in the institution both for inmates and for staff is acoustics. Noise is unwanted sound and should be prevented to the greatest extent possible. Noise can affect peoples experiences of space and promote emotions like stress, anxiety, loss of control and nervousness, all emotions that should be avoided in the instituition in order to keep a good atmosphere among the inmates which is vital for an institution to work smoothly. Noise normally comes from technical equipment, activities and conversations and both the quality and movement of noise can also affect the experience of confidence, intimacy and privacy. The cells are the private spheres and should therefore be placed away from areas with much activity and high sound levels. The work environment for the staff is also affected by noise, so the noise should be kept under the maximum levels in all areas of the institution. [Frandsen et al. 2009]



View to the landscape
A perspective window draws the eye towards the landscape. The materiality of the window sill influences the experience of the landscape.

Window and light
A window slips light in and creates a place to be.



Window as a furniture
Sitting in the window, experiencing the outside. The tactility and light together create a place where one prefers to stay.

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SUB-RECAPITULATION

The restorative approach should be understood as a re-introduction of the original idea of the correctional institution, resocialisation. It should incorporate the presented elements; a temporary refuge, a meaningful-intention, materiality, nature, light, movement and acoustics. Those are informers for the project design, for an architecture related to well-being. As mentioned in the preface the institution in itself should not be seen as a punishment, neither the stay. The loss of freedom is the punishment! The intitution is not a place where people dwell, nor is it place to feel at home that much is clear. It is a place people inhabit, but that does not mean that the stay there cannot contain some meaningfulness, contributed to by the physical surroundings. If the correctional institution does not have an effect on the inmates in a possitive way what use is it then? It is documented through Annemette Nyborg Lauritsen, that several inmates were depressed and committed new crime after their confinement, some say that they feel that the correctional institution does not leave them a choice; it wants them to be criminals. [Nyborg Lauritsen 2011] What use is this for the society? We do not claim that restorative architecture can change this fact, but hopefully it can implement thoughts and ideas that are different from what the correctional institution is today. It is evident that one important parameter to consider when talking about both resocialisation and restorative architecture is how to improve the living conditions for the inmates. The increasing load factor suggests that being able to adapt the correctional institution to the changing demands could be a way of helping the situation and one approach could be through additive architecture.

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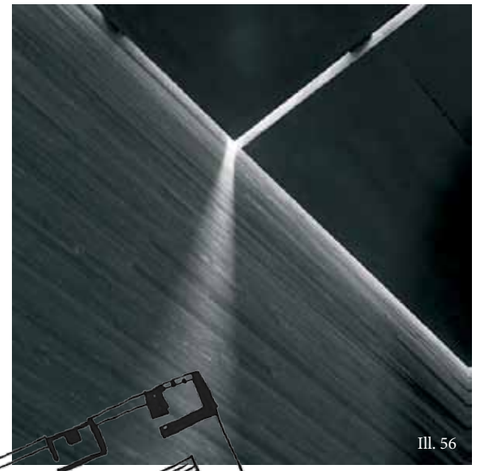

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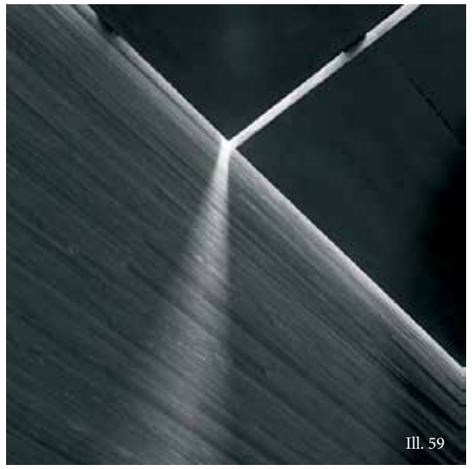

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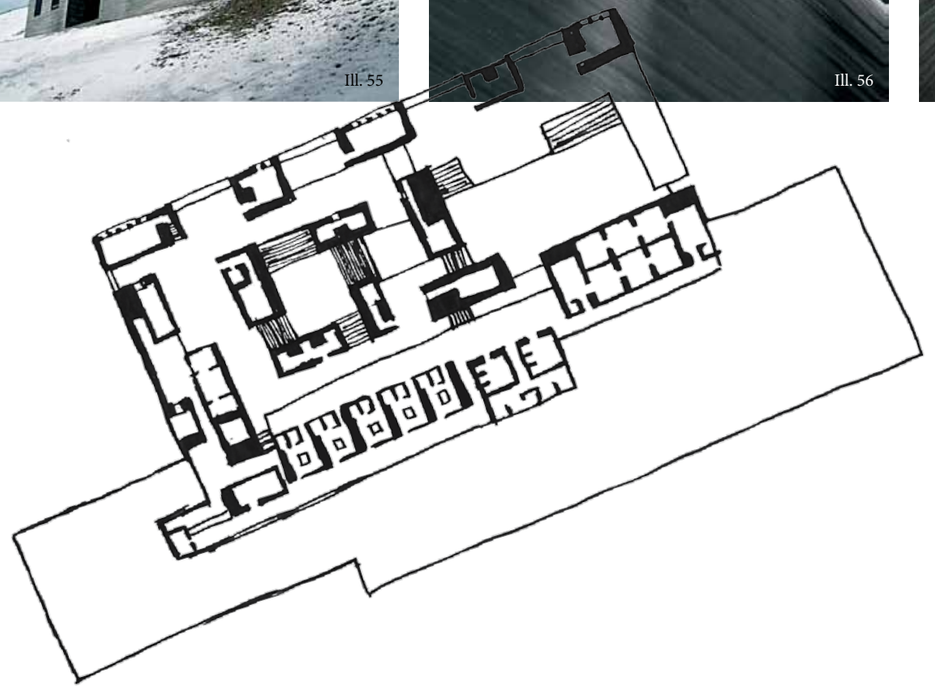

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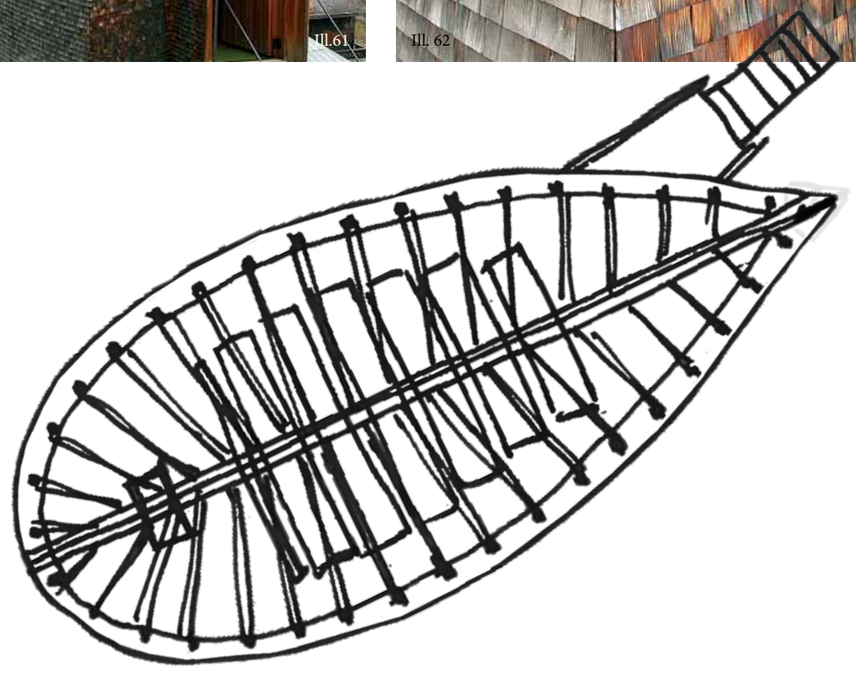
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THE ART OF ATMOSPHERES

CASE STUDY OF THERME VALS AND SAINT BENEDICT CHAPEL

Therme Vals designed by Peter Zumthor in 1996 [archdaily.com 2009] is an example of restorative architecture in its considerations for materiality, texture and light, and in its creation of unique atmospheres. This case study will serve as inspiration on how to use materials in a restorative sense and as inspiration for a further material analysis.
The building seems like it was cut and risen from the mountain it stands on, a monolith deeply rooted in the landscape. The strict geometry of the building is emphasised by the simple, hard, rock material whose layers create associations to the layers of the mountain. The monolithic expression is broken with carefully placed openings that control and frame views of the landscape, the landscape is articulated in the architecture. The openings let light in, focused and fixed light, and spaces are created, spaces of special interest are enhanced, where to stay and how to stay there becomes apparent. [therme-vals.ch 2013]
Saint Benedict chapel also by Peter Zumthor built in 1988 [architecture.about.com 2013] uses many of the same effets as Therme Vals even though it is a completely different scale, expression and form. Materials are chosen in relation to the scale, the small surfaces of the chapel are dramatic and colourful, and they reflect the natural environment in which the chapel is placed. Light flows in from windows above placed all around the chapel and without being able to look directly outside people are enabled to follow the path of the sun and the course of the day.

CONTENTS

ADDITIVE ARCHITECTURE

IN A CHANGING CONTEXT

Additive architecture has in this project its point of departure in the intention of creating architecture which is adjustable to the changing load of inmates in the correctional institution in order to assist resocialisation. The previous chapter 'Restorative Architecture' states the temporary refuge; a small world of your own. Additive architecture must support this. Besides that the additive system could obtain a function as a system that contributes to the restorative architecture in the sense of spatiality.

Parallel with these thoughts we ask ourselves the question; how to approach contemporary architecture? One thing was clear; materiality and tectonics have to be present from the start of the sketching phase, to give them their deserved position in architecture - as the physical representatives of architecture, they have to be allowed to shape the architecture and become parts of the overall aesthetics.

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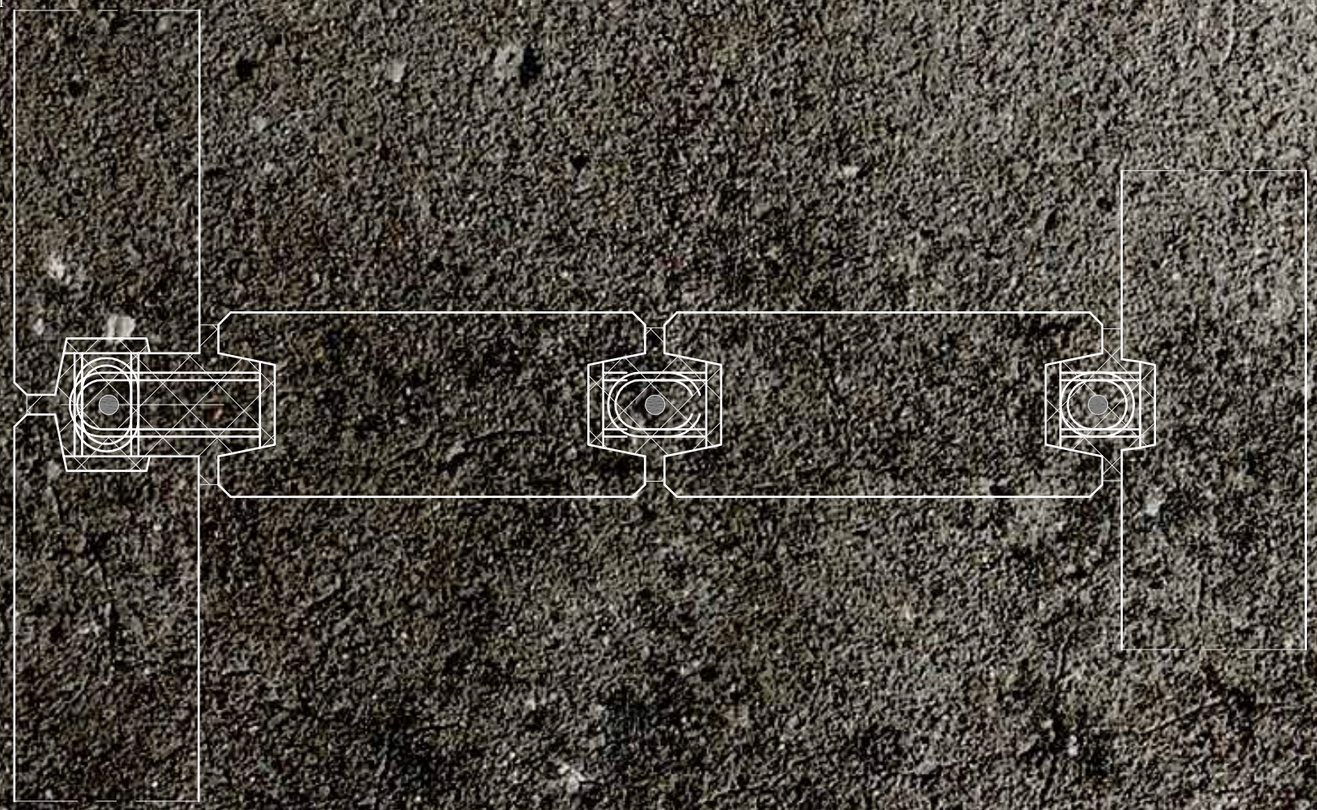


ADDITIVE ARCHITECTURE

IN TERMS OF ACCOMMODATING THE NEEDS FOR A CORRECTIONAL INSTITUTION

Different architects have through time worked with additive architecture. The additive architectural principle has some clear advantages according to functionallity, adjustability and climate which will be described in the following.

WHY ADDITIVE ARCHITECTURE?
The analysis has so far pointed towards the importance of a flexible building system within this assignment:

+ ***FUNCTIONAL*** in terms of avoiding a load factor over 100%
+ ***ADJUSTABLE*** in relation to future-proofing, durability and landscape
+ ***CLIMATIC*** understood as adjustable to the landscape conditions, the changing circumstances regarding daylight and the short building period in Greenland

The following will look at the opportunities for flexible building with focus on additive architecture in order to clarify principles and methods, advantages and disadvantages within the field, and in the end point towards the most appropriate approach when building a correctional institution.

JØRN UTZON AND ADDITIVE ARCHITECTURE
Additive architecture is not a new phenomenon, it has existed for several centuries in many different variations all over the world, not as much in European countries as in countries like Japan, Saudi Arabia and China. Additive architecture has developed a great deal over time, owing to, among others, but especially Jørn Utzon, one of the biggest advocates for additive architecture. Utzon had long been working with element construction, prefabrication and geometrical systems before calling it actual additive architecture and it is a very wide field covering many different topics. Within additive architecture there are many different degrees of additivity. The additive system is a flexible system, a system where one (prefabricated) element can be added or subtracted from the composition and thereby change the layout of a building. With additive architecture Utzon wanted to create more freedom in the planning of buildings, the building should not be limited to the shape of a box and to a given size. [Utzon & Weston 2009]

"In the long run changes take place in life in the house, but rarely in the house itself, and this is quite unnatural and a waste of space and money." [Utzon & Weston 2009 pp. 08]

One of Utzon's early examples and not quite additive architecture in the sense that Utzon later describes it as seen in the quote, but a precursor for it none the less, is the Courtyard Houses from 1958-1962. It is a single housing system consisting of individual housing units that are put together in a composition that creates a community. Every volume is an individual home and you cannot pass through the volumes from one home to another. The homes in themselves are not additive architecture as such, only in combination with others. A later and perhaps Utzon's most famous example is the Espansiva building system from 1969 (see case study pp 56-57). In this system the dwelling in itself is the additive architecture, the expressions and spatialities changes when a module is added or removed. [Utzon & Weston 2009]

Both of these projects by Utzon are examples of an additive architecture where the additive systems are readable in the architecture, they contribute to the expression and creates an understanding of the community/the building. It is also conceivable that the additive system is an underlying element, one that organises and systematizes the layout of the building, but is not visible in the architectural expression when looking at the building as a whole.

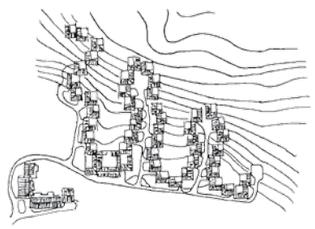
PREFABRICATION AND ADDITIVE ARCHITECTURE
Today most additive architectural systems are based on prefabricated elements. [Utzon & Weston 2009] Prefabrication has also existed in various forms for many centuries and there are today many different types of prefabrication, almost all buildings consist of prefabricated elements to some extent. The first prefabricated wooden houses were made in the United Kingdom in 1624 and the demand grew quickly with the foundation of more and more colonies. [Wraber 2009] Consequently the first standard housing came to Greenland in 1743-1847 and is therefore also an established and well-known building style there. [Steenfos & Taggholt 2012] The main purposes with this type of housing were low costs, fast construction and flexibility.

Some of the early and known examples are the DOM-INO House by Le Corbusier from 1914 and the Building Blocks by Bauhaus architects Walter Gropius and Adolf Meyer from 1923. Known Danish examples are Kubeflex by Arne Jakobsen from 1969-1970 (see case study pp 56-57) and also the Espansiva building system.

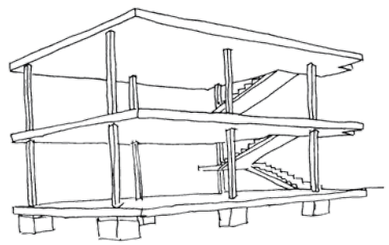
Within additive architecture there are different building types and systems, some have already been mentioned, and in the following a few more will be described.

The building types cover buildings that consist of 3D volumes, of 2D elements and buildings that are customised and built from an element- and detail library, the different types express different degrees of additivity and also different building processes. When building with 3D volumes, the volumes are more or less completed at the factory and then transported to the site where they are assembled with very few adjustments. The production and assembly period is very short, but there are few possibilities for adjustments and changes in the design. The 2D element building consists of large elements that are assembled on site, adjustments are made and the interior is finished. The assembly period is longer due to the larger number of parts. There is low flexibility in the main form, but more possibilities for variations in the exterior expression and the interior of the building. When building on the base of an element- and detail library the process is not that different from traditional building processes and can take just as long. The building consists of small elements that are transported to the site unassembled. It is a very flexible system with numerous possibilities of variation in both exterior and interior. [Wraber 2009]
Within systems there is a differentiation between open and closed (fixed) systems which describes the level of possibilities for changes made by for instance the customer. Closed systems are better for ensuring thought out proportions and order in the building, while it in open systems can be hard to control the proportions and ensure aesthetical and spatial qualities. [Wraber 2009]

ADDITIVE ARCHITECTURE IN A CORRECTIONAL INSTITUTION
The architectural quality and consequently also the many dilemmas within additive architecture are related to flexibility and experience of form, logics and materials. A high degree of flexibility means few possibilities of controlling the final result and final composition, but it also provides more possibilities for adjusting the building to the users, to the site and to the overall context. The building period can be long, but the transport to site is easier. A lower degree of flexibility in construction means good opportunities of securing visual and compositional aesthetics, but fewer options of adjusting the building to the specific context. The building period is shorter and the challenges related to finishing and assembling the building can be addressed beforehand in the protected environment of the



COUNTYARD HOUSES
The same housing unit is multiplied into the landscape



DOM-INO HOUSE
House made from simple prefabricated elements, slabs and columns

BUILDING BLOCKS
Standard row housing system, one of the first pre-cast concrete element projects built in Europe

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factory. [Wraber 2009] It is very important to find the balance of flexibility, to find and strike the happy medium where an appropriate level of flexibility, economy and aesthetics are incorporated. The economic benefits of additive architecture have from the beginning been clear, but the main challenge today still seems to be how to incorporate all the parameters demanded and thereby secure architectural quality in an additive building. [Wraber 2009]

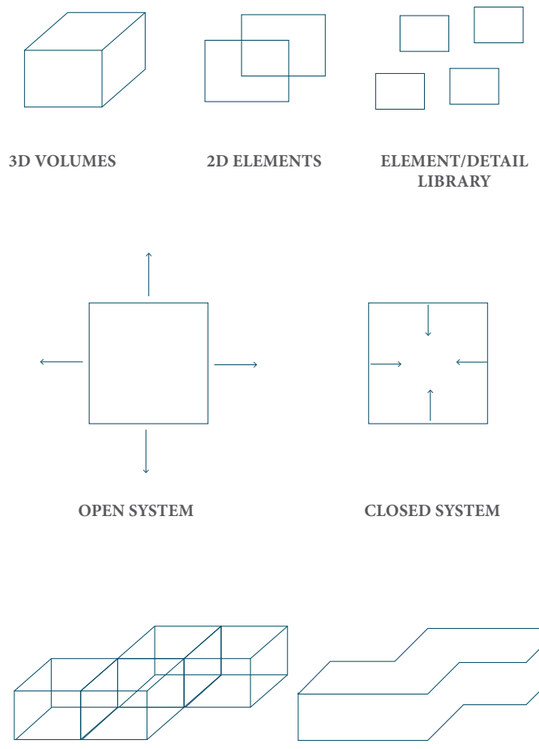
In relation to a correctional institution an additive system seems appropriate in order to enable the flexibility needed for the changing demands of the institution. It creates opportunities to vary the exterior and interior expressions according to the interior function and promotes different spatial compositions. An additive system can be beneficial to help organising the overall institution and the cells in a composition that considers both the inmates and the employees. An additive system is in correlation with the cell and the fixed size of it, but also with the common rooms and other functions that are allowed to be flexible and are not limited by a specific size. It enables the amount of rooms and cells to change. There must however be limitations to the flexibility of the system and an overall plan for additions and subtractions, as it otherwise can be hard to control the quality of the composition and the architectural expression. The fixed cell sizes can be seen as one form of limitation and can be used as such in the development of an appropriate system. The additive system should also consider the security demands which further create limitations in relation to where components can be placed, as it should always be possible to minimise blind angles and maximise transparency for the employees. [Flemming la Cour]

Additive architecture is furthermore in line with the adjustabale intentions for the project as it can provide the ability of the architecture to change according to the landscape which is important when looking at the very steep slope on which the institution will be placed and also the ability of the architecture to change with time and needs. It can ensure shorter building periods with prefabrication, depending on how it is designed. When using prefabrication the construction, assembly system and joints become important parameters to address.

In '*Thinking Architecture*' Peter Zumthor describes his method of designing. Zumthor starts with the functional and the technical requirements, they represent the fundamental task of developing a whole out of many smaller pieces and details, out of functions, forms, materials and dimensions. It is the architect's job to find solutions for constructions and forms, for the edges, the joints, the intersecting surfaces and the meetings of materials. Every element should underline and reinforce the intention and details should express specific needs of the design in specific points of the building in order to create an understanding of the whole. [Zumthor 1998] Marco Frascari is making some of the same points in the article '*The Tell-the-Tale detail*'. Like Zumthor he believes that the detail is central for the understanding of a building.

"In the details are the possibilities of innovation and invention and it is through them that architects can give harmony to the most uncommon and difficult or disorderly built environment generated by a culture." Marco Frascari [Frascari 1981, pp 326]

Zumthor believes that the main core of architectural work is in the act of construction. By that he means when the concrete materials of the design are assembled and erected, when all the different parts of the design transforms from being just an idea to actually becoming a part of the real world. It is in fact the whole purpose of the design, to be able to become a part of the real world, for which reason he thinks that contemporary architecture should be radical, but within limits. It can express a message or make a statement, but it should still have practical usefulness. It should be both aesthetical *AND* functional otherwise the quality of it will be short-lived. This is very much in line with this project and it is an important point within architecture in general, but even more so when designing a correctional institution where meeting the functional demands are key to the success of the design. Architecture is not only a symbol or a message, it is the base for the life that goes on in and around it and should be designed to be so. [Zumthor 1998]
Zumthor is talking about how he approaches architecture in general, but his opinions and methods can be applied within additive architecture as well and so investigations of joints, details and assembly are an important part of the coming design process.



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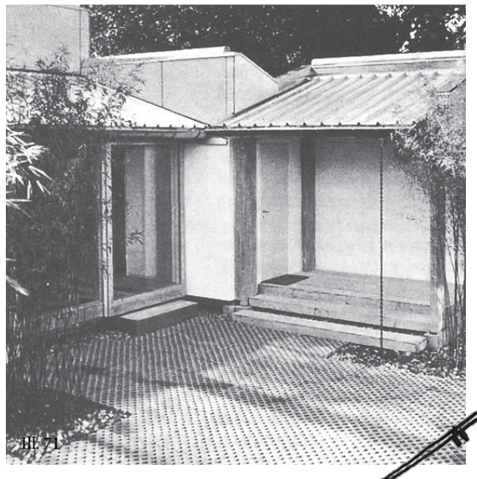

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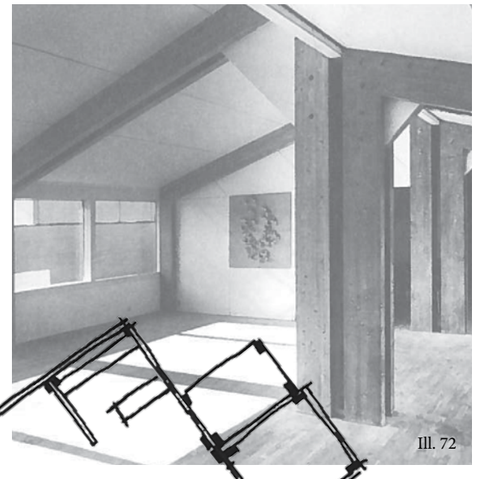

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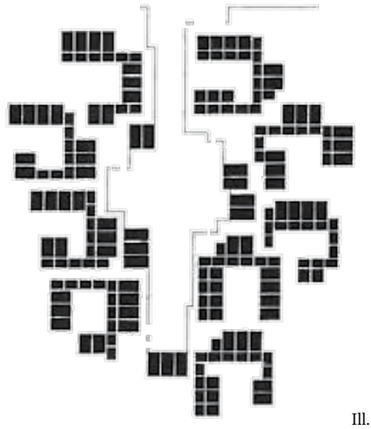

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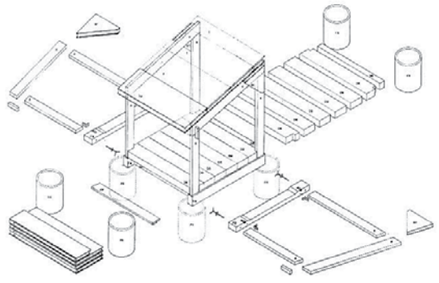

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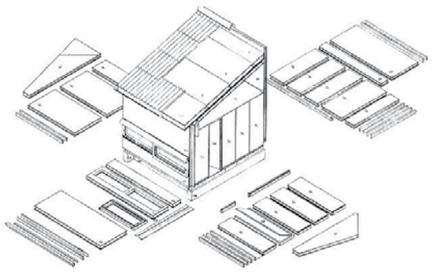

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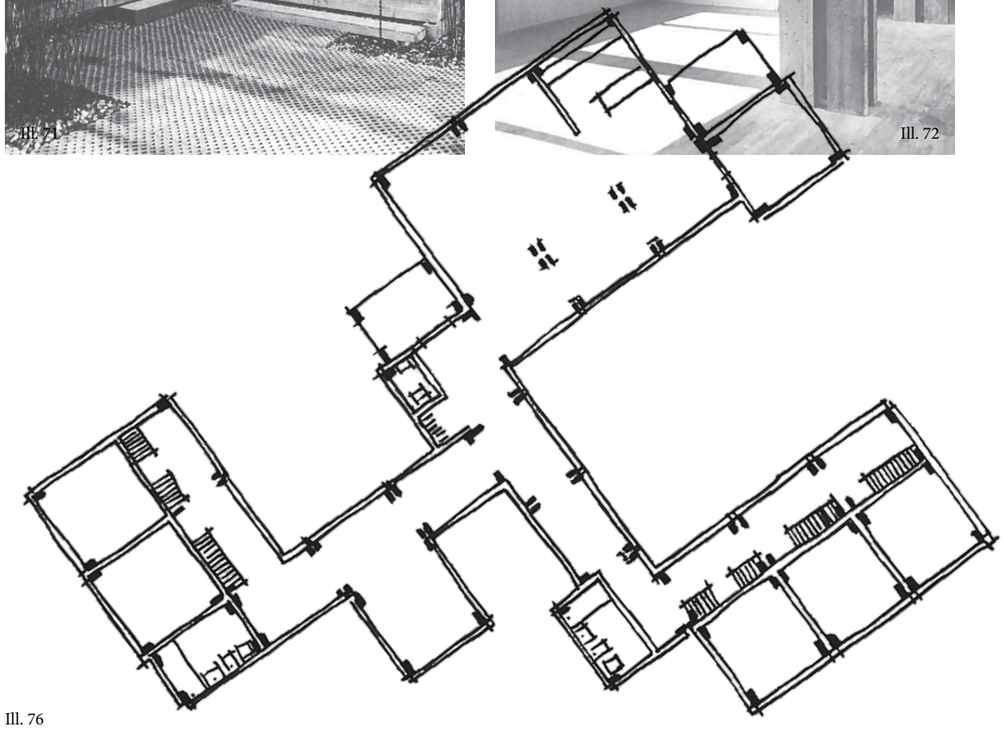

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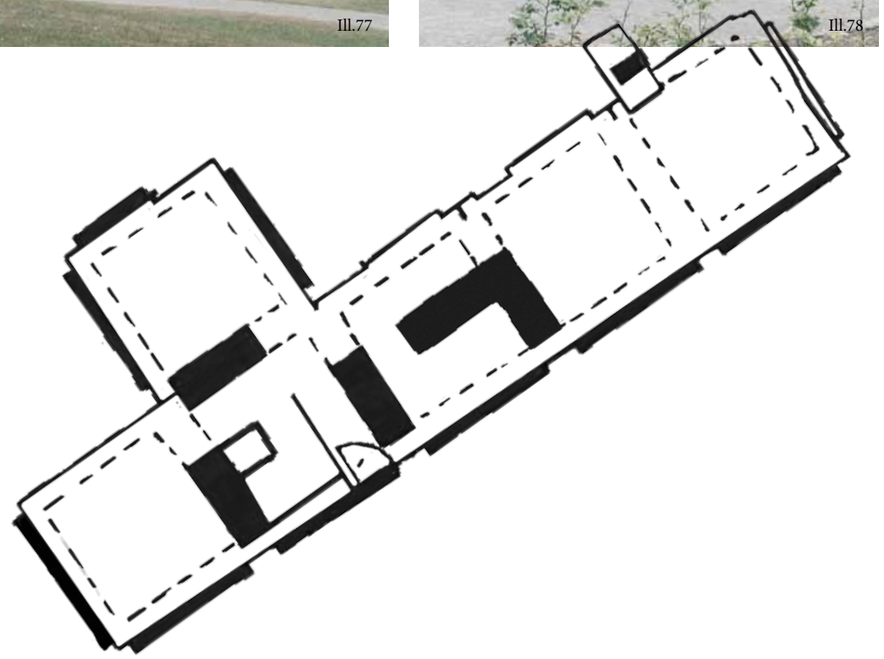

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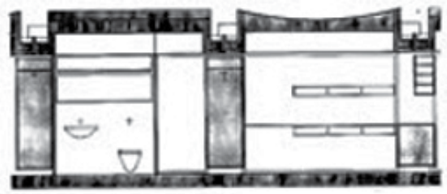

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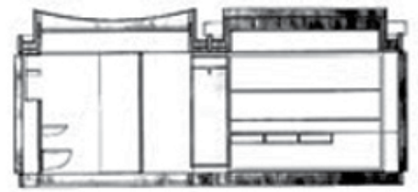

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CONNECTIVITY AND FLEXIBILITY

CASE STUDY OF ESPANSIVA AND KUBEFLEX

The Espansiva building system designed by Jørn Utzon in 1969 is a system made up by modules/units in 4 different sizes according to the functions of a home like passages, kitchens, bathrooms, bedrooms, dining rooms, living rooms etc. Each module is based on 4 columns, one in each corner, made of laminated wood with roof and lightweight concrete floors as unbroken surfaces and with nonbearing external and internal walls. The rooms created are only limited by the span between the columns in the module. The modules can be put together in numerous ways creating a very varied and flexible system. [Utzon & Weston 2009]

The Kubeflex building system developed by Arne Jakobsen in 1969-1970 is a system of room sized modules of 10 m^s each made from wooden frames. The frames can be filled with 7 different panels varying in expression. The combination possibilities are more limited than in the Espansiva, which creates a less flexible system, but also a more controllable one in regards to securing quality of spatiality and architecture as a whole. The house expresses a unity, whereas Espansiva seems more detached, though still together. [Wraber 2009] None of the houses were ever really put into production and they did have some obvious challenges. For example the Espansiva. When the modules are put together 4 columns can in some cases end up next to each other which causes serious over-dimensioning and a large material waste. That aside, the systems contain many qualities, within assembly, organisation and spatiality, and will serve as inspiration in the development of adjustable architecture.

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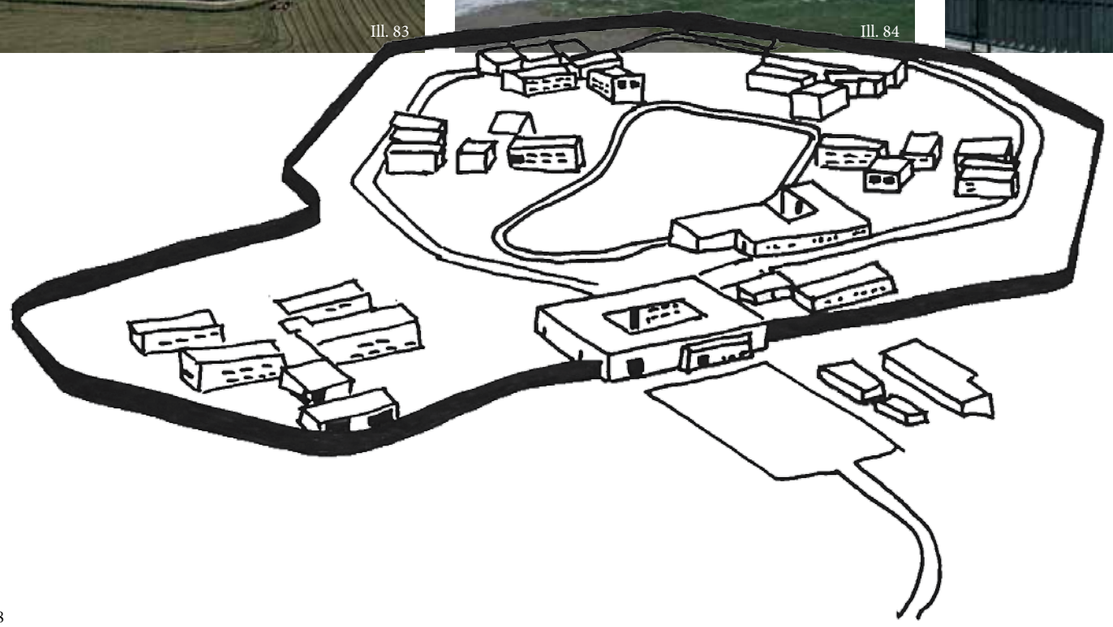

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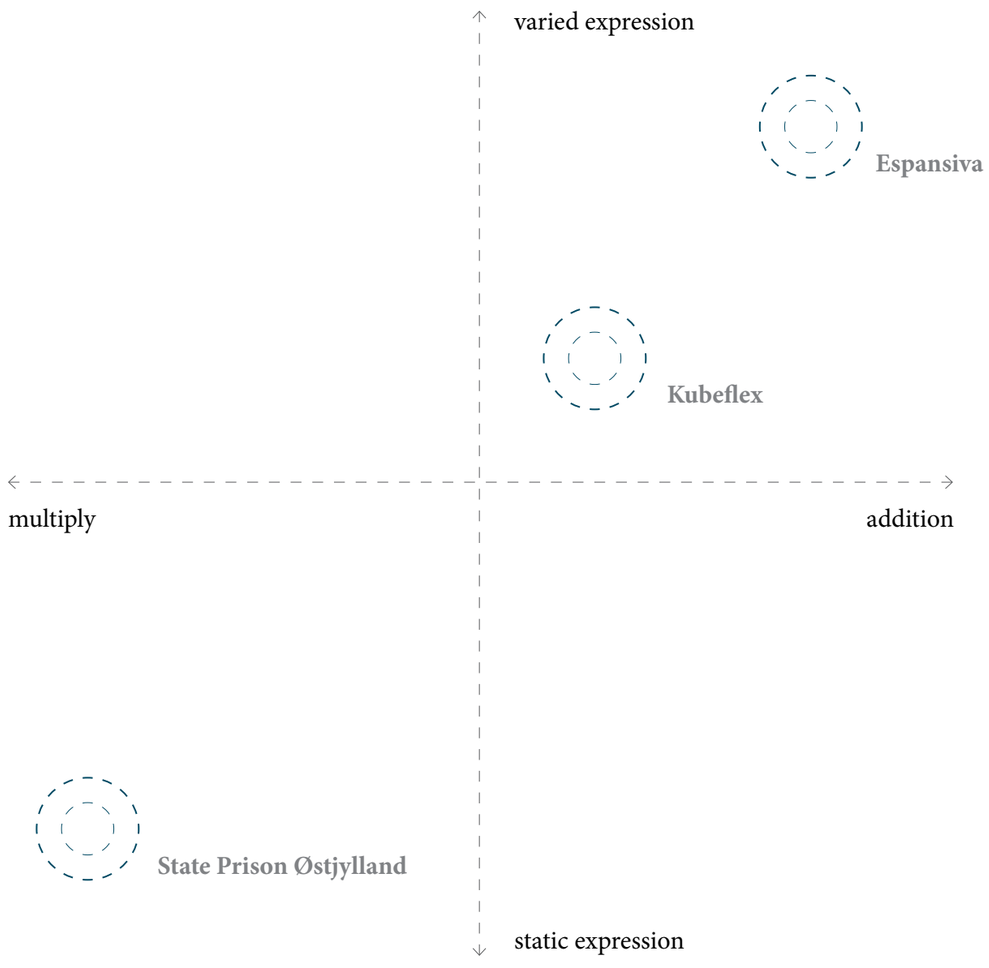
ORDER AND SECURITY

CASE STUDY OF THE STATE PRISON ØSTJYLLAND

The State Prison Østjylland designed by Friis & Moltke and built in 2001-2006 [friis-molke.dk 2013] is a modern, top-secured prison. It is mostly characterised by security, order and functionality, but can be seen as being additive at least to some extent, which is why it is included as a case study. It consists of five departments separated from each other, four of them almost completely identical. One is designed and copied around the central lake. The additivity here is only the possibility to add more departments, but not by physically connecting them to the other buildings. This results in a system not very flexible to changes, neither on the inside or the outside as all shapes and sizes are fixed to begin with. The system does create clarity and transparency for both staff and inmates though. A main path connects all departments to the main administrative core placed outside the inner fence. Movements are controlled, not by the typography of the landscape or the laid out paths, but by motion sensors. Views are controlled by the orientation of the buildings and with bars, there are no possibility of views from one cell to another. The light is mainly artificial light, as a result of the fairly large depth of the departments. The overall feeling is institutional, no doubt this is a prison, the only thing breaking this feeling at some points is oddly enough the organic wall following the typography of the fields surrounding the prison. The wall allows views at specific places to the life outside and tones down the strong feeling of isolation.



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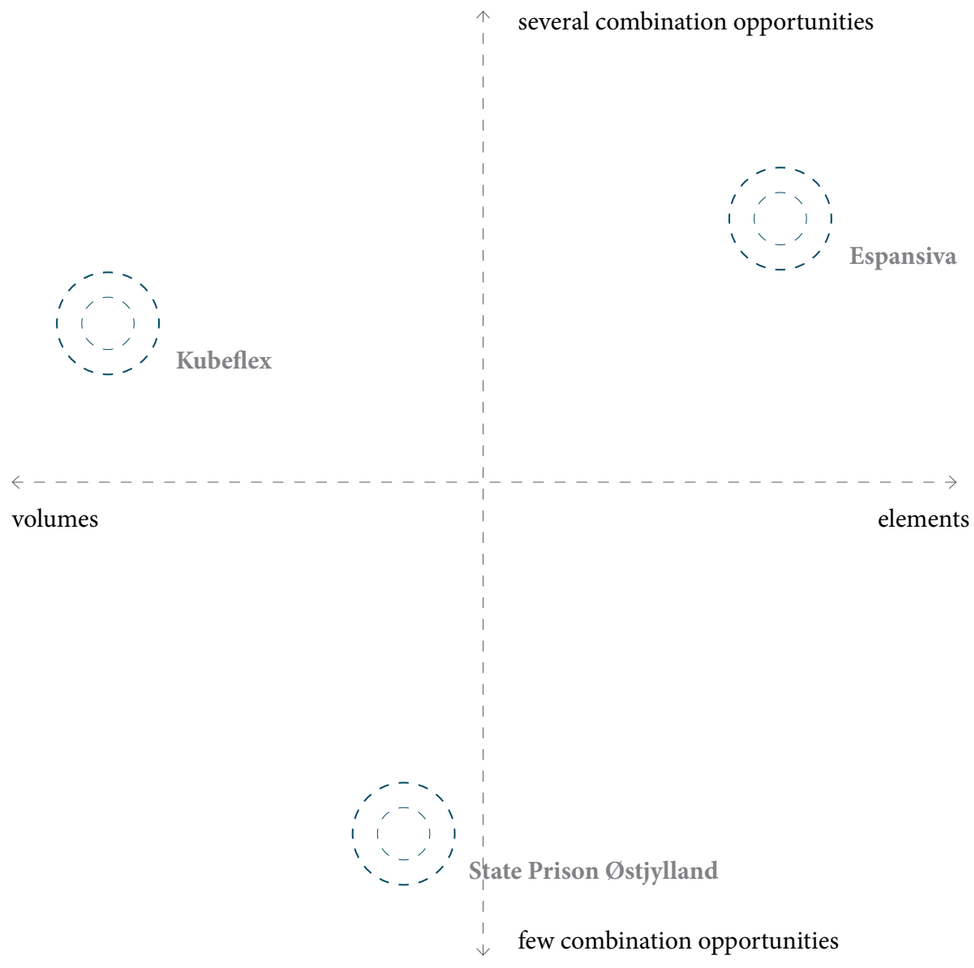
ADDITIVE VARIATIONS

The diagram shows how the different case studies can be categorised in relation to how much they vary in expression, meaning how much they can change in facades and spatialities, and in relation to the extend of additivity.



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ADDITIVE VARIATIONS

The diagram shows how the different case studies can be categorised in relation to the extend of the combinations possible and in relation to how fixed they are. If they are finished volumes or if they are elements to be assembled.

CONTENTS

RECAPITULATION

THE QUALITY OF THE ARCHITECTURE TO COME

ADJUSTABLE ARCHITECTURE
When creating this correctional institution it is evident that the architecture must be adjustable; adjustable in its adaptability to the inmates' feeling of well-being, adjustable in the changing population of inmates and adjustable in the means of adapting into the landscape and the arctic climate. Based on the analyses made adjustable architecture covers the three themes:

+ ARCTIC ARCHITECTURE

+ RESTORATIVE ARCHITECTURE

+ ADDITIVE ARCHITECTURE

Every theme has subtitles which will serve as design parameters for the development of the project, they will be implemented in the intergrated design process along with inspiration from the cases described in relation to the three themes.

ARCTIC ARCHITECTURE
+ ***LANDSCAPE CHARACTERISTICS*** as the main element in establishing the architecture to secure continuing genius loci at the place; the melting of architecture and the landscape.
+ ***CLIMATIC*** effects on buildings, utilisation of darkness and light, protective environment, building shape and materials which are adjusted to an arctic climate and building practise.
+ ***SITE CONDITIONS*** in terms of orientation towards the sun and wind and surrounding landscape elements; sea, river, fell, texture, ground, materials, colour.
+ ***TRADITIONS*** to create recognisability, relations and associations to way of life, culture, history and future.

RESTORATIVE ARCHITECTURE
+ ***TEMPORARY REFUGE*** a notion about having a small world of your own.
+ ***MEANINGFULNESS*** in the sense of having an intention for the stay, in terms of resocialisation - a re-introduction of the original idea of the correctional-institution. To create a relation between people and space.
+ ***MATERIALITY*** in the sense of letting materials be the main ingredient in forming the architecture and to implement their tactility in an atmospherically mean. Letting them create the relation, between surroundings, architecture and user, needed to obtain meaningfulness.
+ ***NATURE AND LANDSCAPE*** elements understood as the nature's presence in architecture according to restorative architecture, where the nature contributes to the well-being of man.
+ ***LIGHT*** as an effect to avoid monotony and promote mental well-being, accomplished by windows allowing open, unrestricted views to outside surroundings.
+ ***MOVEMENT*** and organisation of the spaces, to obtain a feeling of safety and orientation and at the same time seem non-institutional by use of material tactility, light conditions and spatial organisation. Sectioning is a tool to protect the inmates and obtain flexibility in the possible combination of inmates.

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ADDITIVE ARCHITECTURE

+ ***ACOUSTICS*** in order to affect the experience and organisation of space and create a better environment for inmates and staff.
+ ***ASSEMBLY SYSTEMS*** in the meaning of the several ways elements can be assembled and combined. To obtain adjustability and thereby practical usefulness.
+ ***COMPONENT*** in the meaning of a room constructed by the assembly system.
+ ***JOINTS*** understood at the principles between materials, components and the assembly system, in an aesthetic and constructive manner. Focus on architectural details.
+ ***INFORMATIVE ELEMENTS*** understood as the elements which inform the assembly system; landscape, materials, materialism, functions and room program.
+ ***ORDER*** in the sense of organising spaces and creating a system with limitations in order to obtain architectural quality.

CASE STUDIES

In terms of creating a correctional institution which is designed to respect the local culture, climate, landscape and nature and at the same time be a healthy place to be both for inmates and staff in a spatial sense; tactility, light and space, and fulfil its function as a correctional institution in terms of organisation and safety, case studies have been made within the three architectures.

At the Louisiana Museum of Modern Art it is clear how it can be possible to get the architecture to interact, contribute and benefit by and from the surroundings by extending elements of the building into the landscape and thereby blur the boundaries between building and context and by creating flows and movements that are to some extent controlled by the typography.

In Peter Zumpthor's Therme Vals and Saint Benedict Chapel he manages to create relations between architecture and landscape in his choice of materials, materials highly related to both scale, purpose and the materiality of the context. Openings and light either emphasise the landscape or create indoor atmospheres associated to the context.

Both in Kubeflex and Espansiva the focus is on flexibility and variation, the big questions raised are how to control the additivity in the systems in order to maintain architectural quality in all variations. They clearly show that limitations are of importance, what should and should not be additive must be clarified when dealing with additivity in buildings in order to obtain some unity in the architecture as it develops.

The State Prison Østjylland is an example of an additive system with great control, limiting the flexibility and also the variation in the architectural expression. The Prison points out the need for architectural elements to tone down the isolation and institutional feeling. The views are controlled towards the surroundings away from the other buildings and thereby contributes to a more open atmosphere.

The case studies contain the important points summarised above, points to be considered in relation to the new correctional institution and integrated into the design process.

ROOM AND FUNCTION PROGRAMMES

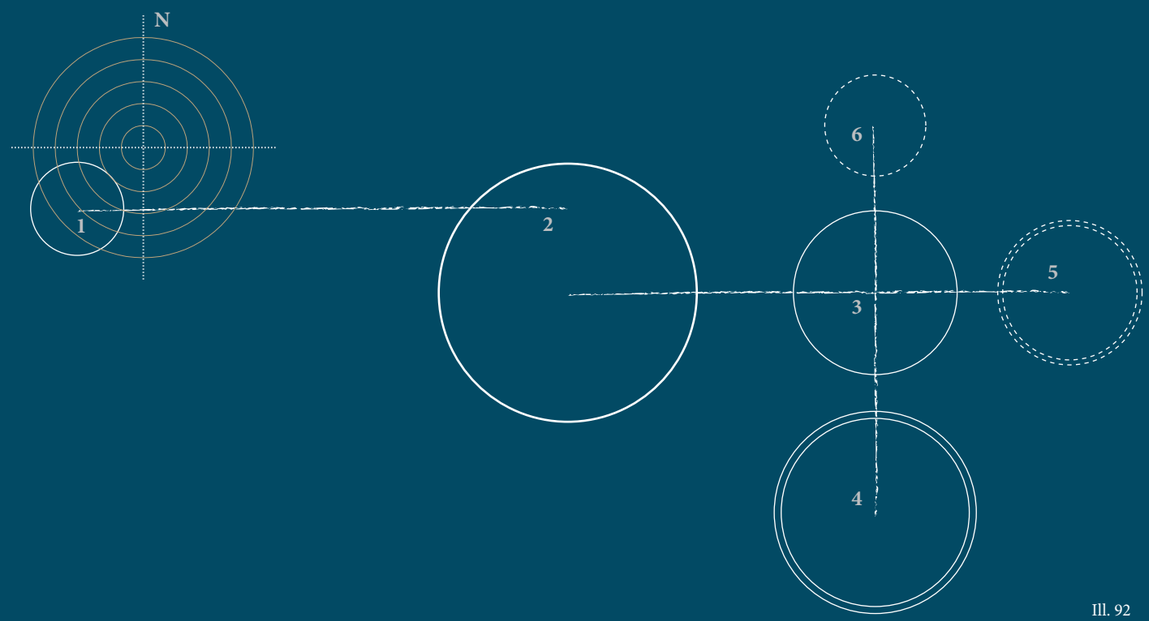
ORGANISATION AND RELATIONS BETWEEN FUNCTIONS

To qualify the design proposal for the new correctional institution a room programme supported by function diagrams is developed.

The room programme is inspired by the competition brief from the Prison Service in Denmark. The categories 'subject' and 'functional demands' are based on the brief, where the 'architectural function' and the 'architectural potential' are derived from the architectural vision concerning arctic architecture, restorative architecture and additive architecture.

The room programme is divided into three schemes; one showing the functions in the correctional institution on a masterplan level, followed by a detailed description of the functions inside the living unit and finally a description of the functions inside the cell. The room programme contain both indoor and outdoor functions in the intent to manifest the importance of both and their relation to each other.

The room programme is supported by function diagrams showing the organisation of the institution and the relation between different functions.



FUNCTION DIAGRAM
masterplan

1: Parking area
Staff area
2: Gate
Visitor department
Office functions
Somatic health
Abuse treatment
Psychiatric treatment
Supply
Temporary cells
3: Cultural centre
Occupation
4: Closed department
Living units
Outdoor facilities
5: Open department
Living units
Outdoor facilities
6: Re-entry department
Living units
Outdoor facilities

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SUBJECT		FUNCTIONAL DEMANDS					ARCHITECTURAL FUNCTION				ARCHITECTURAL POTENTIAL
DOMAIN	FUNCTION	NUMBER	SECURITY LEVEL	SIZE	SIZE USER	DETAILED DEMANDS	MATERIAL	ACTIVITY LEVEL	DAYLIGHT	ARTIFICIAL LIGHT	SPATIAL QUALITY
MASTERPLAN											
Gate	Gateway	1	A/B/C	-	-	- Gateway should be devided into one for cars and one for pedestrians. Inmates will always be brought to the institution by car. - Visitors and staff are using the gate for pedestrians. - The security check is mandatory for everyone entering the institution.	Durable and permanent expression.	+++++	+++++	+++++	- Must refer to something fixed and become the central part of the correctional institution. - Must be considered in a functional way, where the organisation of functions is essential. - Use of natural materials to relate to nature.
	Reception	1	A/B/C	25m²	2			++++	+++++	+++++	
	Security check	1	A/B/C	50m²	5			+++++	+++++	+++++	
	Security check, inmates	1	A/BC	20m²	3			+++++	+++++	+++++	
	Room for surveillance	1	A/B/C	25m²	1			++++	++++	++++	
	Lockers for visitors	1	A/B/C	-	-			++++	+++++	+++++	
	Wardrobe for staff	1	-	20m²	2			+++++	+++++	+++++	
	Garage	1	-	80m²	-			++++	+++++	++++	
Temporary cells	Reception cells	3	A/B/C	10m²	1	- Reception cells are the ones used for new inmates. Quickly they will be placed in a suitable department. - Must be placed in the centre	Durable and permanent expression.	++++	+++++	++++	
	Protection cells	2	A/B/C	10m²	1			+++++	+++++	++++	
	Observation cells	2	A/B/C	10m²	1			+++++	+++++	++++	
	Isolation cells	3	A/B/C	10m²	1			++++	+++++	++++	
Visitor department	Room for check, inmates	1	A/B	20m²	3	- Visitor department is for inmates in the open and closed department and their family. - The visitor rooms are for short visits. - The visitor apartment are for longer stays, normally a day. - Must be placed close to the entrance	Durable and permanent expression.	++++	+++++	+++++	
	Visitor room	2	A/B	25m²	4			++++	++++	++++	
	Visitor apartment	2	A/B	65m²	4			++++	++++	++++	
	Room for Watchman	1	A/B	15m²	2			++++	+++++	++++	
	Outdoor facilities	1	A/B	100m²	20			++++	++++	++++	
Office functions	Offices	9	-	15m²	20	- The offices are for the institution executive, the head guard, secretary and administration, interpreter, social workers, accounting. - A central placement in the institution is necessary, because of overview and distance.	Durable and permanent expression.	++++	+++++	++++	
	Meeting rooms	3	-	25m²	20			++++	+++++	++++	
	Conversation room	1	A/B/C	15m²	3			++++	+++++	++++	
	Lunch room	1	-	50m²	30			++++	+++++	++++	
	Kitchen	1	-	25m²	10			+++++	++++	+++++	
Supply	Technical room	1	-	150m²	-		-	+++++	+++++	++++	
Somatric health	Doctor consultation	1	A/B/C	25m²	3	- Medical check-up and nurse - The flexible room could for example be used to get a haircut. - Must be placed in the centre	Durable and permanent expression.	++++	+++++	++++	
	Dentist	1	A/B/C	25m²	3			++++	+++++	++++	
	Waiting room	1	A/B/C	20m²	4			+++++	++++	+++++	
	Flexible room	1	-	30m²	5			++++	+++++	++++	
Abuse treatment	Group room	1	B	20m²	10	- Are also going to be used by the Frederiksberg Center. - Must be placed close to entrance	Durable and permanent expression.	+++++	+++++	++++	
	Coffee kitchen	1	B	10m²	5			+++++	+++++	+++++	
Psychiatric treatment	Group room	1	A	20m²	3	- The Group room is also for abuse treatment.	Durable and permanent expression.	++++	+++++	++++	
	Conversation room	1	A	10m²	20			++++	+++++	++++	
Occupation	Workshop	2	A/B	200m²	20	- The workshop could contain carpentry, smithy, handicraft ect. - Every school must contain a classroom and a computer room	Durable and permanent expression	+++++	+++++	+++++	
	School	2	A/B	50m²	40			++++	+++++	++++	
	Lunch area, inmates	2	A/B	40m²	4			+++++	+++++	++++	
	Lunch area, staff	2	A/B	15m²	4			+++++	+++++	++++	
	Office staff	4	A/B	10m²	70			++++	+++++	+++++	
Cultural centre	Gym	1	A/B/C	700m²	12	- The activity center contains a music room, a painting room, a sewing room and a multifunctional room. - The grocery shop gets food delivered from local shops. Here the inmates can buy their own food and cook for themselves. - The cultural center is only accessible when followed by a member of the staff.	Durable and permanent expression.	+++++	+++++	++++	
	Fitness	1	A/B/C	120m²	12			+++++	+++++	++++	
	Dressing rooms	2	A/B/C	35m²	12			+++++	+++++	+++++	
	Library	1	A/B/C	80m²	20			++++	+++++	+++++	
	Activity center	1	A/B/C	200m²	70			+++++	+++++	++++	
	Church	1	A/B/C	200m²	10			+++++	+++++	+++++	
	Kitchen facilities	1	A/B/C	20m²	12			+++++	+++++	+++++	
	Grocery shop	1	A/B/C	40m²	1			++++	+++++	+++++	
	Office, librarian	1	A/B/C	10m²	1			++++	++++	+++++	
	Office, priest	1	A/B/C	10m²	3			++++	++++	+++++	
	Conversation room	1	A/B/C	10m²	1			++++	+++++	++++	
Living units *Contain different types of cells*	Detention	-	A	12m²	18	- The living units need to have the same layout in every department.	Durable and susceptible expression.	++++	++++	+++++	- Express the additive tale, the additive narrative and be adjustable to the landscape
	Disciplinary placed	-	A	12m²	10			++++	++++	+++++	
	Detained	-	A	12m²	12			++++	++++	+++++	
	Semi closed	-	B	12m²	12			++++	++++	+++++	
	Open	-	B	12m²	12			++++	++++	+++++	
	Re-entry	-	C	12m²	12			++++	++++	+++++	
Staff area *placed outside the institution*	Classroom	1	-	35m²	1	- The classroom is for education of new staff. - One of the large apartment is for the institution executive. - The other apartments are for temporary stays for the staff. - Must be placed outside the fence	Durable and permanent expression.	++++	+++++	++++	
	Bath and change of clothes	2	-	12m²	20			+++++	+++++	+++++	
	Kitchen, lunch	1	-	20m²	2			+++++	+++++	+++++	
	Staff apartment, small	2	-	40m²	4			++++	++++	+++++	
	Staff apartment, large	2	-	80m²	-			++++	++++	+++++	
Outdoor facilities	Ball game area	2	A/B	300m²	-		Landscape.	+++++	+++++	+++++	
	Running path	2	A/B	-	-			+++++	+++++	+++++	
	Nature experience	-	A/B/C	-	-			+++++	+++++	+++++	
	Terrace	-	A/B/C	-	-			++++	+++++	+++++	
Parking area	Parking	42	-	900m²		- Parking for staff and visitors.	Landscape.	+++++	+++++	++++	

SUBJECT		FUNCTIONAL DEMANDS					ARCHITECTURAL FUNCTION				ARCHITECTURAL POTENTIAL
DOMAIN	FUNCTION	NUMBER	SECURITY LEVEL	SIZE	SIZE USER	DETAILED DEMANDS	MATERIAL	ACTIVITY LEVEL	DAYLIGHT	ARTIFICIAL LIGHT	SPATIAL QUALITY
LIVING UNIT											
Common space	Entrance	1	A/B/C	5m²	3	- The commen spaces have to work as the center of the living unit. - The common space in the living unit is accessible from 7.00 am to 21.30 pm. But in the week days the inmates are occupied by work or school. - Sectioning must be possible.	Outdoor: Durable and susceptible expression. Indoor: Smooth, warm and inviting.	+++++	+++++	++++	- Express the additive tale, the additive narrative and be adjustable to the landscape
Indoor area	Kitchen	1	A/B/C	10m²	4			+++++	++++	++++	
	Dinner area	1	A/B/C	25m²	12			+++++	+++++	++++	
	Activity area	1	A/BC	25m²	12			++++	+++++	++++	
	Television area	1	A/B/C	10m²	4			++++	++++	+++++	
	Watch room, staff	1	A/B/C	5m²	2			++++	+++++	+++++	
	Toilet, staff	1	-	1m²	1			+++++	+++++	+++++	
	Laundry room	1	A/B/C	5m²	1			+++++	+++++	+++++	
	Storage	1	A/B/C	5m²	1			++++	+++++	+++++	
	Storage, staff	1	-	3m²	1			++++	+++++	+++++	
	Technical room	1	-	5m²	1			++++	+++++	+++++	
	Cleaning room	1	-	5m²	1			+++++	+++++	+++++	
Common space	Terrace	1	A/B/C	100m²	12	- Using the terrace is only possible with permission from the staff.		++++	++++	++++	
Outdoor area	Countyard	1	A/B/C	20m²	4			+++++	++++	++++	
Cell unit	Cells	4-12	A/B/C	12m²	1	- Size of cell: 12 m²		++++	++++	+++++	
	Common space	4	A/B/C	6m²	4			+++++	++++	+++++	

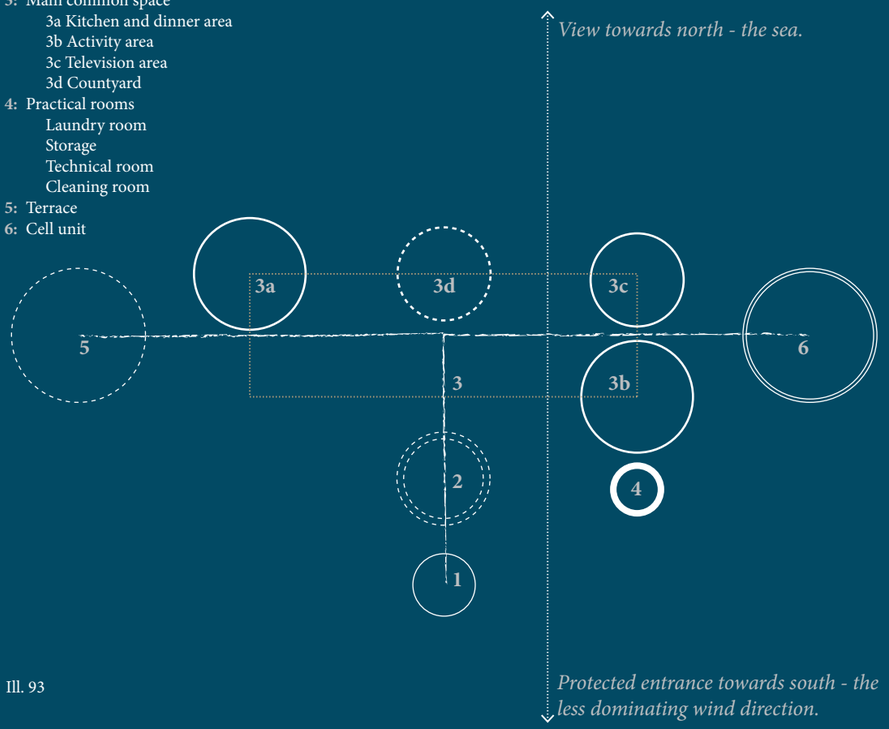
CELL

Refuge	Bed	1	A/B/C	2m²	1	- Overview must be possible - View from one cell to another should be avoided	Outdoor: Durable and susceptible expression. Indoor: Smooth, warm and inviting.	+++++	++++	+++++	- Materials together with light must create the atmosphere in the cell and show where different activities must occur, in a restorative sense.
Immersion	Reading space	1	A/B/C	2m²	1			+++++	++++	+++++	
Floor area	Floor area	1	A/B/C	5m²	1			+++++	+++++	+++++	
	Closet	1	A/BC	1m²	1			+++++	+++++	+++++	
Bathroom	Toilet	1	A/B/C	2m²	1			++++	++++	++++	
	Bath	1	A/B/C		1			++++	++++	++++	
	Washbasin	1	A/B/C		1			++++	++++	++++	

FUNCTION DIAGRAM

living unit

1: Entrance
2: Watch room, staff
Toilet, staff
Storage, staff
3: Main common space
3a Kitchen and dinner area
3b Activity area
3c Television area
3d Countyard
4: Practical rooms
Laundry room
Storage
Technical room
Cleaning room
5: Terrace
6: Cell unit



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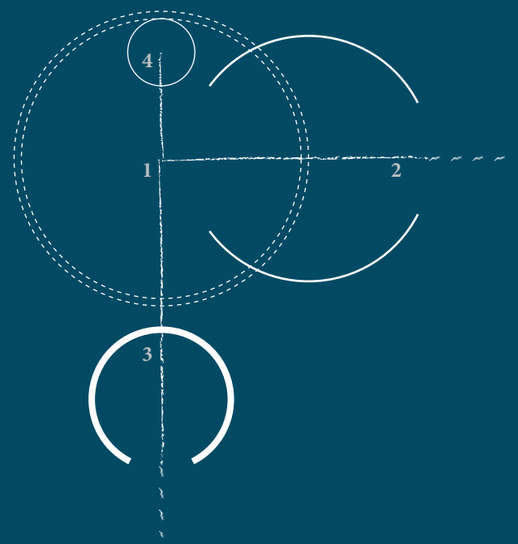
FUNCTION DIAGRAM

cell

1: Floor area
2: Immersion
3: Refuge
4: Bathroom



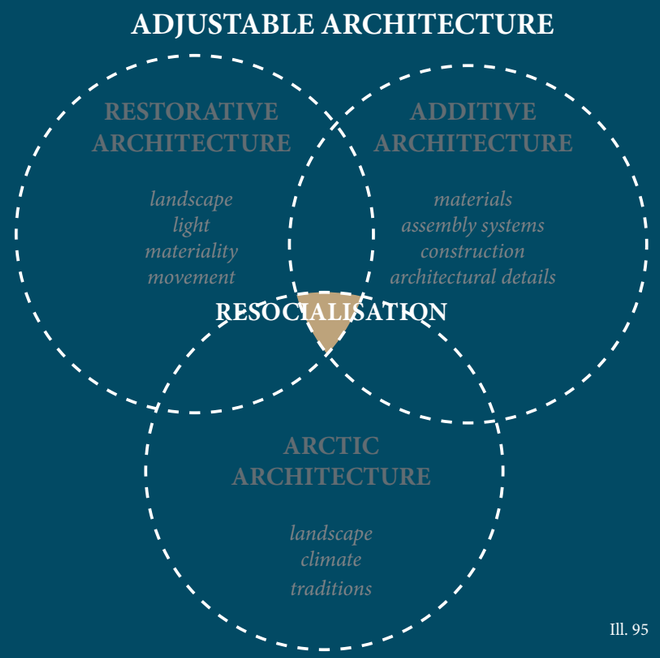
Ill. 94

ARCHITECTURAL VISION

INTENTION

To create a prefabricated, adjustable building system that accommodates the character of the arctic landscape, the changing population of inmates and thereby also the present and future needs of the institution in order to maintain architectural value.

The design has to promote the intention of resocialisation and respect the local culture and the climate; a building both for the inmates, the employees, the community and the surroundings.



Ill. 95

The three mentioned architectures; arctic, restorative and additive cover the architectural vision for the design process.
In general they do correspond to a broad understanding of the terms and are therefore qualified in relation to this project both through the analysis and through the following design process.

CONTENTS

THE DESIGN PROCESS

DESIGNING A CORRECTIONAL INSTITUTION

The design process is an iterative process, where everything is worked on simultaneously and can therefore not be seen as a process on a straight line. The design process is in the following devided into four main parts covering all aspects of the developments made through the project.

The three architectures central to the project are expressions of different scales going from masterplan level down to architectural detailing of the single living unit. These scales will be presented throughout the following where the masterplan, the living unit and the cell will be developed, explained and argued for.

To initiate the design process security is an important factor to consider in relation to the intention and the function of the design as a correctional intitution. Early on a decision was made to work with centain materials supporting security.

Concrete is considered to be the most durable and solid material to use in order to enhance security, tolerate vandalism and reduce prison breaks. To contrast the roughness and hard surfaces of the concrete, wood will be introduced both inside and out as a material to tone down the institutional feeling and as a material associated with the Greenlandic culture, hopefully creating a relation between the users and the place. Materials will further be elaborated on through the design process on pp 100-101 and in appendix 3.

Ill. 96

MATERIAL PROPERTIES

CONCRETE

Positive rate	+
Renewable resource	1
Plentiful amounts	2
Thermal mass	3
Transport easiness	4
Short transport distance	5
Building process time	6
Free maintenance requirement	7
Durability	8

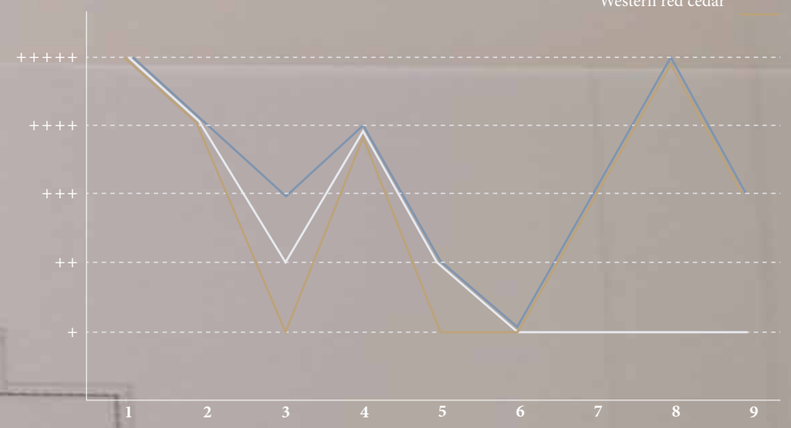
Pre fabricated concrete elements
Pre fabricated light weight concrete elements
In situ concrete

MATERIAL PROPERTIES

WOOD

Positive rate	+
Renewable resource	1
Plentiful amounts	2
Desity	3
Transport easiness	4
Short transport distance	5
Free maintenance requirement	6
Resistance to damp	7
Impregnation free	8
Durability	9

Pinewood
Spruce
Western red cedar



Ill. 97

MOVING IN THE LANDSCAPE

THE CONCEPT OF THE MASTERPLAN

In the intention to maintain the character of the landscape as a sloping fell facing the sea at the north, the architecture must correspond to this by telling the narrative of the landscape it inhabits. The architecture must create a path, where its shape enhance a movement in the landscape narrated by the landscape.

The site analysis and the case study of Louisiana form the concept of the masterplan; moving in the landscape.

A movement in the landscape is a movement through different situations and spaces and among different vegetation and ground conditions, often with a place to stay in mind. It could be a purled brook, a high top with a great expanded view or a pocket sheltered by rocks. The path runs through the landscape and binds situations together into a narrative.

Explained in the site analysis on pp 36-37 edges from the fell and the border from the coastline create a pocket in which the correctional institution will be placed. Another edge is the river crossing the fringe of the site. The size of the river is decided by the season. However, the river acts as an edge to cross when entering the site. When the river is crossed, the correctional institution is entered. The river also creates a natural direction of the site, a direction which is not strict south-north, but turned a little. These elements shape a pocket in which the correctional institution will be placed, framed by natural edges and borders. Another thing important to manifest before presenting the sketching phase is the access. Moving from the city to the correctional institution is a movement through a landscape, where the fell is rising on the right hand and the sea is on the left. Before crossing the river a fell block divides the access over the river into two 'gates'.

In such a refined and dramatic landscape, the complexity in the landscape itself is remarkable. The response to this can be handled in two ways, either by an architecture trying to achieve the same refined expression and complexity as the landscape or an architecture defined by a geometry, where there is a distinction between constructed elements and natural elements. The geometry does not necessarily distinct between architecture and landscape, but is able to emphasise the characters of one another.

During different sketch studies and exploring movement in the landscape, the geometrical planning of the masterplan emphasises the natural landscape elements and its spaces, whereas a more organic planning and shaping would create a disharmony because of tensions between what is constructed and what is natural. The geometrical plan also relates to a parallel organisation in an attempt to ease navigation. A fact which is important as functionality has high priority. The geometrical shape complies to the landscape, where the organic shape compete against it.

WALKING IN THE LANDSCAPE

The path

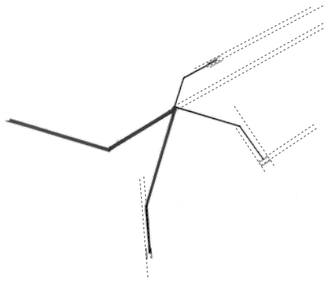
The landscape is the most important material when planning architecture. Its different spaces, rhythms and natural paths indicate where to build. Walking the landscape must therefore be where the architecture takes its departure.

The first step in the design process is for that reason to establish a path. A path which will function as an axis for the architecture to come. This path is running through the landscape and ends in a particular space with a specific character - a natural stop. The path has the aim to express the capacity of the specific space.

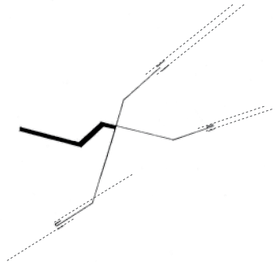
It follows the movement and heights in the landscape to emphasise the natural flow. The path is not a distinction from the landscape, even though walking on a path, man still walks in the landscape.

The following shows the sketches of the path. The sketches correspond to different spaces in the landscape. The access is above the fell protrusion to have the opportunity of being divided into three paths; one for the closed department, one for the open department and one for the re-entry department.

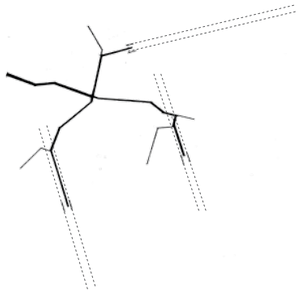
Ill. 98



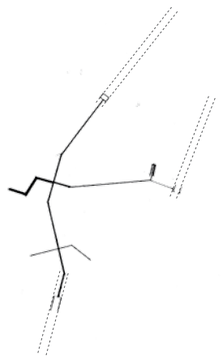
1 / vegetation, rock and fell



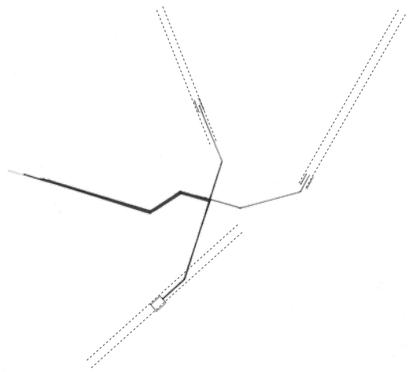
2 / vegetation, river and fell



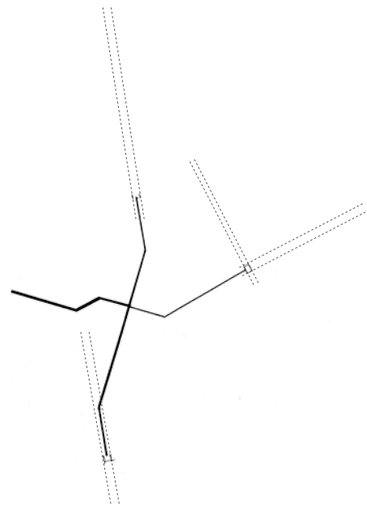
3 / vegetation, rock and fell



4 / vegetation, rock and fell



5 / vegetation, river and fell



6 / vegetation, river and fell

PLACEMENT IN THE LANDSCAPE
the buildings

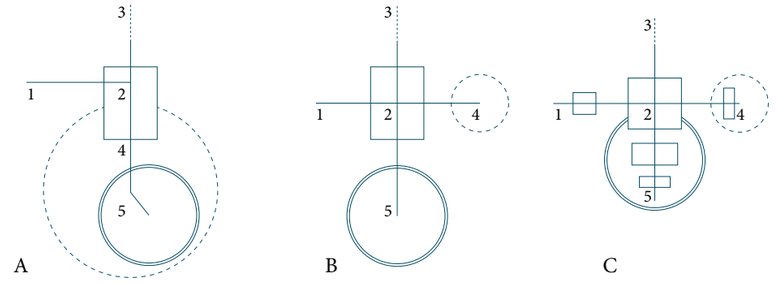
Explained by the room programme, the correctional institution contains some common functions and living units. A variation in the degree of privacy appears in these functions.

1: Common functions; Common space
2: Living unit; semi common space
3: Cell; 'private' space

Ill. 99

When placing the functions in the landscape they somehow must connect to the path. Thereby the path becomes the access to the different functions, ensuring that the buildings are related to the landscape spaces which the path enhances.
When organising the functions different considerations are essential; the functionality according to the inner movement pattern both for inmates and staff, the different departments and their degree of closedness and the movement of the landscape. Therefore various situations could be imagined:

OVERALL ORGANISATION

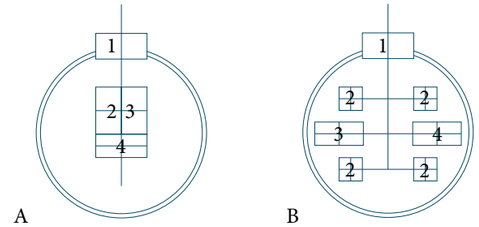


1: Access, 2: Common facilities, 3: Re-entry department,
4: Open department, 5: Closed department

Ill. 100

A: All common functions are gathered. A fence encircles the open department in which the closed department is placed surrounded by a wall.
B: All common functions are gathered. The departments are separated where the open department is encircled by a fence and the closed is enclosed by a wall.
C: The common functions are separated and dispersed in the landscape. The departments are separated and encircled by respectively a fence for the open department and a wall for the closed department.

DEPARTMENT ORGANISATION



1: Access, 2: Living units, 3: Common outdoor area,
4: Workshop and school

Ill. 101

A: All functions are gathered.
B: The functions are separated and dispersed in the landscape.

What the diagram above shows is a dissolving of the building mass into the landscape. A dissolving which makes better daylight conditions possible in the interior and lets the buildings express the movement in the landscape by following it. Further it solves some challenges according to the sloping landscape, because the building only reaches over short distances.

Placement as a symbolic phenomenon
When walking in the landscape the horizon expands over the sea, which leaves a feeling of freedom. Ensuring the felling of moving down the sloping fell side brings the sea and the freedom closer. Therefore the closed department is placed at the farest distance from the sea and the re-entry department is placed closest to the sea. The journey inside the correctional institution, moving from closed department to open department and then finally to re-entry department symbolises moving towards freedom.

The following sketches show different placements of the buildings in the landscape related to the paths on the previous page.

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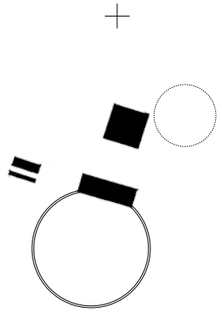
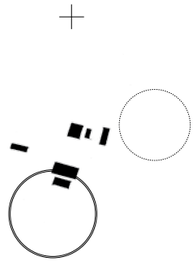
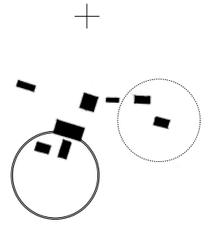


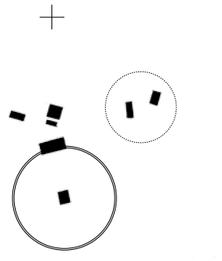
1 / staff area, administration, culture centre
closed department open department + re-entry department



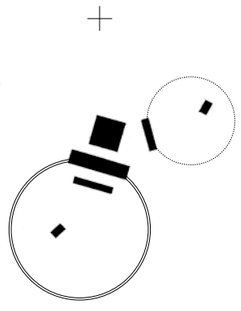
2 / staff area, administration, visitor center, workshop and school , culture centre
closed department open department + re-entry department



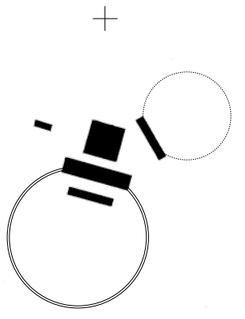
3 / staff area, administration, visitor center, workshop and school , culture centre, outdoor activities
closed department open department + re-entry department



4 / staff area, administration, visitor centre, culture centre, outdoor activities
closed department open department + re-entry department



5 / administration, culture centre, workshop and school, outdoor activities
closed department open department + re-entry department



6 / staff area, administration, culture centre, workshop and school
closed department open department + re-entry department

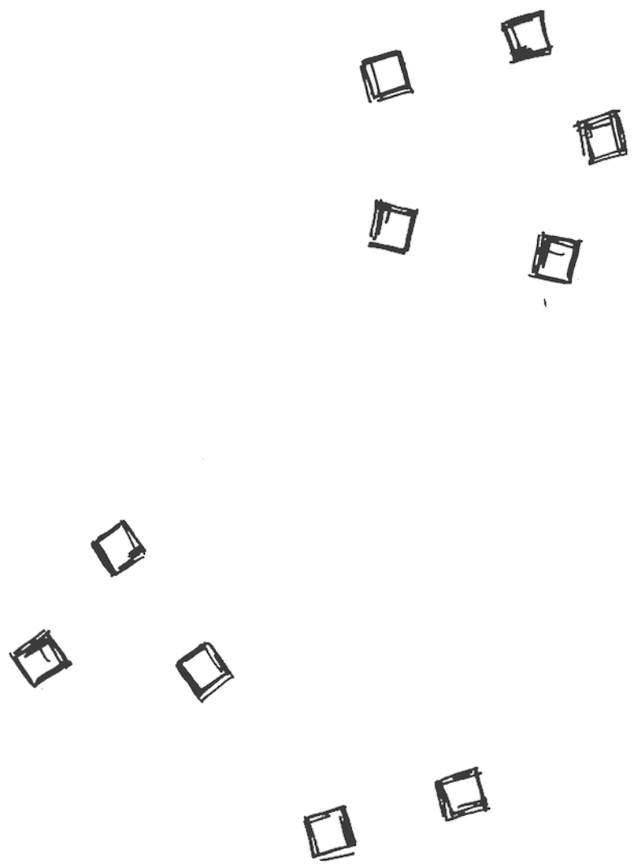
ARCHITECTURAL DEVELOPMENT
building in steps

The landscape is what creates the frame of the architecture to come.

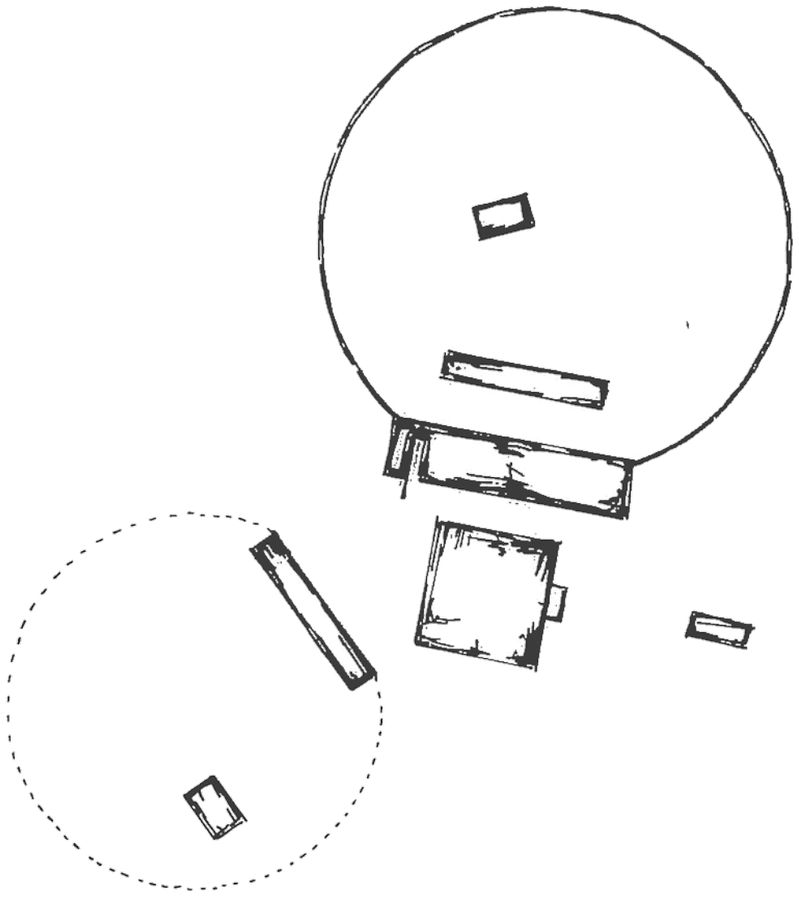
By starting to clarify the movements, the rhythms and spaces the movement of the path is decided - the first step in the architectural development. The path is not a dissociation from the landscape, but a path to the landscape. The fixed buildings use the path as an axis, which indicates where to inhabit the landscape. This is the second step in the development. Finally living units are added on to the path, placed by means of bypaths showing the possible placements. This is the third step in the architectural development. The analysis tell that the number of inmates rises. Therefore it is important that the project opens up for adding in more space in a functional and restorative way.

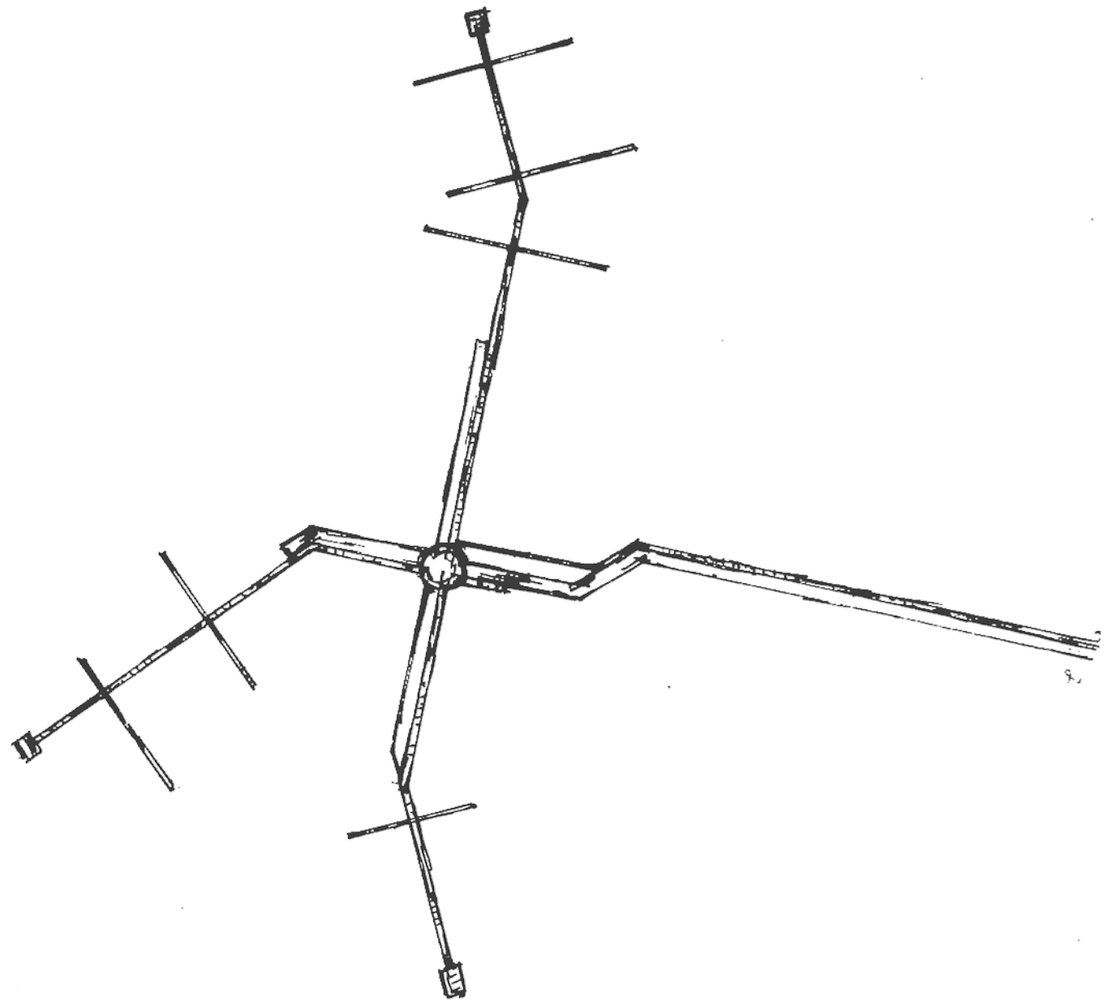
The following sketches show the architectural development and building process dispersed into different layers.

Ill. 103



cell units





path

CHANGEABLE OVER TIME

THE CONCEPT FOR THE LIVING UNITS

The changing population in the correctional institution is stated in the chapter concerning the institution. However, not only the changing population, but also the rising number of placements in the correctional institution aims for an architecture which is changeable over time. This is an important part of the design concept.

Drawn from the previous chapter concerning the organisation the correctional institution contains common facilities such as the administration, the cultural house, the workshops and schools. These functions do not have a need for a change in capacity, because the use of these functions are determined by a changing schedule, and they will therefore not be over-loaded by the changing population in the institution. When the population changes it is in the living units that the correctional institution is missing space - in the number of cells. Therefore an additive building system is an aim for the living unit.

The additive system will be based on a one-year-period, due to certain considerations. The population changes every day, but an architecture corresponding to this would be resource demanding. Concerning the idea of resocialisation, it should not be effortless to detain people, still there has to be enough space. A practical aspect is that more inmates demand more staff. If the number of inmates changes every day, the staff must change too, which is impossible. Finally, as described in the introduction to the design process pp 66, the main material is concrete, a material which complicates a day-to-day additivity because of its weight and transport options. The one-year-period will future proof the correctional institution according to the rising number of placements and the additive building system will not result in uninhabited cells, as places are only added where and if there is a demand.

INFORMATIVE ELEMENTS

Information to the additive system must be given in the intention to match the architectural vision.

INFORMATIVE ELEMENTS:

+ ***Restorative approach***
+ ***Arctic landscape approach***
+ ***Additive approach***

RESTORATIVE ELEMENTS

The restorative elements concern the interaction with the landscape in a textural and visual sense, also with the light conditions in the interior and with the materiality and properties of concrete. The functionality of a correctional institution including the feeling of security and movements are significant.

ARCTIC LANDSCAPE ELEMENTS

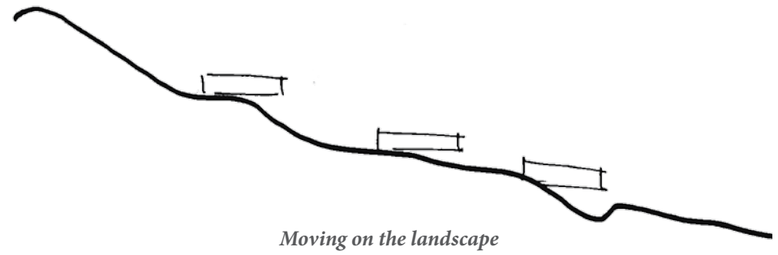
The site conditions express a sloping landscape with varied ground conditions, a low sun and the main wind direction from north. The arctic climate calls for compact well insulated buildings where thermal bridges are avoided, a fact which creates demands for the assembly system and joints.

ADDITIVE APPROACH

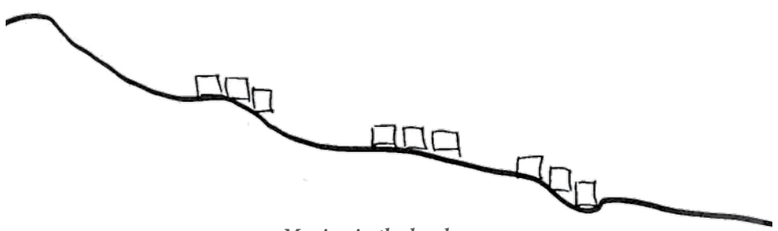
The additive system as to the assembly system, has to relate to concrete joints. The additive system must correspond to pre fabricated elements.

MOVING ALONG OR IN THE LANDSCAPE

In the discussion of how the living unit should correspond to the landscape the following two situatios are possible:



Moving on the landscape



Moving in the landscape

Ill. 104

In terms of the original idea for this project: "To reintroduce resocialisation into the correctional institution", one important aspect should not be forgotten; the architecture must not appear oppressive, but become embracing in the correctional way and express experiences of something the inmates recognize as safe and well-known. The scale of the living unit must not become dominating in relation to human scale and the landscape it inhabits. When the living unit is moving in the landscape the interior becomes closer to the landscape and nature, thereby the landscape will not be reduced into a visual object which seems far away. These considerations conclude that the living unit must follow the landscape.

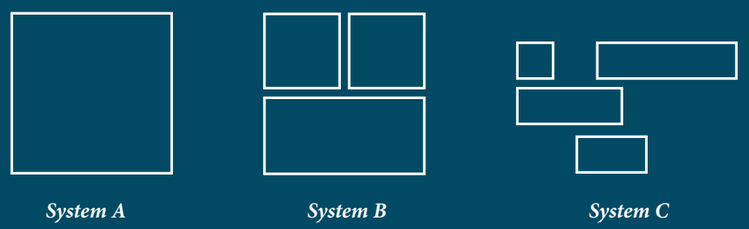
DEGREE OF ADDITIVITY

In the chapter "Additive Architecture" different suggestions for additive architecture has been presented. All represent different degrees of additivity. For a correctional institution various elements must be deliberated, when working with an additive system. From the assignment a high degree of flexibility is requested. However flexibility is a broad term and if it is understood as an extension of the built square metres it may result in difficulties controlling the visual expression. On the other side low flexibility gives challenges in adjusting the architecture to a specific situation.

Drawn from these facts, the additive system for the living units must be able to adjust to the actual landscape conditions, but at the same time have an uniformity among each other both in an economical perspective, but also to ensure the external architectural and spatial quality. The additive system must be adjustable and fixed at the same time.

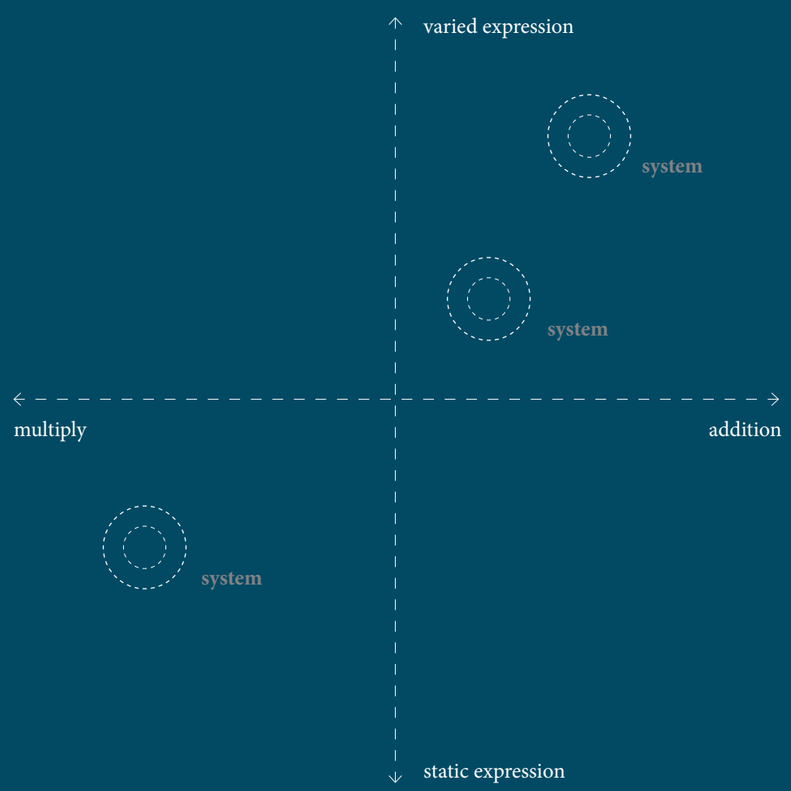
In the following different diagrams explore the possibilities in additive systems which are furthermore expressed in a system showing the expression versus the degree between multiplication and addition, and combination possibilities versus the element or component system.

Based on the studies and the before mentioned considerations the system B expresses a system compatible to the intention of adjusting the building to its actual site, while still ensuring some control of the aesthetic expression in the living unit. The system is consistent with additivity based on a one-year-period, the amount of cells and living units can change from one year to another.



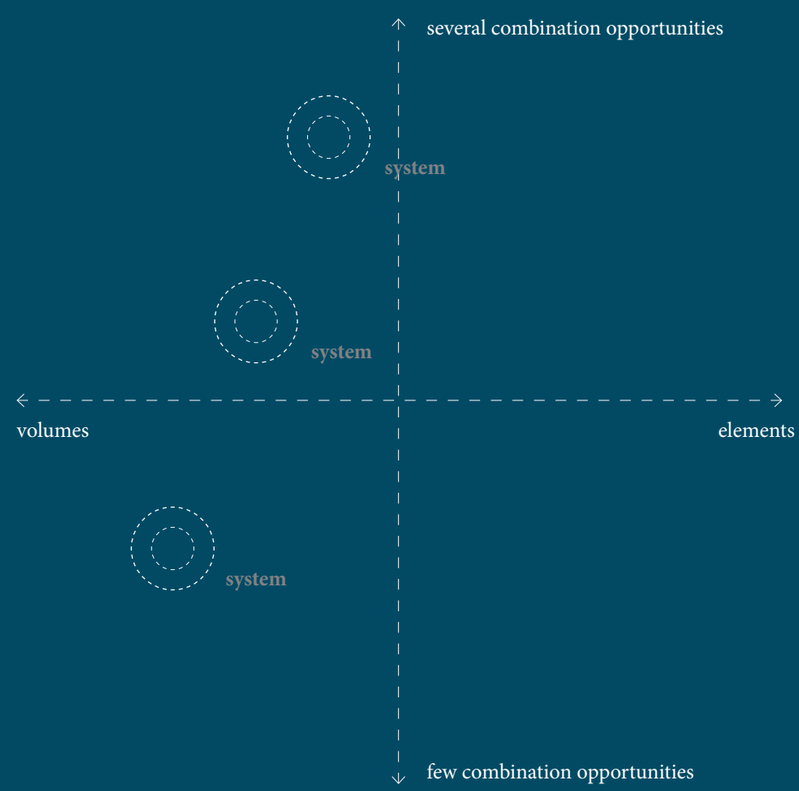
Ill. 105

DEGREE OF ADDITIVITY
The diagram shows different degrees of additivity going form one additive element to several elements.



Ill. 106

ADDITIVE VARIATIONS
The diagram shows how the different systems can be categorised in relation to how much they vary in expression and in relation to the extend of additivity.

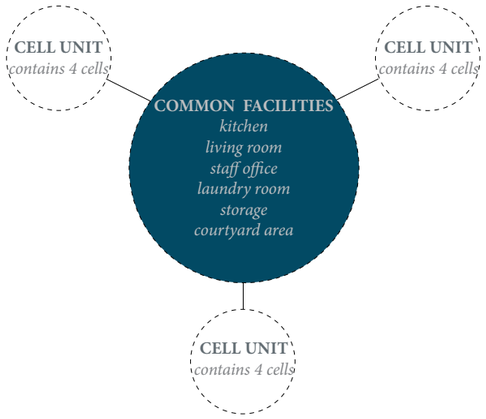


Ill. 107

ADDITIVE VARIATIONS
The diagram shows how the different systems can be categorised in relation to the extend of the combinations possible and in relation to how fixed they are. If they are finished volumes or if they are elements to be assembled.

INFORMATIVE ELEMENTS - STUDIES

When beginning to sketch on the additive system, based on the conclusion for the degree of additivity, the before mentioned informative elements create the frame for the studies. Derived from the room programme every living unit must have the ability to contain a maximum of 12 cells. The assignment clarifies that 4, 8 or 12 people should share the common facilities in the living unit, which for this project is articulated in cell units containing 4 cells each. Thereby the cell unit becomes an additive element, an appendage to the common space of the living unit.



Additive possibilities in a living unit Ill. 108

The studies alongside here are executed as model studies, which are translated into diagrams (photos of the original models can be seen in appendix 4). Study C gives with its rectangular shape the most possibilities of adding cell units in different positions, which enables an adjustment to the landscape. Because of the great terrain differences additional adjustments to the landscape are demanded. The connecting elements between the common space and the cell unit provide this option when turned into a staircase. Further the additive system creates possibilities for a varied facade expression within a uniform system.
For security reasons views from one cell to another should be minimised to avoid communication between inmates when locked in their cells. Bars should be avoided (cf. pp 48) and they are therefore not a possibility for obtaining this, so the building should in itself be able to prevent fields of vision between cells. Systems C provides the most opportunities for achieving this by making it possible to adjust both the cell units and entire living units in relation to each other within the departments.

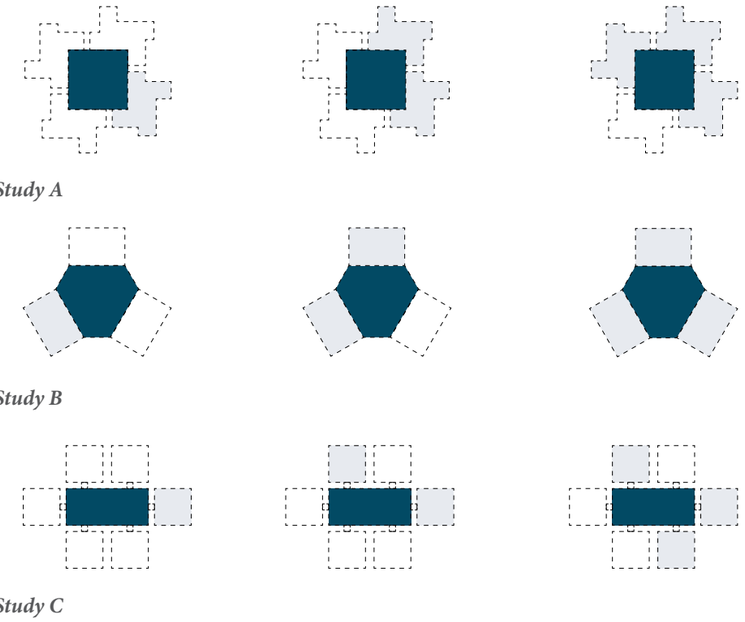
CONTROLLING THE ADDITIVE SYSTEM

In order to control the visual expression of the additive architecture limitations of the system must be determined. Limitations dictating possible addtions, where cells and living units can be added and how many. Therefore pillars are used as foundations and also as preparation for the architecture to come. Further the expression of the pillars emphasise the idea of an additive system, something temporary, movable and changeable as the buildings are only supported in a few places in stead of on whole surfaces. They allow the landscape and the melting water to continue under the building, which also prevents absorption of moisture and supports the moveable expression (cf. pp 28).

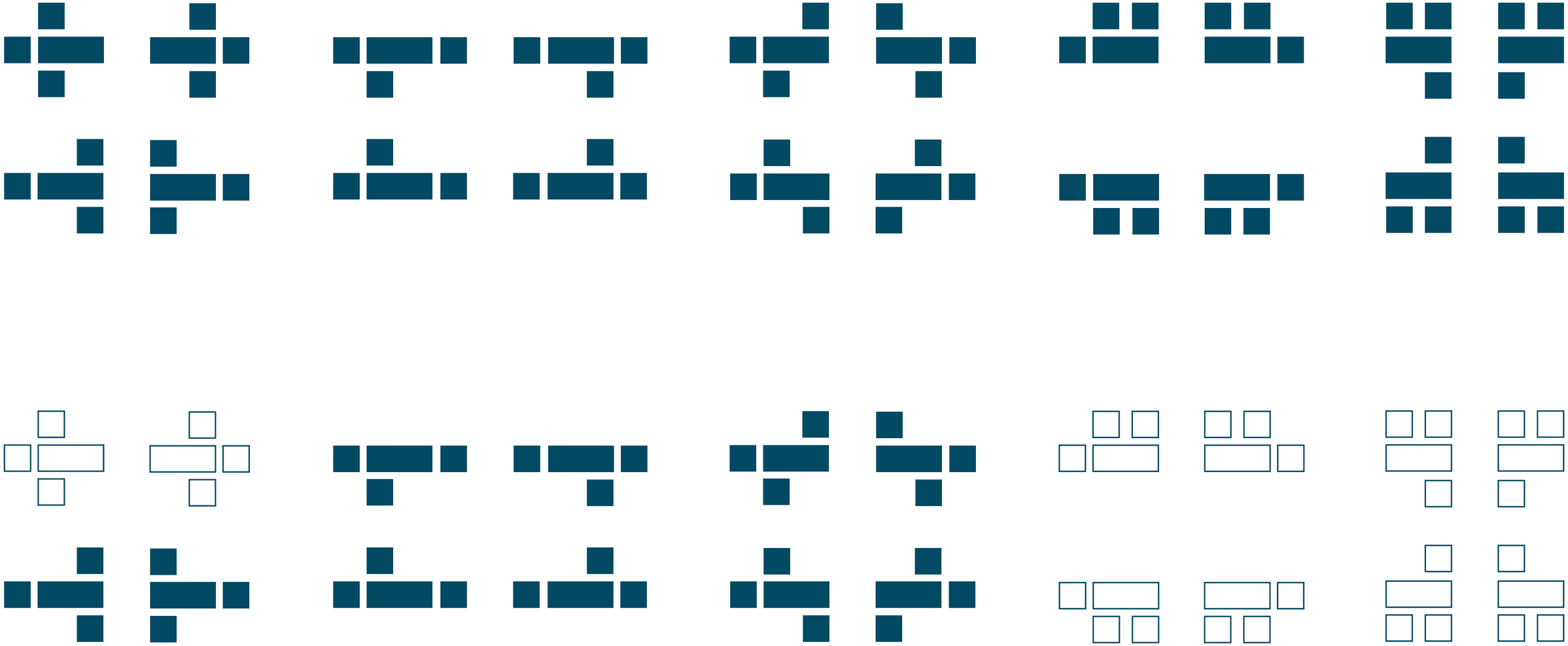
In the previous studies the chosen sketch enables six surfaces to which the connection element and thereby also the cell unit can be added. This makes different combinations possible (see diagrams on opposite page). In terms of letting daylight into the common space, the combination with three cell units connected to the same end of the common space is impossible. Also the situation where two cell units are placed on the same long side of the common space is impossible because the cell units then block each other's view to the landscape and makes it possible to look directly from one cell to another. The potential combination possibilities control the additive system and ensure light and view for both the common space and the cell units.

ADDITIVE HIERARCHY

While the living units are standing on pillars, the fixed functions, described in the previous chapter, are deeply rooted in the fell, communicating a non-additive system. Every living unit must appear as an entirety, however the common space is the centre of the living unit to where the additive cell unit is added. The connection element between the common space and the cell unit must appear as the joining part which connects the appendage, the cell unit, to the core, the common space. A uniformity among the cell units emphasises their appendage function together with a smaller volume. Further the outdoor path accesses the common space, enabling the option of sectioning between the cell units and enhancing the common space as the centre. This will be shown in the following chapter concerning the further design of the living unit and the cell on the basis of a restorative approach.



Ill. 109



Combination possibilities

Ill. 110

FACILITATING RESOCIALISATION

THE CONCEPT OF THE SPATIAL QUALITY

When creating a correctional institution an essential question prevails; how comfortable conditions must those who have committed crime have? This essential question must be clear even before sketching. Drawn from the original idea of the correctional institution, the intention is to correct people – to resocialise. The constructed frames, the architecture, are not the punishment, the confinement is.

With the intention of reintroducing the original idea of resocialisation the architectural development search experiences from restorative approaches described in the chapter 'Restorative Architecture' concerning:

+ Movement + Light + Materiality + View + Sound

The communication between them must intend to promote resocialisation. Even though the architecture does not have the strength to become resocialisating in itself it has the ability to affect people's emotions in a positive way. How the elements communicate will be explored in the following.

The elements communicate in the creation of spaces. Spaces which expand in a scale between the private refuge and the common space.

THE IDEA OF A FLEXIBLE COMMON SPACE

In continuation of the additive approach flexible spaces must be developed to adjust to changing situations. Flexible spaces have the ability to become common spaces, with an expanded possibility for different activities. However, they also have the tendency to lose identity in their attempt to embrace a broad functionality. To avoid this unfortunate situation moveable activities, which take advantage of the expanded space the flexible area provide, will be included.

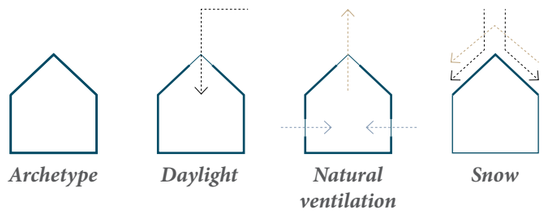
THE IDEA OF THE PRIVATE REFUGE

The private refuge is understood as a place where man feels protected. In the development of this idea the niche occurs. The niche is somehow related to the cave – protecting and embracing. Depending on the size it has the ability to become an intimate private sphere - a place where one's mind is drifting.

In the scale between the two above mentioned spaces the common space and the cell in the living unit occurs.

THE ARCHETYPE OF A HOUSE

Decisive is that the architecture does not appear oppressive to the inmates, but is experinced as something well-known, or to be exact; well-known within frames which are not self chosen. Therefore the archetypes of a house is the shape which characterises the living units, illustrating that this is the living house.



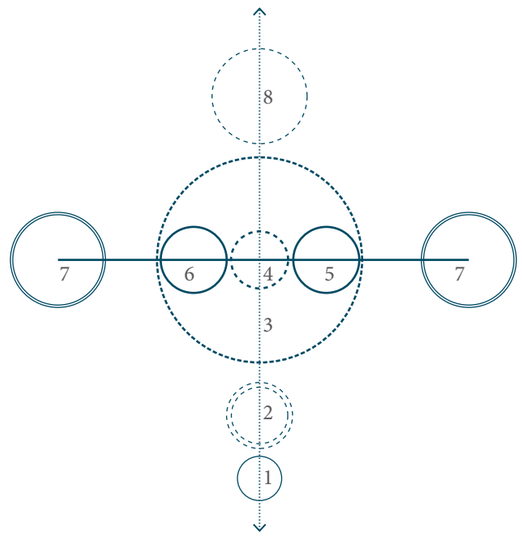
Ill. 111

Further the archetype provides some desirable qualities regarding daylight conditions, natural ventilation and snow.

SOLVING THE COMMON SPACE

The social togetherness is highly prioritised in the Greenlandic society, therefore the common facilities in the living unit are seen as the core of the house. There must be space for different social activities, but also space to retract to. The core must occur as a unity, an archetype, in its aim to become the centre of the living unit. In the core a courtyard is going to be implemented. This is the outdoor space the inmates can use unaccompanied in the time span they have access to the common space in the living unit, that means not at the night where they are locked into their cells and in the time period during the day where they are at work. The expanded horizon and the sea towards north are in terms of view the most attractive. However the correctional institution is surrounded by untouched pure nature and the sun direction is from the south. There is really no bad directions. Therefore openings must be placed in different directions to ensure both daylight and view. The main wind direction is from the north, therefore the entrance must be placed on the southern side of the living unit in an attempt to create a protected access. When building in Greenland thick walls to ensure a proper u-value must be introduced. Besides an appropriate u-value, the thick walls create some architectural possibilities - they have the ability to become spaces in terms of niches. In continuation of the movement of the outdoor path, the intention is to continue the path in the interior of the living unit to connect the living unit to the path. The path follows the movement of the landscape - the living unit should follow this idea. When running through the living unit, the path indicates a direction which is always searching for the landscape.

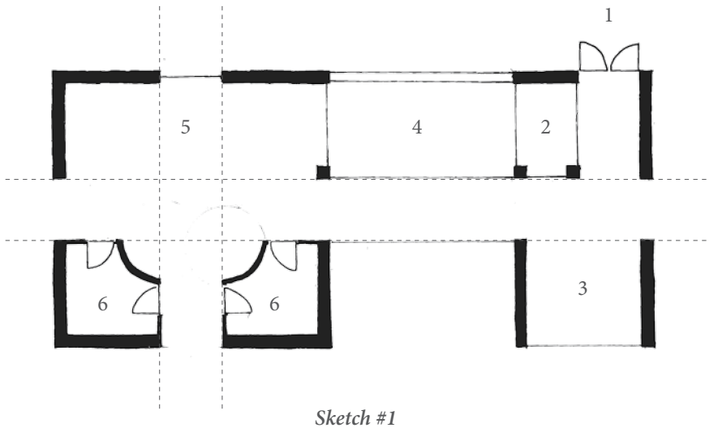
In the following different selected sketches show the development of the living unit.



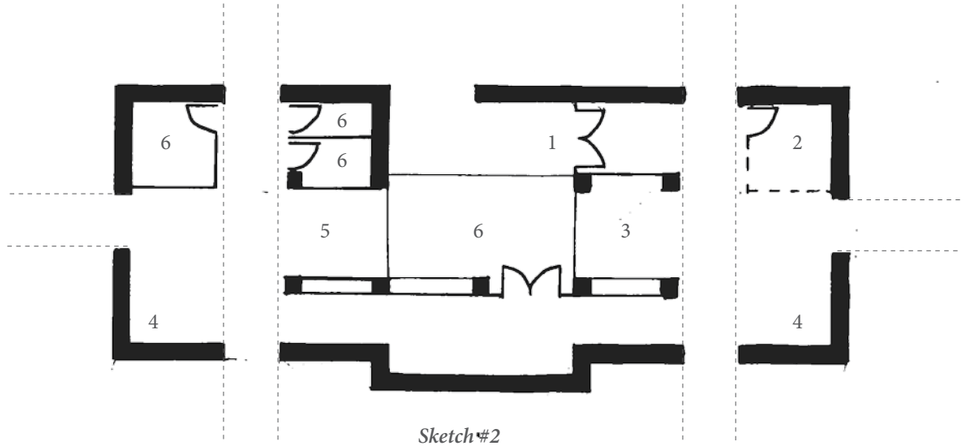
Function diagram of living unit

1/ protected entrance, orientated towards south 2/ Watch room, staff 3/ Flexible common space 4/ Courtyard 5/ Kitchen 6/ Television 7/ Cell units 8/ Terrace

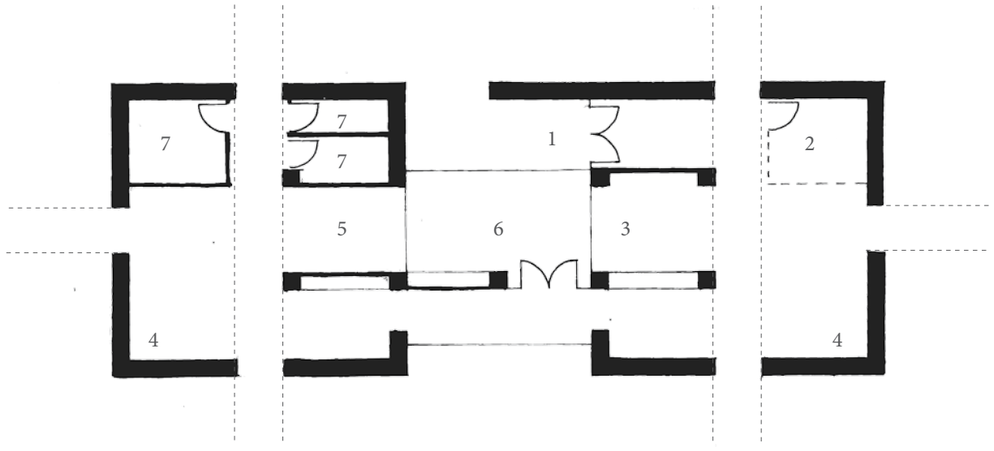
Ill. 112



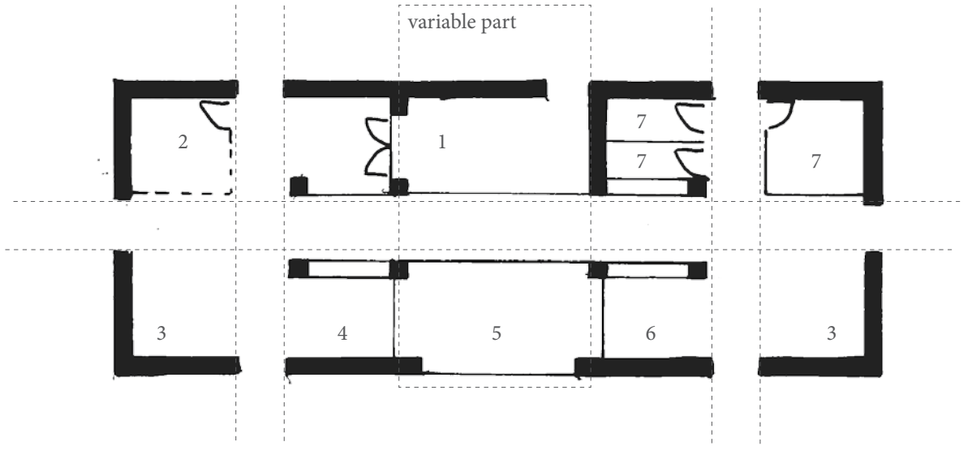
Sketch #1
1/ Access 2/ Watch room staff 3/ Kitchen 4/ Courtyard
5/ Flexible space 6/ Practical rooms



Sketch #2
1/ Access 2/ Watch room staff 3/ Kitchen 4/ Flexible space
5/ Television 6/ Courtyard 7/ Practical rooms



Sketch #3
1/ Access 2/ Watch room staff 3/ Kitchen 4/ Flexible space
5/ Television 6/ Courtyard 7/ Practical rooms



Sketch #4
1/ Access 2/ Watch room staff 3/ Flexible space 4/ Kitchen
5/ Courtyard 6/ Television 7/ Practical rooms

DECIDING THE COMMON SPACE

To keep the unity of the common space without breaking it up sketch #4 shows the creation of an axis, where the ridge is continuing. The path is shaped by directions which lead the eye to the landscape. The courtyard is the centre of the common space, protected from the wind by a screen and access permitted from both the kitchen and the television space. The thick interior walls are hollowed out and create niches. The corners are avoided by transparent or translucent surfaces.

When thinking of the before mentioned, moving along or moving in the landscape, the sketch #4 has the ability to be variable in its middle part, different varaitions of the variable part will be shown later in the report.

The function of the living unit is to embrace the inmates, therefore the material of the interior walls must occur as lining in a “cave”. The materials will be described later on pp 100-101.

Ill. 113

SOLVING THE CELL
in a restorative sense

The cell is the closest the inmates get to a private space. This is the place where one has a small world of their own and it works as a refuge. In the time span from 8.30 pm to 7 am the inmates are locked in their cells, therefore the aim is to create different unbounded spaces in the cells related to the functions;

+ Immersion + Refuge + Bath + Floor

Immersion means a place to read and write. The refuge is a place to let one's mind drift and to sleep, here the niche is introduced. The openings in the walls, the view to the outside, is important for those two spaces. Where man is left alone the relation to the landscape and the outdoor is essential. Openings allows light to enter and makes it possible to follow the changes of the day and the year. The landscape might also lead to feelings of longing, regret and reflection.

In terms of security there has to be a view from the door to the whole cell. In the following the development of the cells are shown.

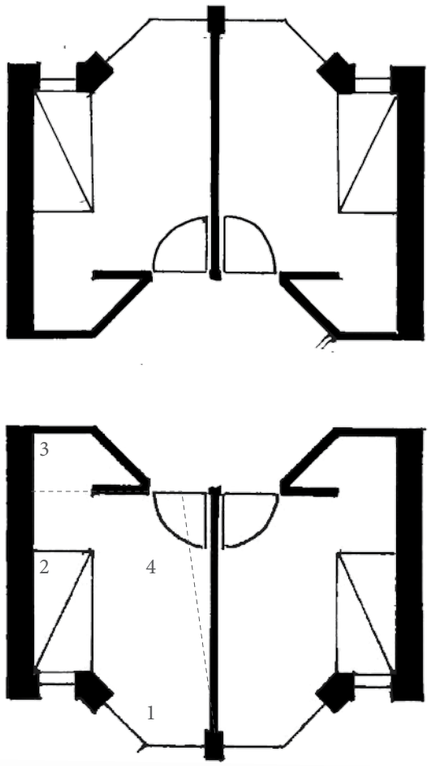
DECIDING THE CELL
The cell should not only take the four mentioned spaces into account, but also be imagined in a relation to the common space of the living unit, here the archetype of a house.

Drawn from these arguments sketch #6 is the one which will be further elaborated. The fields of vision are illustrated to visualise the overview in the cell. The wall to the bath hinders full overview, but when using transparent or translucent surfaces it can be solved. In terms of daylight, which is important in a restorative sense, windows ensure daylight from different directions by having different orientations. The refuge is the niche, where small windows allow view to the landscape. The immersion space is represented by a windowsill to sit in, where a larger window ensures proper daylight conditions.

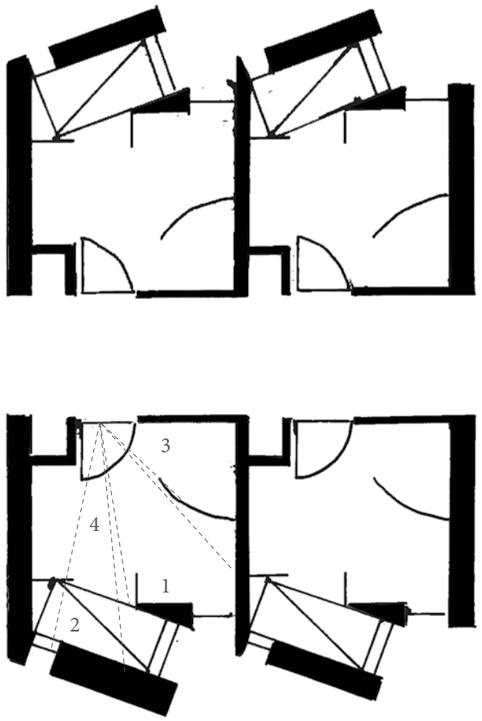
In appendix 5 models of the different sketches are shown.

In the following the merging of the common space and the cell unit will be handled.

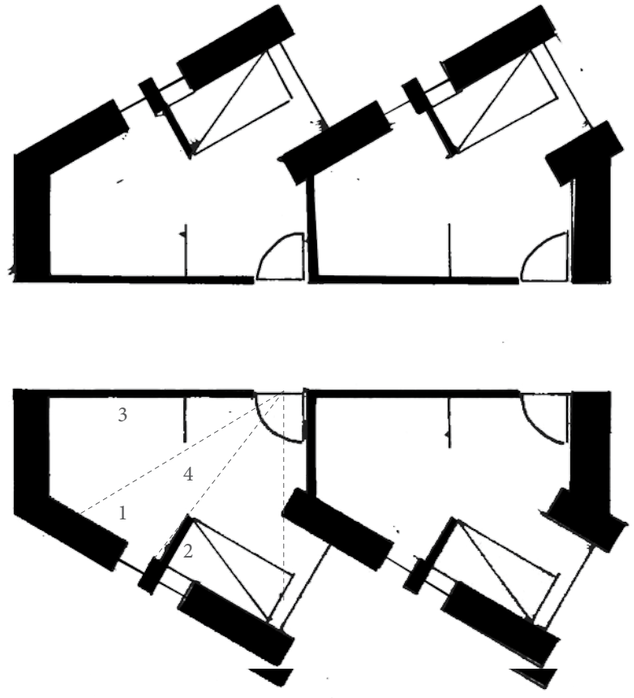
Ill. 114



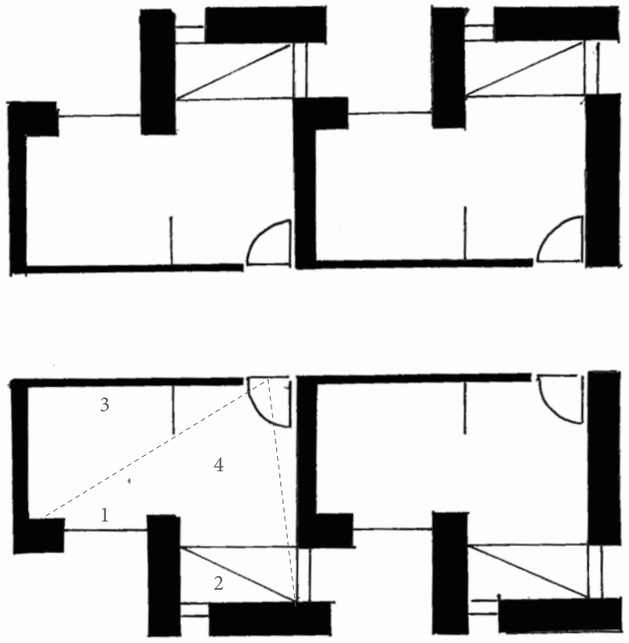
Sketch #1
1/ immersion 2/ refuge 3/ bath 4/ floor



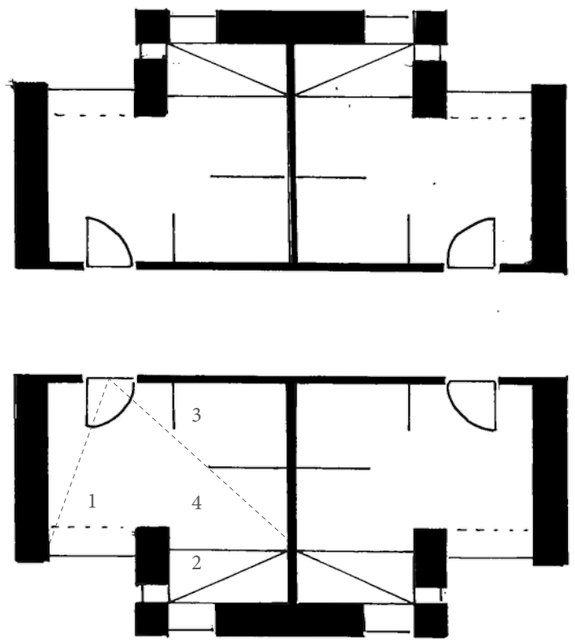
Sketch #2
1/ immersion 2/ refuge 3/ bath 4/ floor



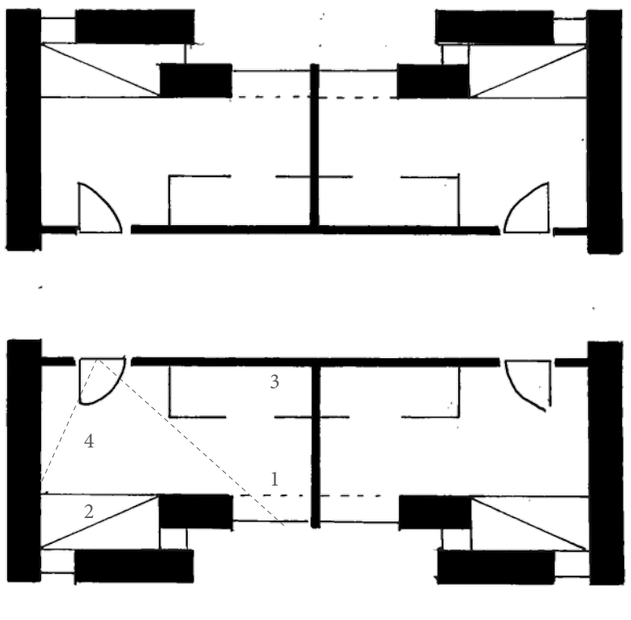
Sketch #3
1/ immersion 2/ refuge 3/ bath 4/ floor



Sketch #4
1/ immersion 2/ refuge 3/ bath 4/ floor



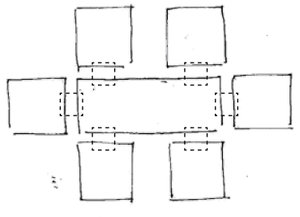
Sketch #5
1/ immersion 2/ refuge 3/ bath 4/ floor



Sketch #6
1/ immersion 2/ refuge 3/ bath 4/ floor

ADJUSTING TO A SLOPING LANDSCAPE
merging the living unit

When merging the common space and the cell unit into the living unit the space in between them becomes articulated. The connection element is an adaptor, connecting the two parts together. Besides the act of creating physical connections it also visualises the continuation of the path (cf. pp 86).

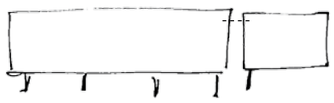


Ill. 115

The hierarchical and structural tension between the two parts, the common room and the cell units, were explored in simple models, which are shown as sketches.

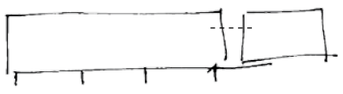
Ill. 116

Sketch #1
The pillars indicate where to add the cell unit. When thinking of the hierarchical composition between the parts there is no structural difference between the common space and the cell unit, however the cell unit must be connected to the common space in order to work functionally.



Ill. 117

Sketch #2
Again the pillars indicate where to add the cell unit. Only two pillars bear the load of the cell units and a tension cable ensures to counteract the moment. The cell units then become structural dependant on the common space and a structural hierarchy occurs. Challenges arise caused by the heavy load of the concrete cell unit supplemented by the fact that this is pre fabricated concrete elements. This will create challenges in making the elements strong enough to counteract the moment that the cell unit will cause. Furthermore concrete is a material with a high density which creates a contraction when placed high above the ground.



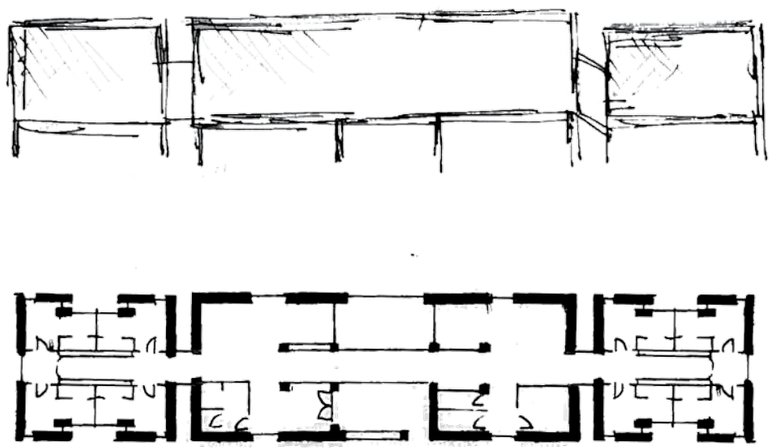
Ill. 118

Sketch #3
Nothing in the building containing the common space indicates where to add on. The structural hierarchy is however more visible, but the same challenges according to the construction as mentioned above occur.

Even though the structural hierarchy is the most visible in sketch #2 and #3 challenges related to the construction occur and the intention about following the landscape becomes problematic. The connection element must be an element which can make the adjustability to the landscape possible, further it has to pay equal attention to both the common space and the cell unit both in a functional and structural manner. However the connection element creates a narrative of hierarchy by separating the two building parts, the cell unit is the additive element.

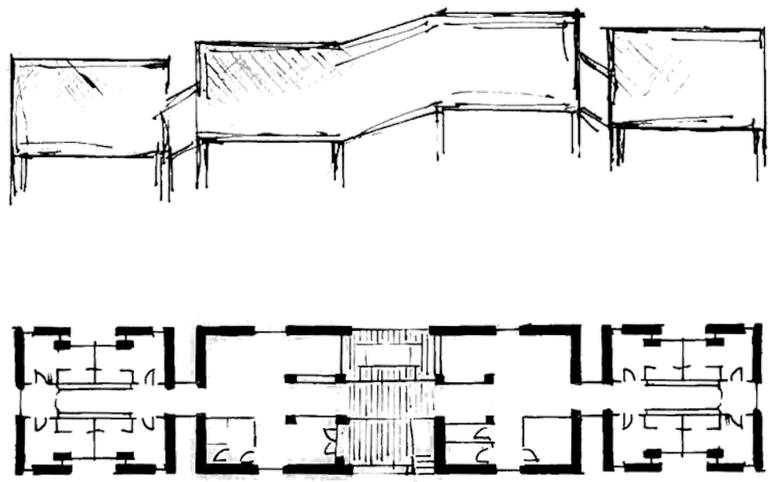
The sloping landscape dictates variable elements in the building to accommodate adjustments to the slope of the landscape. The possible level differences the connection elements create is not enough in terms of following the landscape, therefore the middle part of the common space becomes a variable part as well, adjusting the common space further to the landscape.

On the following page the common space and the cell unit are merged together and shown according to different landscape situations.



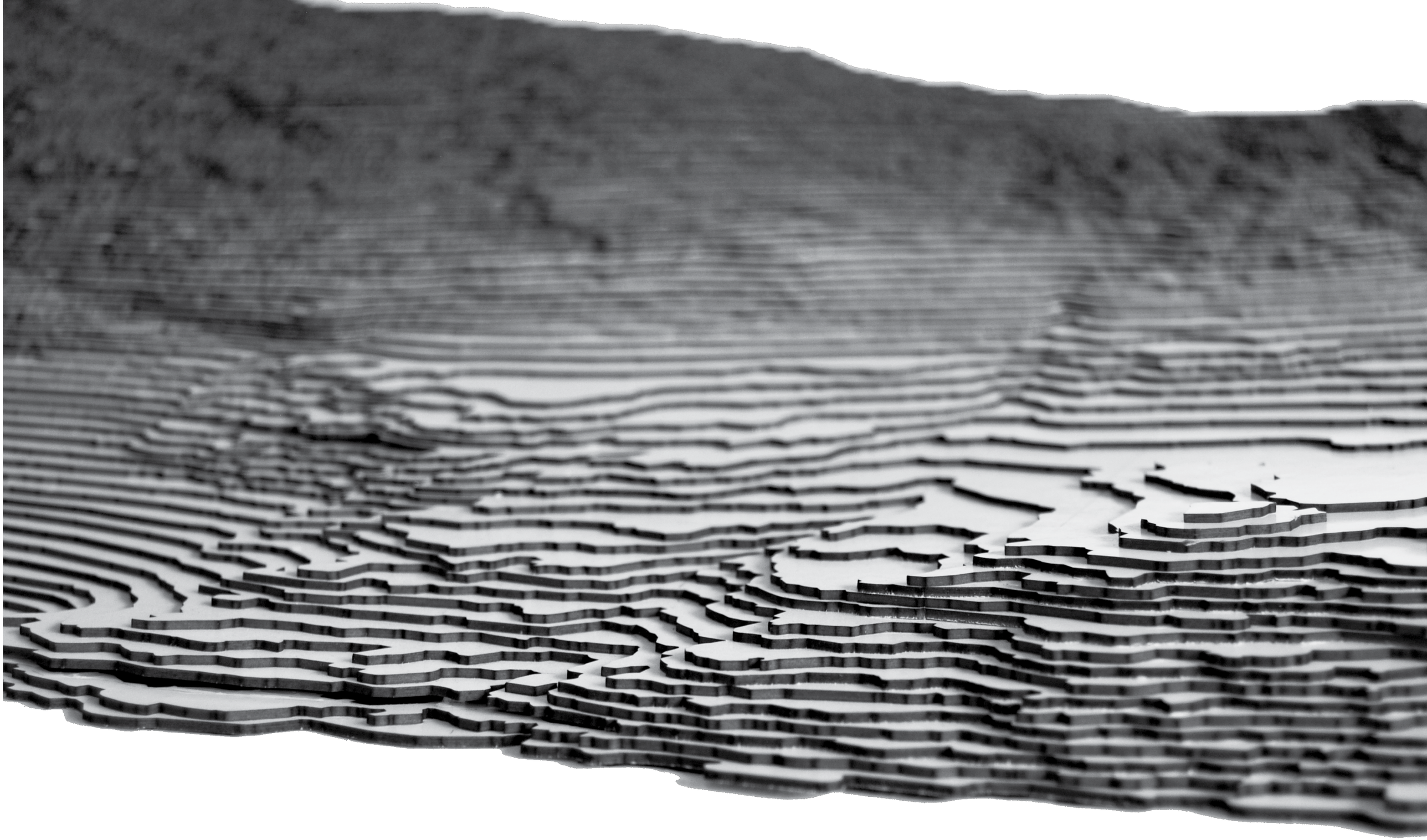
Ill. 119

Living unit - straight
The landscape underneath the building has little or no inclination, therefore no level adjustment is needed in the common room.



Ill. 120

Living unit - staircase
The landscape underneath the building has an inclination, therefore a level adjustment is needed within the common room.



Ill. 121

MATERIALITY
texture and expression

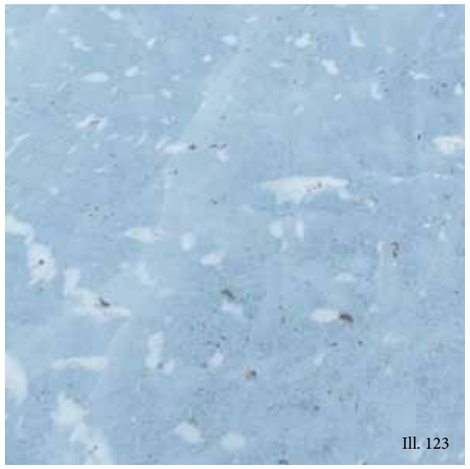
An introduction to the selection of materials has already taken place in the introduction to the design process, explaining the choice of materials (see pp 66-67).

The landscape consists of concrete phenomenons, so does architecture. [Norberg-Schulz 1984] [Zumthor 1998] What we see and touch are materials which cannot be reduced to building materials only. The term embraces all materials representing the experience of the architecture, thereby also the natural materials that the building materials must relate to. The architecture must take advantage of the landscape and respect it in the choice of materials. The materials of the landscape on the specific site are the points of departure in deciding the textures and substances of the materials for the buildings.

The building materials narrate the tale about the building process, explaining the history among the materials. The architecture becomes a natural part of the landscape. In the following a more detailed explanation of the material choices is visualised.


Ill. 122

FELL
Some of the fell is visible most of the year because the wind blows the snow from higher exposed places to lower sheltered places. In the landscape the fell is somehow a furniture, when looking for places to sit the fell is the obvious choice.


Ill. 123

ICE
The cold and hard ice is a natural sculptural element adorning the landscape.


Ill. 124

SPRING VEGETATION
Low red and brown vegetation breaks through the snow.


Ill. 125

SNOW
In the winter season snow covers most of the landscape. The sun is reflected in the snow and the light becomes decisive in the experience of the landscape.


Ill. 126

SUMMER VEGETATION
In the summer a green carpet containing multiple kinds of vegetation covers the landscape.

Ill.127

WOODEN PATH, FLOOR AND FURNITURES

Wood is a natural material. Its light expression is utilised by a path floating through the landscape both outdoors and indoors in the living units. The direction of the planks indicates the direction of the movement through the landscape.

Wood contributes to a warm atmosphere with its tactility and colour and at the same time it has an acoustic potential. Therefore wood shapes interior furnitures and in cooperation with the light it indicates places to be. Where planks in the path show the direction of the movement wooden plates indicate places to stay - places without direction.

Ill. 128

IN SITU CONCRETE WITH WOODEN FORMWORK

The dark colour symbolises the imperishable in the built and mark the permanent structures of the correctional institution as clear lines in the landscape. Vertical orientation of the wooden formwork shorten the visual experience of the elongated, permanent in situ concrete buildings. On a distance the buildings appear as sharp dark volumes, raising from the fell as fell-protrusions deeply rooted in the fell. Up close the pattern from the wooden formwork appear and adapt the facades to a human scale creating life and variation in the facades.

Ill. 129

CORRIDORS IN CORTEN STEEL

Corten steel contributes to a warm atmosphere and indicates entrances in the corridors in the permanent buildings.

In Greenland the daylight conditions changes during the course of the year. The winter is dark and the daylight sparse. Therefore the integration of artificial light is of particular importance. Patterns of light are created in the corridors, as a play of colours together with the shimmer tones of the corten steel.

Ill. 130

PRE FAB. CONCRETE WITH SUSCEPTIBLE SURFACES AS EXTERIOR FACADES ON ADDITIVE BUILDING SYSTEMS

The concrete surfaces of the pre fabricated living units are light and rough. Light to indicate a temporary situation and rough in order to be susceptible for the environment. A rough surface is more susceptible for environmental factors. Thereby, over time the buildings will slowly merge into the landscape through their patina.

The light colour will over time change to darker tones and tell the narrative of the historical time perspective in the additive building system, indicating the age of the buildings - separating newly added units from the old units.

Ill. 131

PRE FAB. CONCRETE WITH SMOOTH SURFACES AS INTERIOR FACADES IN ADDITIVE BUILDING SYSTEMS

The interior walls in the pre fabricated living units appears as smooth white concrete. The white colour and the smooth surfaces give the impression of a lined refuge protecting you from the often rough outdoor climate.

ACOUSTIC ENVIRONMENT
based on studies of reverberation time

In relation to the restorative approach, the acoustic quality is important in the attempt to obtain an environment which reduces negative experiences. The acoustic quality is not that easy to define, because the acoustic quality always depends on an actual situation. However what influences the experience of the sound is the materials and their ability to absorb sound. Where hard materials such as concrete reflect the largest amount of the sound, porous materials have better conditions for absorbing the sound. The area of materials together with the total volume influence what is experienced as the acoustic quality which is described as the reverberation time.

The reverberation time is characterised by Sabines formel, which is a measure for how fast the sound will be reduced by 60 dB. It is decided by the volume of the room and the equivalent absorption area:

$T = 0{,}16 \cdot (V/A)$

V= The volume of the room in m^3
A= Equivalent absorption area, $\Sigma \alpha \cdot S$
S = The area of the absorbing material
α = Absorption coefficient

[rockfon.dk 2013]

As the formula states the reverberation time is proportional with the volume, so if the volume becomes double size, the reverberation time will be double too. [troldtekt 2009] In this case an additional height in the rooms is chosen to ensure proper daylight conditions (will be described in the following chapter). But the height gives some challenges together with the choice of materials which is mainly concrete according to the reverberation time which affects the experience of the acoustic quality.

STUDIES
In the following studies of the reverberation time in the respective areas, the common space and the cell in the living units, are accomplished. In both cases the calculations are based on Sabines formula. The rooms are calculated as closed rooms, with closed doors and without non-permanent furniture. Three different scenarios with different materials are investigated, to explore the influences of the materials on the reverberation time.

The studies are based on the following volumes:

Common space: 447,67 m^3
Cell: 41,5 m^3

By using wood as the material covering the floor and creating the fixtures the reverberation time corresponds positively. Further the implementation of a concrete acoustic roof reduces the reverberation time additionally. There are no values describing the permitted reverberation time in a situation like the cell, but the reverberation time for common spaces should maximum be 0,4 seconds according to BR2010 [rockfon.dk 2013]. The value is a little higher, but when adding additional furniture and persons the reverberation time will be reduced to the permitted. The original calculation can be found on the enclosed cd.

ACOUSTIC ENVIRONMENT
COMMON SPACE

CASE STUDY I
Concrete surfaces
All interior surfaces are left as pure concrete surfaces except from glass surfaces, thereby also windows.

CASE STUDY II
Wooden floors and furniture
Wood forms some of the interior surfaces, such as floors and furniture.

CASE STUDY III
Acoustic concrete ceiling
This study contains the same settings as case study II, but the concrete ceiling is replaced by an acoustic concrete ceiling.

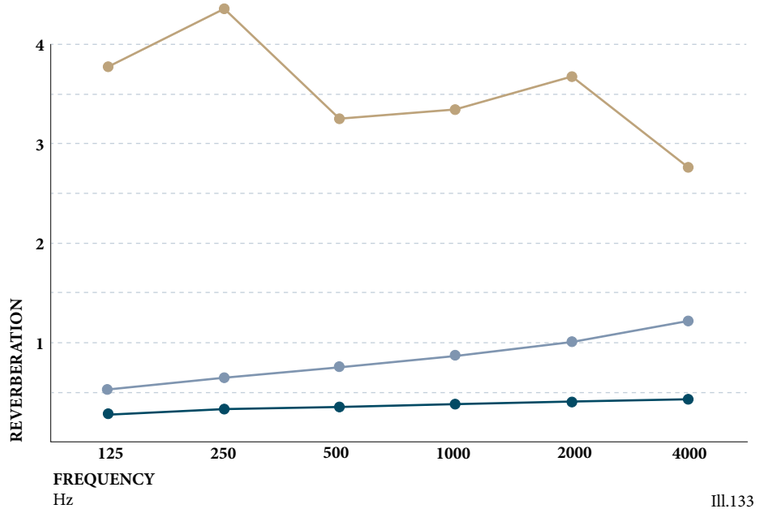
Ill.132

ACOUSTIC ENVIRONMENT
CELL

CASE STUDY I
Concrete surfaces
All interior surfaces are left as pure concrete surfaces except from glass surfaces, thereby also windows.

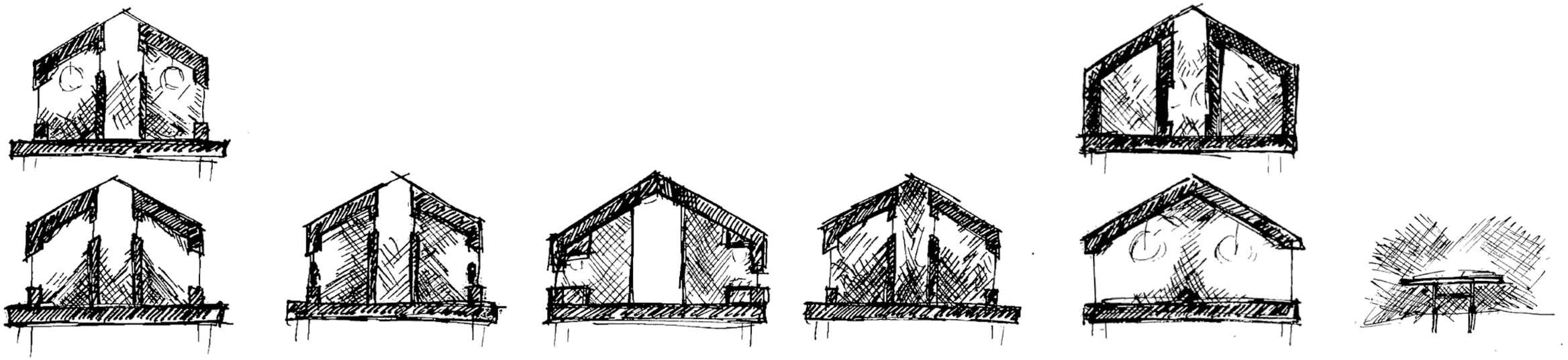
CASE STUDY II
Wooden floors and furniture
Wood forms some of the interior surfaces, such as floors and furniture. Also wooden panels are placed as cover for the bathroom.

CASE STUDY III
Acoustic concrete ceiling
This study contains the same settings as case study II, but the concrete ceiling is replaced by an acoustic concrete ceiling.



Ill.133

Daylight is constantly changeable, it is never the same during the day and over the year, and especially in Greenland the changes are great because of the low sun. In summer there is light almost 24 hours a day and in winter darkness dominates the hours (see sun conditions pp. 40). Both daylight and artificial light therefore become essential matters, as light can be of vital importance to the experience of space and the emotional response of people [Decottes 2011].



THE CELL

BACKGROUND LIGHT

During the course of the year daylight will flow into the cell from many different directions which is important as the cells will be oriented differently throughout the entire site. Light in the cell, both natural and artificial, is used as a tool to create different experiences and atmospheres [Decottes 2011].
A window placed high in the wall towards the hall lets light in from the skylight in the hall creating an even "background" light in the room. In winter when natural light is sparse artificial light hanging down from the ceiling provides the diffuse "background" light in the room and lowers the room height, creating a protective sphere within the cell.

THE CELL

WINDOW NICHE

By the desk and in the window niche the inmate will sit and have a wide view to the surroundings and the presence of nature close by when working. A lot of light is therefore desirable. The daylight factor by the desk and the big window is therefore quite high (see diagram pp 105). Small lights placed in the top of the window emphasise the place as a place to stay.

THE CELL

THE SLEEPING NICHE

By the bed the daylight factor is lower. This is a place for sleeping and because parts of the year has daylight for almost 24 hours a day it is attempted to create a more intimate and cave-like atmosphere where the inmate can look out, but others cannot look in. Small, dim lights in the top of the niche further emphasises the intimate space. A small window is placed opening up towards the landscape, usable when sitting up in the bed. Another window is placed high up at the foot of the bed allowing the inmate to look out towards the sky when lying down in the bed. Through this window light flows in and strikes at the head of bed in the niche emphasising the structure and warmth of the wood lining it. In the cell there is a clear purpose of all openings and thereby also all light (see light studies in appendix 6).

TRANSITIONAL SPACE

THE CELL UNIT PASSAGES

In the hall outside the cells pointed light flows down the long walls to emphasise the diverse structure and the directional pattern of them. When walking towards the common room the light levels are increased to draw attention into the depths of the building, a visible effect when moving around inside, but also when moving outside the buildings [Decottes 2011].

COMMON ROOM

BACKGROUND LIGHT

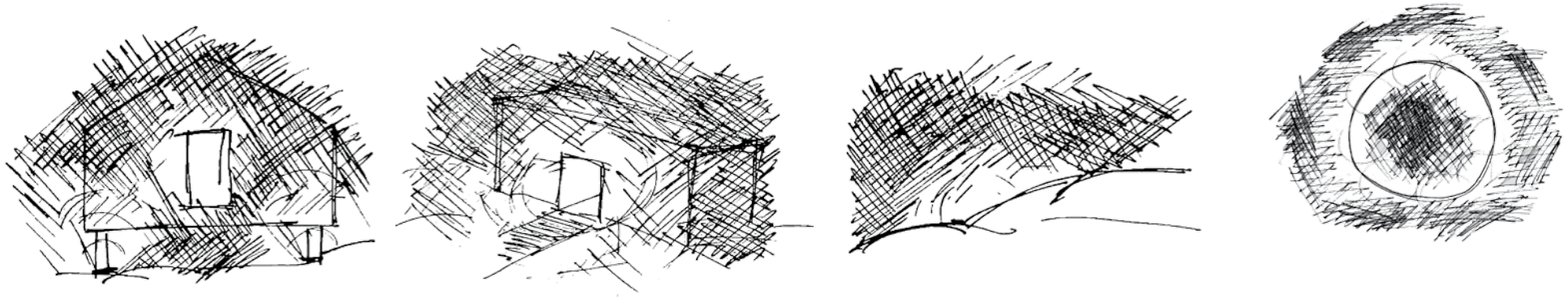
In the common rooms the light is controlled by the additive system. The daylight factor will vary depending on the amount of cell units connected to the common room, as some of the windows will be transformed into corridors and less light will slip in directly. The daylight factor is generally high, as this is a place for activities that demand more light (see diagram pp 105). The key light sources are the central open courtyard enabling light both into the kitchen and into the living rooms and the two large skylights at the end of the central hall over the kitchen niche and the sitting niche in the living area. Across from the sitting niche placed in continuation of the central passage is an artificial fireplace (for safety reasons) contributing to a changed character of this particular space.
Like in the cell, low hanging artificial lights lower the room height in winter whereas natural light in summer allows the common rooms to be experienced to their full extent.

MASTERPLAN

THE PATH

On an urban scale lighting will serve as an organizer and create spatial hierarchies. It will orient inmates and staff on the site and emphasise places of interest to them. It will also be used to provide visibility and safety throughout the institution [Decottes 2011].

The path will be lit up from the sides spreading across the paths, making them visible in darkness and enhancing their function as the main connection. They will appear dark underneath and will thereby almost seem flowing in the landscape.



Ill.134

MASTERPLAN

LIVING UNITS

Underneath the living units small lights will light up the dark side and underline the “lightness” of the pillars and the movability of the houses.

MASTERPLAN

PERMANENT FUNCTIONS

On the permanent functions circular spotlights will be placed in the passages lined by corten steel breaking the monotony of the concrete and creating a warmth symbolising transitions to the indoors.

MASTERPLAN

LANDSCAPE

Around the landscape projectors will light up special places, places of interest visually and as places to stay.

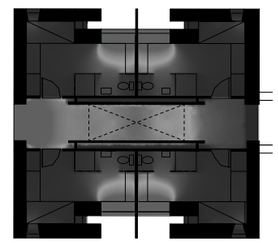
MASTERPLAN

THE WALL

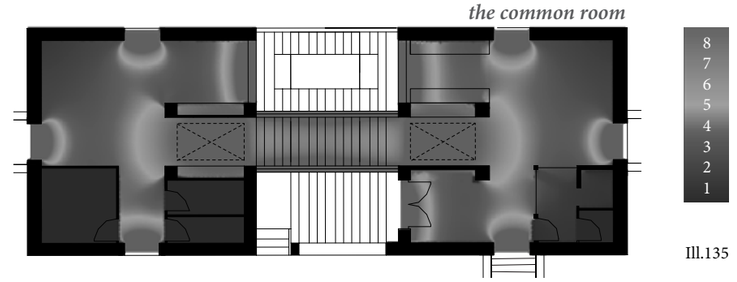
All along the wall lights at the bottom will light up the wall and visualise the wall as the definite boundary of the institution. The fence in the open department will have the same effect.

DAYLIGHT FACTOR

the cell unit



the common room



Ill.135

FIELDS OF VISION
the living unit

An important security matter to take into account is fields of vision.

Based on principles from the State Prison Østjylland there should be no direct fields of vision from one cell to another in order to avoid communication between the inmates when they are locked in their cells. This has been an important parameter throughout the design process and in each plan development the fields of vision in the single living unit have been examined and the units optimised in an attempt to minimise the fields as much as possible. In the following the different steps can be seen.

Another step, though not documented here, is the distance between the cell unit and the common room. This distance should be as small as possible to make the angle of the fields of vision between cell units smaller. However the distance is also highly affected by the detailing of the connection and the height difference between the cell unit and the common space and will therefore be finally decided in the chapter "Architectural Detailing" on pp 120.

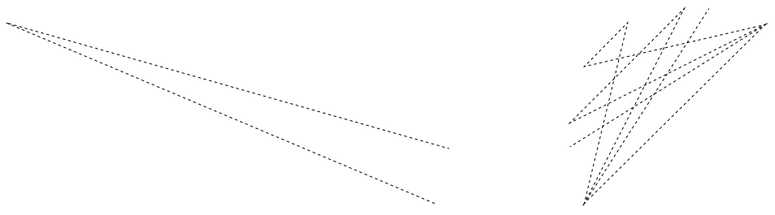
1) The plan shows big areas with fields of vision from one cell to another, especially in relation to the large window niches for sitting. These should be minimised.

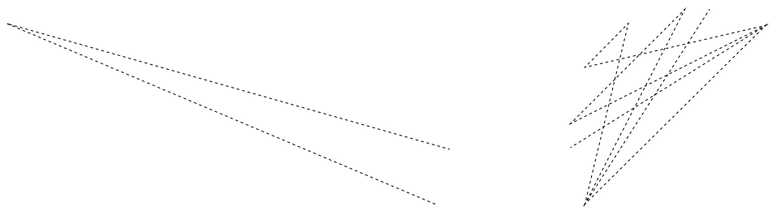
2) The wall separating the two cells next to each other is prolonged out of the facade in order to block views in certain directions. The effect is clear, the fields of vision are minimised significantly, but could be further improved.

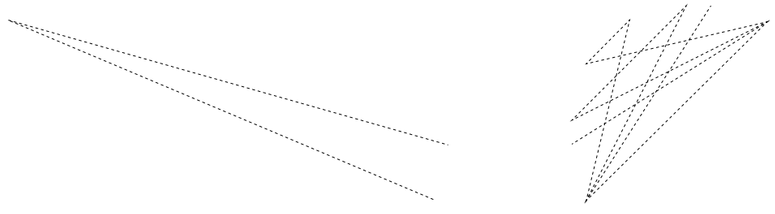
3) The large window niche is shortened to see the effect on the sizes of the fields of vision. They are only shortened 100 mm as the windows otherwise become too short to sit in. There is an effect, though it is rather small.

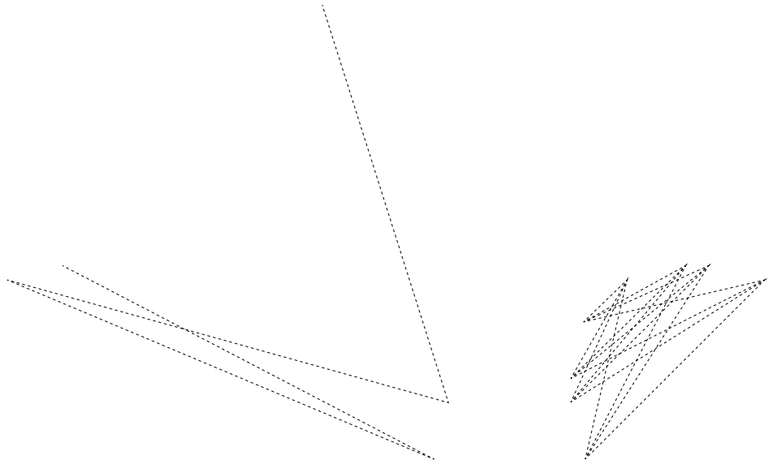
4) The fields of vision from the small windows in the sleeping niche are instead attempted optimised by cutting them diagonally in the wall, making the opening smaller on the inside and bigger on the outside. This further improves the minimisation of fields of vision and opens up the view towards the landscape.

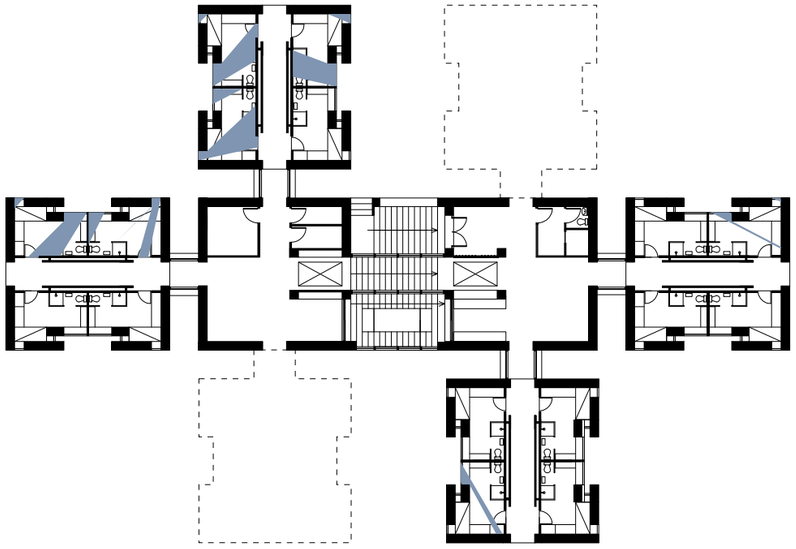
Ill.136



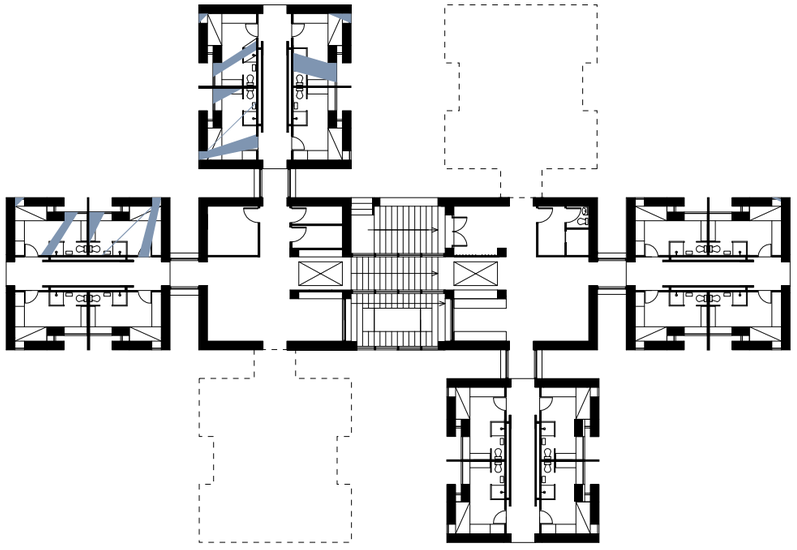




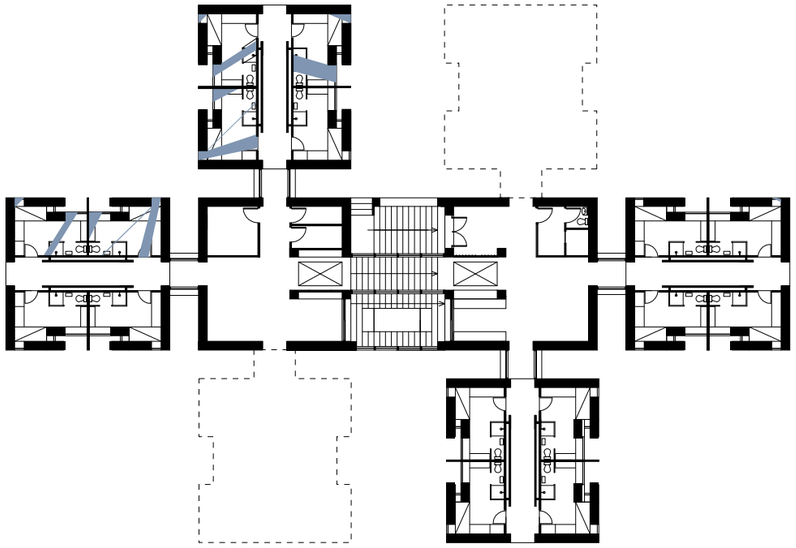




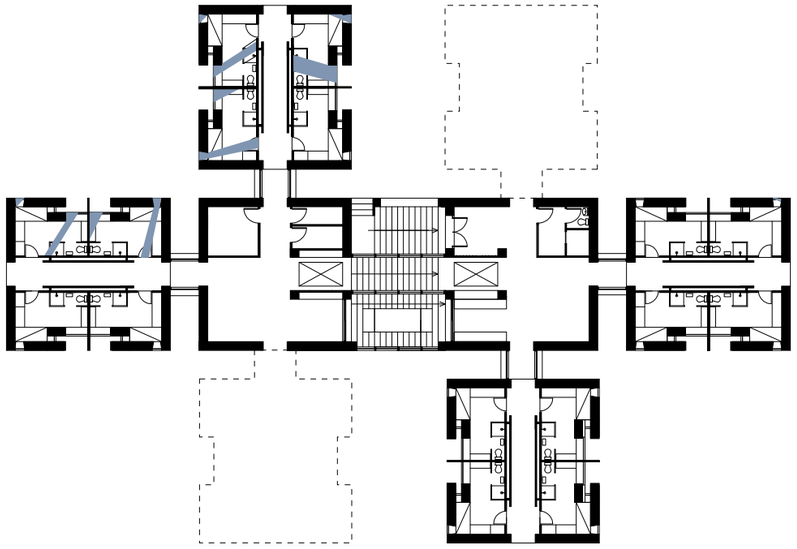
Step #1



Step #2



Step #3



Step #4

CONNECTING THE ELEMENTS
the masterplan

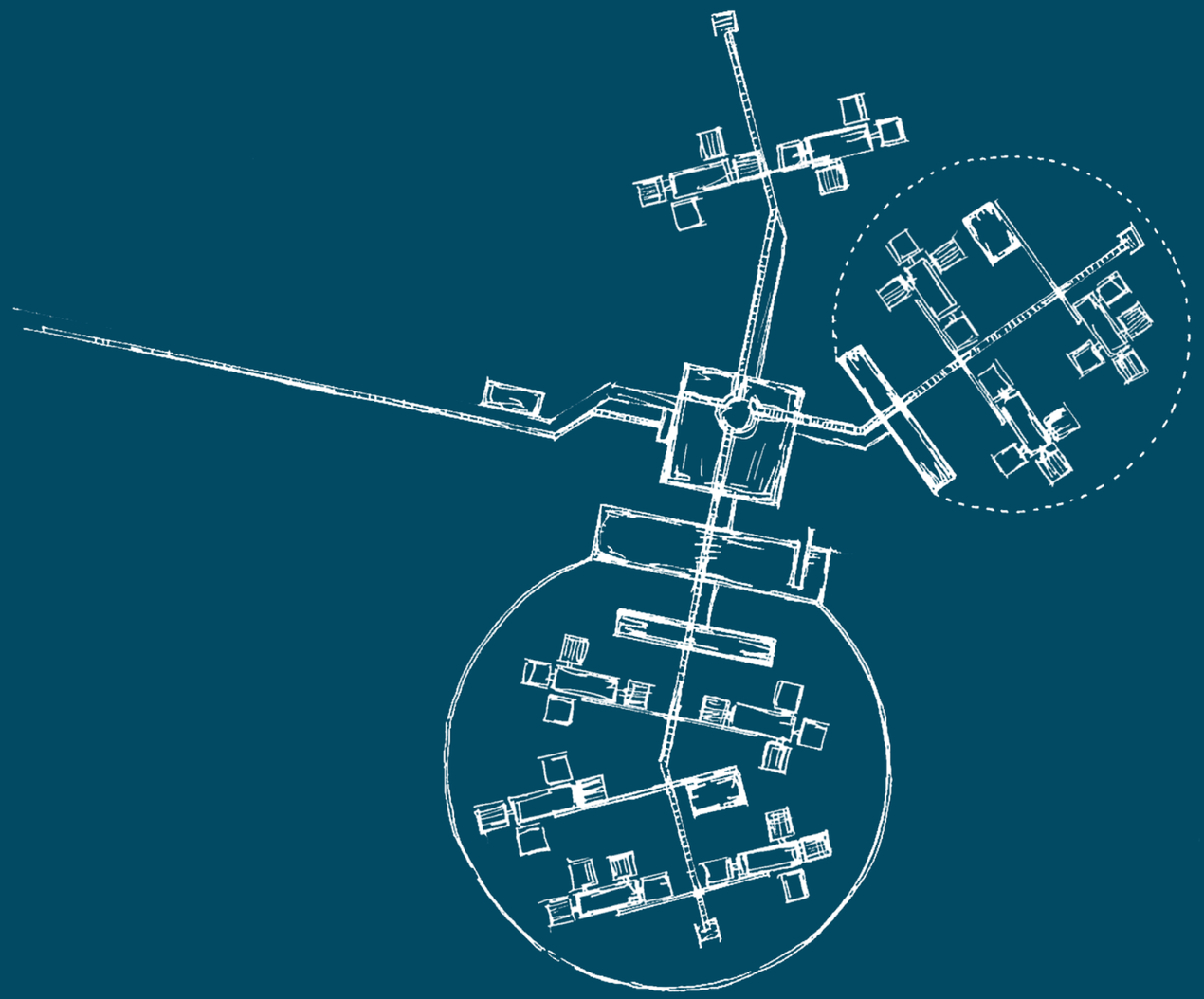
Based on the results of the previous developments of both the masterplan and the living unit the different elements contained in the masterplan can now be connected into one.

Within the masterplan between living units climate protected spaces are created in order to optain usable outdoor areas for different purposes. In some areas terraces or sports fields will be placed for the inmates to use and in others nature remains intact.

Through the complex the landscape flows almost untouched by buildings and paths, and continues its natural course.
The path connects to the landscape at various points in order to maintain a relation between buildings and nature and to enable access for the inmates to use the surroundings actively.

In the following the placement of living units will be optimised further on the basis of this masterplan, in order to minimise fields of vision between cell units.

Ill.137

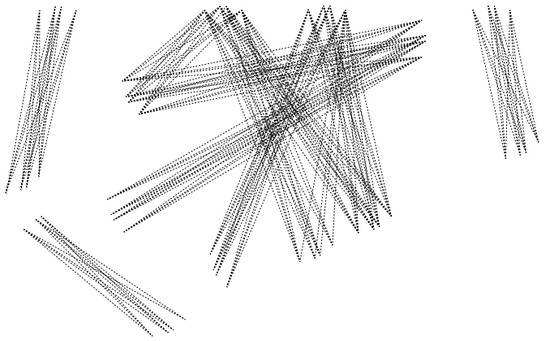


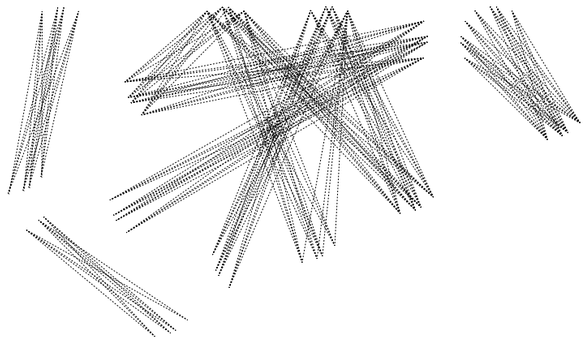
FIELDS OF VISION
the masterplan - closed department

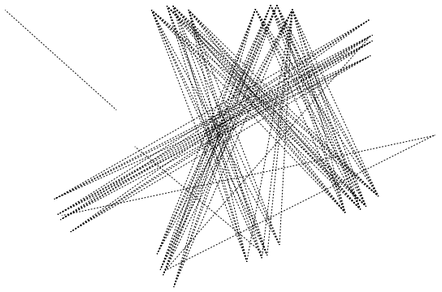
Fields of vision are also examined in relation to the overall masterplan in order to optimise the placement of the living units according to views. The diagrams only show optimisations related to a plan view. The differences in landscape levels are not considered in this study, but must be seen as a factor bettering the conditions. In the open and the re-entry department minimising fields of vision is not considered as important as in the closed department which is why the optimisation in the closed department is more elaborate. In both studies the fields of vision are minimised in relation to the maximum amount of cell units possible even though fever are required.

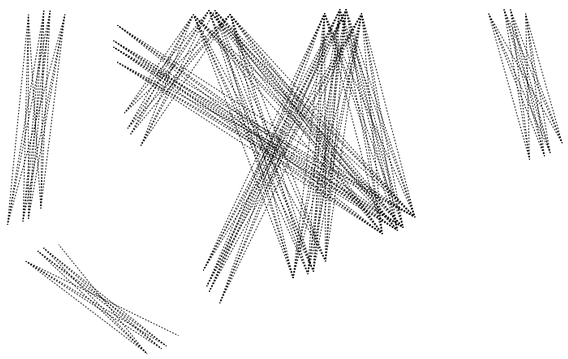
1) In diagram 1 big problems with fields of view are obvious, especially in the 4 cell units in the middle in A-B-C-E, but also in the ones to the sides, these should be minimised.
2) Living unit B is moved up to see the effects on the fields of view. The conditions worsen as it is now possible to see from A to B which was not possible before.
3) An attempt with other combinations of living units in C and D creates other problems with direct fields of vision between B and C, B and D, D and A and are therefore quickly discarded.
4) D and B are changed back, and A and E are reversed compared to diagram 3. All living units have changed distances from path a little in order to change the angles between living units for the better. Compared to diagram 3 some problematic fields of vision are removed between A and D, A and B.
5) This is the same plan as in diagram 4, but here the smallest of the fields of vision are deleted, as they are considered not to give issues.
6) The extra cell units are deleted, so only the units needed compared to the project requirements are left on the masterplan.

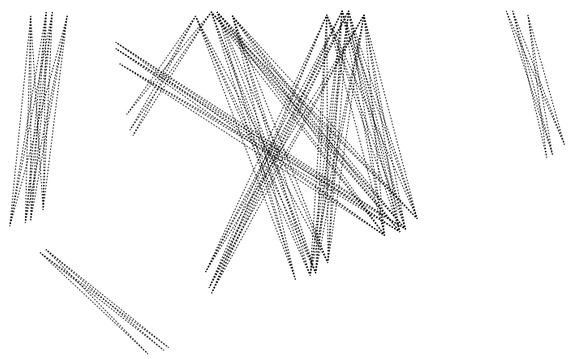
Ill.138

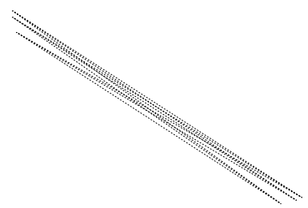












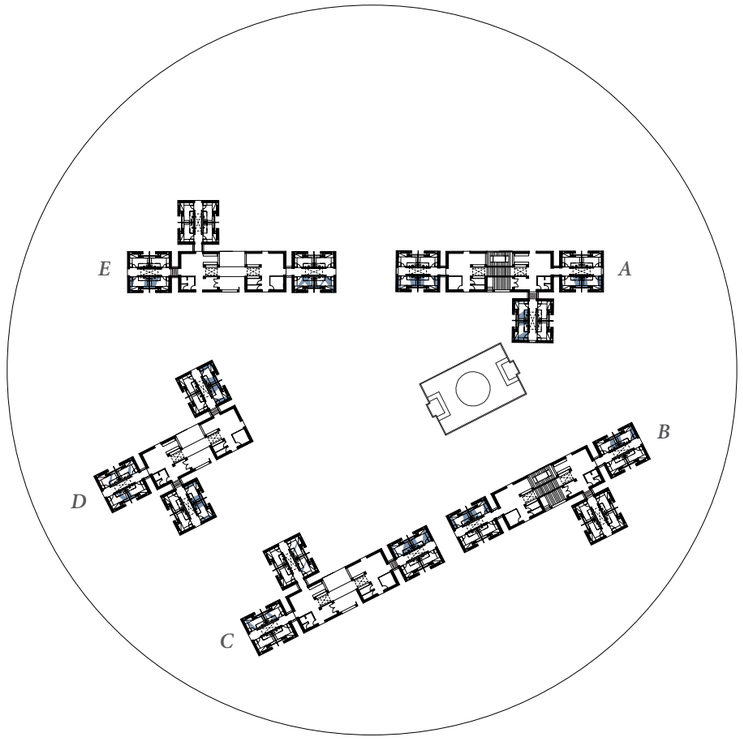


Diagram #1

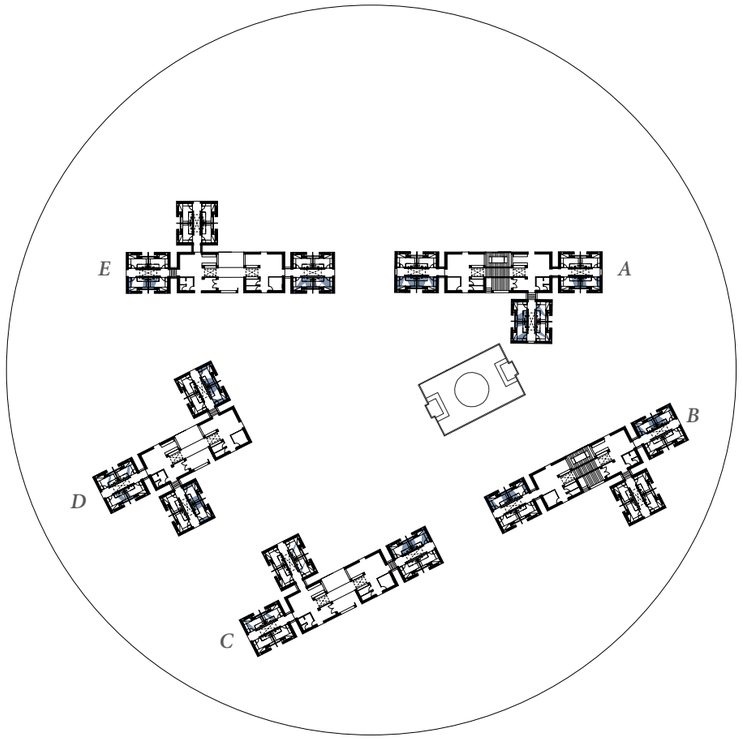


Diagram #2

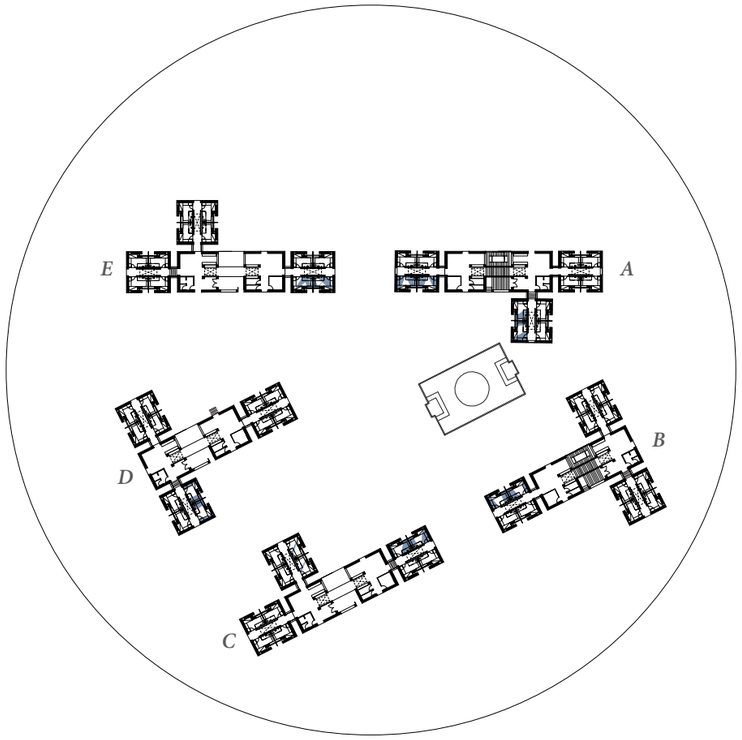


Diagram #3

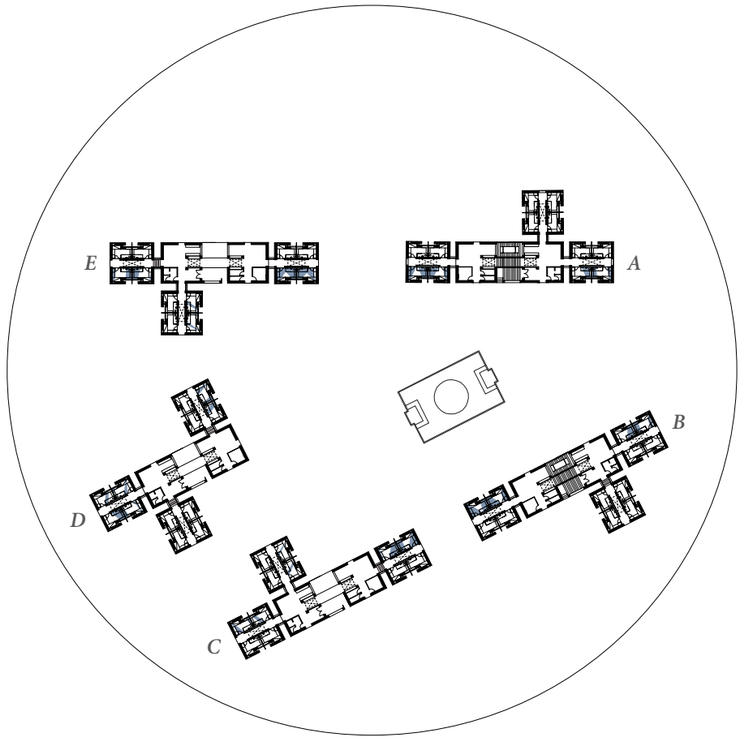


Diagram #4

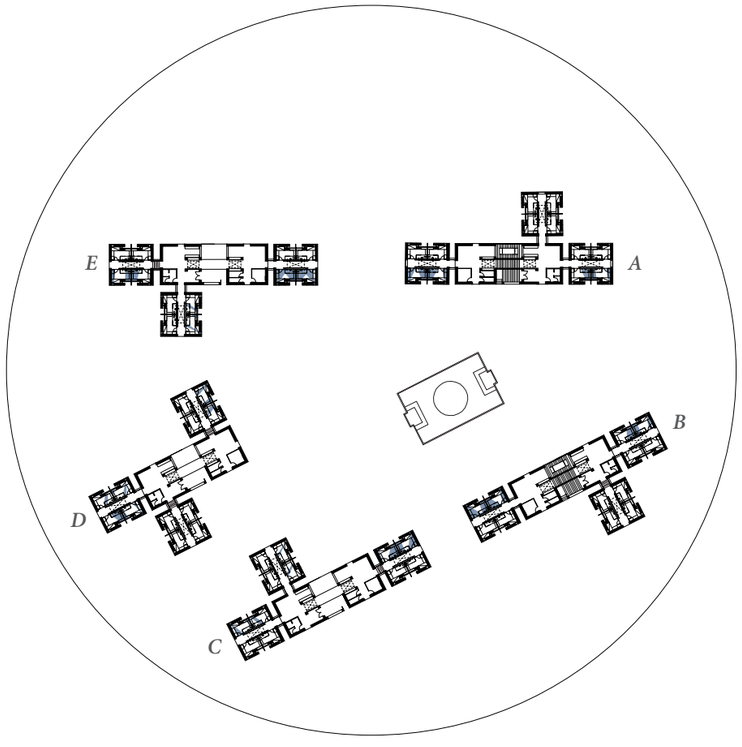


Diagram #5

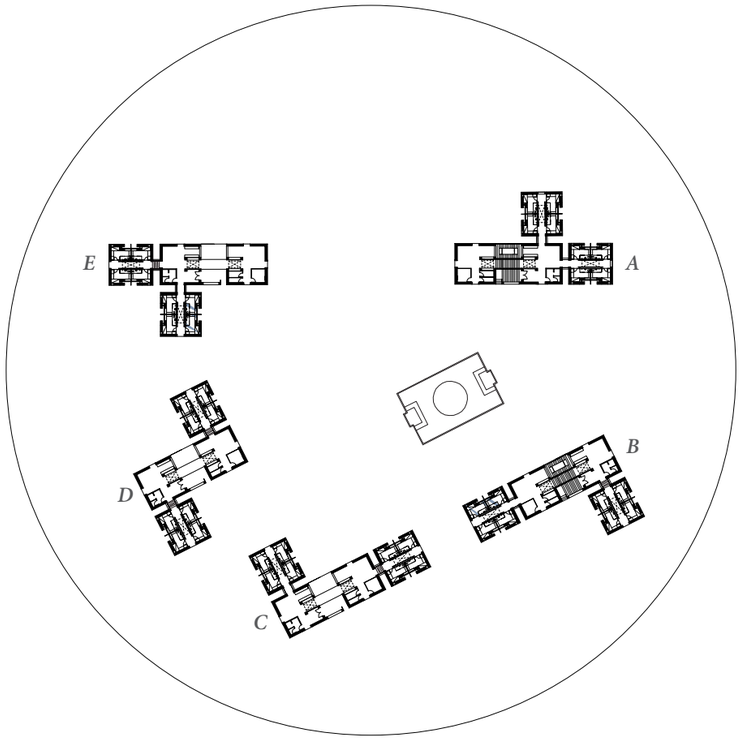


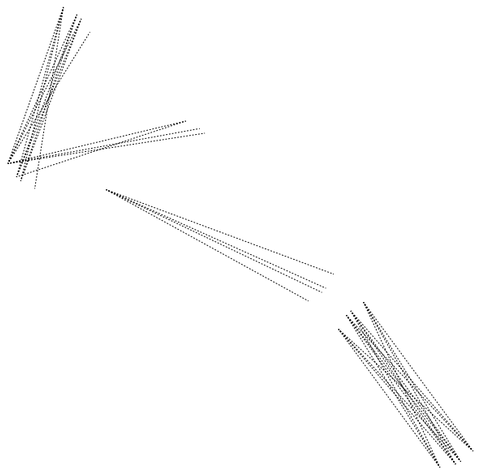
Diagram #6

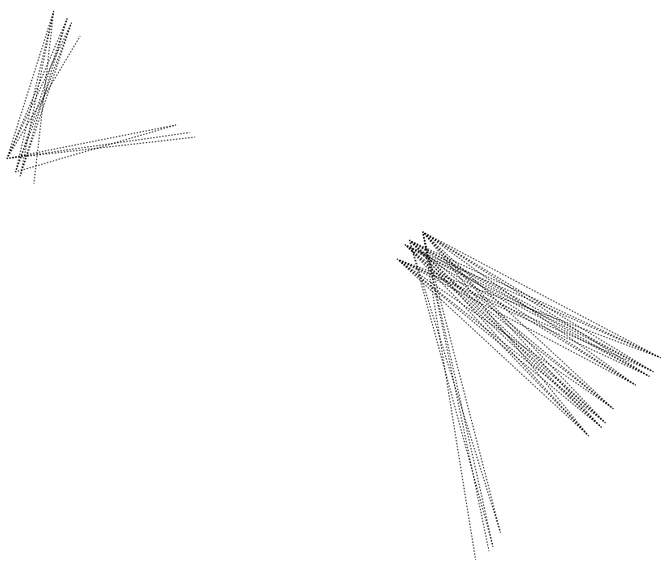
FIELDS OF VISION
the masterplan - open + re-entry departments

1) The diagram shows problems between H, I and J that should be optimised.
2) I and J are rotated and F and H are reversed, minimising the fields of vision between H, I and J
3) Extra cell units are deleted, so only the units needed compared to the project requirements are left on the masterplan.

In the chapter "Facilitating Resocialisation" the overall design and expressions of the architecture of both masterplan, living unit and cell are determined. The relation to the three architectures presented in the beginning is clear, however the intention, functionality and assembly of the design have to be elaborated through architectural detailing. Joints play a vital role in this project as it is the intention to create an adjustable building system pursuing "realisability" to some extent. Joints and assemblies will therefore be the key focal points for the next chapter resulting in architectural details picturing the final solutions.

Ill.139





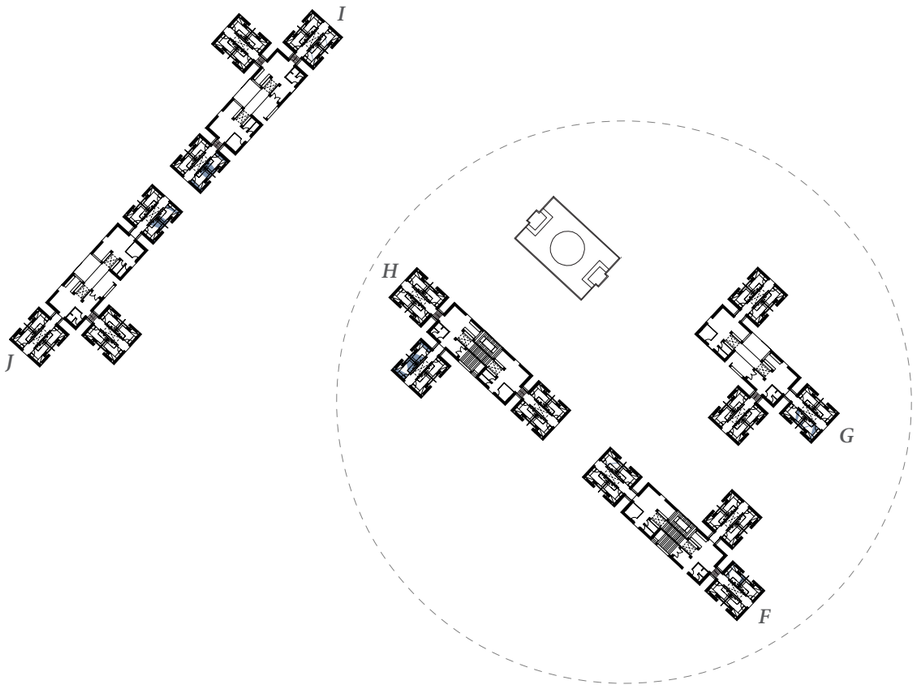


Diagram #1

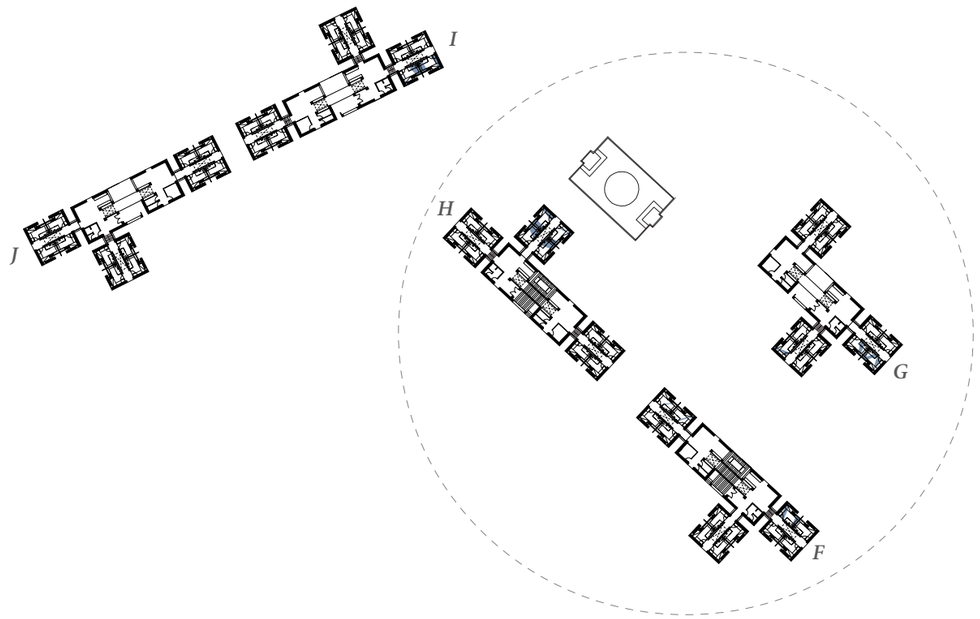


Diagram #2

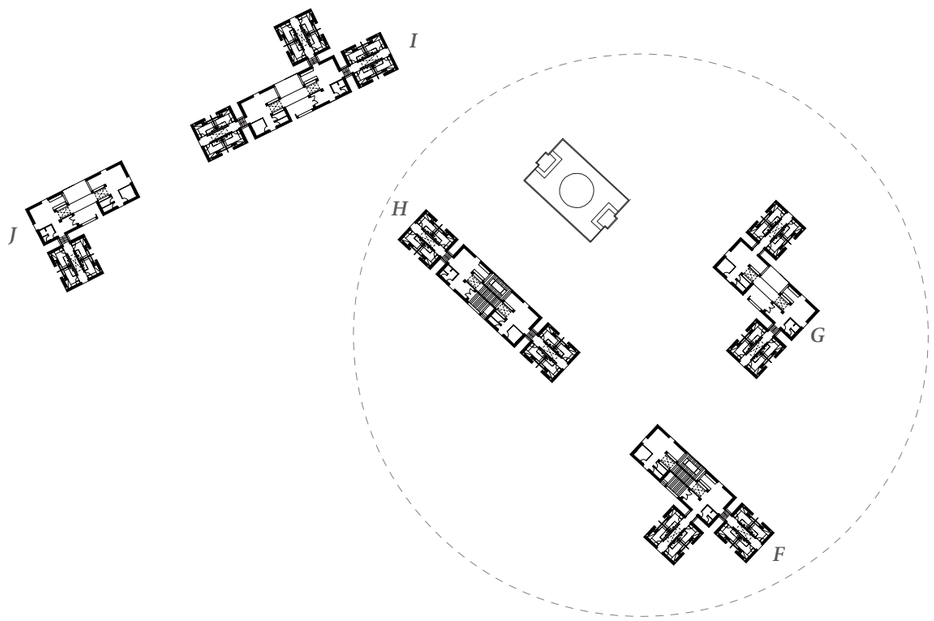


Diagram #3

ARCHITECTURAL DETAILING

THE CONCEPT OF JOINTS

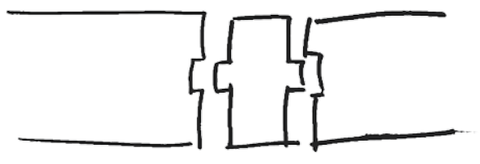
"Architecture is an art since it is concerned with not only the original need for shelter, but in putting together in a meaningsful manner spaces and materials. This is achieved through the making of formal and actual joints. [...] it is possible to observe that any architectural element defined as a detail is always a joint. Details can be 'material joints' such as in the case of the capitales which are the connection between columns shafts and architraves, or they can be 'formal joints' such as in the case of the porch which is the connection between an interior and an exterior space." Marco Frascari [Frascari 1981, pp 326 + 335]

The following architectural detailing, covering joints, assemblies and static principles, will study the aesthetics of the design in a smaller scale, providing the project with some degree of "realisability", leading back to the point made by Zumthor (cf. pp 55) about the purpose of architecture being "becoming a part of the real world" and the intention of the project. The process of architectural detailing was initiated early in the design process and continued throughout the project, highly affecting the design and the aesthetics. The approach of detailing concerns two different purposes, where one treats the way prefabricated elements meet each other and the other concerns how the additive assembly system should be thought and developed.

'Formal joints' in the sense of transitions (the path), described by Marco Frascari above, have already been introduced both in relation to the masterplan, the living unit and the cell, but will be elaborated further, however here more concerning *"how"* as opposed to *"where"* and *"why"* described earlier in the process. Further this chapter will handle 'material joints' meaning the aesthetics, dimensions, functions and the actual assembly of the prefabricated building system leading towards a final presentation of the design.

HOW TO MAKE THE ADDITION POSSIBLE

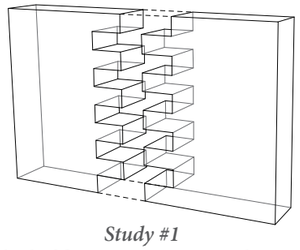
The connection joint between the common space and the cell unit is in its totality seen as a 'formal joint'. It is a joint which connects and makes transition possible between two spaces. Its qualities regarding its function as a formel joint are expressed through its ability to adjust to the sloping landscape and its opportunity for additivity.



Concept of the formal joint Ill.140

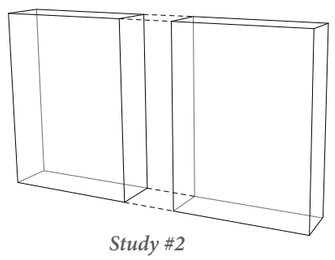
As described in the previous chapter the connection element may pay equal attention to both common space and cell unit, also by being equally structurally connected to both.

The question about how to assemble elements in a 'material joint' led to the following studies of ways to assemble concrete elements:



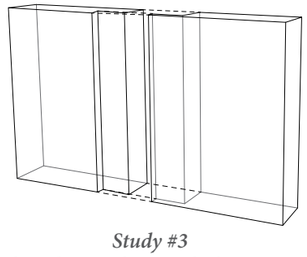
Study #1 Ill.141

The assembly method of finger joints causes a dominating expression.



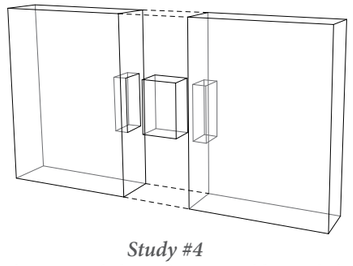
Study #2 Ill.142

The assembly method of collision causes movement between the elements.



Study #3 Ill.143

The assembly method of overlaps makes interlockning possible between elements.



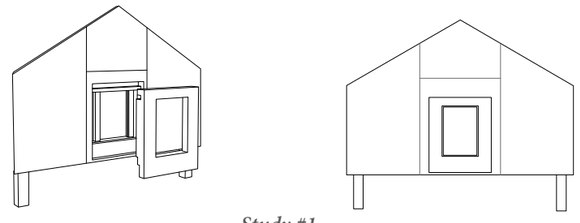
Study #4 Ill.144

The assembly method using an 'adapter' causes additional elements and joints.

What is essential to remember is that the joints between the concrete elements will be visible both to ensure a system which do not demand additional working afterwards, but also to communicate its additive being. The joints will achieve a potential of becoming an aesthetic parameter and concurrently narrate where and how things are assembled. The system becomes readable.

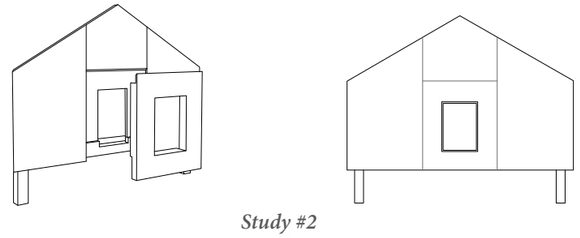
In the showed studies of ways to assemble elements, sketch #3 illustrates a way of assembly, where interlockning is possible while also avoiding thermal bridges, an initiative which becomes substantial when thinking of thermal loss and use of energy, while also responding to a good experienced indoor climate. The assembly method as an overlap expressed through vertical and horizontal lines support the intention about a geometrical expression.

Followed by these studies solutions of how the connection element should meet the common space and the cell units is explored in two directions:



Study #1 Ill.145

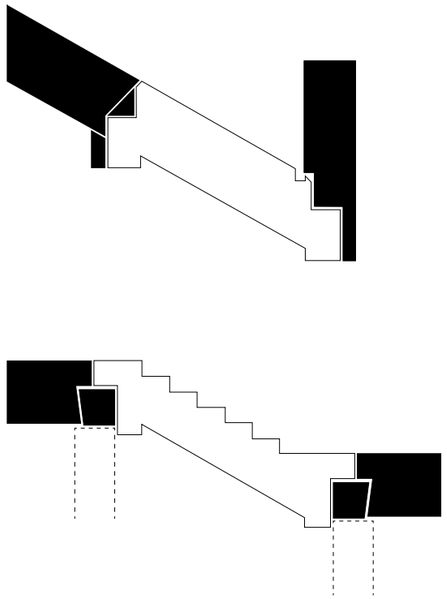
Facades as recipient



Study #2 Ill.146

Facade element as part of the connection element

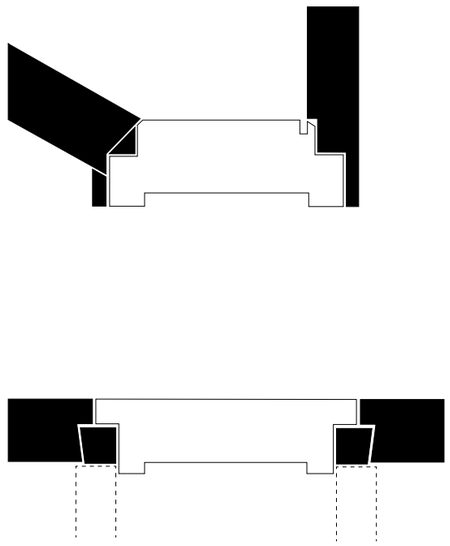
Study #1 was explored through models with different expressions. In a way it communicates the connection element as *the* connection element. Further the facade expresses where additions are possible by exposing squared frames in the facade. However this way of assembling the spaces to the connection element becomes complicated by its joints. The joints are complicated and will look so. The simple way of joining elements seems essential in an additive system though (Pictures of models can be seen in appendix 7). Where study #1 visually divides the facade into smaller parts study #2 uses the facade element as a part of the connection element. A solution appear where few lines divide the facade which results in the facade expressing a more simple way of joining elements together which is desirable. Here the windows express where to add. Joining happens by replacing particular facade elements.



Ill.147

Stair connection

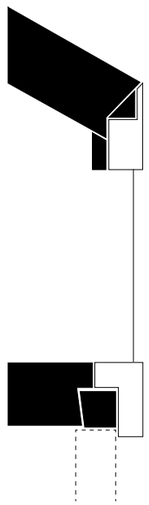
This connection element is shaped as a staircase allowing a level change of 1 meter between the common room and the cell unit in order to comply with the sloping landscape when needed.



Ill.148

Straight connection

This connection element is a straight connection to be used when the landscape has little or no inclination.



Ill.149

Replaceable facade element

Where additions are possible a facade element like shown above can be replaced by one of the two connetion elements and the opening within the element is transformed from a window to a passage.

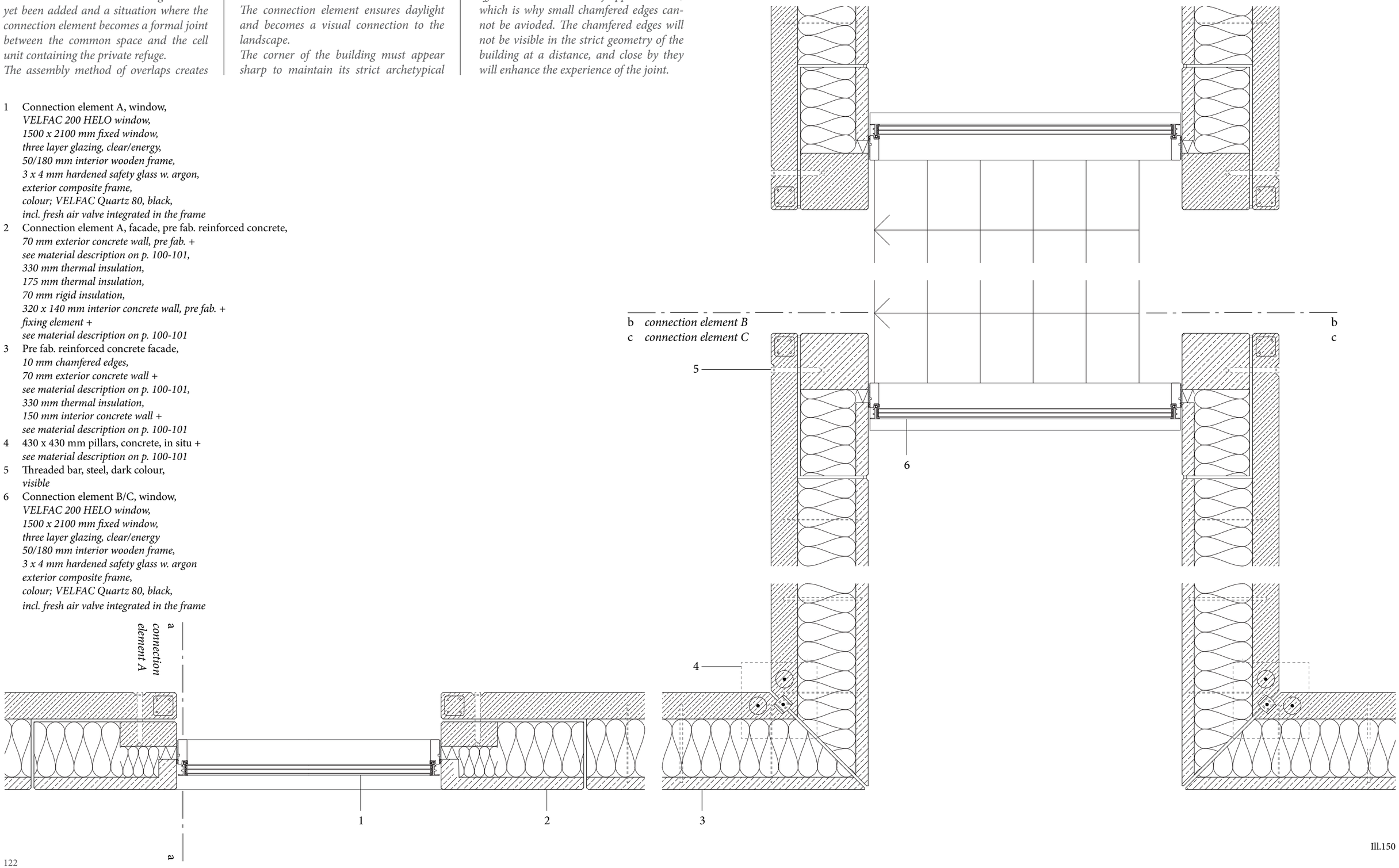
THE CONENCTION ELEMENT AS A FORMAL AND MATERIAL JOINT

The plan above shows where possibilities for additions occur. As mentioned before the function of the connection element is also to make the adjustment of the building to the landcape possible. Therefore the connection element will be developed as three elements allowing different level changes, while maintaining the same assembly method. The following shows details of the different connection elements.

CONNECTION ELEMENTS
WALL JOINTS
HORIZONTAL SECTION
Detail 1:20

The vertical section expresses a situation where the connection element occurs as a window element where no living unit has yet been added and a situation where the connection element becomes a formal joint between the common space and the cell unit containing the private refuge.
The assembly method of overlaps creates an interlocked connection which is further reinforced by a visible threaded bar in dark steel.
The connection element ensures daylight and becomes a visual connection to the landscape.
The corner of the building must appear sharp to maintain its strict archetypical shape. When making and transporting the concrete elements, sharp edges can break off and corners can thereby appear blurred, which is why small chamfered edges cannot be avioded. The chamfered edges will not be visible in the strict geometry of the building at a distance, and close by they will enhance the experience of the joint.

1 Connection element A, window,
VELFAC 200 HELO window,
1500 x 2100 mm fixed window,
three layer glazing, clear/energy,
50/180 mm interior wooden frame,
3 x 4 mm hardened safety glass w. argon,
exterior composite frame,
colour; VELFAC Quartz 80, black,
incl. fresh air valve integrated in the frame
2 Connection element A, facade, pre fab. reinforced concrete,
70 mm exterior concrete wall, pre fab. +
see material description on p. 100-101,
330 mm thermal insulation,
175 mm thermal insulation,
70 mm rigid insulation,
320 x 140 mm interior concrete wall, pre fab. +
fixing element +
see material description on p. 100-101
3 Pre fab. reinforced concrete facade,
10 mm chamfered edges,
70 mm exterior concrete wall +
see material description on p. 100-101,
330 mm thermal insulation,
150 mm interior concrete wall +
see material description on p. 100-101
4 430 x 430 mm pillars, concrete, in situ +
see material description on p. 100-101
5 Threaded bar, steel, dark colour,
visible
6 Connection element B/C, window,
VELFAC 200 HELO window,
1500 x 2100 mm fixed window,
three layer glazing, clear/energy
50/180 mm interior wooden frame,
3 x 4 mm hardened safety glass w. argon
exterior composite frame,
colour; VELFAC Quartz 80, black,
incl. fresh air valve integrated in the frame

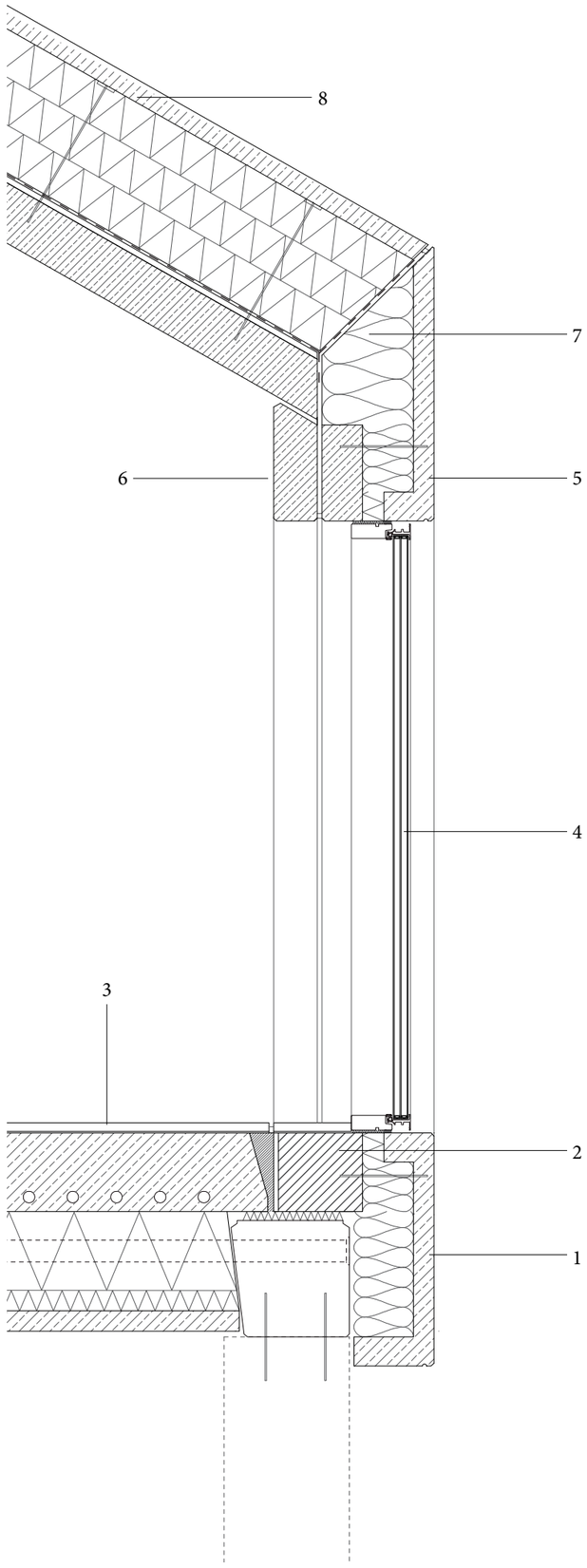


Ill.150

aa_CONNECTION ELEMENT A
WINDOW VERSION
VERTICAL SECTION
Detail 1:20

The vertical section of the connection element as a window narrates in some cases a temporary situation, because this is the place where additions are possible. Where the addition is intendend pillars are already established in the landscape and support a terrace until an addition becomes a reality. Where a terrace is placed, the window element is a door - a formal joint connecting the interior with the exterior. In the closed department the access will only be possible by permission.

1 Connection element A, facade, pre fab. reinforced concrete,
70 mm exterior concrete wall +
see material description on p. 100-101,
200 mm insulation,
2 330 x 270 mm leca block
3 Slab, pre fab.,
30 mm spruce floor, wooden plankes,
sound membrane,
270 mm concrete slab,
floor heating,
270 mm rigid insulation,
ø75 mm NilAIR ventilation cables,
70 mm rigid insulation,
70 mm reinforced concrete slab, bottom plate +
see material description on p. 100-101
4 Connection element A, window,
VELFAC 200 HELO window,
1500 x 2100 mm fixed window,
three layer glazing, clear/energy,
50/180 mm interior wooden frame,
3 x 4 mm hardened safety glass w. argon,
exterior composite frame,
colour; VELFAC Quartz 80, black,
incl. fresh air valve integrated in the frame
5 Connection element A, facade, pre fab. reinforced concrete,
70 mm exterior concrete wall +
see material description on p. 100-101,
330 mm insulation,
dripping edge
6 Pre fab. reinforced concrete facade,
150 mm interior concrete wall +
see material description on p. 100-101
7 Insulation triangle
8 Pre fab. acoustic concrete roof,
70 mm reinforced concrete slab +
see material description on p. 100-101,
440 mm rigid insulation,
waterproof membrane,
sound absorbent material,
180 mm perforated concrete roof +
see material description on p. 100-101

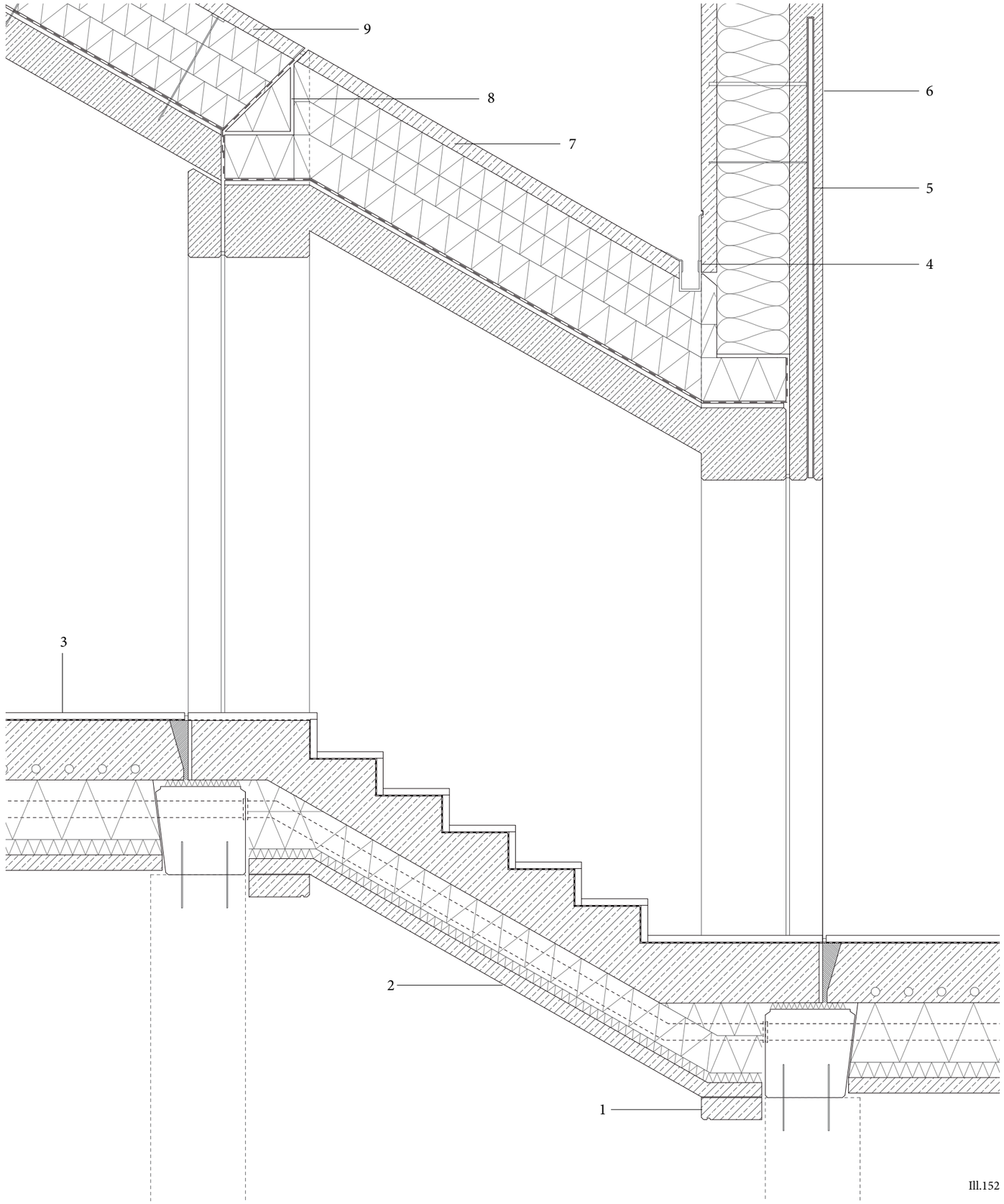


Ill.151

bb_CONNECTION ELEMENT B
STAIRCASE VERSION
VERTICAL SECTION
Detail 1:20

The connection element B ensures adjustment to the sloping landscape by becoming a staircase. The staircase is in itself an architectural element, however it causes reduced accessibility, an parameter that is related to functionality within the organisation of a 'prison'. However it supports the essential idea of the building not becoming oppressive by allowing the building to follow the landscape. Further the Greenlandic people are used to walking and used to the dramatic landscape. The connection element B ensures an interior reflecting the exterior and relates them in a higher extent.

1 Reinforced exterior concrete wall, pre fab.,
see material description on p. 100-101
2 Connection element B, deck, pre fab.,
70 mm reinforced concrete slab, bottom plate +
see material description on p. 100-101,
45 mm rigid insulation,
170 mm rigid insulation,
ø75 mm NilAIR ventilation cables,
concrete staircase, 176/300 mm, pre fab.,
sound membrane,
30 mm spruce floor, wooden planks
3 Slab, pre fab.
30 mm spruce floor, wooden plates,
sound membrane,
270 mm concrete slab,
floor heating,
270 mm rigid insulation,
ø75 mm NilAIR ventilation cables,
70 mm rigid insulation,
70 mm concrete slab, bottom plate +
see material description on p. 100-101
4 Drainage trench, steel,
cover the joint between the connection element B and the gable of the cell unit,
5 Vertical sliding door, translucent polycarbonate
6 Pre fab. reinforced concrete facade,
150 mm interior concrete wall +
see material description on p. 100-101,
330 mm thermal insulation,
70 mm exterior concrete wall +
see material description on p. 100-101
7 Connection element B, roof, pre fab.,
70 mm reinforced concrete slab +
see material description on p. 100-101,
440 mm rigid insulation,
waterproof membrane,
180 mm perforate concrete roof +
see material description on p. 100-101
8 Insulation triangle
9 Pre fab. acoustic concrete roof,
70 mm reinforced concrete slab +
see material description on p. 100-101,
440 mm rigid insulation,
waterproof membrane,
sound absorbent material,
180 mm perforate concrete roof +
see material description on p. 100-101

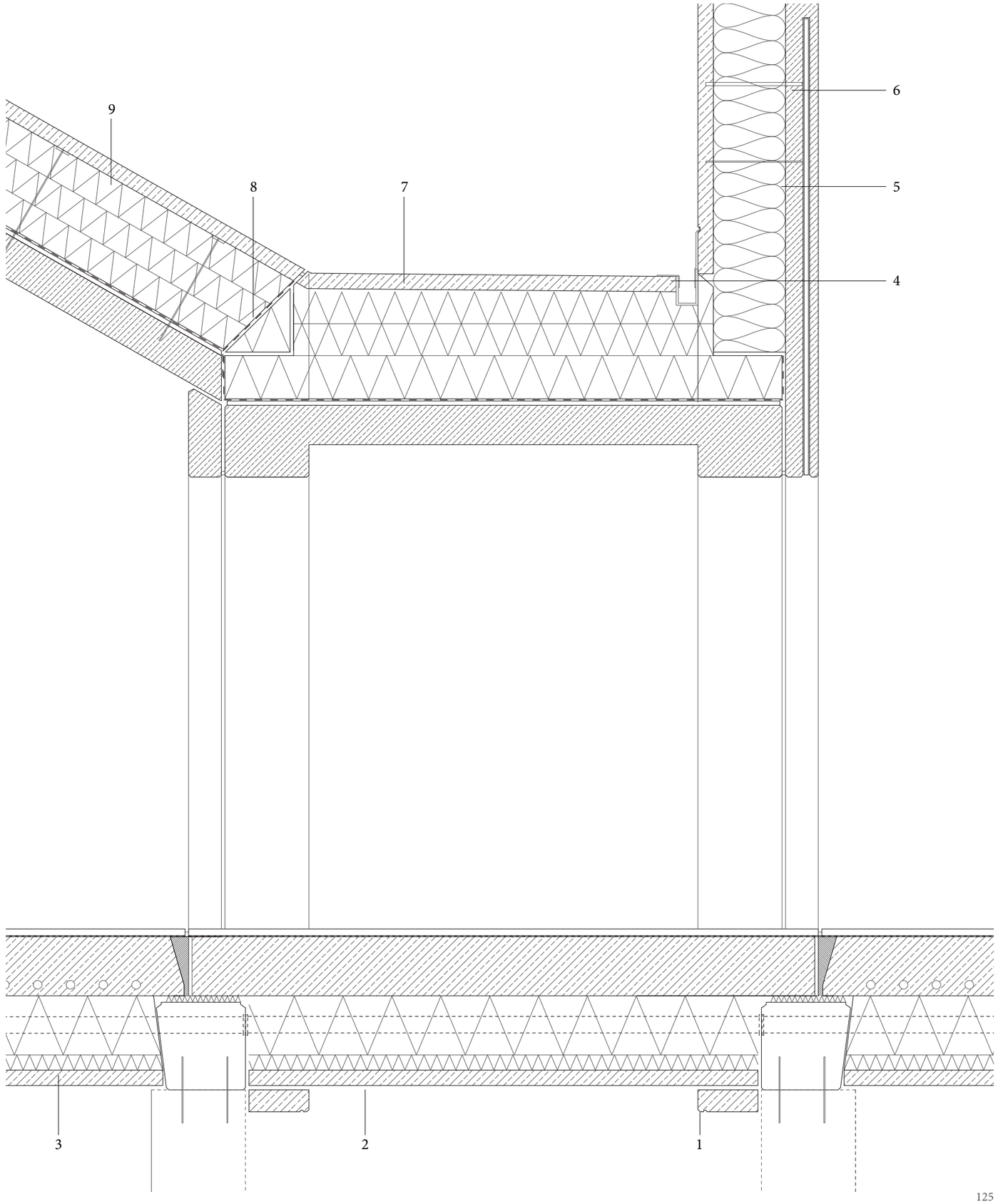


Ill.152

cc_CONNECTION ELEMENT C
HORIZONTAL VERSION
VERTICAL SECTION
Detail 1:20

Connection element C is as B a formal joint, a passage, between the common space and the cell unit. Even though the connection element is a passage, daylight is transmitted though the windows, allowing views to the landscape and creating a place to be even if it is only for a short while. The window is moved a little from the path area and thereby creates small pockets in which one can stand. The size of the pockets are decided by the idea of allowing a stay and at the same time becoming so small that no one can hide in them.
In the interior wall of the cell unit a door in a translucent material is placed to ensure the possibility of sectioning.

1 Reinforced exterior concrete wall, pre fab.,
see material description on p. 100-101
2 Connection element C, deck, pre fab.,
70 mm concrete slab, bottom plate +
see material description on p. 100-101,
70 mm rigid insulation,
270 mm rigid insulation,
ø75 mm NilAIR ventilation cables,
270 mm concrete slab, pre fab.,
sound membrane,
30 mm spruce floor, wooden planks
3 Slab, pre fab.,
70 mm reinforced concrete slab, bottom plate +
see material description on p. 100-101,
70 mm rigid insulation,
270 mm rigid insulation,
ø75 mm NilAIR ventilation cables,
270 mm concrete slab,
floor heating,
sound membrane,
30 mm spruce floor, wooden plates
4 Drainage trench, steel,
cover the joint between the connection element B and the gable of the cell unit,
5 Vertical sliding door, translucent polycarbonate
6 Pre fab. reinforced concrete facade,
150 mm interior concrete wall +
see material description on p. 100-101,
330 mm thermal insulation,
70 mm exterior concrete wall +
see material description on p. 100-101
7 Connection element C, 7º, roof, pre fab.,
70 mm reinforced concrete slab +
see material description on p. 100-101,
500 mm rigid insulation,
waterproof membrane,
180 mm perforated concrete roof +
see material describtion on p. 100-101
8 Insulation triangle,
9 Pre fab. acoustic concrete roof,
70 mm reinforced concrete slab +
see material description on p. 100-101,
440 mm rigid insulation,
waterproof membrane,
sound absorbent material,
180 mm perforated concrete roof +
see material description on p. 100-101



Ill.153

DIVIDING INTO PRE FAB

joint filler as an aesthetic parametre

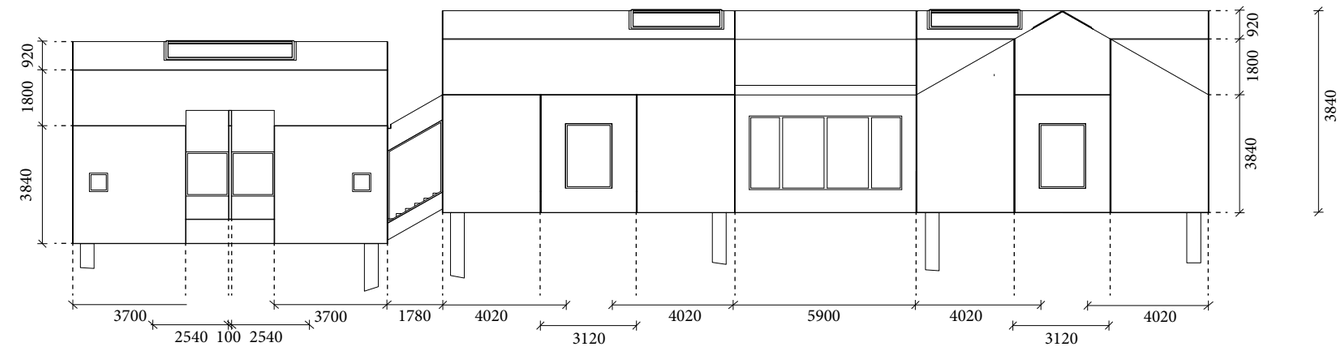
When designing a prefabricated building system certain considerations are vital; the completed elements must be transportable from one place to the other, and thereby the sizes of elements depend on the transport, therefore no elements must exceed 3,9 m on its shortest side according to the sizes of the lorry. Further they must not be longer than 12 m. [Dorthe Lorenzen] These measurements are not fixed measures, but rules of thumb.

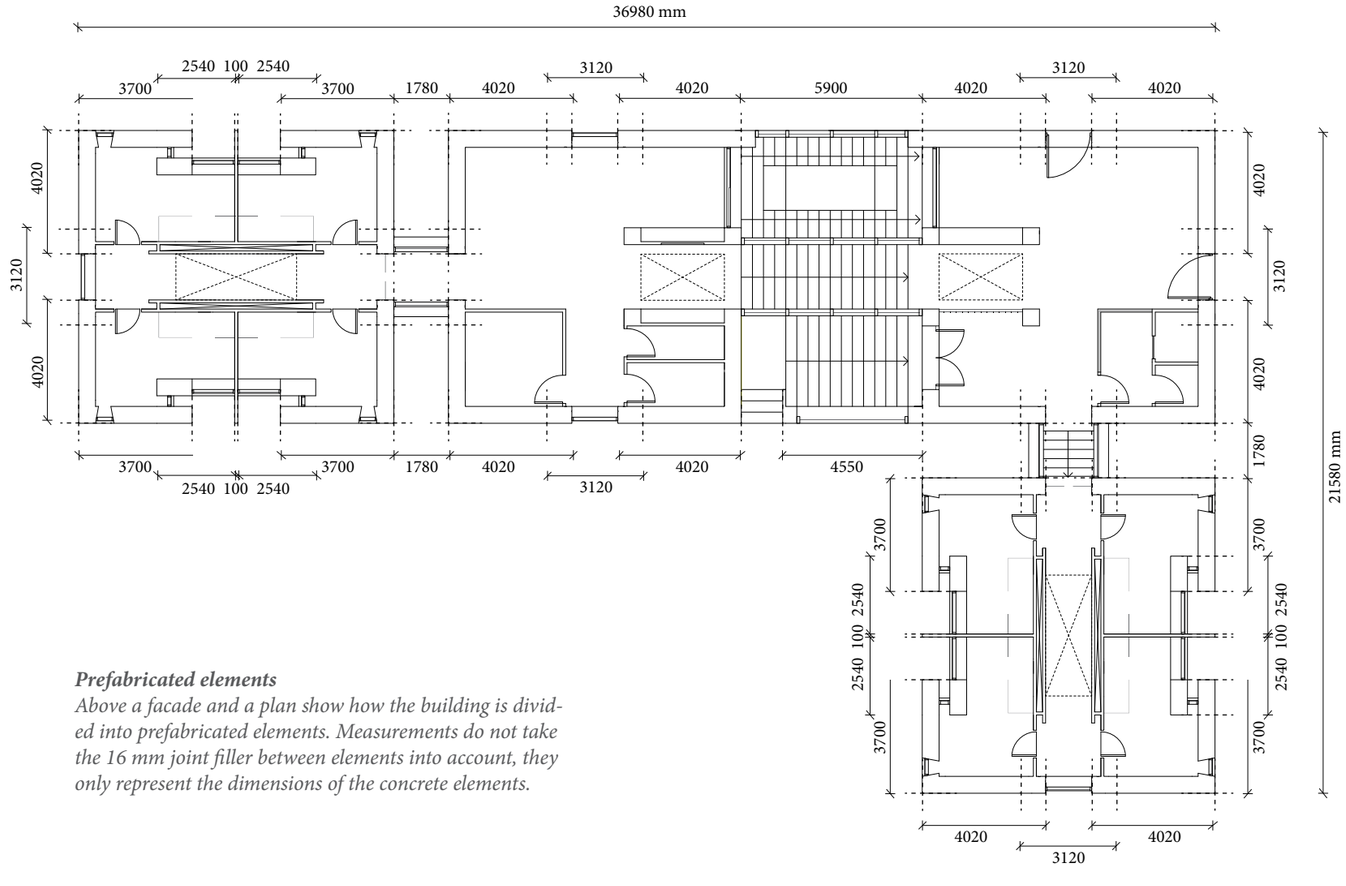
To develop a building system which contains as many of the same elements as possible is preferable. Then the same casting mould can be used to produce the concrete elements.

Often only industries use standard measurement. There is no such consequences in using individual design elements. This offers a degree of fredoom in the architectural development to adjust the prefabricated elements to the expression which is desired both in relation to architectural experience, but also to functionality. Only one element must be a fixed measurement, the size of the floor slab, which must be 1200 mm in its width. [Dorthe Lorenzen]

When assembling prefabricated elements a joint filler of 16 mm will be visible and a part of the visual expression of the architecture. (Visual expressions of the joint filler can be seen in appendix 8)

In the following drawings show the division of the elements.





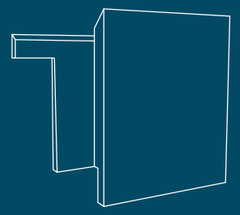
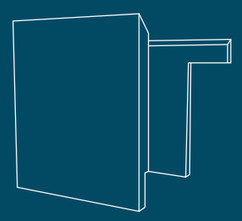
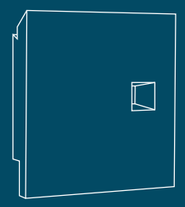
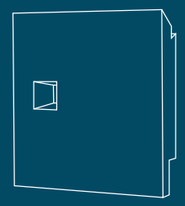
Prefabricated elements
Above a facade and a plan show how the building is divided into prefabricated elements. Measurements do not take the 16 mm joint filler between elements into account, they only represent the dimensions of the concrete elements.

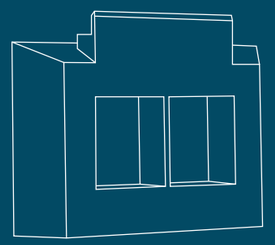
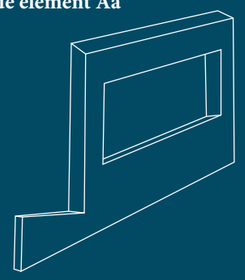
Ill.154

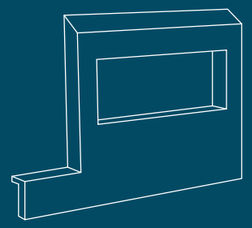
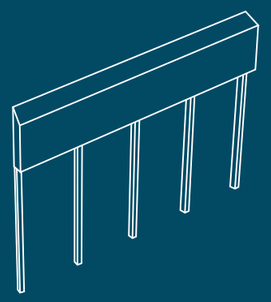
ELEMENT TABLE
different elements in the additive system

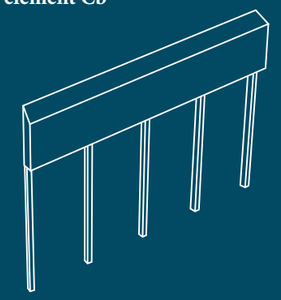
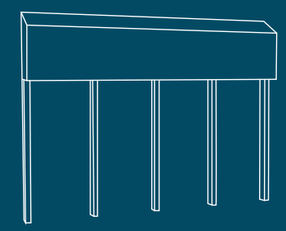
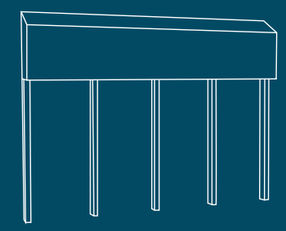
The tabel shows the the different concrete exterior elements that the living unit consists of. The elements which are variable are described as variable or connection elements, the rest is basic elements.
The building envelope should ensure that aims for future energy requirements, of u-values equalling low energy class 2015, are achieved. The u-values are calculated in Rockwool Energy.

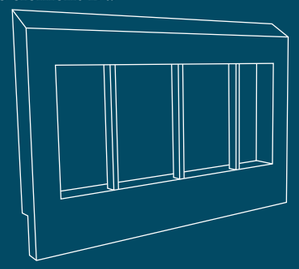
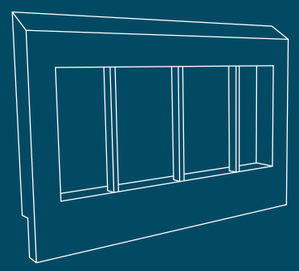
More detailed describtions of the construction can be found in the presentation or on the previous detail drawings of the connection elements.

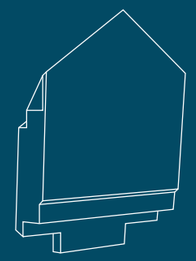
ELEMENT GEOMETRY	STRUCTURAL FUNCTION	CONSTRUCTION	U-VALUE
Facade element 1a *common space* 	**Wall**	**550 mm width:** 70 mm exterior concrete wall 330 mm insulation 150 mm interior concrete wall	0,10 W/m²K
Facade element 1b *common space* 	**Wall**	**550 mm width:** 70 mm exterior concrete wall 330 mm insulation 150 mm interior concrete wall	0,10 W/m²K
Facade element 2a *cell unit* 	**Wall** **Window** **60 x 60 mm**	**550 mm width:** 70 mm exterior concrete wall 330 mm insulation 150 mm interior concrete wall **3 layered energy safety glass w. argon:** LT value: 0,79 g-value: 0,62	0,10 W/m²K 1,14 W/ m²K Ug value
Facade element 2b *cell unit* 	**Wall** **Window** **60 x 60 mm**	**550 mm width:** 70 mm exterior concrete wall 330 mm insulation 150 mm interior concrete wall **3 layered energy safety glass w. argon:** LT value: 0,79 g-value: 0,62	0,10 W/m²K 1,14 W/ m²K *Ug value*

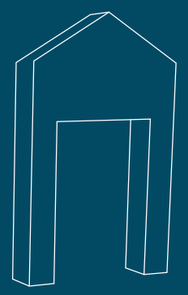
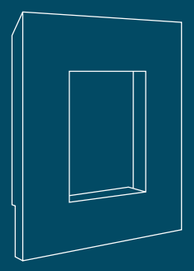
ELEMENT GEOMETRY	STRUCTURAL FUNCTION	CONSTRUCTION	U-VALUE
Facade element 3a *cell unit* 	**Wall**	**550 mm width:** 70 mm exterior concrete wall 330 mm insulation 150 mm interior concrete wall	0,10 W/m²K
	Window 350 x 500 mm	**3 layered energy safety glass w. argon:** LT value: 0,79 g-value: 0,62	1,14 W/ m²K *Ug value*
Facade element 3b *cell unit* 	**Wall**	**550 mm width:** 70 mm exterior concrete wall 330 mm insulation 150 mm interior concrete wall	0,10 W/m²K
	Window 350 x 500 mm	**3 layered energy safety glass w. argon:** LT value: 0,79 g-value: 0,62	1,14 W/ m²K *Ug value*
Facade element 4 *cell unit* 	**Wall**	**550 mm width:** 70 mm exterior concrete wall 330 mm insulation 150 mm interior concrete wall	0,10 W/m²K
	Window 1390 x 1445 mm	**3 layered energy safety glass w. argon:** LT value: 0,79 g-value: 0,62	1,14 W/ m²K *Ug value*
Variable facade element Aa *common space* 	**Wall**	**550 mm width:** 550 mm concrete	Outdoor wall

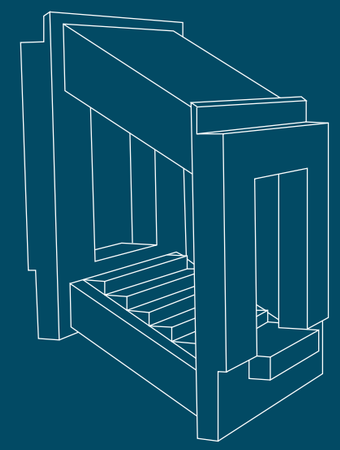
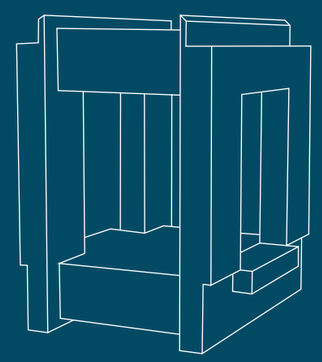
ELEMENT GEOMETRY	STRUCTURAL FUNCTION	CONSTRUCTION	U-VALUE
Variable facade element Ab *common space* 	**Wall**	**550 mm width:** 550 mm concrete	Outdoor wall
Variable facade element Ba *common space* 	**Wall**	**100 mm width:** 100 mm concrete	Outdoor wall
Variable facade element Ca *common space* 	**Window**	**3 layered energy safety glass w. argon:** LT value: 0,79 g-value: 0,62	1,14 W/ m^2K *Ug value*

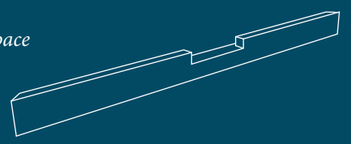
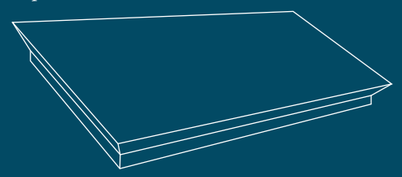
ELEMENT GEOMETRY	STRUCTURAL FUNCTION	CONSTRUCTION	U-VALUE
Variable facade element Cb *common space* 	**Window**	**3 layered energy safety glass w. argon:** LT value: 0,79 g-value: 0,62	1,14 W/ m^2K *Ug value*
Variable facade element Cc *common space* 	**Window**	**3 layered energy safety glass w. argon:** LT value: 0,79 g-value: 0,62	1,14 W/ m^2K *Ug value*
Variable facade element Cd *common space* 	**Window**	**3 layered energy safety glass w. argon:** LT value: 0,79 g-value: 0,62	1,14 W/ m^2K *Ug value*

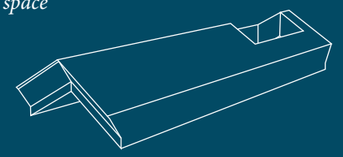
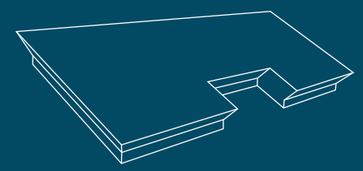
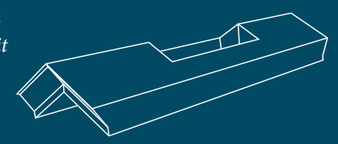
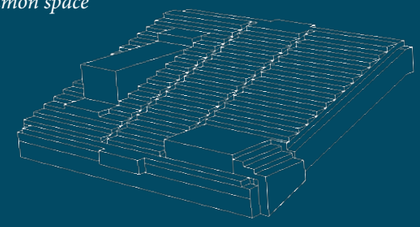
ELEMENT GEOMETRY	STRUCTURAL FUNCTION	CONSTRUCTION	U-VALUE
Variable facade element Da *common space* 	**Wall**	**3 layered safety glass**	**Outdoor wall**
Variable facade element Db *common space* 	**Wall**	**3 layered safety glass**	**Outdoor wall**
Gable element 1a *Common space* *cell unit* 	**Wall**	**550 mm width:** 70 mm exterior concrete wall 330 mm insulation 150 mm interior concrete wall	**0,10 W/m²K**
Gable element 1b *Common space* *cell unit* 	**Wall**	**550 mm width:** 70 mm exterior concrete wall 330 mm insulation 150 mm interior concrete wall	**0,10 W/m²K**

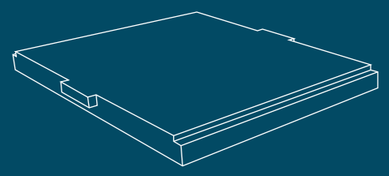
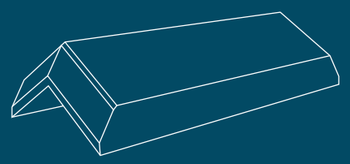
ELEMENT GEOMETRY	STRUCTURAL FUNCTION	CONSTRUCTION	U-VALUE
Gable element 2 *common space* *cell unit* 	**Wall**	**550 mm width:** 70 mm exterior concrete wall 330 mm insulation 150 mm interior concrete wall	0,10 W/m²K
Gable element 3a *common space* 	**Wall** **Window**	**550 mm width:** 70 mm exterior concrete wall 330 mm insulation 150 mm interior concrete wall **3 layered energy safety glass w. argon:** LT value: 0,79 g-value: 0,62	0,10 W/m²K 1,14 W/ m²K *Ug value*
Gable element 3b *common space* 	**Wall** **Window**	**550 mm width:** 70 mm exterior concrete wall 330 mm insulation 150 mm interior concrete wall **3 layered energy safety glass w. argon:** LT value: 0,79 g-value: 0,62	0,10 W/m²K 1,14 W/ m²K *Ug value*
Gable element 4 *common space* 	**Wall**	**550 mm width:** 70 mm exterior concrete wall 330 mm insulation 150 mm interior concrete wall	

ELEMENT GEOMETRY	STRUCTURAL FUNCTION	CONSTRUCTION	U-VALUE
Gable element 5 *common space* 	**Wall**	**550 mm width:** 70 mm exterior concrete wall 330 mm insulation 150 mm interior concrete wall	0,10 W/m²K
	Glass door	**3 layered energy safety glass w. argon:** LT value: 0,79 g-value: 0,62	1,14 W/ m²K *Ug value*
Gable element 5 *common space* 	**Wall**	**550 mm width:** 70 mm exterior concrete wall 330 mm insulation 150 mm interior concrete wall	0,10 W/m²K
Connection element A *common space* *cell unit* 	**Wall**	**384 mm width:** 70 mm exterior concrete wall 314 mm insulation	0,10 W/m²K *meeting w. interior wall*
	Window 1500 x 2100 mm	**3 layered energy safety glass w. argon:** LT value: 0,79 g-value: 0,62	1,14 W/ m²K *Ug value*

ELEMENT GEOMETRY	STRUCTURAL FUNCTION	CONSTRUCTION	U-VALUE
Connection element B *common space* *cell unit* 	**Wall**	**384 mm width:** 70 mm exterior concrete wall 314 mm insulation	0,10 W/m²K *meeting w. interior wall*
	Window	**3 layered energy safety glass w. argon:** LT value: 0,79 g-value: 0,62	1,14 W/ m²K *Ug value*
	Deck	**705 mm width:** 70 mm concrete bottom plate 45 mm rigid insulation 170 mm rigid insulation concrete staircase 30 mm spruce floor	0,20 W/m²K
	Roof	**690 mm width:** 70 mm concrete slab 440 mm rigid insulation 180 mm concrete roof	0,07 W/m²K
Connection element C *common space* *cell unit* 	**Wall**	**384 mm width:** 70 mm exterior concrete wall 314 mm insulation	0,10 W/m²K *meeting w. interior wall*
	Window	**3 layered energy safety glass w. argon:** LT value: 0,79 g-value: 0,62	1,14 W/ m²K *Ug value*
	Deck	**710 mm width:** 70 mm concrete bottom plate 70 mm rigid insulation 270 mm rigid insulation 270 mm concrete slab 30 mm spruce floor	0,09 W/m²K
	Roof	**690 mm width:** 70 mm concrete slab 525 mm rigid insulation 180 mm concrete roof	0,07 W/m²K

ELEMENT GEOMETRY	STRUCTURAL FUNCTION	CONSTRUCTION	U-VALUE
Beam 1 *common space* *cell unit* 	**Beam**	**KBE beam** 406 x 620 mm 155 mm abutment	
Beam 2 *cell unit* 	**Beam**	**KBE beam** 406 x 620 mm 155 mm abutment	
Slab 1 *common space* *cell unit* 	**Slab**	**710 mm width:** 70 mm concrete bottom plate 70 mm rigid insulation 270 mm rigid insulation 270 mm concrete slab 30 mm spruce floor	0,10 W/m²K
Roof 1 *common space* 	**Roof**	**690 mm width:** 70 mm concrete slab 440 mm rigid insulation 180 mm concrete roof	0,07 W/m²K

ELEMENT GEOMETRY	STRUCTURAL FUNCTION	CONSTRUCTION	U-VALUE
Roof 2 *common space* 	**Roof**	**690 mm width:** 70 mm concrete slab 440 mm rigid insulation 180 mm concrete roof	0,07 W/m²K
	Skylight	**2 layered energy safety glass:** g-value: 0,050	1,0 W/m²K
Roof 3 *cell unit* 	**Roof**	**690 mm width:** 70 mm concrete slab 440 mm rigid insulation 180 mm concrete roof	0,07 W/m²K
Roof 4 *cell unit* 	**Roof**	**690 mm width:** 70 mm concrete slab 440 mm rigid insulation 180 mm concrete roof	0,07 W/m²K
	Skylight	**2 layered energy safety glass:** g-value: 0,050	1,0 W/m²K
Variable slab 1a *common space* 	**Slab**	**660 mm width:** 70 mm concrete slab 70 mm rigid insulation 250 mm rigid insulation 270 mm concrete slab wooden staircase, spruce	0,1 W/m²K

ELEMENT GEOMETRY	STRUCTURAL FUNCTION	CONSTRUCTION	U-VALUE
Variable deck 1b 	**Deck**	**710 mm width:** 70 mm concrete bottom plate 70 mm rigid insulation 270 mm rigid insulation 270 mm concrete slab 30 mm spruce floor	xxx
Variable roof 	**Roof**	**690 mm width:** 70 mm concrete slab 440 mm rigid insulation 180 mm concrete roof	0,07 W/m²K
Variable roof 	**Roof**	**690 mm width:** 70 mm concrete slab 440 mm rigid insulation 180 mm concrete roof	0,07 W/m²K

Ill.155

FREIGHT

In Greenland they only have insitu concrete as a local produced material. To support the local community and further to be aware of the environmental consequences by transporting building materials over long distances, the parts of the correctional institution which are in insitu concrete will be produced i Nuuk. Even though we are not able to solve the social challenge in Greenland according to the high unemployment rate, some responsibility for the context and its inhabitants must be taken.

The pre fabricated concrete elements and other materials and furniture will be produced somewhere else and freighted by ship.

STATICAL SYSTEMS
transfer of forces

In Greenland strong loads caused by the wind and snow are predominant and induce horizontal and vertical loads on the building. The additive expression and the itention about letting the landscape continue under the building is expressed by pillar foundations. The pillars are fixed in the fell and the added prefabricated elements are fixed to the pillars by a anchorage cylinder going from the wall through the beam to the pillars. When using pillars the wind load will affect the slab of the building. However, the deadload of the slab itself resists the wind load.

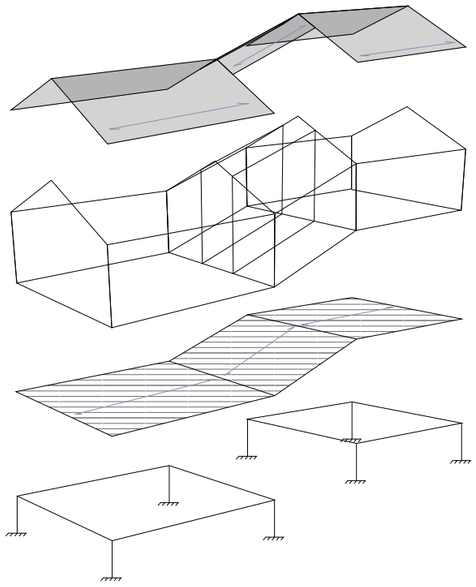
Thereby the stabilising moment of the building is larger than the driving moment caused by the outer forces.

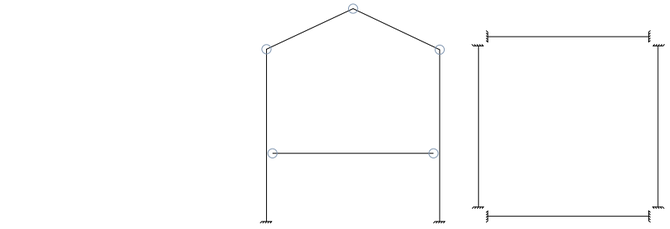
The variable and connection elements are not cast together with the other basic elements, but are interlocked and further reinforced by a threaded bar. Thereby they a become removable modules which transfer their forces to the beams in the basic systems and further to the pillars and the fell.

Even though the system consists of charnier joints when looking in section, the walls are fixed together by anchorage hooks and thereby work as a barrel hoop for the structure and secure stability of the construction.

Below diagrams are showed accounting for the transfer of forces and the structural construction.

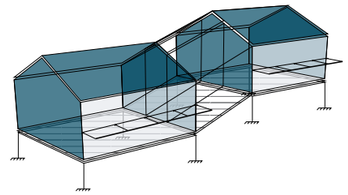
STRUCTURAL SYSTEM
1: extruded plan, structural system of living unit - common space
2: section and plan, structural system of living unit - common space

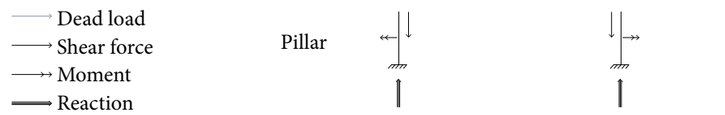


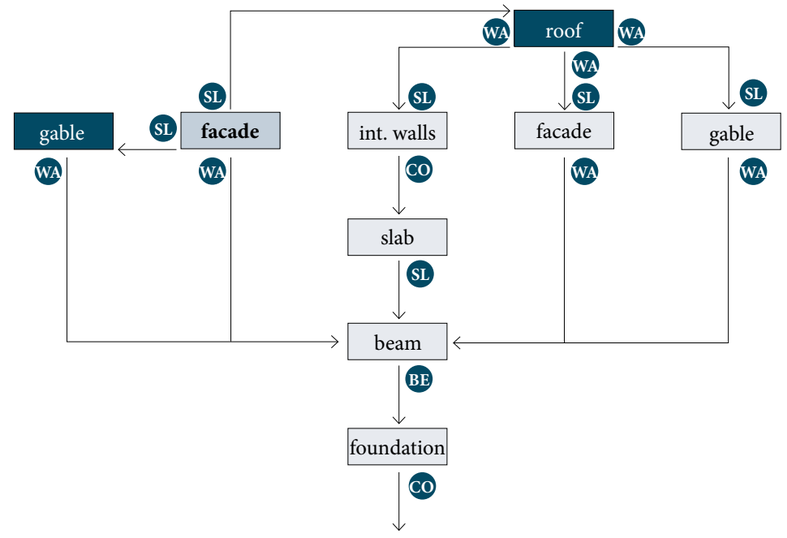


HORIZONTAL LOAD
wind load on facade

SL Slab function
WA Wall function
CO Column function
BE Beam function

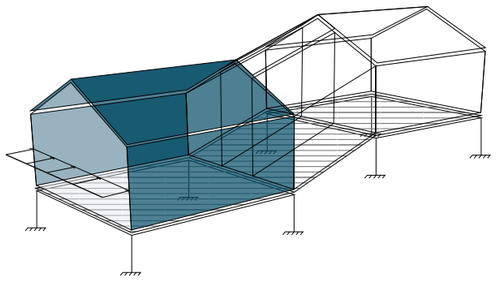


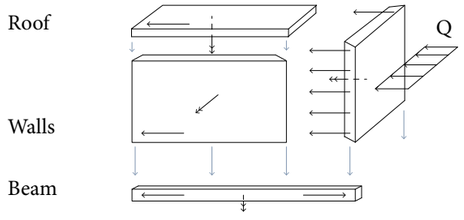




HORIZONTAL LOAD
wind load on gable

- SL Slab function
- WA Wall function
- CO Column function
- BE Beam function

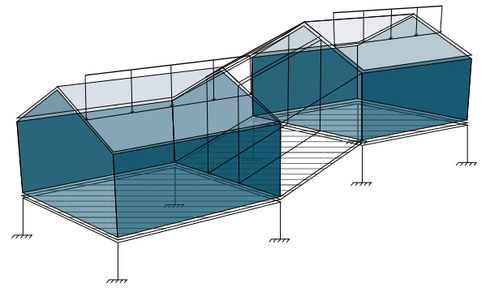


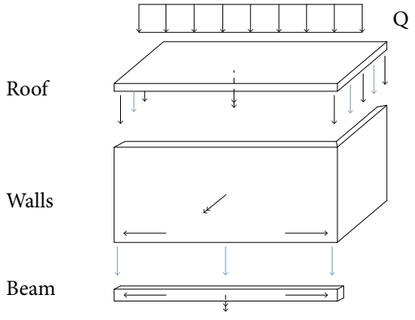


- Dead load
- Shear force
- Moment
- Reaction

VERTICAL LOAD
self-weight and snow load

- SL Slab function
- WA Wall function
- CO Column function
- BE Beam function

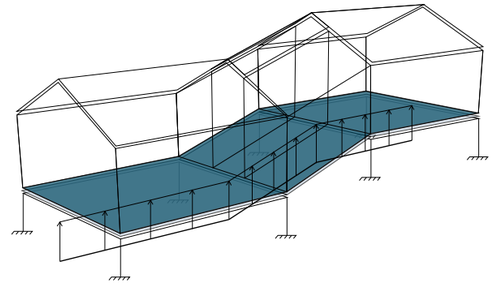


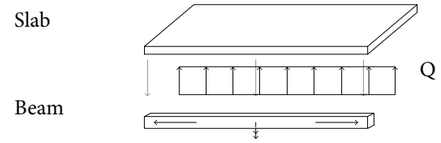


- Dead load
- Shear force
- Moment
- Reaction

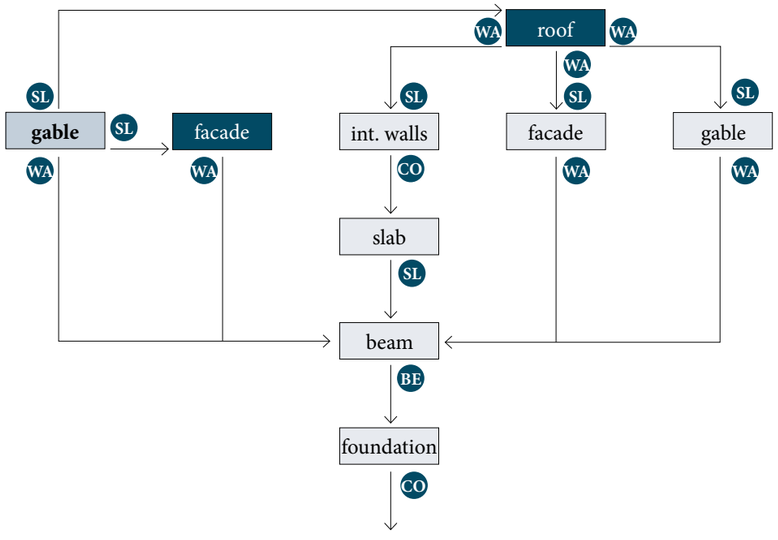
VERTICAL LOAD
wind load on deck

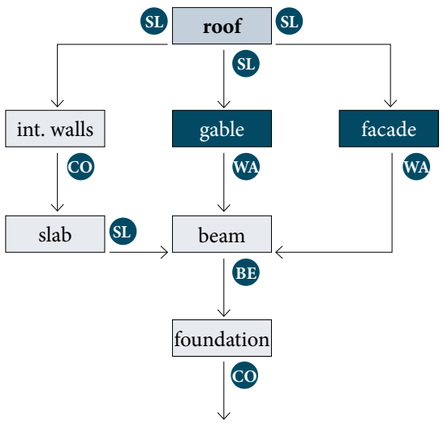
- SL Slab function
- WA Wall function
- CO Column function
- BE Beam function





- Dead load
- Shear force
- Moment
- Reaction





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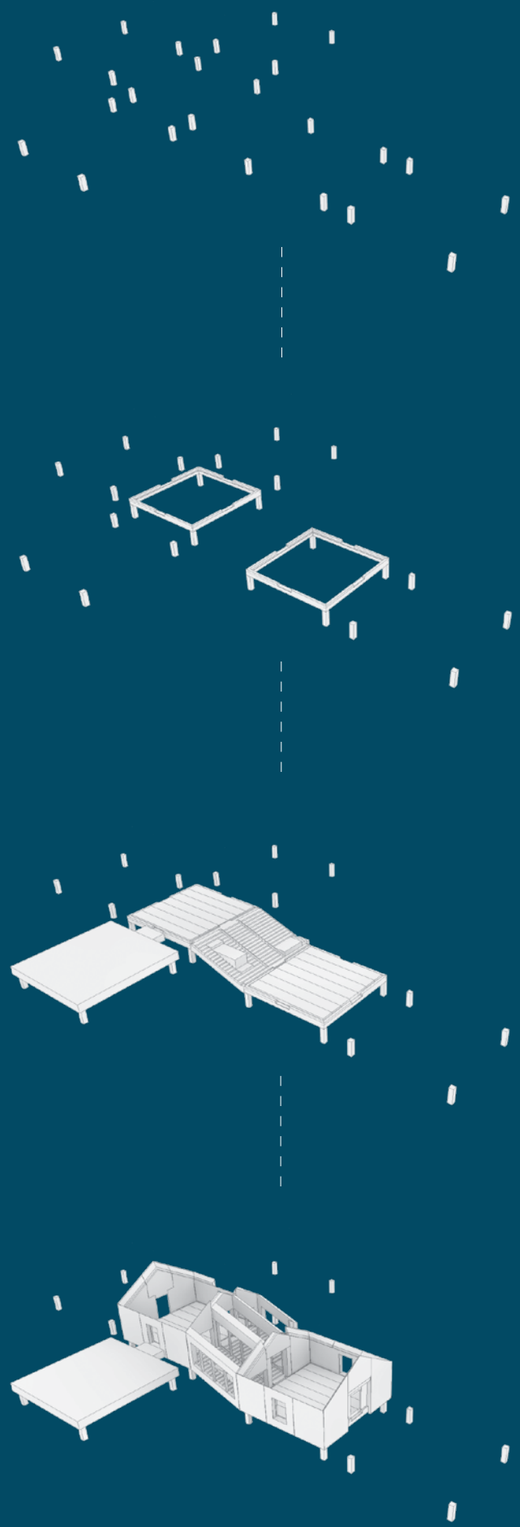
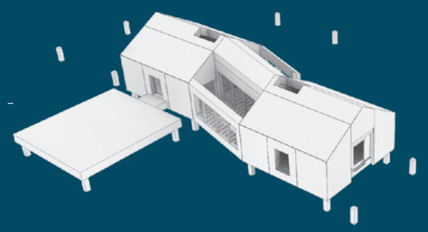
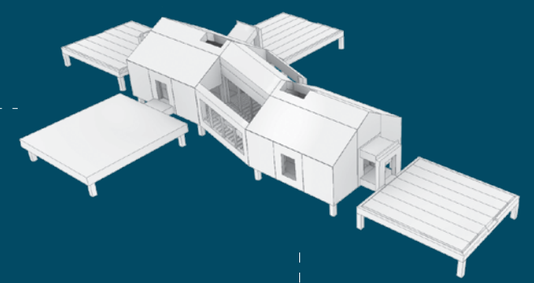
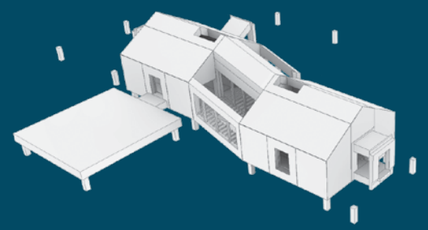
BUILDING PROCESS
a step-by-step method

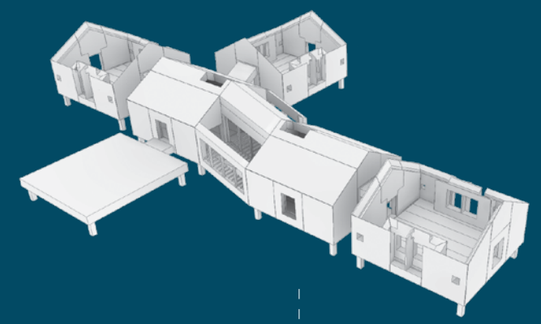
The pillars are founded parallel with the fixed insitu buildings. They indicate where to build the liviing units. Beams and slabs in the commen space are the first to be added, followed by the walls, roofs and terraces. Together they embrace the common space of the living unit. Continued the connection elements are added. They lead to the cell units which are the last thing being added in the building process and occur in relation to the needs for more cells.

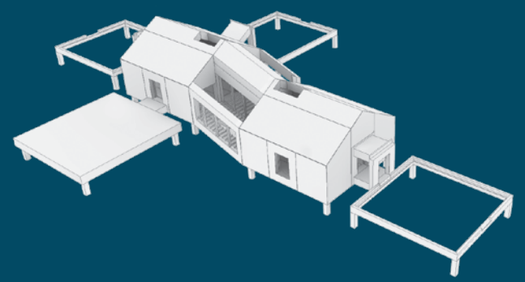


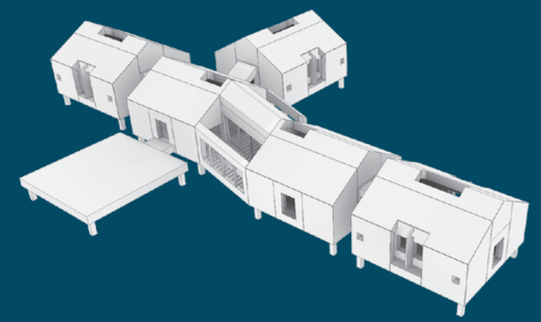












Ill.157

EXTRUDED COMPOSITION
technical descriptions

As explained on the step-by-step illustration on the previous page the pillars are the first step in the building process of the living unit. However, as explained in the chapter 'Moving in the landscape' in the design prosess the path is the first to come. The path is beside its funcion as an axis of the architecture and a movement to certain places, also an access and supply path which creates the physical access to the living units and supply them with piping. In the techinical room in the main administration building fell heating is used to heat up the water a few degrees and then led to the living units by the supply path. In the livng units the water will be heated additionally to hot utility water. This approach is chosen to minimise the heat loss, but also to minimise the number of pipes.

Hybrid ventilation is the ventilation approach for the living units.
Mechanical ventilation is distributed locally in the living unit and is running in the insulation in the slabs. A NilAIR system can be used in this case. Further the windows are provided with fresh air valves, where thermal buoyancy will ensure fresh air circulation.

QUALIFYING THE ADDITIVITY
an additive building system

With reference to the chapter 'Additive architecture - in a changing context' the different approaches to additive architecture were communicated through a diagram. When retuning to the additive system of this project, this system can be illustrated as an element based system, where the prefabricated concrete elements are the *building stones* for the project. In terms of a closed or open system the connection elements make a degree of openness possible, but limited by the pre founded pillars which indicate where to add. Therefore the degree of additivity is based on the opportunity for adding, but still ensures control of the aesthetic expression. As described in the previous the *material joint* of the concrete elements creates visible lines in the architectural expression, how and where to assemble the building becomes readable and the construction expresses the aesthetics.

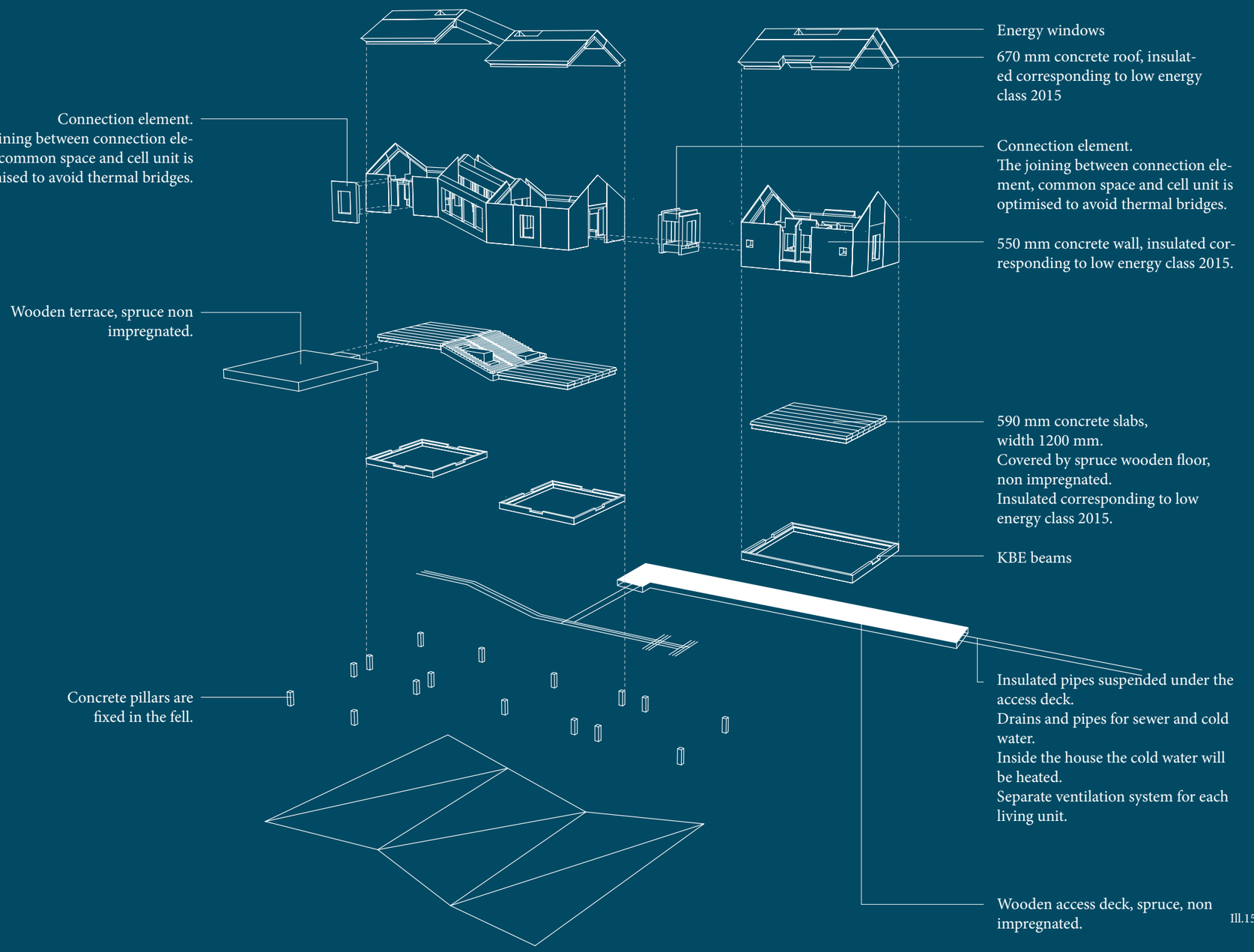
2D elements
Prefabricated concrete elements

System
Hybrid between open and closed system

Construction
Construction express the architecture
Ill.158

When building the architecture becomes concrete and in relation to what Zumthor and Norberg-Schulz states "the world is a gatering of concrete things", the architecture must be reachable in the sense of touch and experince. Here the materials are an essential part, without materials the architecture will not be able to become concrete.

By creating architecture joint occur as *formal joints* and *material joints*. Both have a purpose for the expression and experience of the architecture. The *formal joints* become passages or transitions in between spaces, here in this project as the path, the connection element, but also the door and the corridoor and to some extent the window. The *material joint* is the detailing and the meeting of the materials, which also represents an essential part, even though they occur as smaller parts compared to the totality of the architectural experience.


Energy windows
670 mm concrete roof, insulated corresponding to low energy class 2015
Connection element.
The joining between connection element, common space and cell unit is optimised to avoid thermal bridges.
Connection element.
The joining between connection element, common space and cell unit is optimised to avoid thermal bridges.
550 mm concrete wall, insulated corresponding to low energy class 2015.
Wooden terrace, spruce non impregnated.
590 mm concrete slabs,
width 1200 mm.
Covered by spruce wooden floor, non impregnated.
Insulated corresponding to low energy class 2015.
KBE beams
Concrete pillars are fixed in the fell.
Insulated pipes suspended under the access deck.
Drains and pipes for sewer and cold water.
Inside the house the cold water will be heated.
Separate ventilation system for each living unit.
Wooden access deck, spruce, non impregnated.

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CONTENTS

PRESENTATION
NUUK CORRECTIONAL INSTITUTION

Through the design process various themes affecting the design in many different ways have been described and illustrated. The design has been developed from the large scale of the masterplan to the small scale of a single joint. This all leads to the final presentation of the design where the end result will be explained, visualised and reflected upon. All drawing material is based on the demands of the correctional institution at present unless told otherwise.

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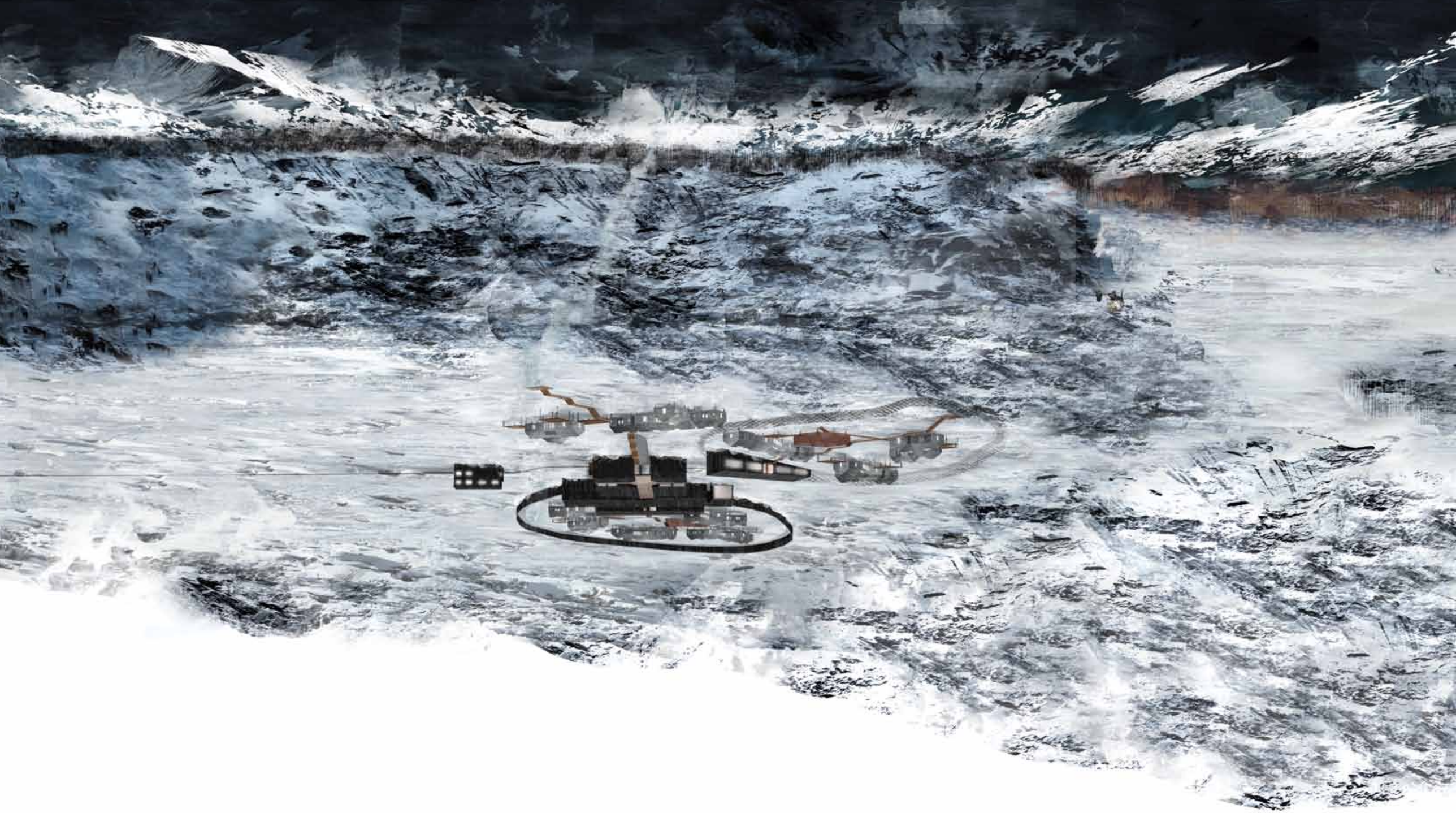
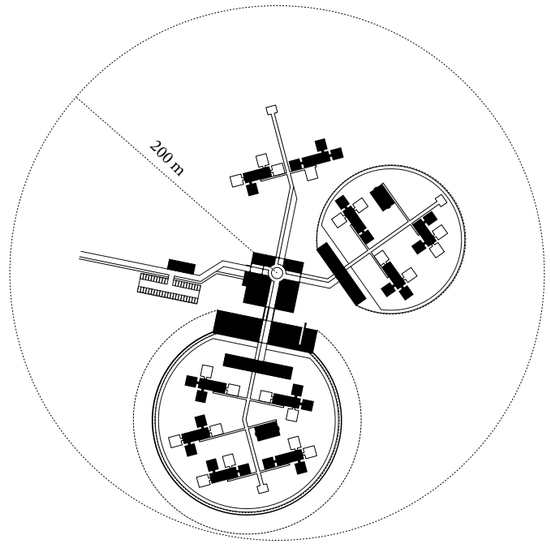
EXPERIENCING THE CORRECTIONAL INSTITUTION
visualisation, from the water

Seen from the water the essence of the correctinal institution becomes clear.

The fell is an evident part of the composition and the overall expression. The buildings relate to the surrounding context; the landscape, the culture, the climate, by strectching out into the landscape, creating a clear reference to something recognisable, an association to the traditional Greenlandic village, the Bygd.

Ill.161





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MASTERPLAN
winter, year 2015
1:2000

Before entering the correctional institution the path makes a turn around a fell protrusion and directs the view towards the sea.

When entering the core of the correctional institution paths to the departments lead in different directions. The wooden planks of the path indicate a direction, and every path stretches towards a place to stay.

When moving through the landscape man experiences different landscape characters, as every department has different landscape spaces; In the closed department the river runs through the wall, creating a river bank in the west end of the department. Stone blocks shape pockets in the landscape, which together with the arrangement of the living units create sheltered outdoor spaces.

In the open department wetlands create a foundation for colourful vegetation in the summer period.

The re-entry department stretches towards the sea and the direction of the path allows the view of the eye to continue towards the horizon. A terrace is tip toing the river and becomes a place for get-togethers.

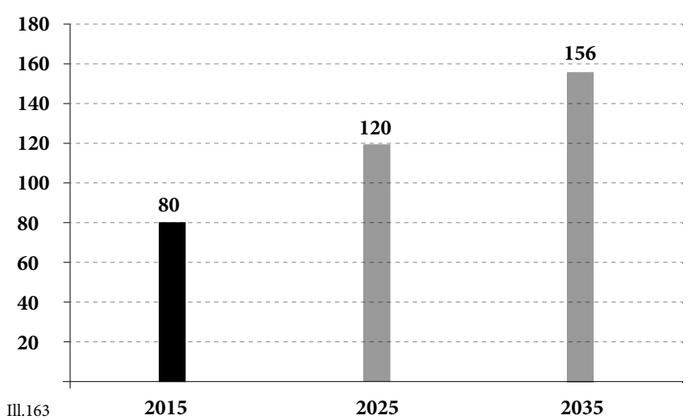
Outdoor activities such as ball games, running paths and recreational spaces created by the landscape make outdoor life inviting.

REFERENCE TO THE BYGD
The core is the centre and the common functions, they are all represented by darker concrete materials visualising the reference to something fixed.

The departments are placed in the landscape where parallels to the village, the bygd occur. The departments appear as small societies which together creates a unity.

BASED ON ADDITIVITY
The living units are based on an additive system which over time is imagined to develope and extend according to the social development.

The masterplan of year 2015 provides placements for 80 inmates.



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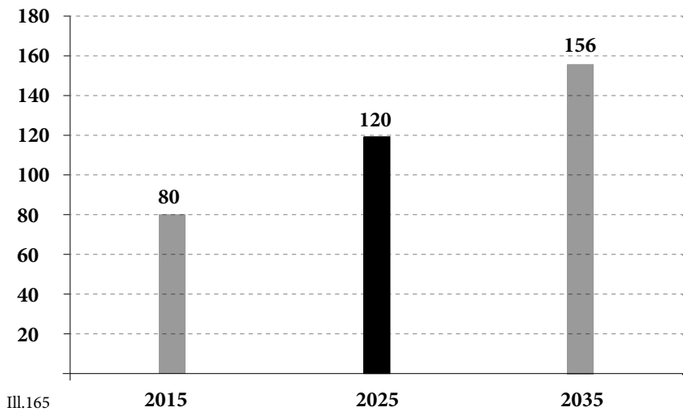
N

MASTERPLAN
winter, year 2025
1:2000

The living units are extended to full capacity, where some terraces are revoked and cell units are placed instead. Thereby the correctional institution contains room for 120 inmates. Through time the materials of the living units patinate and appear darker creating distinctions between the newly added units and the older ones.



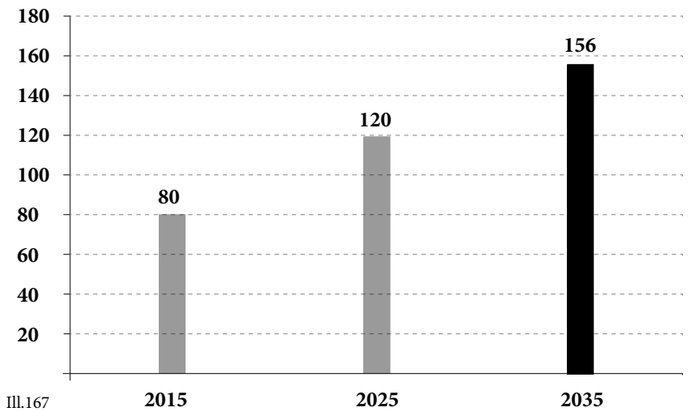
Ill.165 Ill.166


N

MASTERPLAN
winter, year 2035
1:2000

If the increase of the number of placements in the correctional institution continues the possibility for an extension is necessary to ensure future-proofing.

The scenario of 2035 is to add on one more open department. Thereby the capacity of the institution will be rooms for 156 inmates.



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N

MASTERPLAN
floor plan, summer, year 2015
1:2000

Using the river as an edge before entering.

The common fixed facilities are placed in the centre of the correctional institution. From here everything is organised, it is the core of the system.

When staying in the re-entry department, inmates are allowed to have work in the city and spend time with family outside the institution, however no one have permission to leave the institution without the approval from the staff.

In the open department inmates are employed in the institution, but only a fence separate them from the surroundings.
Being an inmate in the closed department comprise full confinement. The inmates are only allowed to leave the department with staff. The only time inmates leave the inside of the walls are when visiting relatives in the visitor department, using the somatic health centre or the temporary cells. The placement of those are related to the intention of not getting relatives to deep into the institution and having the health centre and the temporary cells centrally placed.

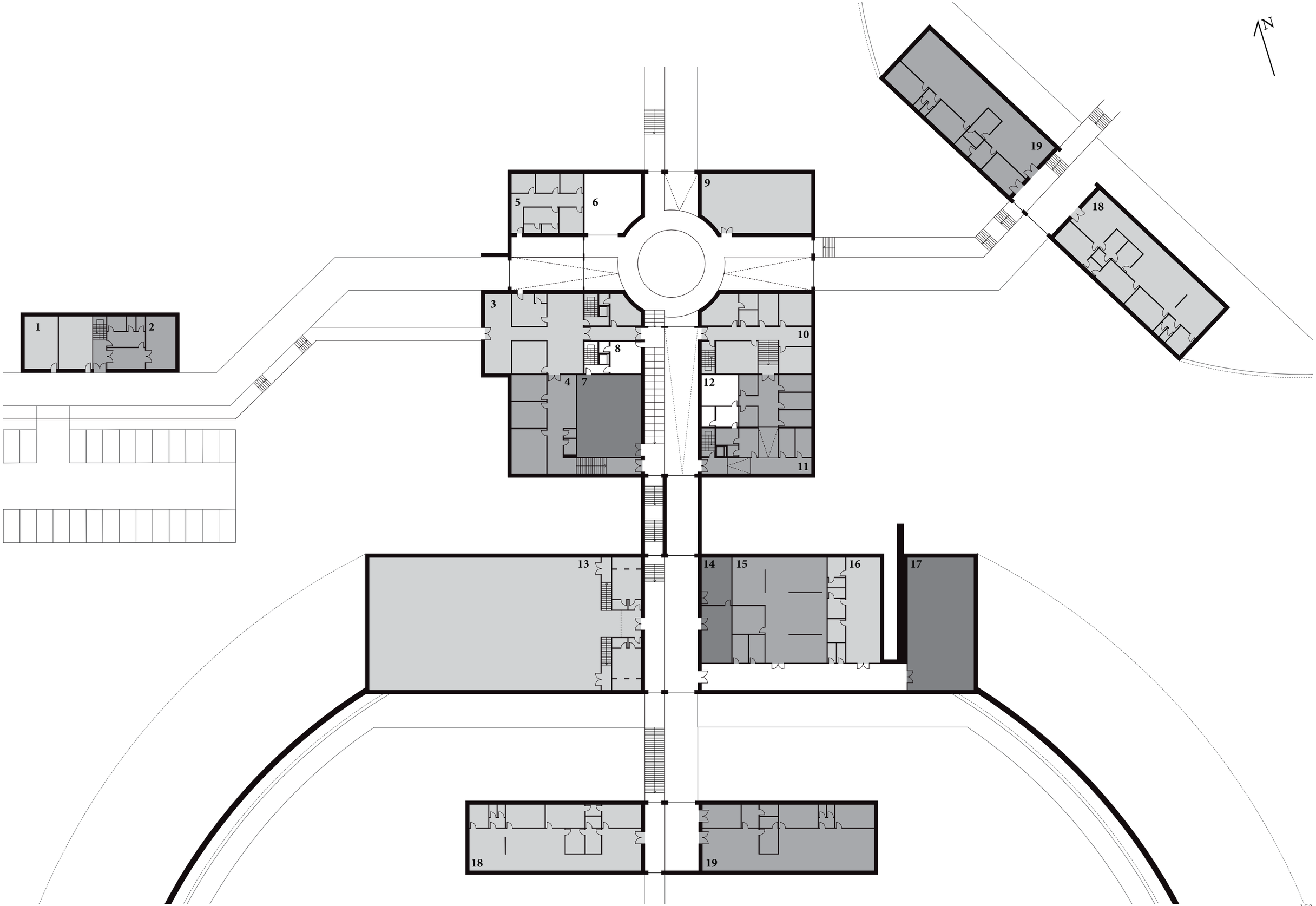
The organisation of the common fixed facilities are presented on the following pages. Ill.169


N

PLAN DRAWING
ground floor, fixed buildings
1:500

1 STAFF APARTMENTS
2 STAFF AREA
Dressing room
Shower
Toilets
Lunch room
Classroom
3 GATE
Reception
Surveillance
Security check
Lockers for visitors
Staircase to visitor department
Elevator to visitor department
Wardrobe, staff
4 'PUBLIC' FACILITIES
Abuse treatment, group room
Meeting rooms
Toilets
Kitchen
5 RECEPTION DEPARTMENT
3 reception cells
Security Check
Storage
6 GARAGE
7 STORAGE
8 ACCESS TO VISITOR DEPARTMENT, INMATES
Security check
Toilet
Staircase to visitor department
Elevator to visitor department
9 TECHNICAL ROOM
10 SOMATIC HEALTH
Flexible room
Storage
Toilet, staff
Toilet, inmates
Conversation room
Doctor consultation
Dentist
Waiting room
Staircase to offices
11 TEMPORARY CELLS
2 protection cells
3 isolation cells
2 observation cells
Security Check
Toilet, inmates
Storage
Staircase to offices
Elevator to offices
12 STAFF AREA
Techinical room
Toilet, staff
Storage
13 CULTURAL CENTRE - GYM
Gym
2 dressing rooms
14 CULTURE CENTRE - GROCERY SHOP
Grocery shop
Storage, grocery shop
15 CULTURE CENTRE - ACTIVITY AREA
Activity area
Music room
Kitchen
Toilets
16 CULTURE CENTRE - LIBRARY
Library
Office, librarian
Office, priest
Toilets, staff
Toilets, inmates
Conversation room
17 CULTURE CENTRE - CHURCH
18 OCCUPATION - SCHOOL
2 classrooms
Abuse treatment, group room
Fitness
Office, staff
Lunch area, inmates
Lunch area, staff
Toilet, staff
Toilets, inmates
Storage
Technical room
19 OCCUPATION - WORKSHOP
Workshop
Storage
Office, staff
Toilets, inmates
Toilet, staff
Technical room
Outdoor storage

Ill.170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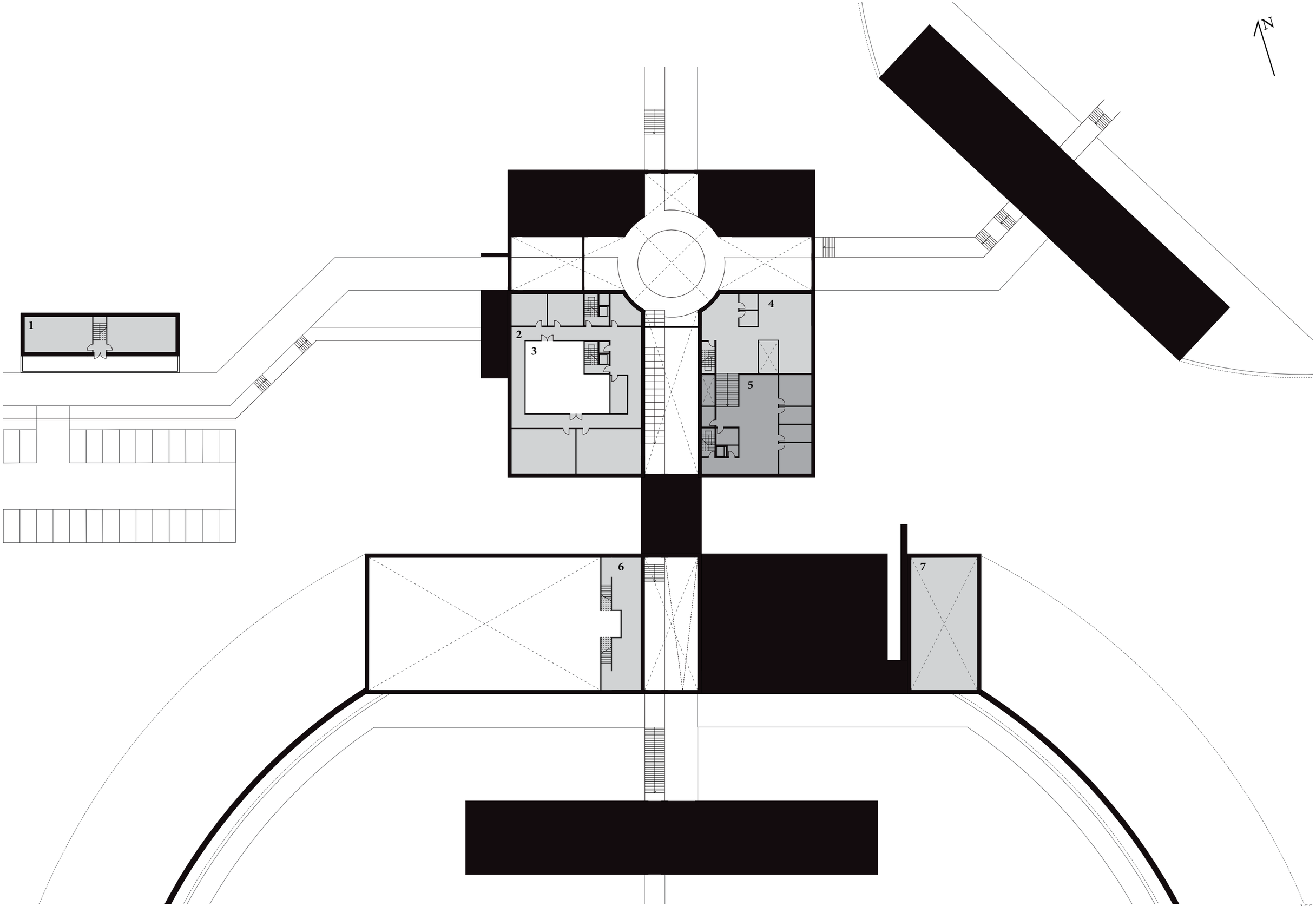
PLAN DRAWING
1. floor, fixed buildings
1:500

1 STAFF APARTMENTS
2 VISITOR DEPARTMENT
2 visitor rooms
2 visitor departments
Watchman
Storage
Toilet
Staircase to reception
Elevator to reception
Staircase to Security check, inmates
Elevator to security check, inmates
3 COURT YARD
4 OFFICE AREA
Lunch area
Kitchen
Toilets
Staircase to somatric health
5 OFFICE AREA
Office, institution executive
Office, interpretor
Office, accounting
Office, 2 social workers
Open office
Toilets
Copy room
Staircase to temporary cells
Elevator to temporary cells
6 CULTURE CENTRE - GYM
Fitness
7 CULTURE CENTRE - CHURCH

Ill.171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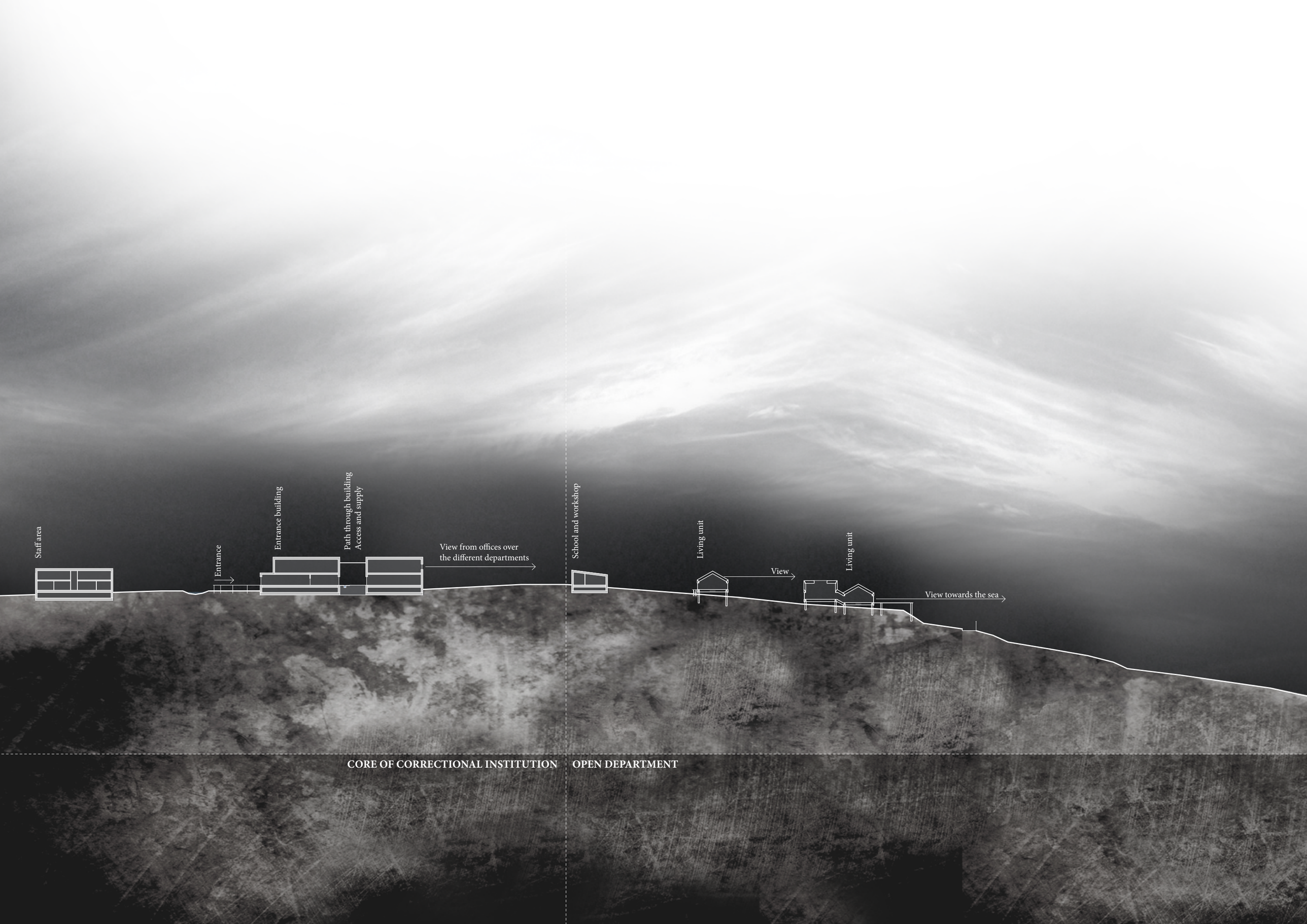
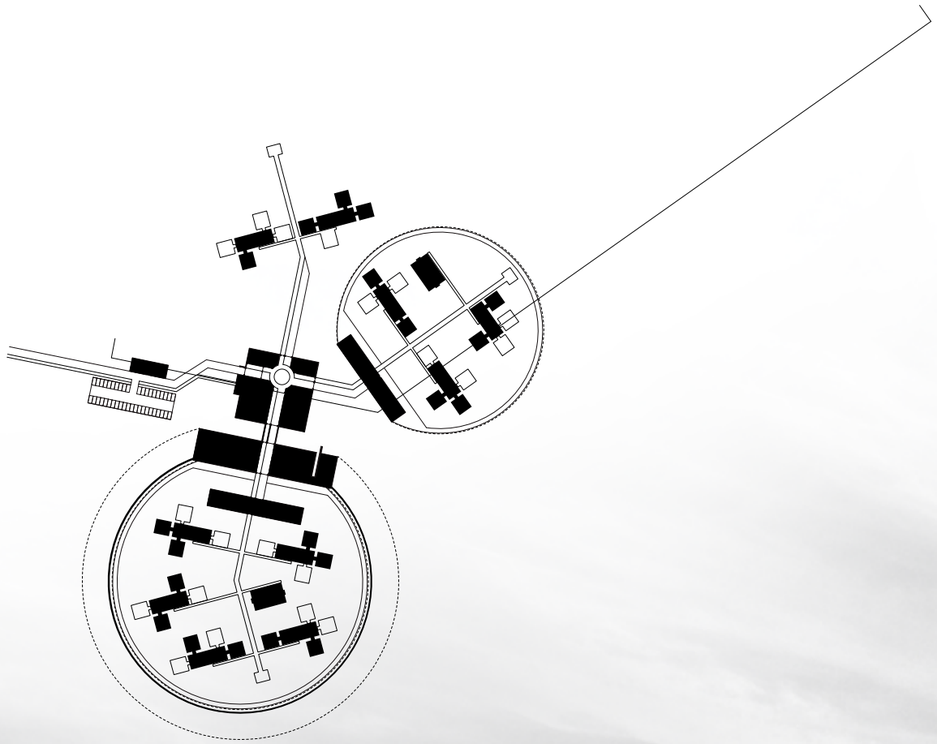

Staff area
Entrance
Entrance building
Path through building
Access and supply
View from offices over
the different departments
School and workshop
Living unit
View
Living unit
View towards the sea
CORE OF CORRECTIONAL INSTITUTION
OPEN DEPARTMENT



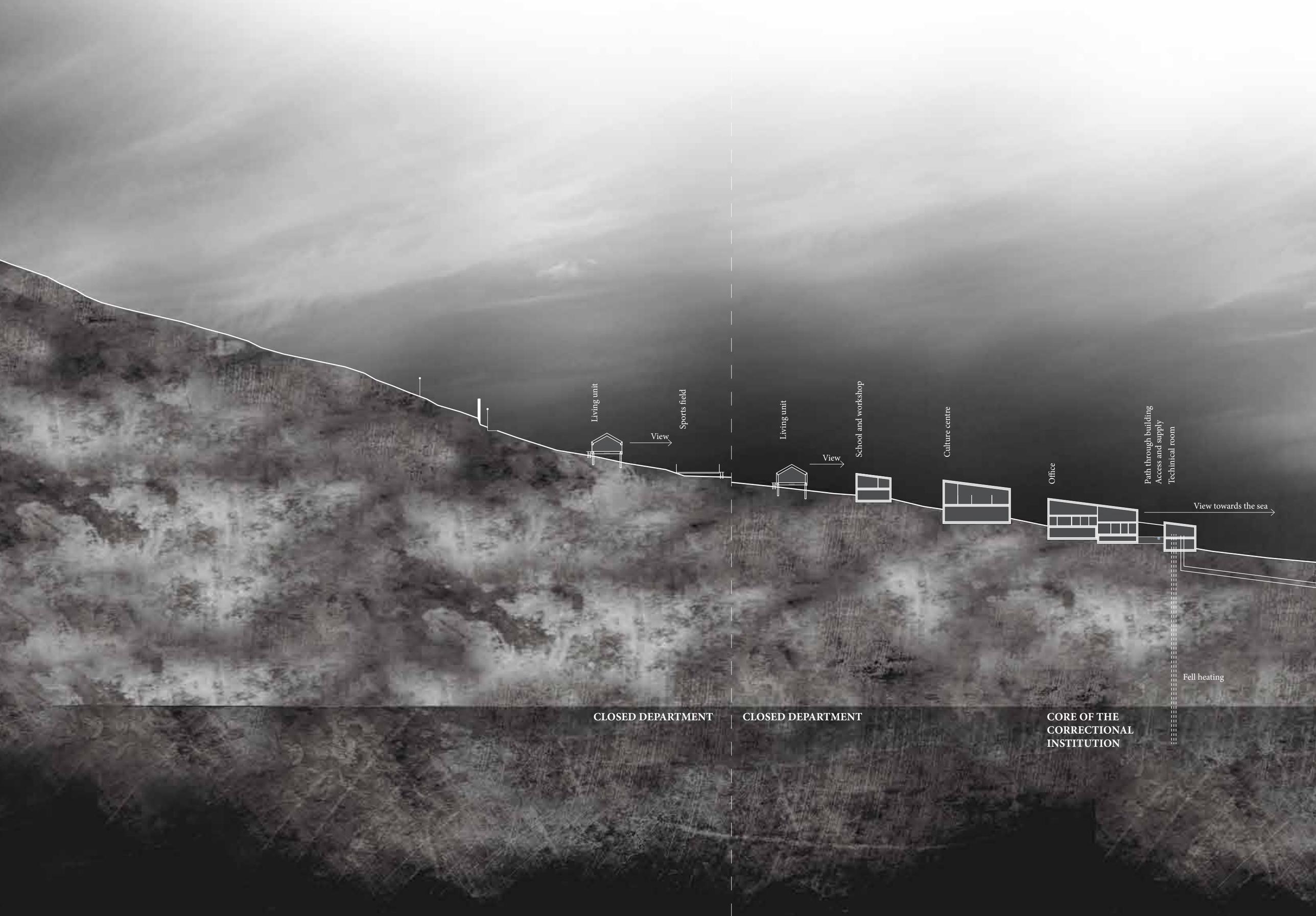
LANDSCAPE SECTION
cross section
1:1000

The landscape has to be crossed before reaching the correctional insitution.

First passing by the staff area, crossing the river and afterwards when entering, reaching the core of the institution.

From the core views expand over the whole institution.

Ill.172


Living unit
View
Sports field
Living unit
View
School and workshop
Culture centre
Office
Path through building
Access and supply
Techinical room
View towards the sea
Fell heating
CLOSED DEPARTMENT
CLOSED DEPARTMENT
CORE OF THE CORRECTIONAL INSTITUTION

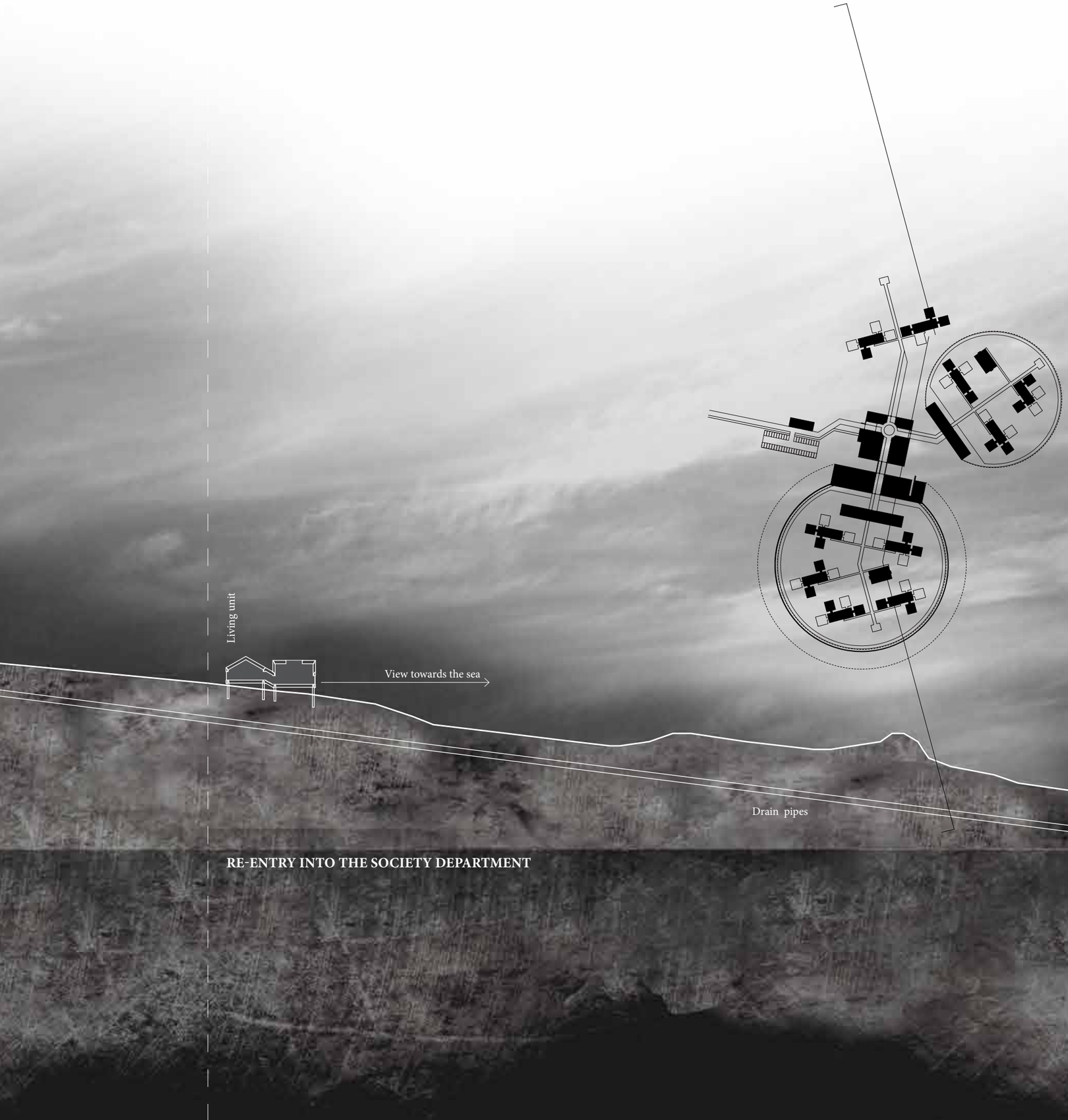
LANDSCAPE SECTION
longitudinal section
1:1000

The sloping landscape makes views the sea possible.

Walking towards the sea brings man closer to freedom, where freedom is represented by the expanded horizon and the placement of the different departments.

Pillars underneath the living units allow the landscape; the melting water, the vegetation - the natural flow, to continue beneath.

Where the pillars supply the additive tale, the common functions which are fixed are deeply rooted in the fell representing fell protrusions.



RE-ENTRY INTO THE SOCIETY DEPARTMENT

CLOSED DEPARTMENT
Wall and terrace
Fell and vegetation
part A

CLOSED DEPARTMENT
Living unit and terrace
Fell, stoneblocks and vegetation
part B

CLOSED DEPARTMENT
Living unit, school and workshop
Fell and vegetation
part C

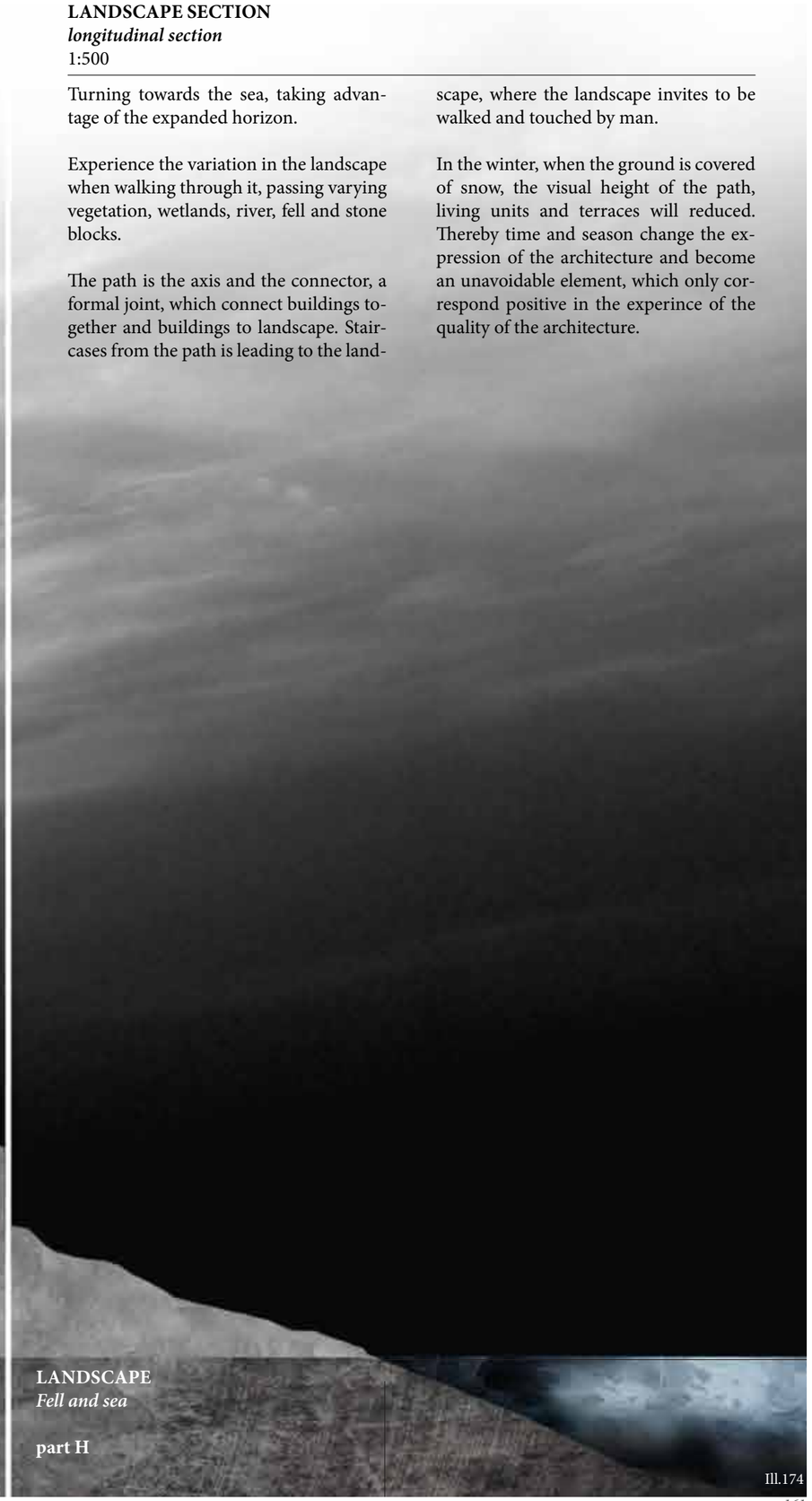
CORE OF INSTITUTION
Pathway
Fell and vegetation
part D

CORE OF INSTITUTION
Pathway
Fell, vegetation and wetland
part E

RE-ENTRY DEPARTMENT
Path and terrace
Fell and river
part F

LANDSCAPE
Fell and vegetation

part G



LANDSCAPE
Fell and sea

part H

LANDSCAPE SECTION
longitudinal section
1:500

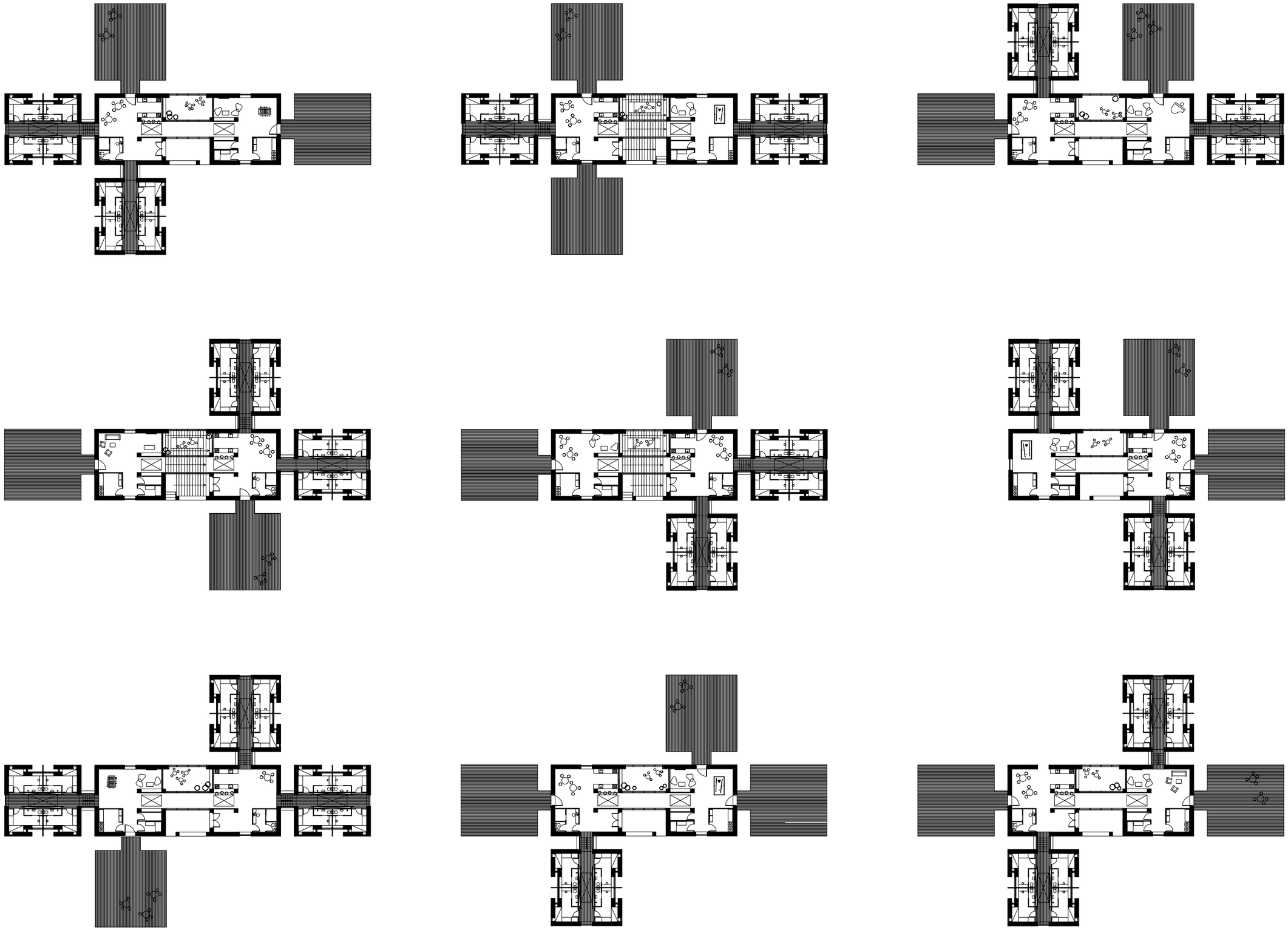
Turning towards the sea, taking advantage of the expanded horizon.

Experience the variation in the landscape when walking through it, passing varying vegetation, wetlands, river, fell and stone blocks.

The path is the axis and the connector, a formal joint, which connect buildings together and buildings to landscape. Staircases from the path is leading to the landscape, where the landscape invites to be walked and touched by man.

In the winter, when the ground is covered of snow, the visual height of the path, living units and terraces will reduced. Thereby time and season change the expression of the architecture and become an unavoidable element, which only correspond positive in the experince of the quality of the architecture.

Ill.174

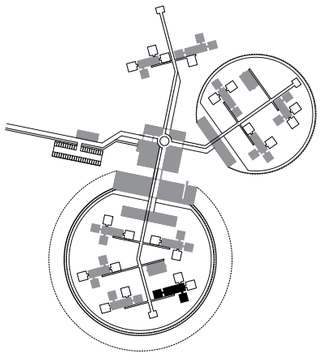


Ill.175

PLAN DRAWINGS
living units, plan combinations
1:500

The additive approach creates possibilities for different plan solutions, where flexible spaces are used for different intentions. Further the additive system makes the adjustment to the typography of the landscape possible, because of its variables and connection elements.

The showed plan combinations are those used in the masterplan, year 2015. One (showed to the right and beneath) will be further detailed in the following to express the architectural experience of the living unit.



PLAN DRAWING
living unit
1:200

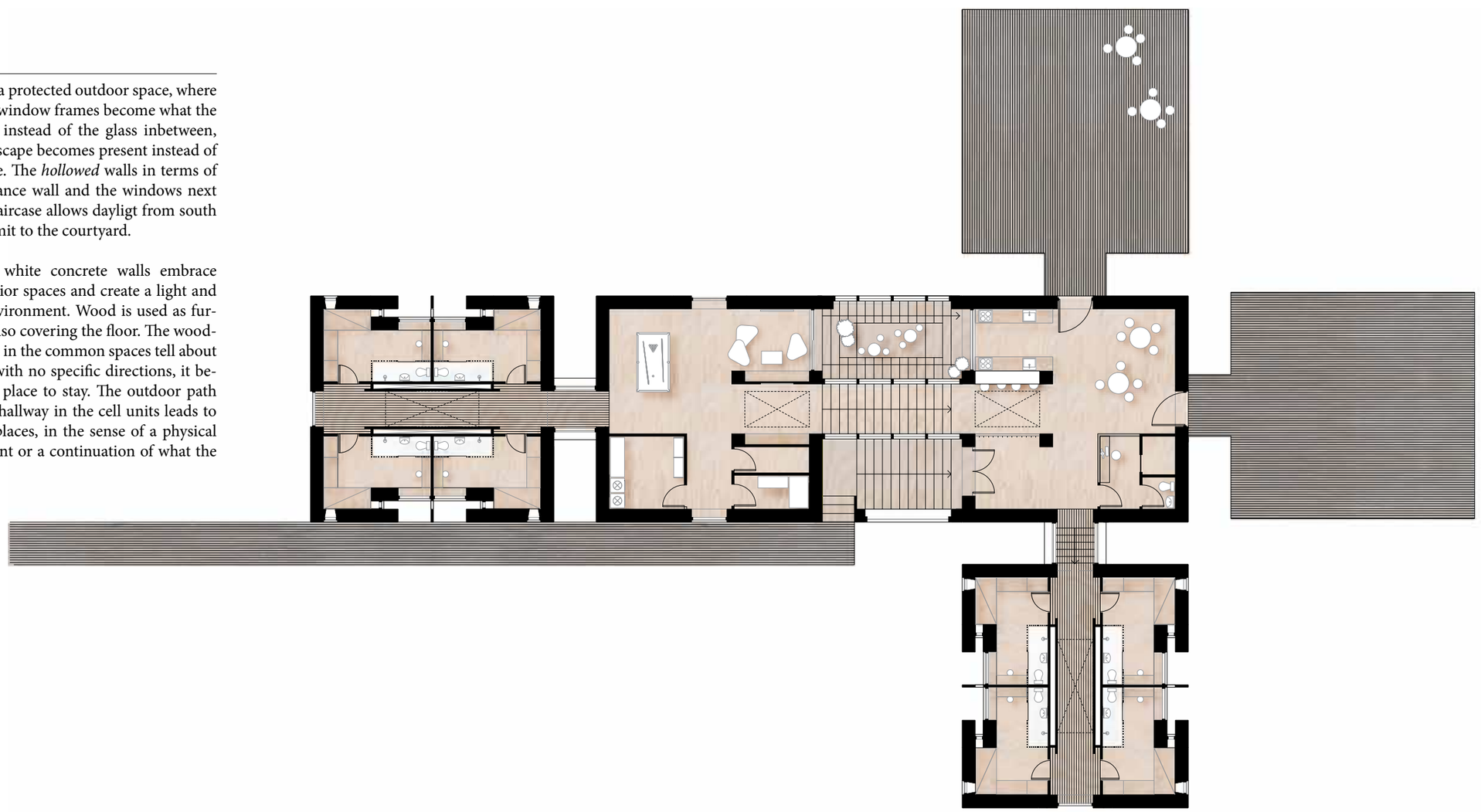
A protected entrance towards south shaped by exterior walls dissolve the boundaries between interior and exterior. When entering, the staff office is the first that appears.

Interior walls divide the common space into flexible spaces for togetherness and activities and intimate spaces for reading and quiet behaviour.

A translucent wall divide the entrance from the kichen, but still allows visibility through. Transparent walls in the centre of the living unit allows daylight to slip in and create visibilty through the living unit.

The courtyard is the centre of the living unit, turned towards the north and the sea. It is a protected outdoor space, where marked window frames become what the eye sees instead of the glass inbetween, the landscape becomes present instead of an image. The *hollowed* walls in terms of the entrance wall and the windows next to the staircase allows dayligt from south to transmit to the courtyard.

Smooth white concrete walls embrace the interior spaces and create a light and open environment. Wood is used as furniture, also covering the floor. The wooden plates in the common spaces tell about a place with no specific directions, it becomes a place to stay. The outdoor path and the hallway in the cell units leads to certain places, in the sense of a physical movement or a continuation of what the eye sees.

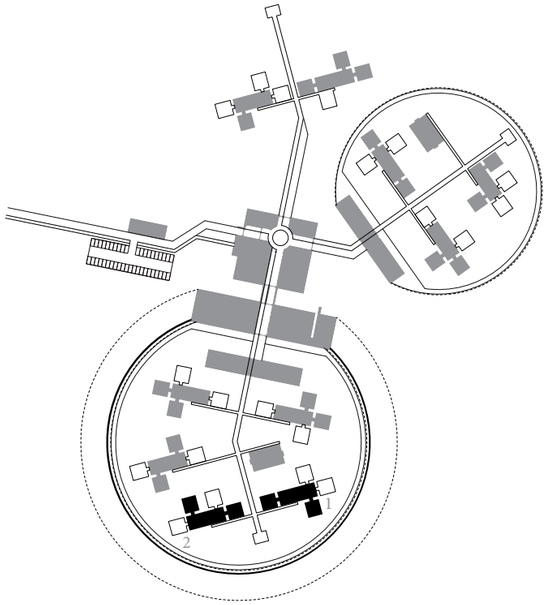


Ill.176

FACADE DRAWINGS
living units
1:200

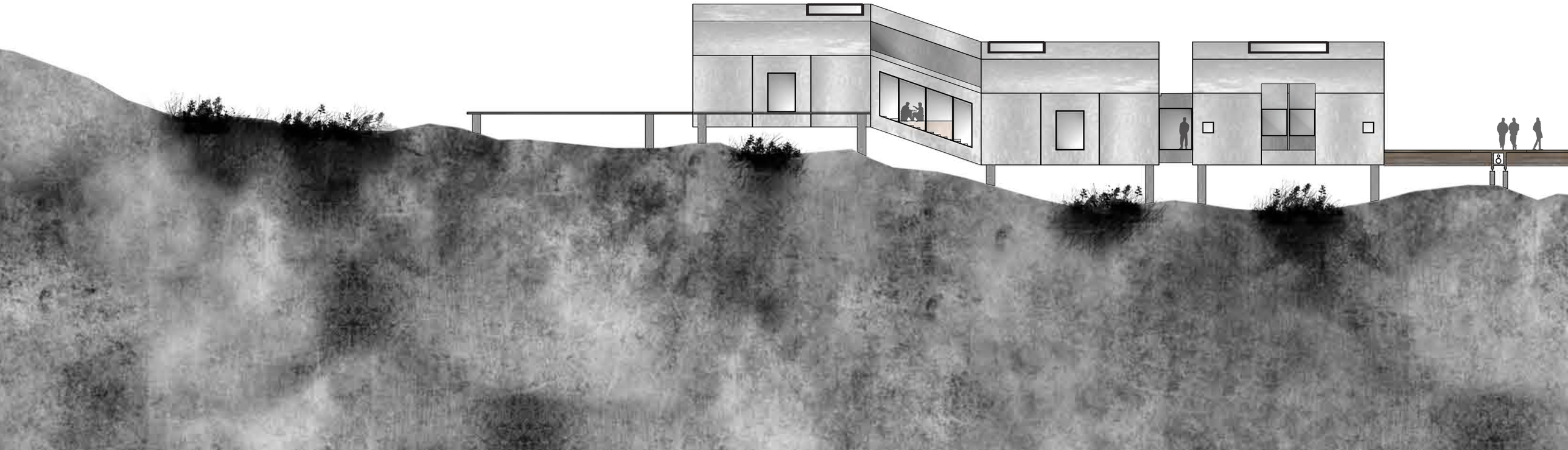
The facades of prefabricated concrete have a light grey, porous surface susceptible to the impacts of the surroundings. Through time the facades will change expressions and colours separating the units from each other.

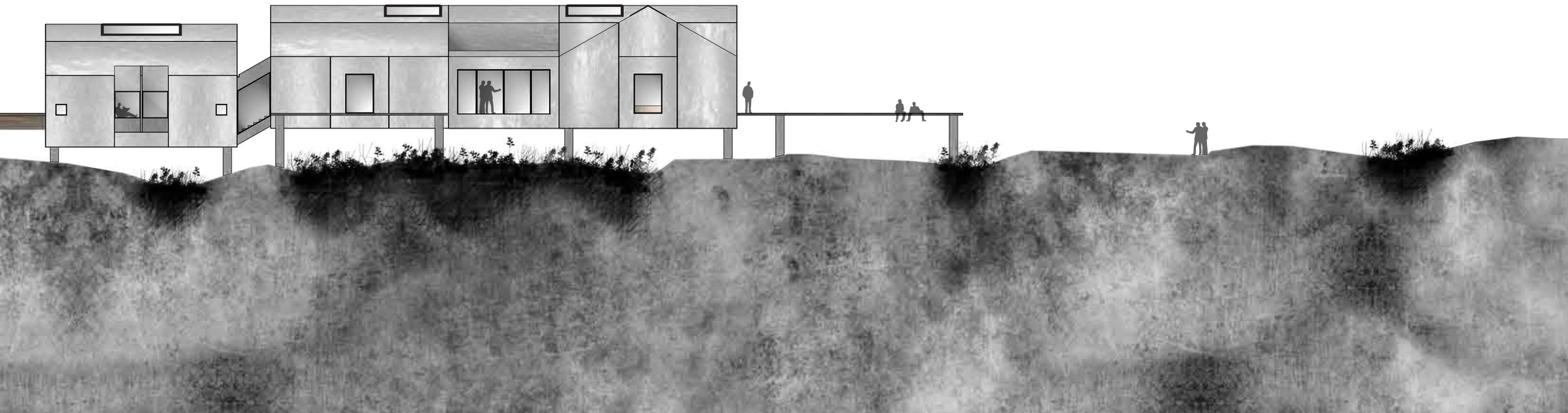
The subtle expression and the simplicity of the additive joints support the strict geometry of the buildings and express a unity within in the living units; the recognisable - the architype of a house.
By placing windows close to the facade the landscape is reflected within them. Inside spatial qualities appear in the niches created. The black window frames next to the white interior surfaces draws attention to openings marking them as special places. Outside the windows are not noticable the same way and so the windows become somewhere you look out, not in.



FACADE DRAWINGS
north facade
1:200

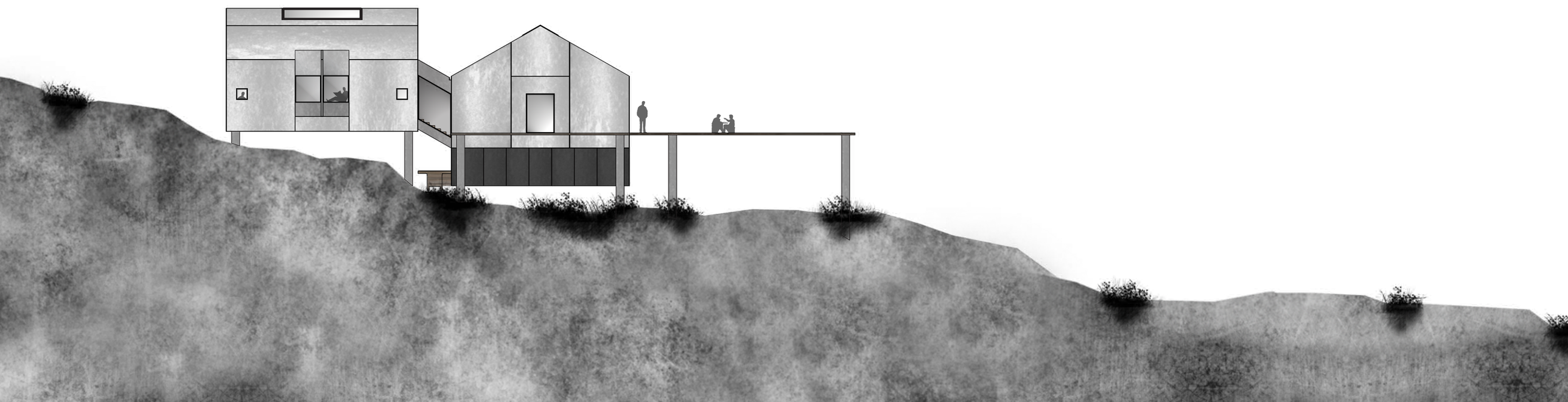
Ill.177





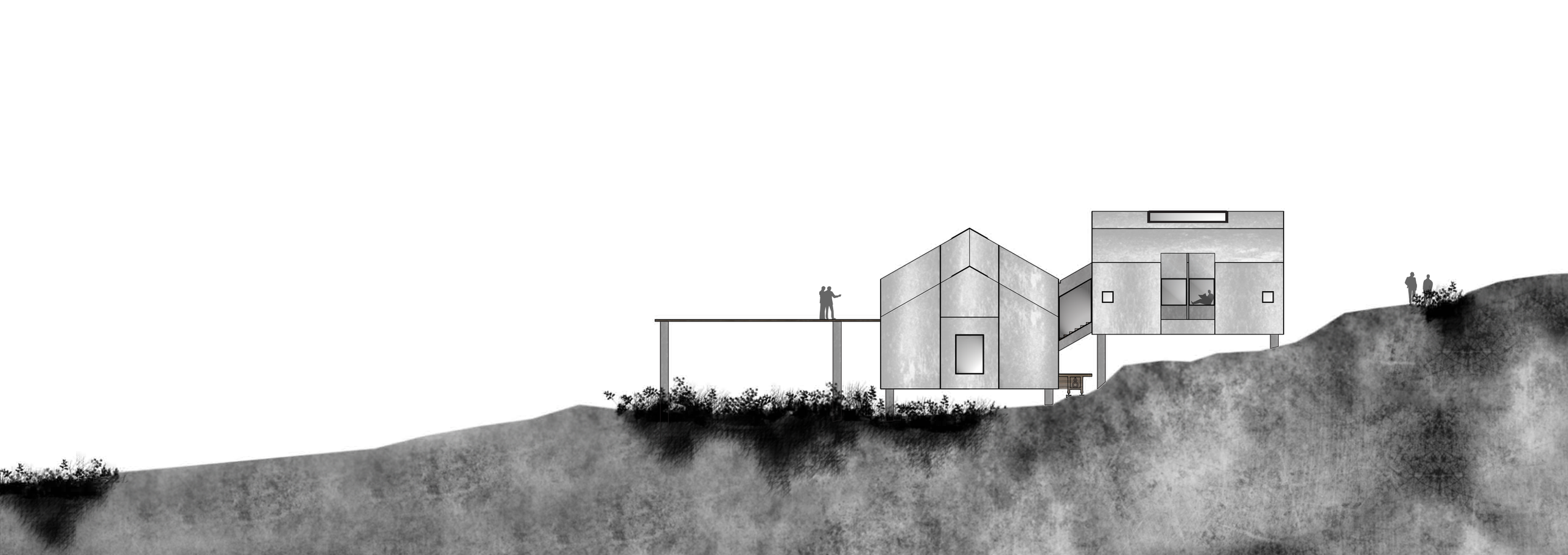
FACADE DRAWINGS
east facade, living unit 1
1:200

Ill.178



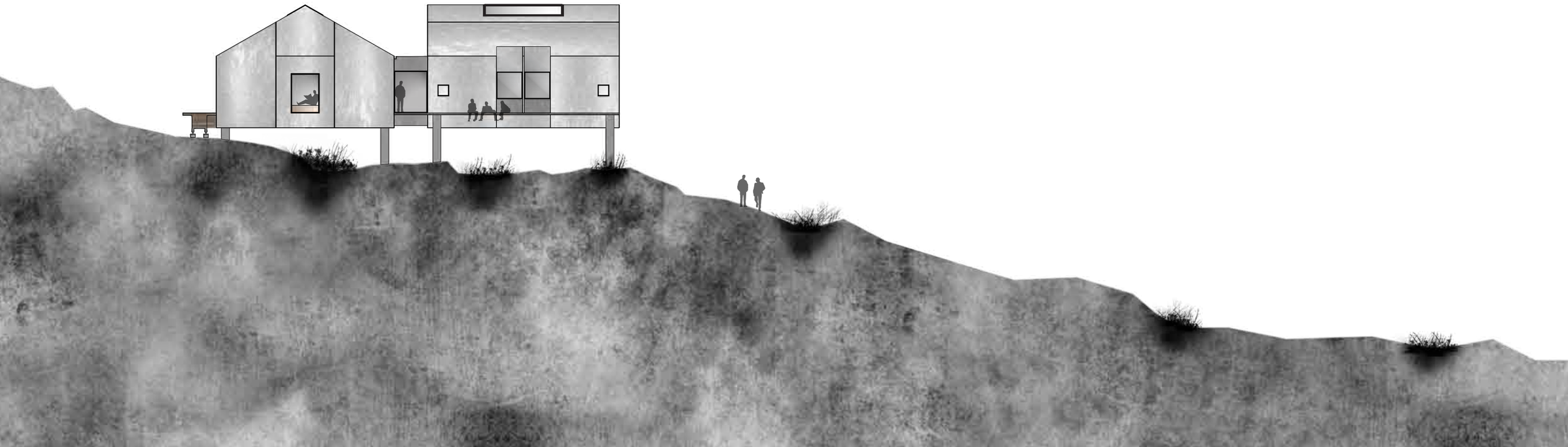
FACADE DRAWINGS
west facade, living unit 1
1:200

Ill.179



FACADE DRAWINGS
east facade, living unit 2
1:200

Ill.180

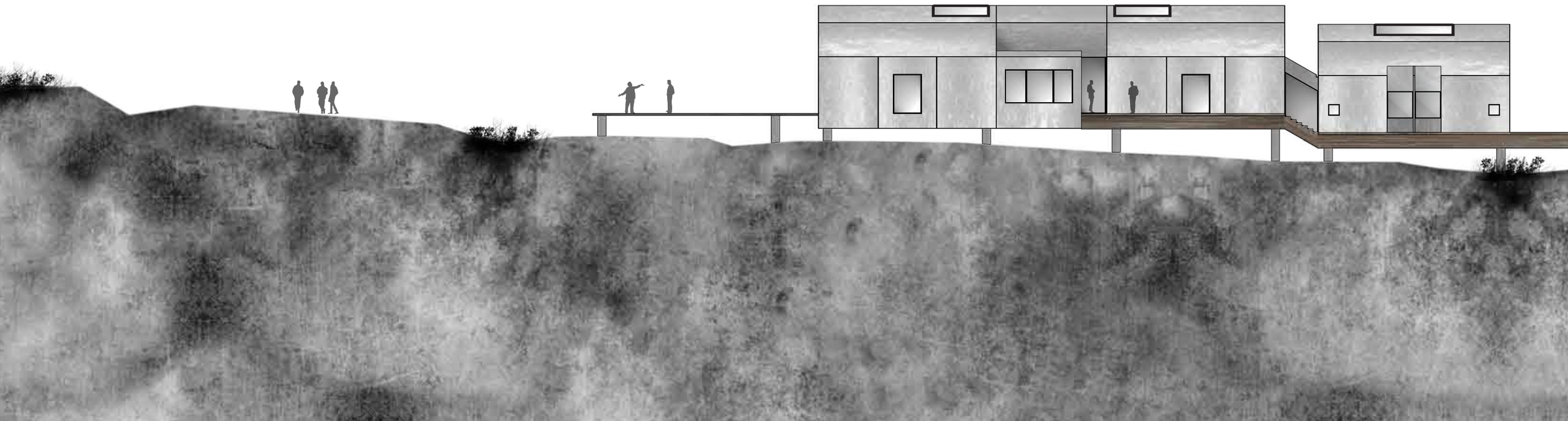


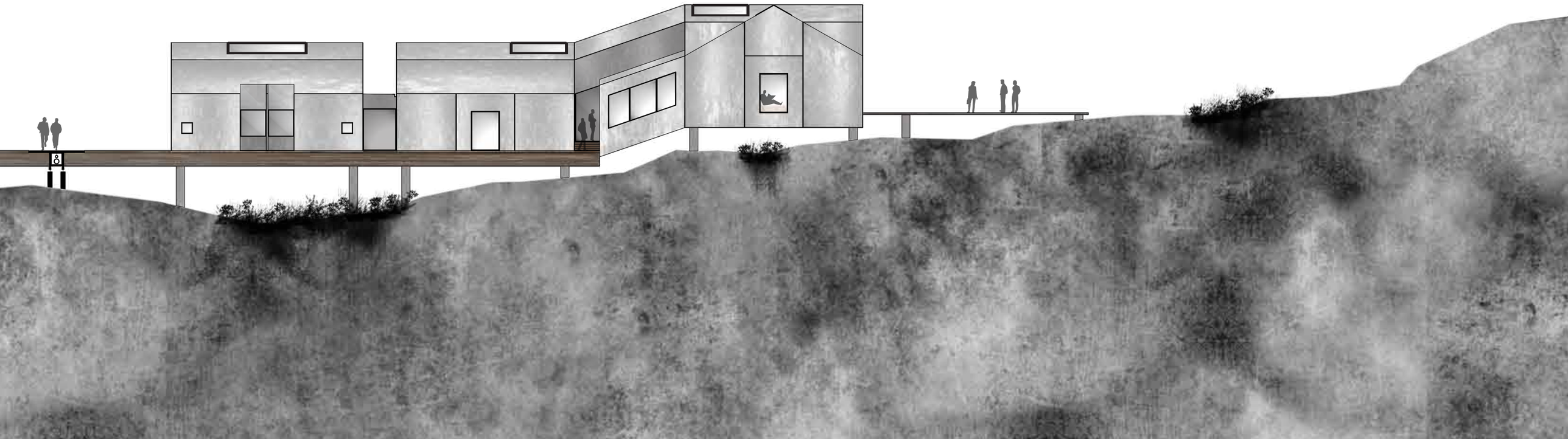
FACADE DRAWINGS
west facade, living unit 2
1:200

Ill.181

FACADE DRAWINGS
south facade
1:200

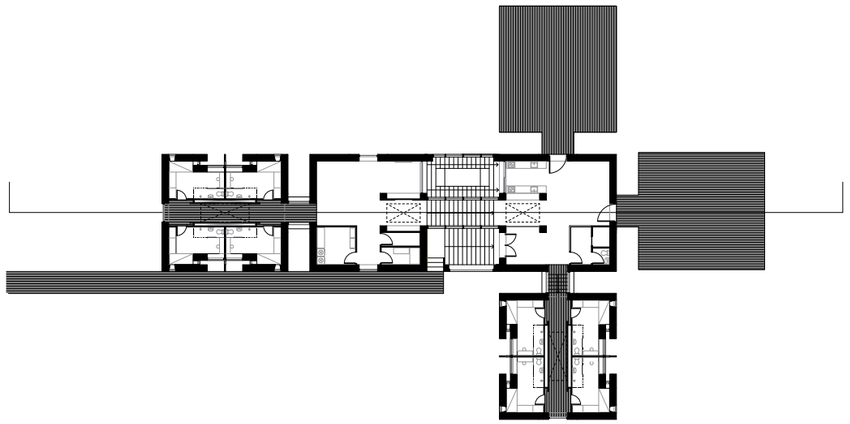
Ill.182

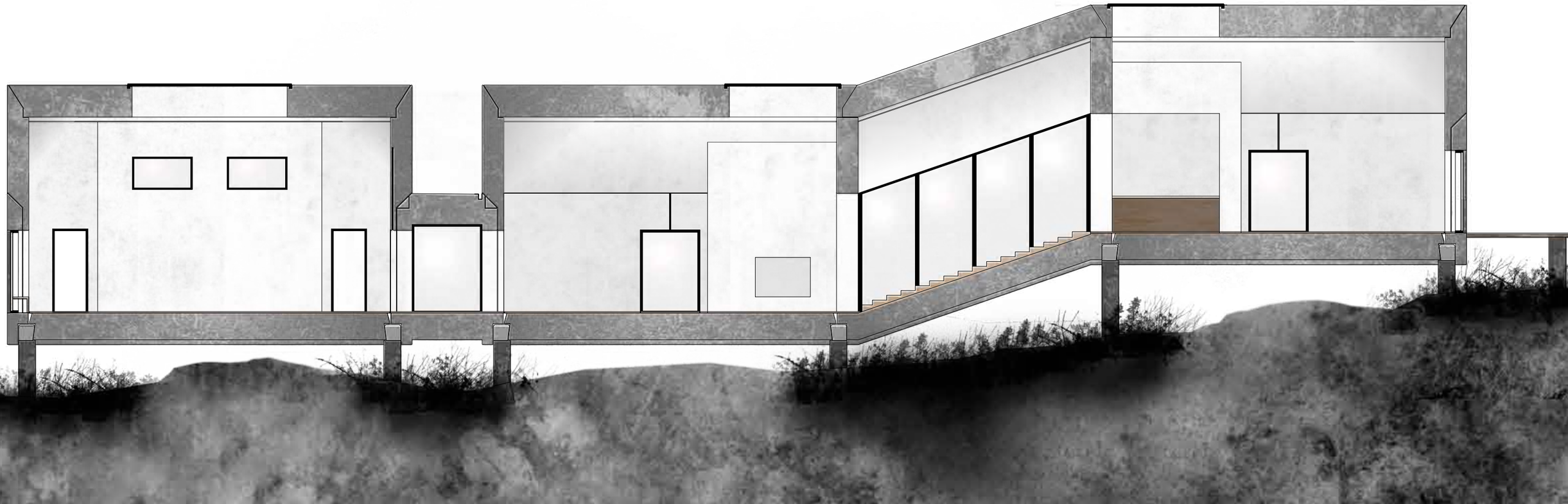


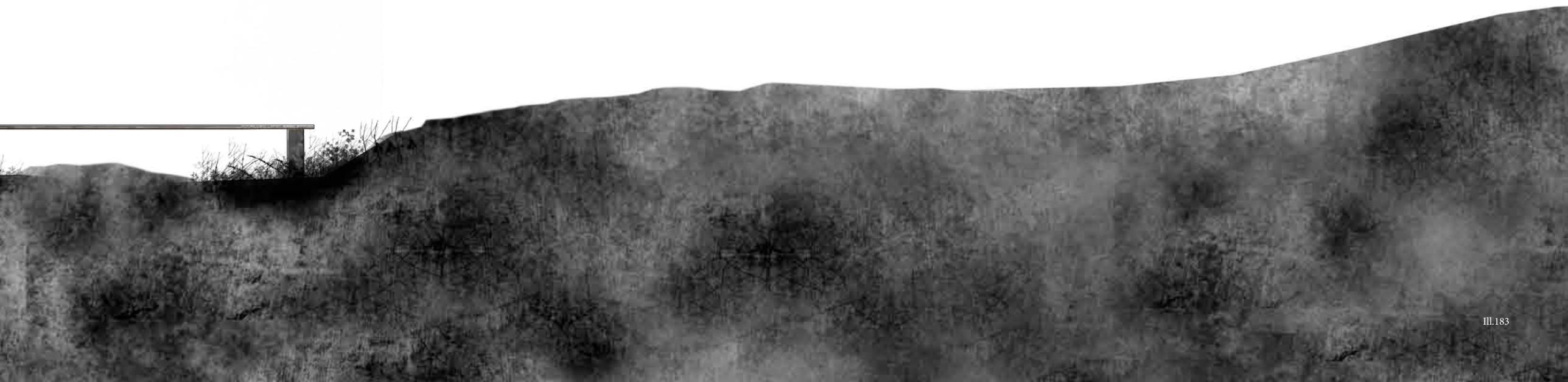


LONGITUDINAL SECTION
living unit
1:100

Within the living units the path continues as a directional axis pointing through the cell units towards the surroundings. Due to the variable element in the centre and the connection elements the buildings moves towards the landscape, making it present in the architecture.



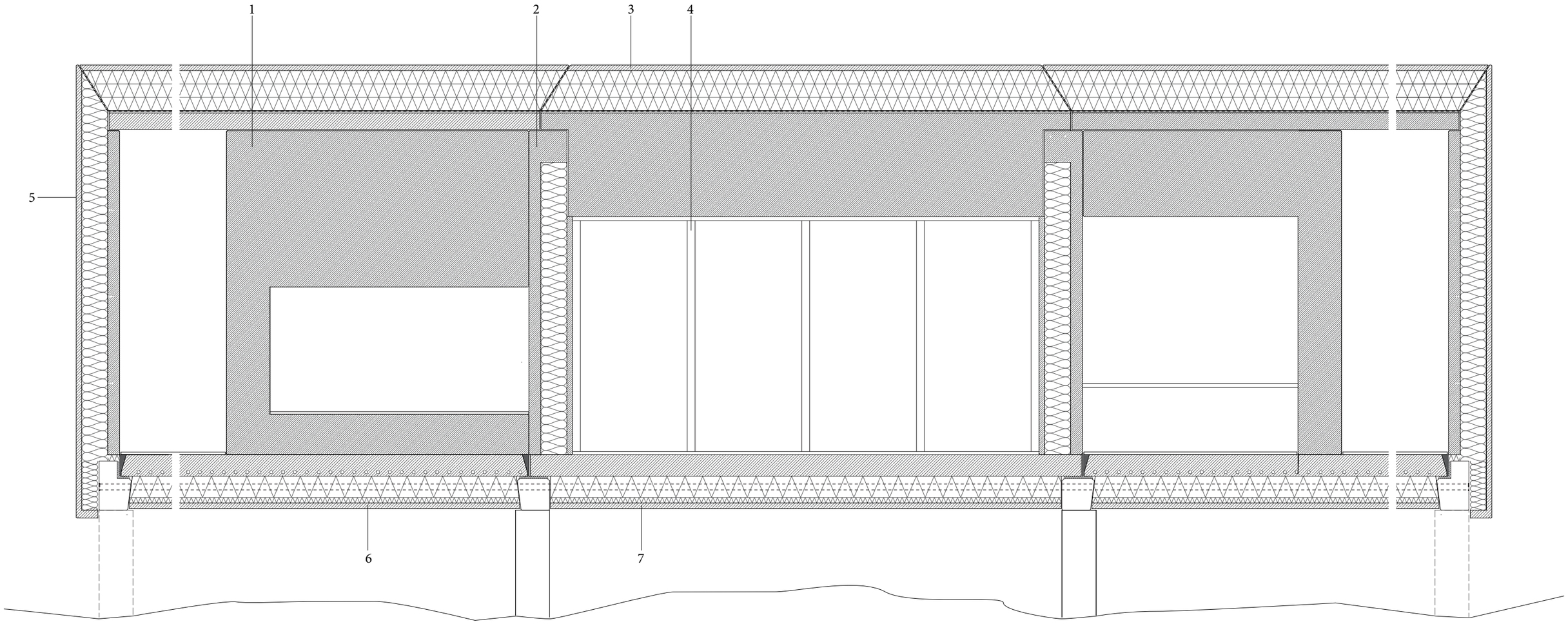




Ill.183

DETAIL
longitudinal section. living unit, common space
1:50

Ill.184



COMMON SPACE
STAIRCASE VERSION

1 550 mm inner concrete wall +
w. niche for sitting +
see material description on p. 100-101

2 Pre fab. reinforced concrete facade,
10 mm chamfered edges,
70 mm exterior concrete wall +
see material description on p. 100-101,
330 mm thermal insulation,
150 mm interior concrete wall +
see material description on p. 100-101
reinforced concrete beam

3 Pre fab. acoustic concrete roof,
70 mm reinforced concrete slab +
see material description on p. 100-101,
440 mm rigid insulation,
waterproof membrane,
sound absorbent material,
180 mm perforated concrete roof +
see material description on p. 100-101

4 VELFAC 200 HELO window,
fixed window,
three layer glazing, clear/energy,
50/180 mm interior wooden frame,
3x4 mm hardened safety glass w. argon,
exterior composite frame,
colour; VELFAC Quartz 80, black,
incl. fresh air valve integrated in the frame

5 Pre fab. reinforced concrete facade,
10 mm chamfered edges,
70 mm exterior concrete wall +
see material description on p. 100-101,
330 mm thermal insulation,
150 mm interior concrete wall +
see material description on p. 100-101

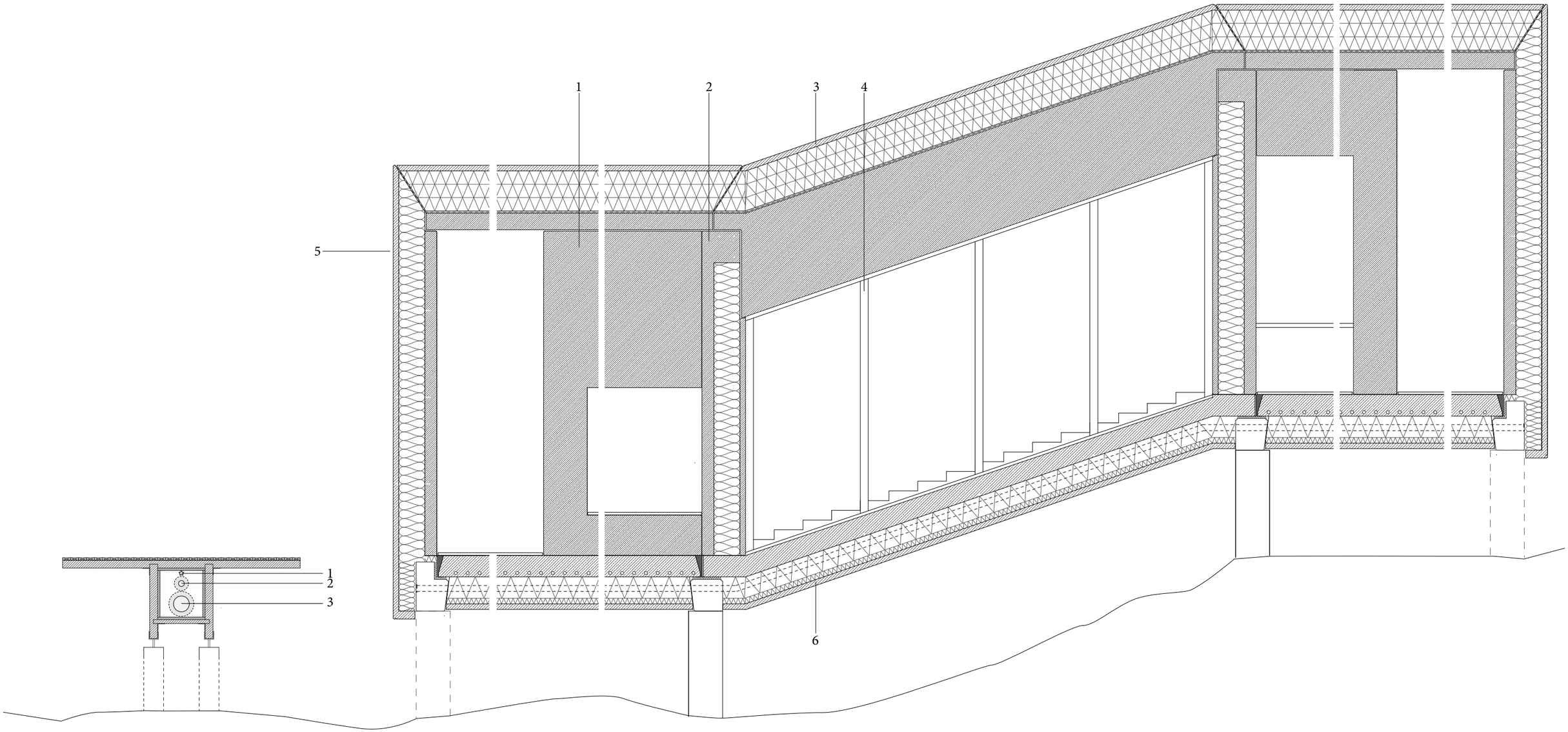
6 Reinforced concrete slab, pre fab.,
70 mm reinforced concrete slab,
bottom plate +
see material description on p. 100-101
70 mm rigid insulation,
250 mm rigid insulation,
270 mm concrete slab,
floor heating,
sound membrane,
wooden staircase, spruce

7 Reinforced concrete slab, pre fab.,
70 mm reinforced concrete slab,
bottom plate +
see material description on p. 100-101
70 mm rigid insulation,
270 mm rigid insulation,
270 mm concrete slab,
sound membrane,
30 mm wooden plates, spruce

DETAIL
longitudinal section. pathway
1:50

DETAIL
longitudinal section. living unit, common space
1:50

Ill.185



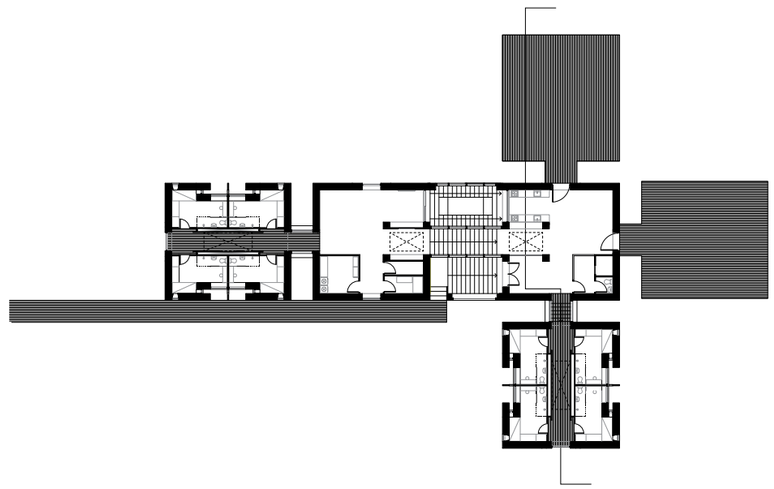
PATHWAY
1 Pipe for electricity
2 Pipe for water
3 Drain pipe

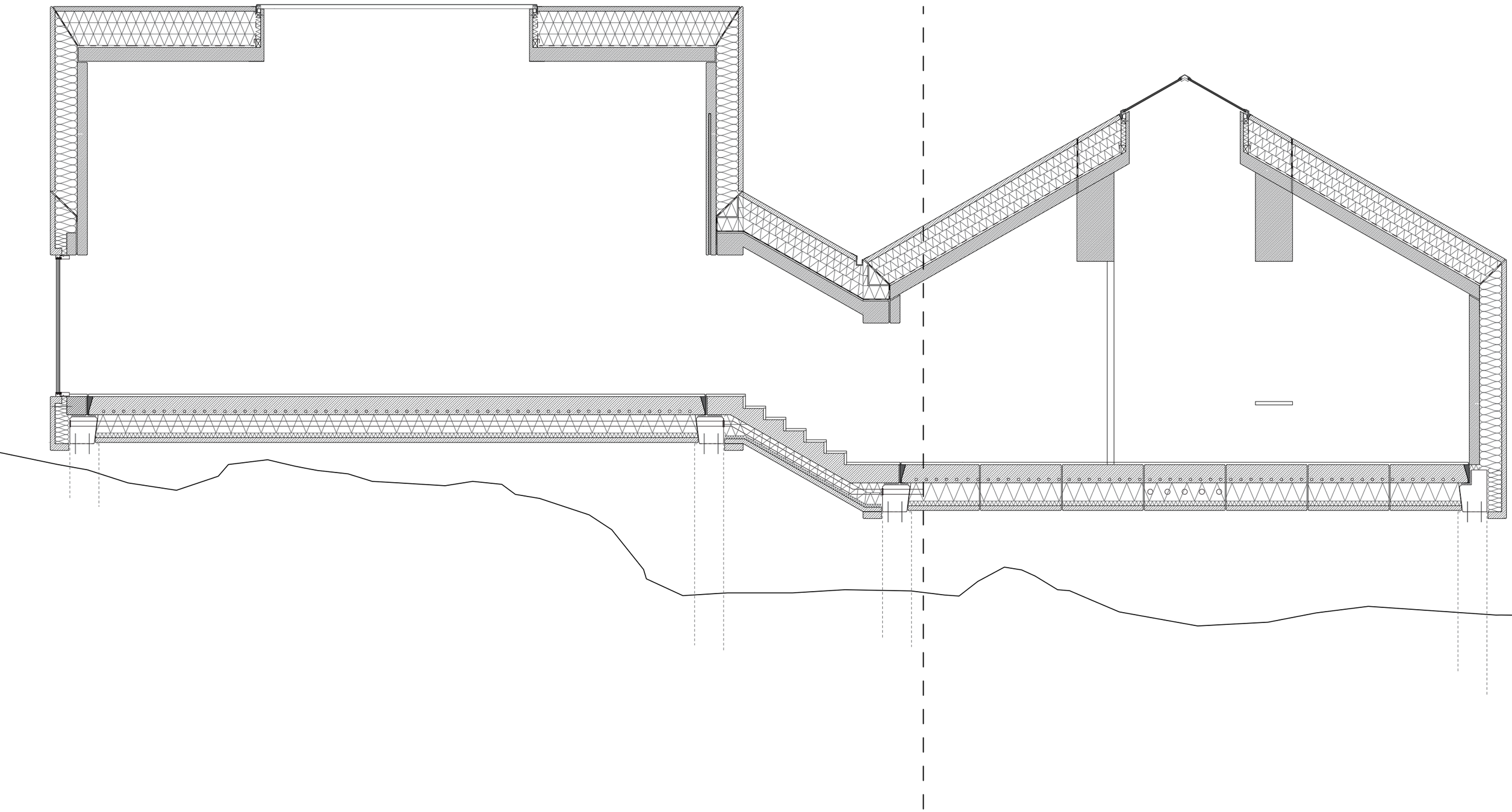
COMMON SPACE
STAIRCASE VERSION
1 550 mm inner concrete wall +
w. niche for sitting +
see material description on p. 100-101
2 Pre fab. reinforced concrete facade,
10 mm chamfered edges,
70 mm exterior concrete wall +
see material description on p. 100-101,
330 mm thermal insulation,
150 mm interior concrete wall +
see material description on p. 100-101
reinforced concrete beam
3 Pre fab. acoustic concrete roof,
70 mm reinforced concrete slab +
see material description on p. 100-101,
440 mm rigid insulation,
waterproof membrane,
sound absorbent material,
180 mm perforated concrete roof +
see material description on p. 100-101
4 VELFAC 200 HELO window,
fixed window,
three layer glazing, clear/energy,
50/180 mm interior wooden frame,
3x4 mm hardened safety glass w. argon,
exterior composite frame,
colour; VELFAC Quartz 80, black,
incl. fresh air valve integrated in the frame
5 Pre fab. reinforced concrete facade,
10 mm chamfered edges,
70 mm exterior concrete wall +
see material description on p. 100-101,
330 mm thermal insulation,
150 mm interior concrete wall +
see material description on p. 100-101
6 Reinforced concrete slab, pre fab.,
70 mm reinforced concrete slab,
bottom plate +
see material description on p. 100-101
70 mm rigid insulation,
250 mm rigid insulation,
270 mm concrete slab,
sound membrane,
wooden staircase, spruce

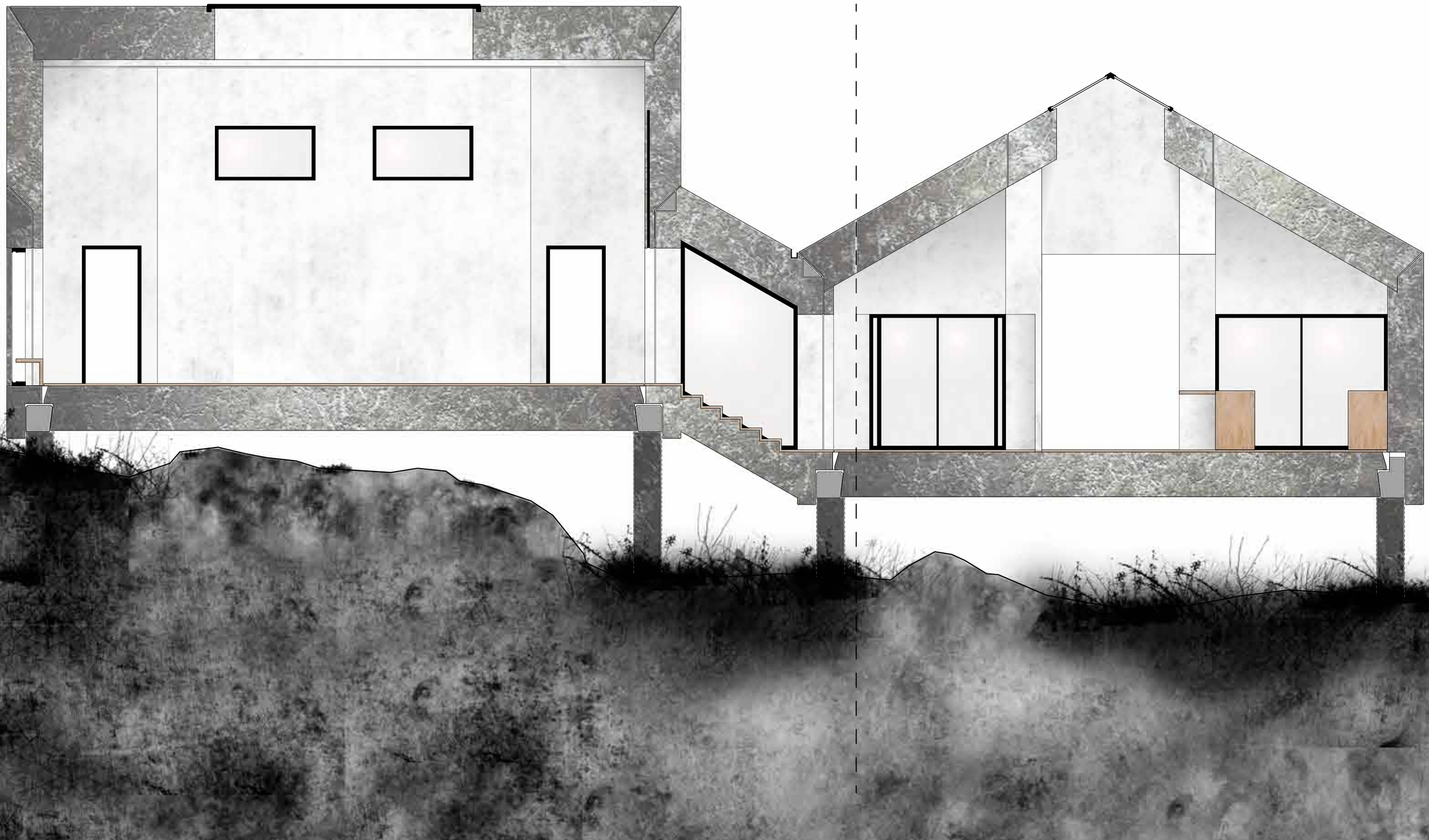
DETAIL
cross section. living unit
1:50

Within integrated design it is important to think of the design in its entirety.
The constructive details affect the aesthetical expression and at the same time the material properties affect the constructions.

Ill.186







COMMON SPACES IN LIVING UNIT
visualisation

The common spaces are characterised by their great amounts of light. The light from the skylights together with the shifting materiality between wood and concrete create places to be. The central courtyard opens up the building and together with the inner continuation of the path extended views to the landscape appear in many directions. The open layout provides easy overviews of the interior for both staff and inmates creating a safe and comfortable atmosphere.

Ill.187

Ill.188

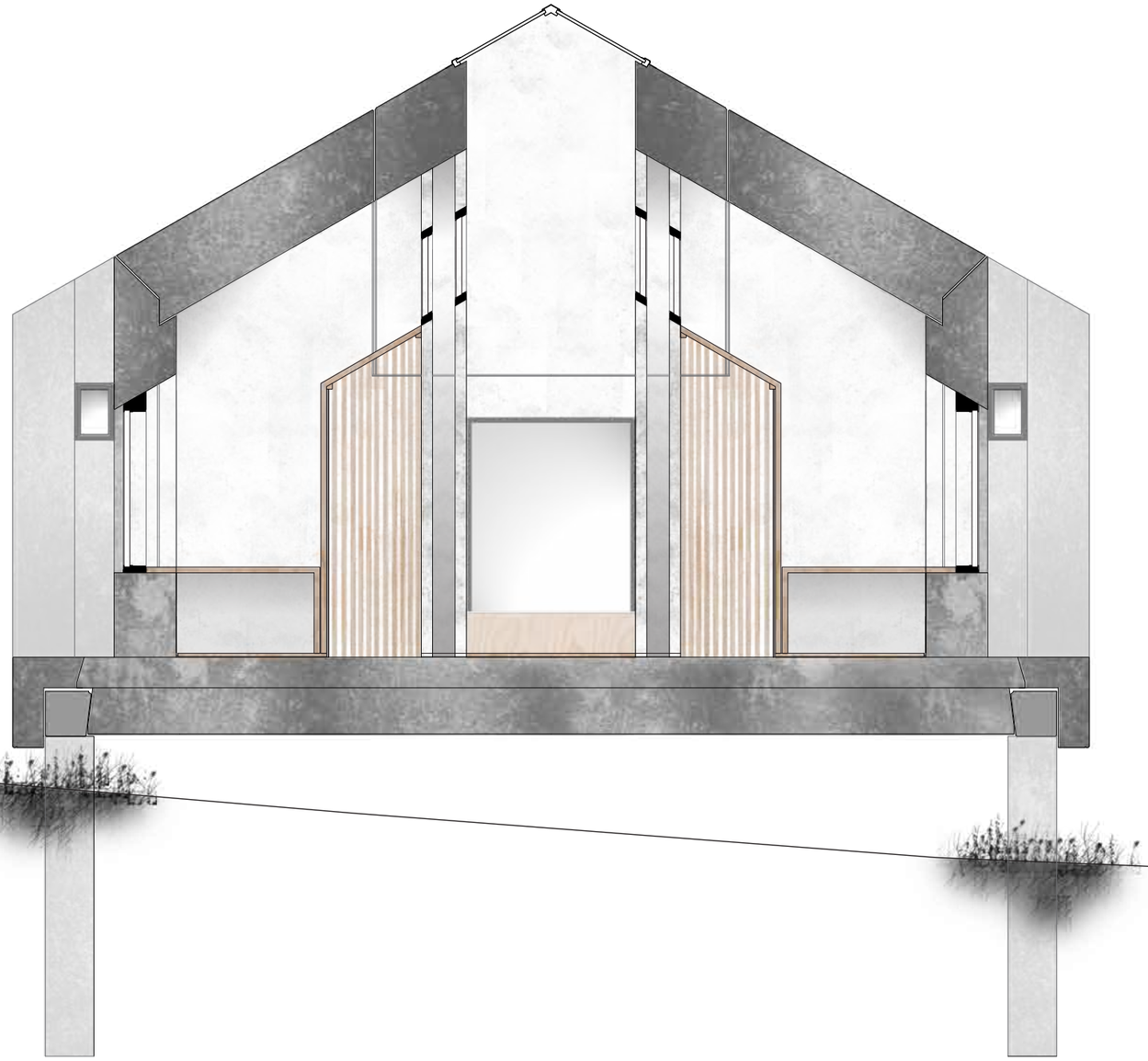
CELL
section and plan
1:50

The cell is the closets the inmates come to a private space.

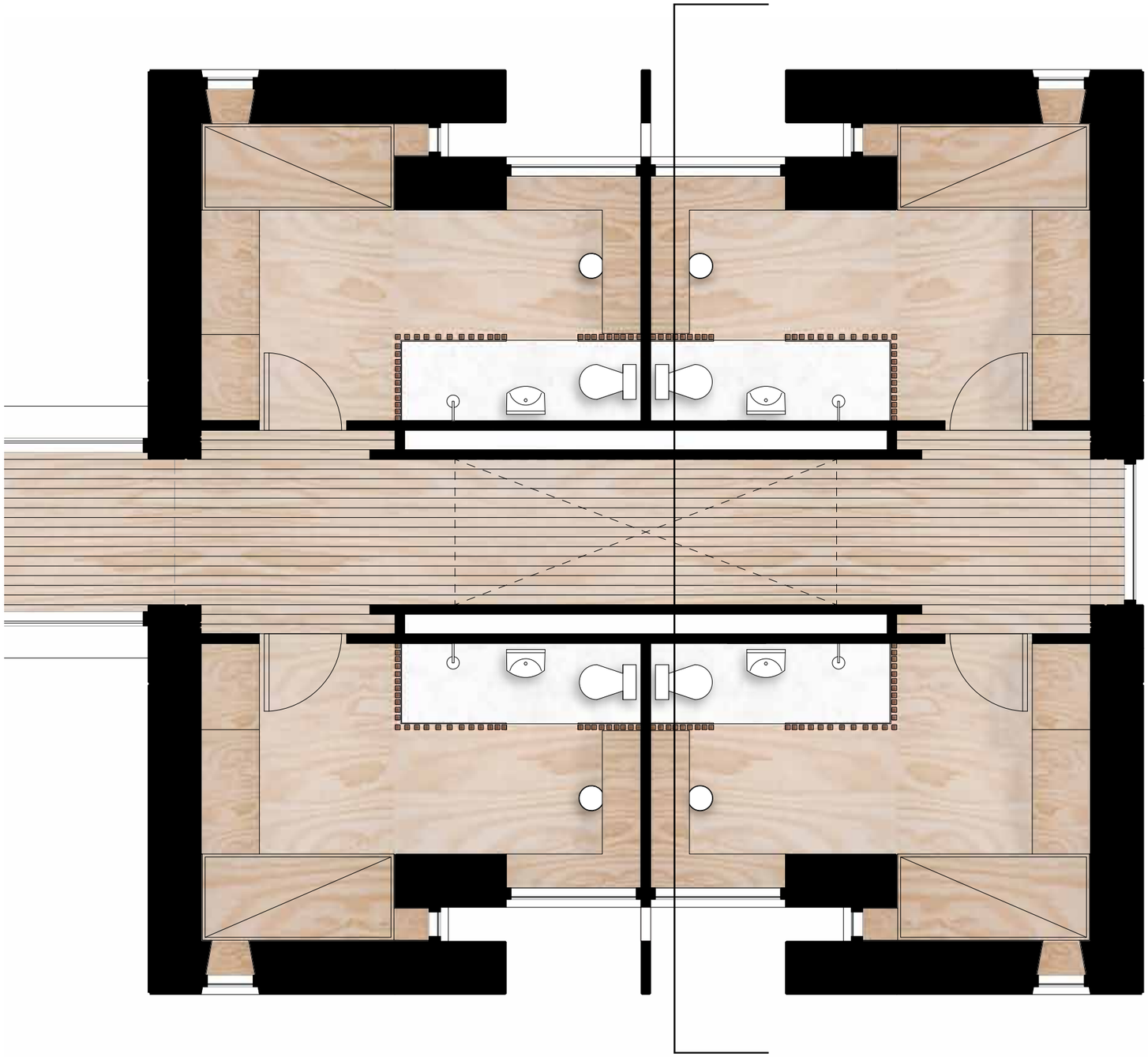
Different openings have different functions and makes daylight from different directions possible.

A window facing the hallway allows light to slip in by take advantage of the skylight in the hallway. A perspective shape of the window in the niche enhancer the experience of the expanded landscape. Another window, also placed in the niche, permits view to the sky when laying down. A large window is for immersion, when used as a placed to sit. The different light conditions creates dark and light places, which refer to the certain activity connected to the space.

Wood used as a furniture infuse to a warmer atmosphere. It embrace the niche, which is the refuge for the inmate and it covers the floor and window sill by plates which do not indicate a direction, but place to stay. In the end of the hallway between the cells a bench become a place to stay, a place for gathering when at the same time experience the landscape.
The bathroom is screened by wooden panels, which cast shadows in the room and still permit overview in the cell when entre the door.



Ill.189



Ill.190

CELL
visualisation

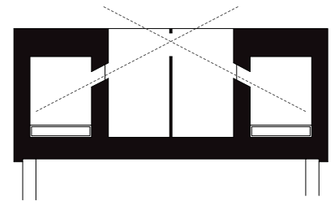
The cell is the private sphere, the refuge. This is were the need for privacy and reflection is met. The personal refuge is expressed by a wooden niche containing the bed. Small windows enable the inmate to connect to the landscape and the sky. Through a high window light slips in emphasising the softness and warmth of the wooden texture.

In the cell light moves through the hours of the day, creating a relation to the outside, and an experience of the changes in time and seasons.

A big window sill and desk express the place for immersion. Here an unobstructed view to the surroundings brings the inmate closer to nature creating a connection between man and landscape.

Wooden panels demarcating the bathroom, ensures openness in the small cell and enables a fast overview of the cell, while still creating spaces in the space.

In the cell the architecture is not only something to look at, but something to look with.



Ill.191

DETAIL
vertical section. perspective window in cell
1:10

Ill.192

The small window in the sleeping niche is a perspective window opening up towards the surroundings.

Bacause of the many sunlight hours in summer, curtains are integrated in the outer wall enabling the inmate to control the amounts of light transmitted into the cell, supporting a feeling of self-determination and having an influence on the interior of the cell.

Wood lines the window opening and is continued towards the wood of the sleeping niche createing a framing of the window.

WINDOW IN CELL AND ROOF

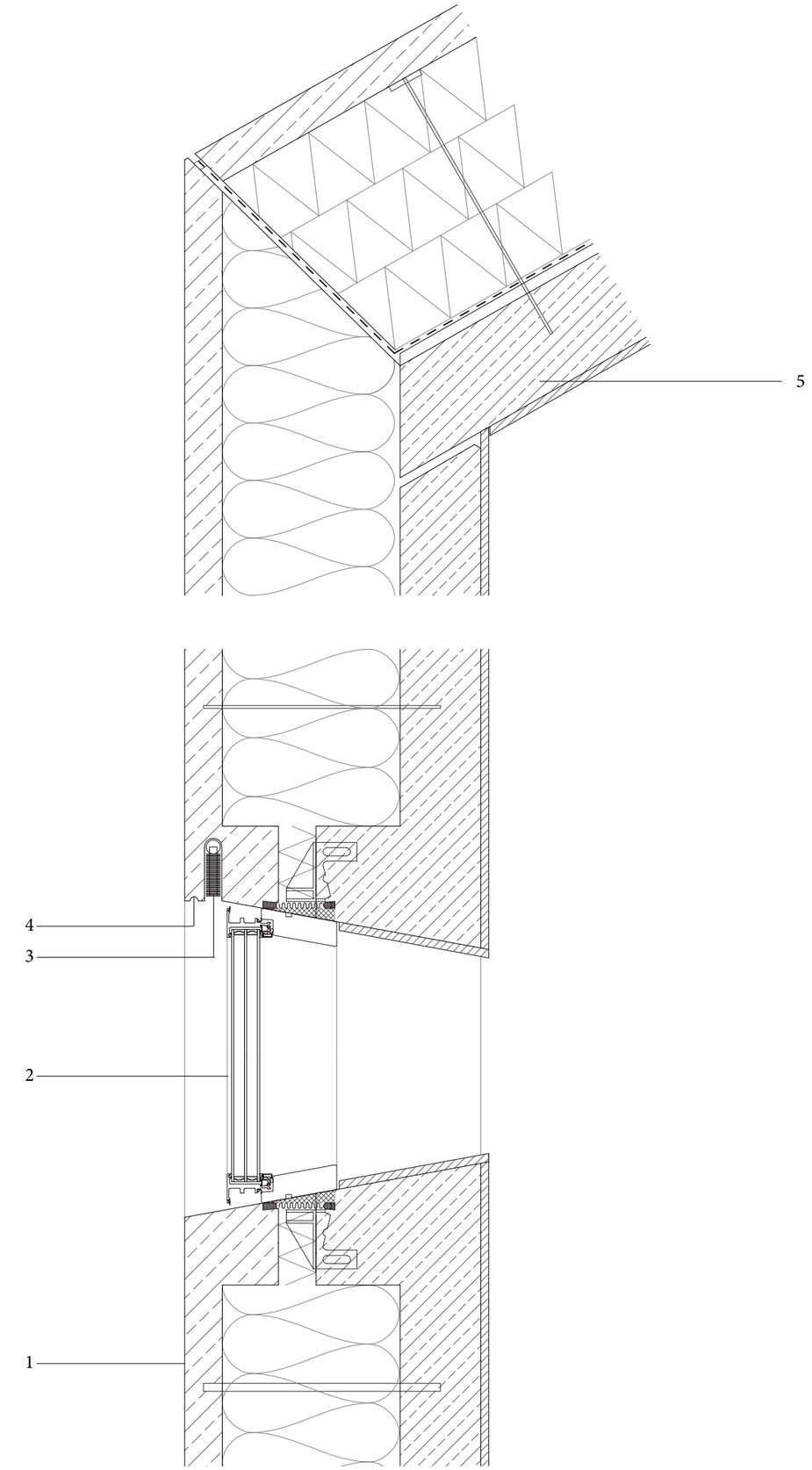
1 Pre fab. reinforced concrete facade,
70 mm exterior concrete wall +
see material description on p. 100-101,
330 mm thermal insulation,
150 mm interior concrete wall +
see material description on p. 100-101,
15 mm spruce wooden plates glued to concrete wall

2 Velfac 200 HELO window,
600 x 600 mm fixed window,
three layer glazing, clear/energy,
50/180 mm interior wooden frame,
3 x 4 mm hardened safety glass w. argon,
exterior composite frame,
colour; VELFAC Quartz 80, black,
incl. fresh air valve integrated in the frame,

3 Outdoor window blind, galvanized steel, dark colour

4 Dripping edge

5 Pre fab. acoustic concrete roof,
70 mm reinforced concrete slab +
see material description on p. 100-101,
440 mm rigid insulation,
waterproof membrane,
sound absorbent material,
180 mm perforated concrete roof +
see material description on p. 100-101,
15 mm spruce wooden plates glued to concrete ceiling



DETAIL
vertical section. meeting between slab, pillar, wall and roof
1:20

Ill.193

The stricht geometry of the building is ensured by the details; the joints of elements and the placement of skylights.

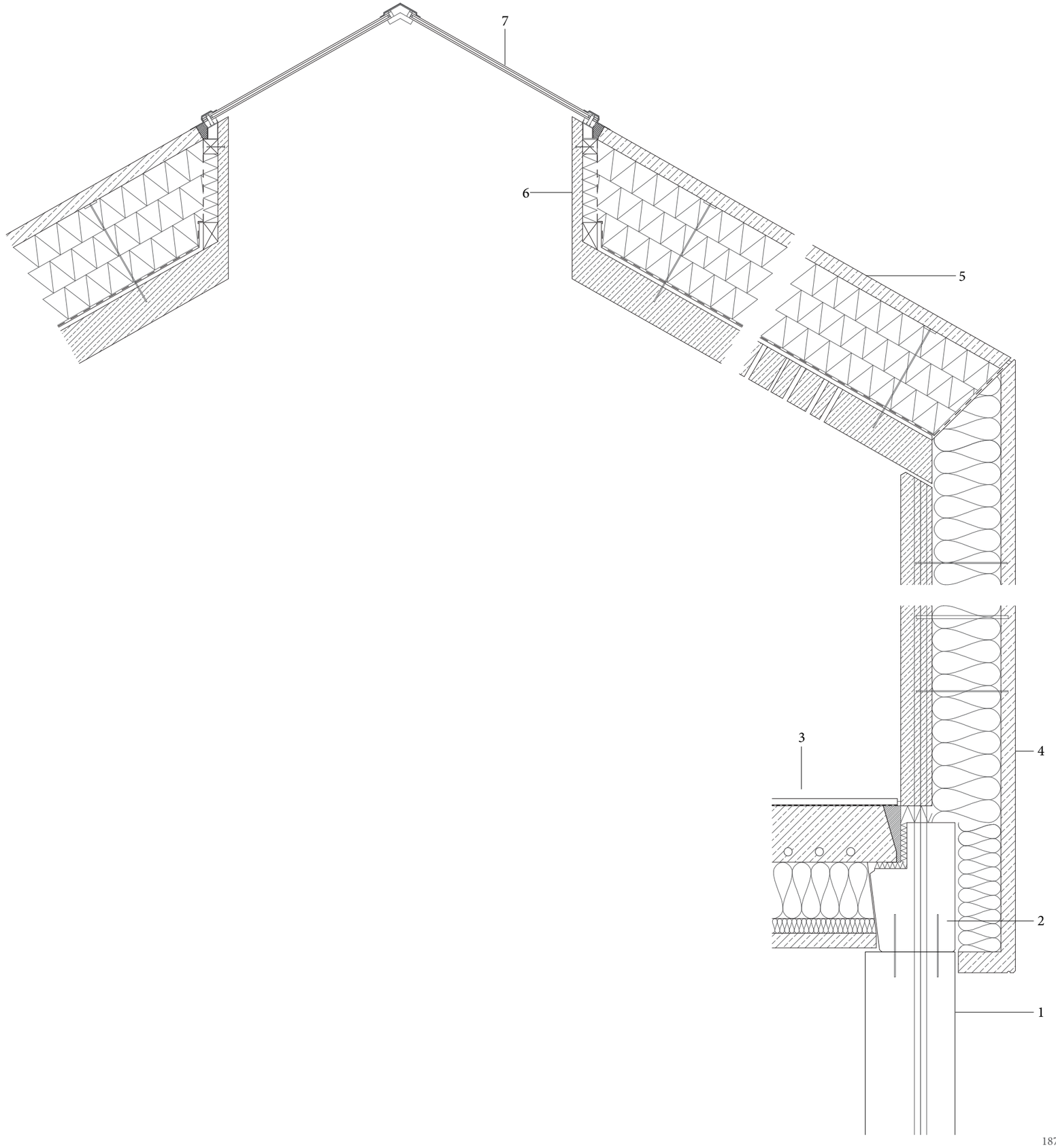
The skylights are placed as close to the roof surface as possible in order to maintain the expression of the plain surface.

The facades are pulled down covering the beams underneath to emphasise the unified shape of the building.
Thermal bridges are avoided in all joints to ensure a better indoor environment and lower energy consumption.

The joint filler in the roof is placed where the roof and the wall create and edge for aesthetical reasons. Placing the joint here supports the architectural expression and the stricht geometry.

ROOF, WALL AND SLAB

1 430 x 430 mm pillars, concrete, in situ +
see material description on p. 100-101
2 KBE concrete beam, pre fab. +
see material description on p. 100-101
3 Slab, pre fab.,
30 mm spruce floor, wooden plates,
sound membrane,
270 mm concrete slab,
floor heating,
270 mm rigid insulation,
70 mm rigid insulation,
20 mm concrete slab, bottom plate +
see material description on p. 100-101
4 Pre fab. reinforced concrete facade,
Vertical reinforcement from facade to pillar,
10 mm chamfered edges,
70 mm exterior concrete wall +
see material description on p. 100-101,
330 mm thermal insulation,
150 mm interior concrete wall +
see material description on p. 100-101
5 Pre fab. acoustic concrete roof,
30 mm concrete slab +
see material describtion on p. 100-101,
440 mm rigid insulation,
waterproof membrane,
sound absorbent material,
180 mm perforated concrete roof +
see material description on p. 100-101,
6 50 mm embrasure in concrete +
see material description on p. 100-101
7 VELUX skylight window, 30º,
two layer glazing,
interior wooden frame, hidden by embrasure concrete,
2 x 4 mm hardened safety glass w. argon,
exterior galvanized steel,
colour; dark



STRETCHING TOWARDS THE SEA
visulisation, open department

The total expression of the institution fulfills the intention of creating something recognisable, something to relate to in order to support resocialisation; a collection of houses that create associations to the traditional Greenlandic village, the Bygd.

The natural materials of the complex relate to the nature and create a connection to the natural elements of the landscape.

The great views to the surroundings and to the landsmark of Nuuk, the "Saddle", emphasise the connection to the place and serves as points of orientation. The inmates are not isolated far away from their usual surroundings in an unknown context, they might be unaccustomed to the situation they find themselves in, but what they could see from the city of Nuuk, they can still see here.

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CONCLUSION

MEETING THE INTENTION

To create a prefabricated, adjustable building system that accommodates the character of the arctic landscape, the changing population of inmates and thereby also the present and future needs of the institution in order to maintain architectural value.

The design has to promote the intention of resocialisation and respect the local culture and the climate; a building both for the inmates, the employees, the community and the surroundings.

Introducing the words prefabricated, adjustable, culture, climate and resocialisation individually might seem obvious related to a correctional institution, as they are all very relevant parameters. Introducing the words together on the other hand, as done in the architectural vision for this particular project, a correctional institution in Nuuk, Greenland, sets a whole new variety of questions, challenges and experiences, it is none the less what is attempted achieved; to create a correctional institution containing all these, and several to follow.

The design presents a solution representing adjustability in many scales and varieties. As points of departure for the project three different architectures; arctic, restorative and additive were presented all containing the opportunities of fulfilling the intention and therefore used actively in the creation of the institution. Clearly characterised by the Greenlandic culture, nature and traditions while incorporating human factors through a restorative approach the intitution becomes a contemporary interpretation of a Greenlandic correctional institution.

Divided into three departments centered around administrative buildings the intitution spreads out through the landscape by means of a main path. The path creates both visual and physical connections and furthermore accessability between the different buildings, to special places in the landscape and finally towards the society outside of the correctional institution. Integrated functions such as employment, school, shopping for groceries, church, sport activities etc. enable the layout of the institution to reflect everyday life, leaving the house for work, shopping, activities in the morning and arriving back in the afternoon. Through meticulous placements of living units unwanted fields of vision are avoided through the architecture itself, resulting in: NO BARS!

The architypical shape of a house is beneficial according to climatic concerns in an arctic context, and spread out on the site in groups a recognisability of and an association to the traditional Greenlandic way of life, the life in the village, the Bygd, is provoked. The choice of materials, primarily wood and concrete, reflect the context and enable the buildings to adjust to the character of the landscape over time. The materials represent a textural quality and expression, and they obtain different functions in relation to activities and atmospheres.

In the living units and the cells a strong connection to nature and its many facets is maintained through experiences of changing light and darkness, through openings and unobstructed views creating different atmospheres within the buildings. A connection which is considered to be of the utmost importance for Greenlandic people in general.
The cell is the place for privacy, philosophising, tranquility and isolation with its intimate spaces and focused openings. The common rooms are places of activity where the landscape is drawn near by large openings and a central courtyard providing air and light to the building. The living units are adapted to the surroundings by means of the small connectional spaces adjusting to the terrain underneath and opening up for the possibility of adding or removing cells according to changing population securing the correctional in future perspectives in whatever direction the development will go.

The developed additive system makes an adjustment to the landscape possible and lets the landscape become present in the archtectural expression. The architecture submits to the landscape either by being interpretations of fell protrusions as the fixed common buildings, or by letting the landscape flow beneath the building as the living units. The architecture becomes a part of the landscape - built into the landscape and not on it.

All the mentioned factors acts as contributors to the architecture in promoting resocialisation within secure frames and in many ways also in enabling the dissolution of the traditional institution creating new relations between man and place.

According to our personal motivation and views on architecture we believe this project is an example of integrated design, where the architecture is not seen as an isolated object, but as a part of the landscape, the culture, and the lifestyle that surrounds it. Rooted in our view on the importance of considering many scales and the interaction between them, the scale of this project is comprehensive. The layers are noumerous, but equally important.

One layer is time. Time is essential. Time is considered as an active co-player intergrated on many levels from the changing expression of the landscape, the patina of the materials to the adjustability of the joints.

All in all, we believe we have created architecture with quality at this particular time, through time and over time.

REFLECTION

REFLECTIONS BASED ON PERSONAL EXPERIENCES

Through this project we have experienced a broad representation of places with the purpose of confinement. In Nuuk an almost familiar atmosphere among staff and inmates picture the daily life. The institution was placed right beside a public road, often crossed by inmates when walking from one building to another, this was clearly freedom under responsibility. Talking to some of the inmates about their life in the institution touched us and left a deep impression that has stayed with us throughout the project.

CONCRETE AND ADDITIVITY

In relation to the choice of an additiv architectural approach and the choice of concrete as main material, we do recognise the challenges. It is clear that a lighter material, such as steel which is very durable and strong as well, would have made the additive aspects of the project easier to accomplish. However we chose concrete, for security reasons, because it is one of the most durable and unbreakable materials available and we realised the possibilities within working with concrete in relation to additive architecture as a prefabricated element system and as a visual relation in the arctic context. However an additive system also demands a subtraction element. If the population of inmates should reduce in the future, one could imagine that the living units could be moved to somewhere else to serve another function. The developed additive system makes the separation of common spaces and cell units possible. Therefore, if moving the living units to another context, they will have to be transported as a connected common space and a connected cell unit. A scenario which is possible.

DISTANCES AND FUNCTIONALITY

In Horsens we experienced how functionality and the demands for security can affect the environment. The State Prison Østjylland is a prison with a capital P, one of the most secure prisons in Denmark, and designed to be so. This is very recognisable in both composition, plan layouts and the use of materials. The intentions of new correctional institution in Nuuk and the demands for it are quite different even though a closed department with hightened security will be added. Because of this fact we have chosen some alternative solutions regarding the masterplan and the path that results in distances between the different functions and at the same time provide measures supporting the main idea of an restorative environment. We wanted take advantage of what this unique landscape has to offer by streching out into it using special places of interest as directional for the paths. The distances between functions relate to the routines of everyday life which is important for the experience of normality.

ADJUSTABLE ARCHITECTURE AND RESOCIALISATION

In the preface significance is put on the creation of adjustable architecture both in relation to the arctic climate and landscape, the structural system and to the changing population in the correctional institution. This we feel we have succeded in, but why is it so important with adjustability regarding the changing population?

According to statistics the development of the criminal rates show a steady increase in the number of criminals sentenced to stay at a correctional institution (see pp 21). The administration of justice (retsvæsenskommisionen) however state that with the efficiency improvements of the Prison Service that became effective in 2010 a decrease in sentences will show, but so far no results have been released as far as we know, so we have chosen to believe statistics in this matter [Kriminalforsorgen 2009].

The question could then be: why support this negative development? We do not think we do so. Our mission with this project is to improve the conditions for the staff, the current inmates and the inmates to come, and to make sure everyone has equal possibilities of a good environment whatever direction the development will go. A way of doing this is through a restorative approach promoting well-being and additive architecture ensuring adjustability. We have seen that the surroundings and the facilities can very much effect the quality of the stay and then maybe if there is quality, contribute to the stay becoming meaningfull in some ways, for the society as well. It all relates back to the question of punishment. We have met a lot of astonishment as to why a correctional institution needs architectural quality and why it needs to be a good environment for the inmates. *"It is not a hotel stay"* is the typical reaction. **As we have established at the beginning of the project the frames are not the punishment, the confinement is.** We deal with people, people who have done wrong and people with problems, no doubt about that, but people none the less.

This results in another question imposing: what if the correctional institution environment becomes better than what the inmates return too on the other side of their confinement? Would that prompt more and new crime just for the possibility to return? In our opinion nobody wants to be in confinement no matter the physical frames, this is not a place you stay for the fun of it, it is not a place you dwell. Further we do not only see it as our jobs as architects, to solve these challenges, this is a job for the entire system. What is important, is that the inmates will be given the opportunities or taught the means to better their own situation upon being released, this it what they should gain from the stay. It is not the architecture that should do this, it is the contents of the stay and the structure of it. We do not claim to solve all of these problems with this project, but we do suggest how we think architecture can contribute to and promote a stay that in itself should be meaningfull, educative and remedial.

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APPENDIX
ADDITIONAL MATERIAL

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APPENDIX 1
announcement of the competition

The official announcement from "Arkitektforeningen" about the competition concerning a new correctional institution in Nuuk. [arkitekforeningen.dk 2012]

NY ANSTALT I NUUK, GRØNLAND

Indbudt projektkonkurrence
Prækvalifikationsfrist udløbet

Med vedtagelse af en ny kriminal- og retsplejelov for Grønland i april 2008 er det blevet besluttet, at der i Nuuk skal etableres en ny fængselsanstalt på ca. 8.000 m2 i bruttoetageareal. Kriminalforsorgen udskriver derfor en indbudt projektkonkurrence, som blandt andet har til hensigt at gøre det grønlandske retsvæsen mere tidssvarende og moderne.

Byggeriet skal omfatte bygninger med boenheder til ca. 76 indsatte fordelt i henholdsvis en lukket og en åben afdeling med forskellige sikkerhedsniveauer. Derudover skal byggeriet bl.a. omfatte faciliteter til beskæftigelse, fritid og besøg for de indsatte, administrationsafsnit, samt diverse tekniske anlæg og udenomsværker af sikkerhedsmæssig art. Området skal indhegnes, og den lukkede afdeling skal omkranses af en ringmur.

Projektkonkurrencen er med efterfølgende totalrådgivning, bestående af arkitekt-, ingeniør- og landskabsarkitektydelser i alle faser. Det forventes at prækvalificere fem deltagere.

Der er afsat en samlet bevilling til projektet på Finansloven 2010 på ca. DKK 347 000 000, og anstaltsbyggeriet skal være færdig i 2017.

Se ansøgningskriterierne i EU-bekendtgørelsen.

Arkitektforeningen er konkurrencerådgiver gennem hele forløbet.

Konkurrencens sekretær
Bent Kolind, arkitekt MAA
Arkitektforeningens Konkurrenceafdeling

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APPENDIX 3
material analysis

The following shows an elaborated analysis of materials.

CONCRETE
pre fabricated elements

renewable resource	plentiful amounts	thermal mass	transport easiness	short transport distance	building process time	free maintenance requirement	durability
Concrete consists of cement (limestone and clay), sand, stone and water [aalborg-portland.dk] [Sassi 2006].	Rawmaterial is in plentiful amounts [dansk beton.dk 2006]	The thermal mass is related to the density of the material. [PDF, Lars Olesen]	Concrete is heavy to transport.	Must be produced in Denmark and sent by cargo ship to Greenland [Bjarke Jensen].	The building process on the site is faster than the in situ building process.	Concrete is not maintenance-free, but maintenance-easy [synligbeton.dk 2013].	[dansk beton.dk 2013]

LIGHT WEIGHT CONCRETE
pre fabricated elements
used as both interior and exterior walls

renewable resource	plentiful amounts	thermal mass	transport easiness	short transport distance	building process time	free maintenance requirement	durability
Light weight conrete consists of cement, sand, burned clay and water [everything-about-concrete.com 2013][Sassi 2006].	Rawmaterial is in plentiful amounts [dansk beton.dk 2006]	The light and porous hard burned clay contain small cells filled with air, which gives the lighter density than normal weight concrete. [bef.dk 2007] [bef.dk 2013] [PDF, Lars Olesen]		Must be produced in Denmark and send by cargo ship to Greenland [Bjarke Jensen].			Light weight concrete is not made for exposing the concrete. The climate will damage the facade over time. [expan]

CONCRETE
in situ

renewable resource	plentiful amounts	thermal mass	transport easiness	short transport distance	building process time	free maintenance requirement	durability
[Sassi 2006]	Rawmaterial is found in plentiful amounts [dansk beton.dk 2006]	[PDF, Lars Olesen]		In situ concrete is the only building material which can be produced in Greenland [Bjarke Jensen].			[dansk beton.dk 2006]

PINEWOOD

renewable resource	plentiful amounts	density	transport easiness	short transport distance	maintenance requirement	resistance to damp	impregnation free	durability
(Sassi 2006)	Pinewood is growing in the forests in Scandinavia [fbbb.dk 2002].	The density of Spruce is 0,35-0,67 10^3 kg/m^3 [engineeringtoolbox.com 2013] [fbbb.dk 2002]		Transported from Denmark.	[ubehandlede trefasader, Knut Einar Larsen og Johan Mattson]	In the case of non-impregnated.	Must be impregnated when used as an outdoor material [antikacb.dk 2013]	In the case of non-impregnated. If the only the wooden core is used and impregnated the durability is higher than spruce [treteknisk.no, gran 2011]

SPRUCE

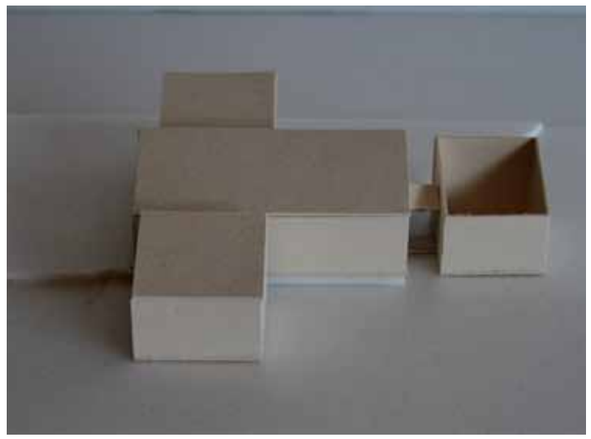
renewable resource	plentiful amounts	density	transport easiness	short transport distance	maintenance requirement	resistance to damp	impregnation free	durability
[Sassi 2006]	Spruce is growing in the forests in Scaninavian [Peter Barfoed] [treteknisk.no, gran 2011]	The density of Spruce is 0,4-0,7 10^3 kg/m^3 [engineeringtoolbox.com 2013] [Peter Barfoed]		Transported from Denmark.	[treteknisk.no, ubehandlede trefasader 2011]	Based on studies i Nuuk developed by Peter Barfoed [Peter Barfoed]	Because of the cell structure of spruce is it not possible to impregnate [treteknisk.no, gran 2011]	Based on studies i Nuuk developed by Peter Barfoed [Peter Barfoed]

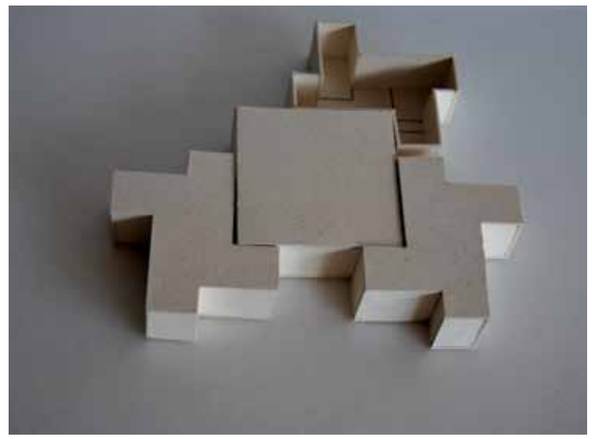
WESTERN RED CEDAR
in situ

renewable resource	plentiful amounts	density	transport easiness	short transport distance	maintenance requirement	resistance to damp	impregnation free	durability
[Sassi 2006]	WRC is growing in the woods in Canada [wrcla.org]	The density of WRC is 0,38 10^3 kg/m^3 (engineeringtoolbox.com) [Peter Barfoed]		Transported from Canada.	[treteknisk.no, ubehandlede trefasader 2011]	Based on studies i Nuuk developed by Peter Barfoed [Peter Barfoed]	[Robinie.dk]	Based on studies i Nuuk developed by Peter Barfoed [Peter Barfoed]

APPENDIX 4
possible addition methods

The following shows model studies in relation to the cell unit as an additive element, an appendage to the common space of the living unit.



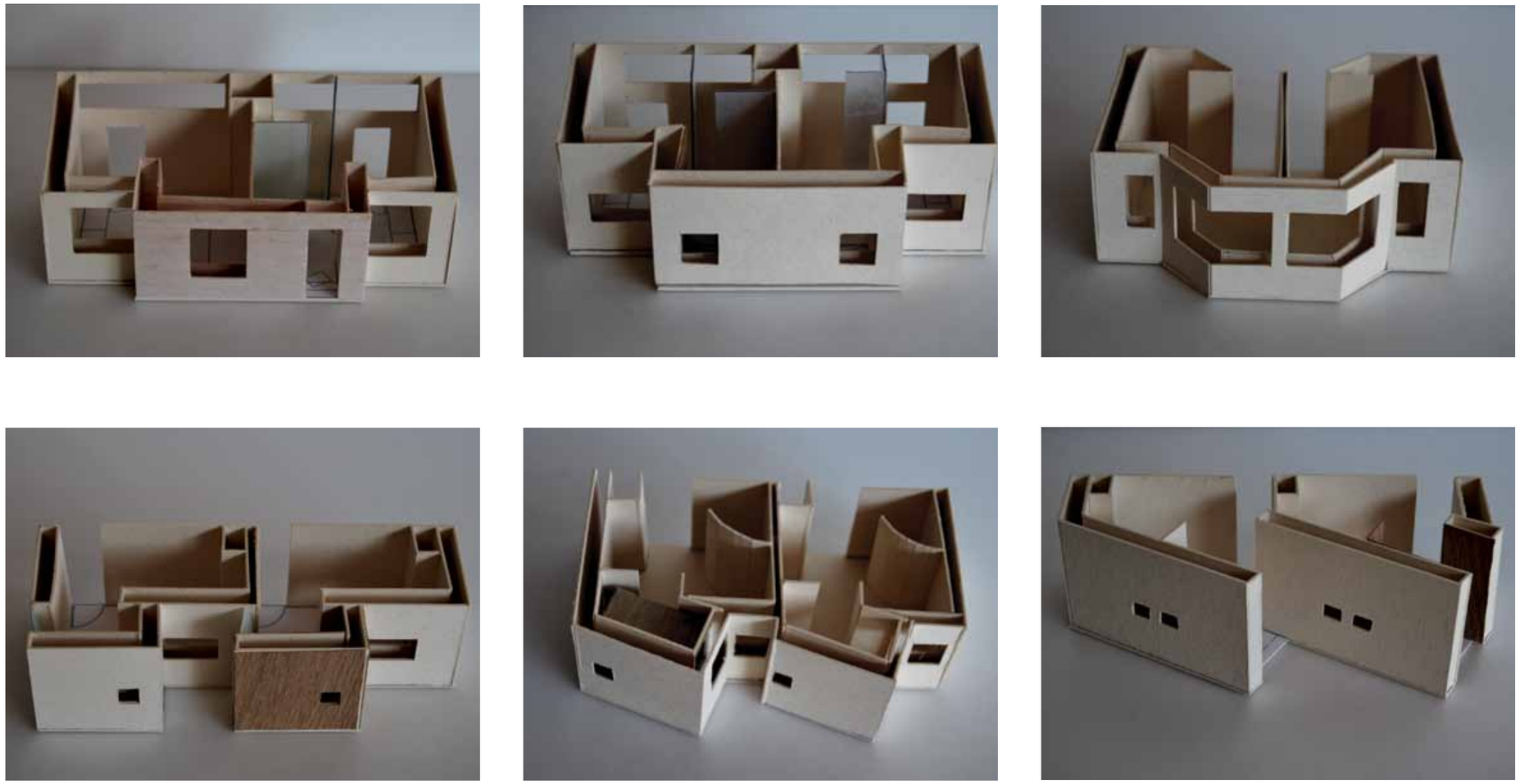


Ill. 197

APPENDIX 5
deciding the cell

The following shows model studies of different cell layouts related to the functions;

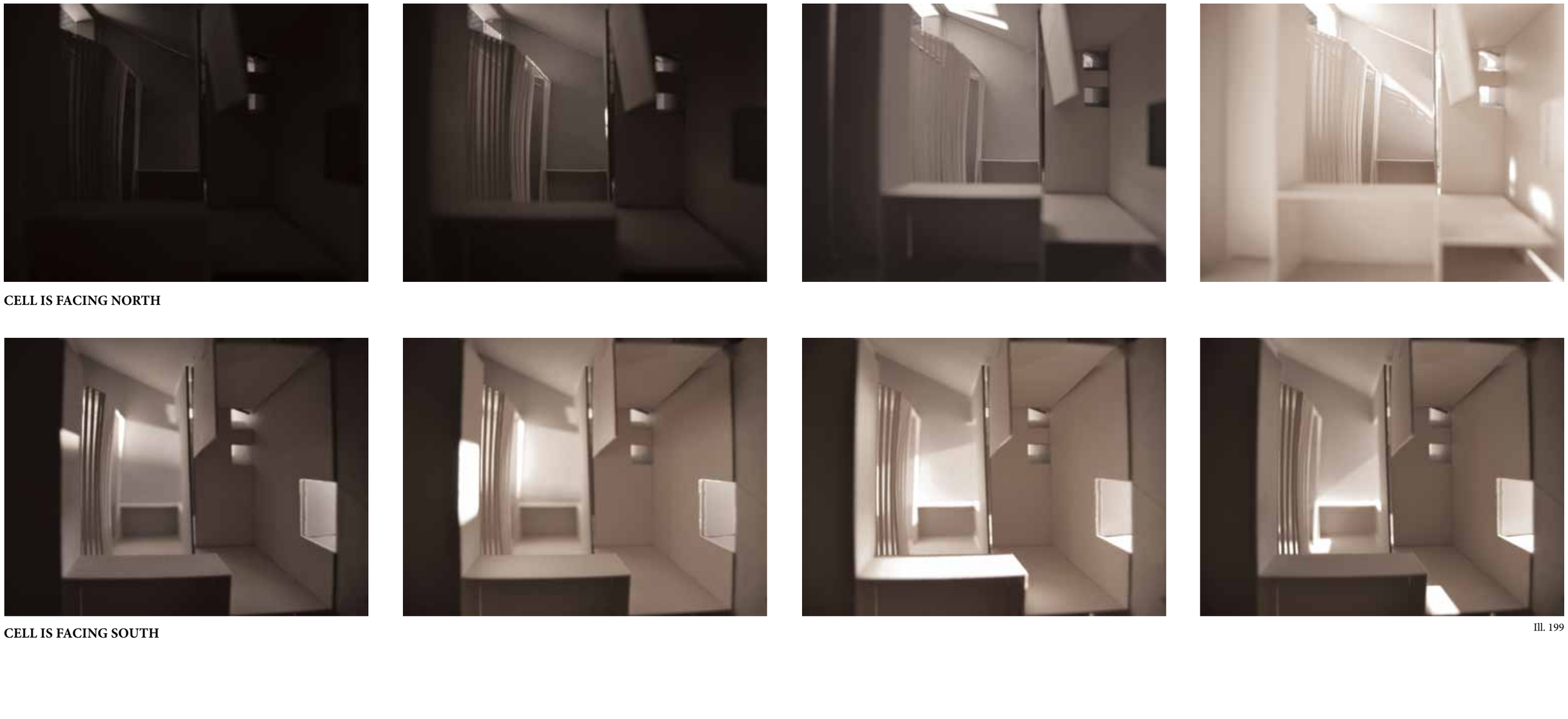
+ Immersion + Refuge + Bath + Floor



Ill. 198

APPENDIX 6
light and darkness

In the following light studies of the cells are shown. The studies are made in the Heliodon at the lighting laboratory at the University of Aalborg. The heliodon is adjusted to match Greenlandic lighting conditions.



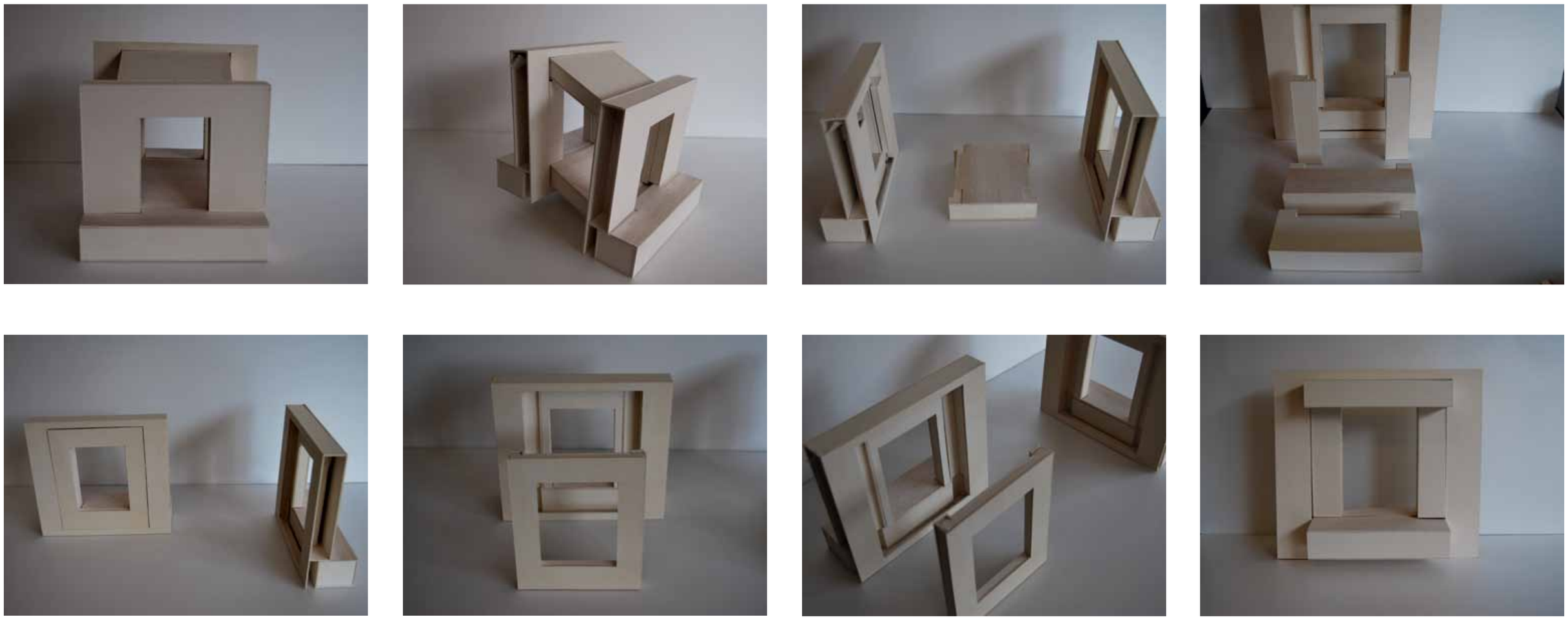
CELL IS FACING NORTH

CELL IS FACING SOUTH

Ill. 199

APPENDIX 7
how to make the addition possible

Different ways of connecting the connection element, facade expressions and aseemblies have been explored in the following models.



Ill. 200

APPENDIX 8
the visual expression of the joint filler

All the additive parts of the correctional institution, the living units, are made of prefabricated concrete elements assembled at the site. When assembling prefabricated elements a joint filler of 16 mm will be visible and a part of the visual expression of the architecture. The following studies examples of joint fillers in prefabricated architecture.


Ill. 201


Ill. 202


Ill. 203


Ill. 204

THE FOUR BOXES GALLERY

Place: Krabbesholm Højskole, Skive
By: Atelier Bow-Wow

Concrete elements primarily in vertical sections with different heights.
Spaces between elements are filled with a grey joint filler in the same tone as the concrete. It tones down the joint so that it does not take over the simple and clean expression of the facade., even though it is still visible. The visible vertical sections creates a movement upwards in the facade. Strict holes are cut specific places in the facade to create varied views. [Phillips 2012]

KATTEGATCENTRET

Place: Grenå
By: Kjaer & Richter

Concrete elements in different sizes with a grey joint filler in the same tone as the concrete between the elements.
The facade elements are subdivided into many fields that togehter with the grey joint filler mask the actual joints by creating an illusion of many more. The concrete facade gets a dynamic and varied expression. [synligbeton.dk - Kattegatcentret 2013]

Ill. 205

Ill. 206

Ill. 207

Ill. 208

3F ÅRHUS

Place: Århus
By: 3XN

Black concrete elements with the same height, but varying in 3 different widths.
Here there are no vertical joints between the concrete elements. The elements are separated by windows whose sizes seems to be defined by the width of the elements. The windows are framed by aluminium frames that mark the transition between materials. The horisontal joints are filled with a black joint filler drawn back from the facade; it underlines the floor height and the horisontal direction in the building. Due to the varied element widths the concrete facade gets a controlled, but dynamic expression. [synligbeton.dk - 3F Århus 2013]

GRUNDFOS KOLLEGIET

Place: Århus
By: Cebra Arkitekter A/S

Concrete elements with the same height, but varying in widths.
The horisontal joints between the elements are emphasised by a differentiation in the surface colour and surface texture. The vertical joints fade and are almost not visible at a distance because of the dominating surfaces of the building. The emphasis of the vertical joints create a movement upwards in the building. [building-supply.dk 2012]