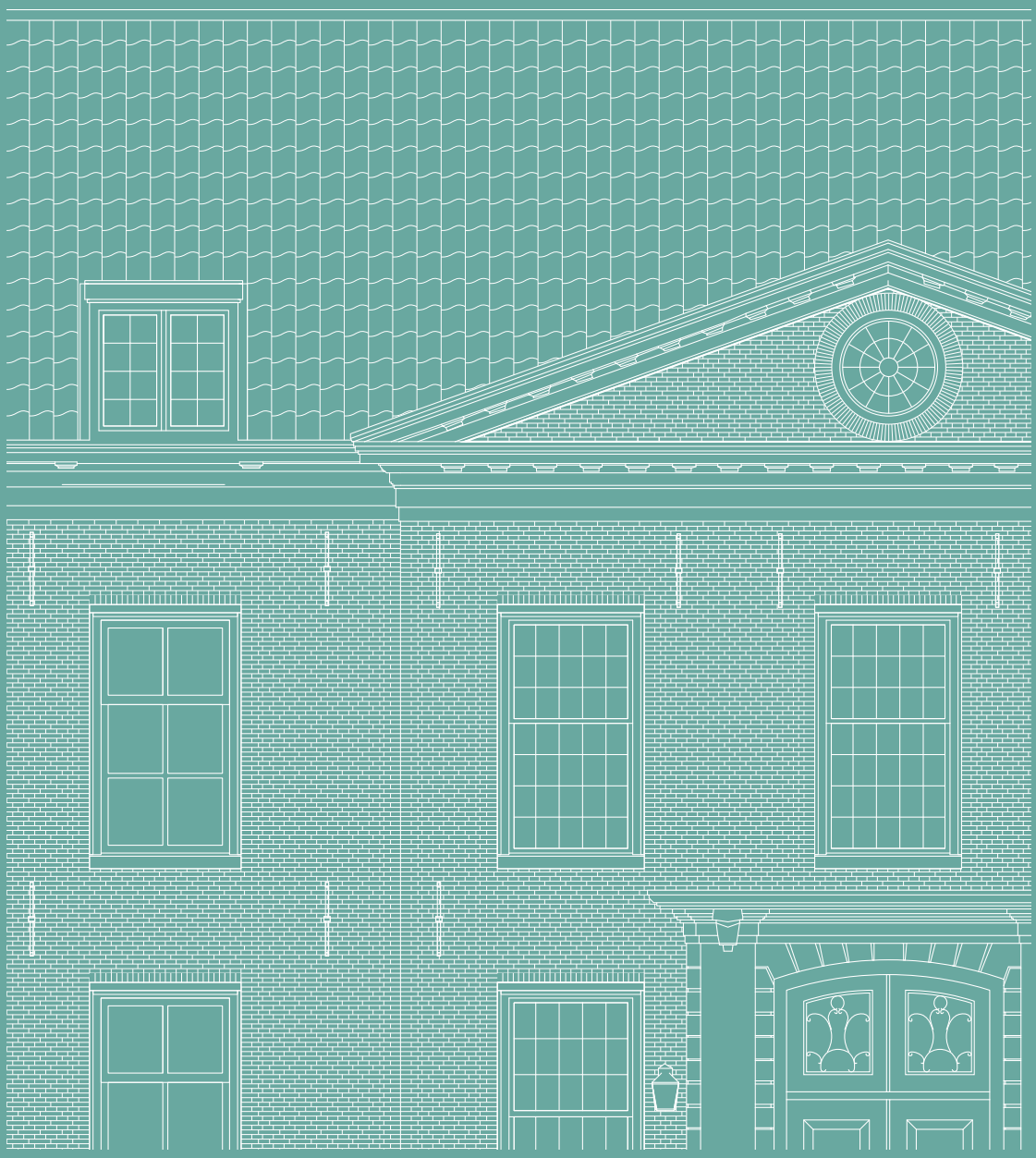
PERMANENT SPACE // CHANGEABLE USE

Adaptability without future architectural interventions

AR3AH105 I Vacant Heritage
Annemiek Braunius I 4597613



PERMANENT SPACE // CHANGEABLE USE

Adaptability without future architectural interventions

AR3AH105 I Vacant Heritage
Annemiek Braunius I 4597613

PREFACE

Redesigning from the permanent, in which the people that are using the building need to be more flexible instead of designing a flexible building will be the starting point for this graduation studio. Therefore the following research question has been formulated: How could the space plan of a monument like the Koudenhorn be redesigned to accommodate changes in use over time?

We live in an environment where it is normality to buy or make something new once it is broken and we forgot how to give a new purpose to things. While at the same time, climate change has become more present every year and we have been using more materials than are available on this planet (Global Footprint Network, 2021). That is why we need to adjust to the time we are living in and focus on the existing building stock. This is precisely the reason why I have chosen to graduate within the vacant heritage studio: adapting 20th-century heritage.

Designing a building for the future means giving definitive form to something for an unpredictable amount of time. One could say that the task given to architects is to design buildings that are constantly subject to change. Taking this into account, adaptability is one of the keywords coming to mind when facing the unpredictable. Therefore is interesting to redesign a space plan in such a way that it can accommodate changes in use over time.

I am grateful for taking part in the graduation studio of vacant heritage to conclude the years of studying at the Faculty of Architecture and the Built Environment at the Delft University of Technology. Besides, I would especially like to thank Lidy Meijers, Frank Koopman and Hielkje Zijlstra for their input and efforts throughout this process.

INDEX

CHAPTER 1
RESEARCH PROCESS

RESEARCH PROCESS

1.1 Introduction Vacant Heritage Graduation Studio

1.1 INTRODUCTION VACANT HERITAGE GRADUATION STUDIO

1.1.1 VACANCY OF POLICE ESTATE

After the state of the Netherlands, the police owns the most property in this country (Sebregts, 2021). With the formation of the National Police in the Netherlands in 2013, the Dutch police are facing a major real estate challenge. In the next ten years, approximately 700,000 square meters of real estate will be divested, and 200,000 square meters of new construction are planned (Politie Bouwmeester, 2021). In addition, buildings will be renovated or adapted functionally. Because of the formation and the digitalisation of their work, a lot of the police buildings become obsolete or do not fit within the requirements needed. The challenges imply the need to achieve a good relationship between functional, technical, spatial, aesthetic and financial requirements, in a task that is expected to result in savings of 76 million euros per year (Politie Bouwmeester, 2021).

For the Vacant Heritage Graduation Studio, the Politie Bouwmeester has selected 10 locations throughout the Netherlands to reflect on this topic through research and design.

1.1.2 POLICE IN DUTCH SOCIETY

To be able to get a better understanding of this topic, lectures were given on topics such as the *introduction on the Dutch national police* in the head police office in The Hague or *managing police real estate*. Besides, research was conducted on the things happening within a police building and what police means in Dutch society, as seen below.

Police in Dutch society.

RESEARCH PROCESS

1.2 Location visits and emotional mapping

1.2 LOCATION VISITS AND EMOTIONAL MAPPING

1.2.1 LOCATION VISITS

Out of the offered locations througout the Netherlands, I choose to visit 5 out of the 10. When arriving at the locations, I tried to perceive the buildings through all kinds of lenses. The different values the building could have, how the building was situated in its surroundings, the relation with the neighbourhood and how the building seems to be used. Looking back at these location visits I noticed that the buildings from which I could see the different time layers and read into their history ended up in the following selection of favorite buildings:

1.2.2 HUIS 'T VELDE, WARNSVELD

At first sight, this 'havezate' looks like an isolated castle surrounded by the beautiful Dutch landscape. Build in 1640, the havezate has been used as a residence for multiple inhabitants. As of today, the house is used as a conference and study centre of the Police Academy. The historical value of the building can be clearly seen in the facade of the building, there are different facades to the building showing the different ages it has been build in. Looking closer at the facade of the building, one could see old decorations from the renaissance and other old elements. The surrounding landscaping itself has an ecological value with all its trees and animals.

1.2.3 KOUDENHORN, HAARLEM

In contrast to the 'Huis 't Velde' this police building is located in the inner city of Haarlem. This building covers an entire urban block in the city but does not directly seem to be this massive when approaching the building. This building also has a history before it was used by the police, it used to be a former deacon house and afterwards barracks. The building was originally finalized in 1771, and from 1971 the Haarlem police headquarters was established in the Koudenhorn. The building always used to serve a social task to the public, first to house children and less wealthy elderly people and afterwards the police as a public function. Besides its social value, the building also has historical, aesthetical and age value. The building is listed as a national monument and has been preserved throughout the years.

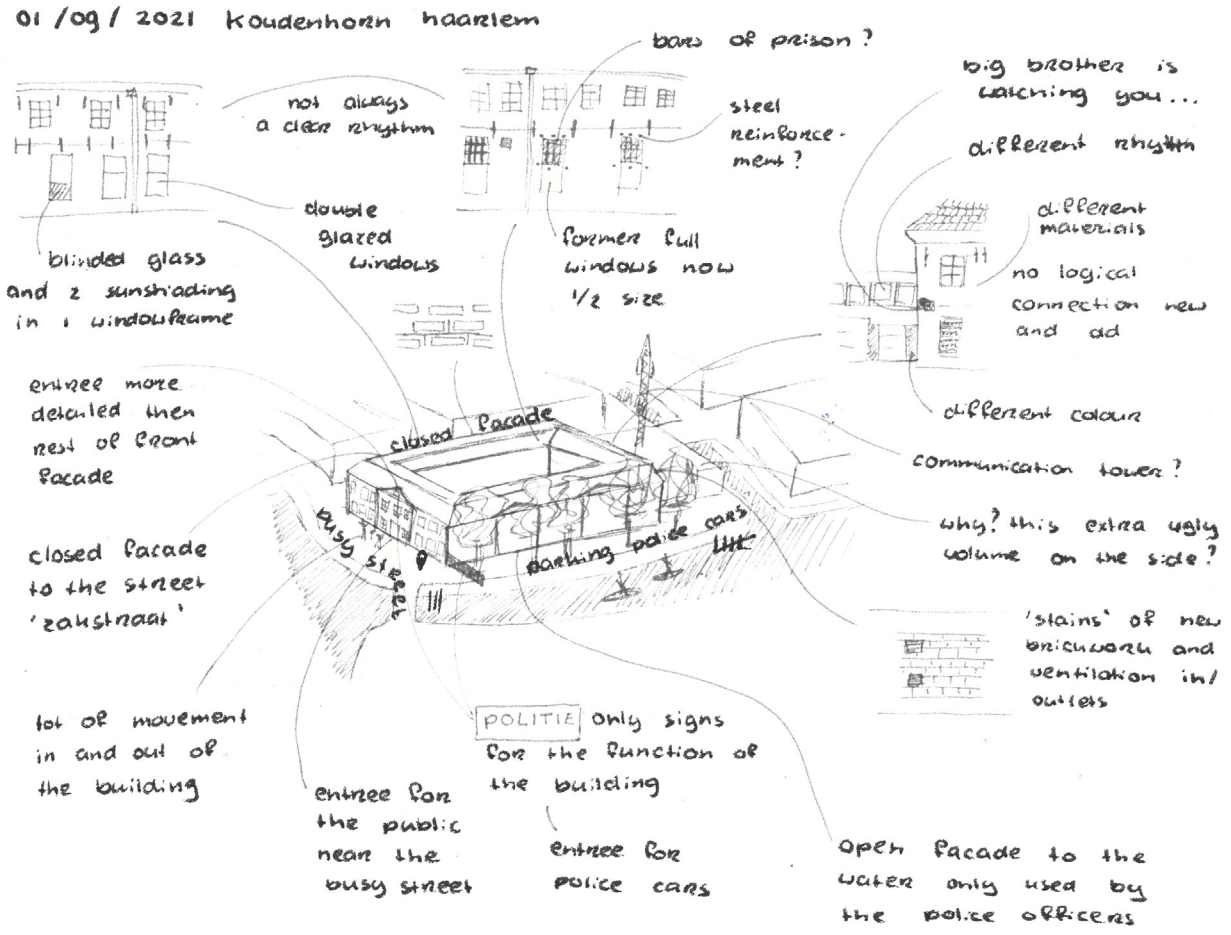
1.2.4 HAVENPOLITIE, ROTTERDAM

Eventhough the Havenpolitie in Rotterdam has been build later than the Koudenhoorn and Huis 't Velde, it also has a rich history. The oldest building has been build in 1938 and the taller building has been added in 1994. But the 'Havenpolitie' have been there already since 1911 on a floating pontoon. During the Second World War, the offices of the River Police were in the hands of the German troops, and Dutch officers were captured in the cells. The police building is located near the water and situated in a quiet and calm neighbourhood.

1.2.5 CONCLUSIONS

Even though I was asked to make a top three in the first week, I could not make up my mind yet what the order of the above-mentioned buildings should be. All three buildings intrigued me because of their history, the previous functions, the scale of the buildings to their surroundings and the aesthetically pleasing features. But all buildings are also different in their own ways, because of their seize and context it is hard to compare the three buildings.

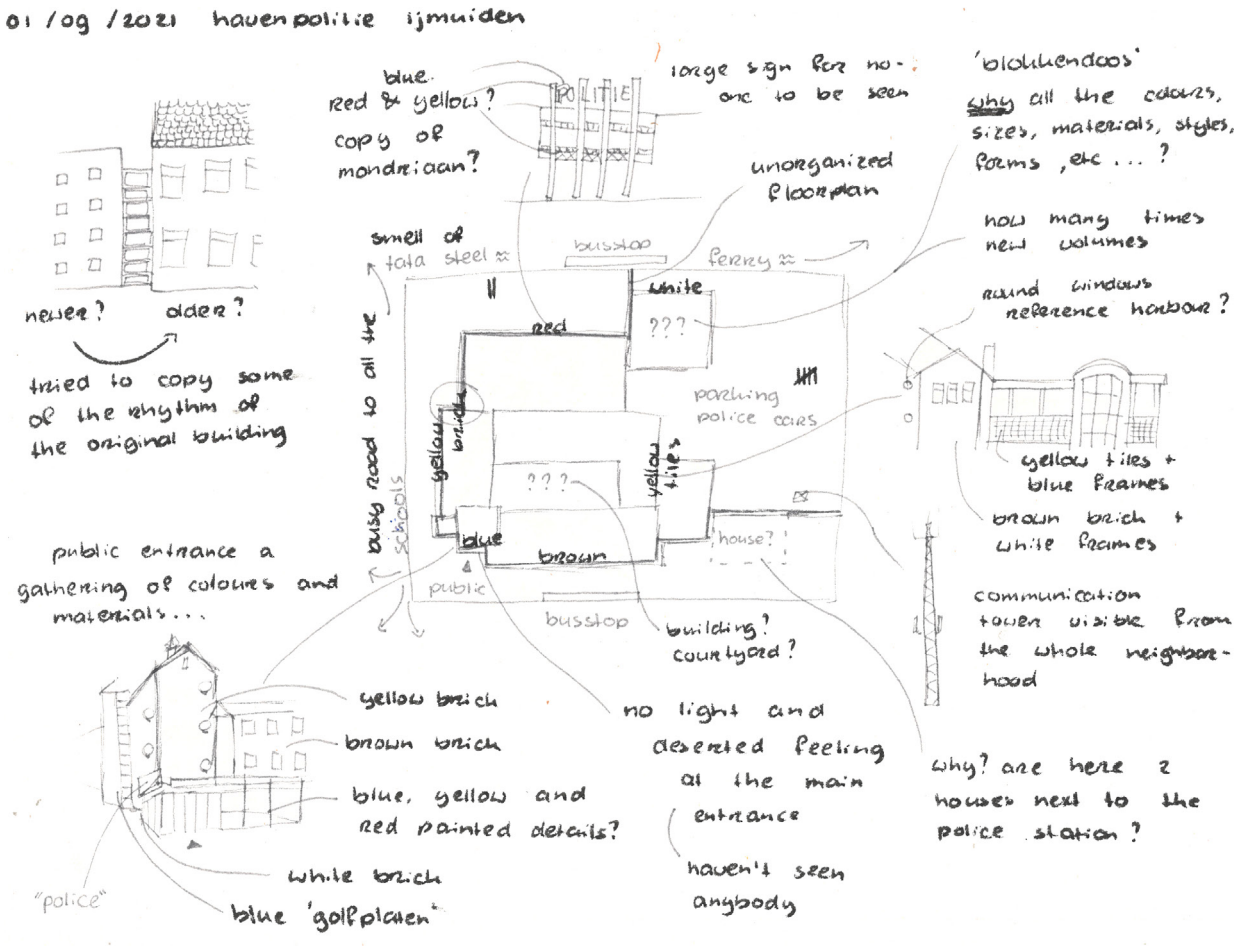

POLITIE



Pictures and drawing from location visit Koudenhorn, Haarlem.

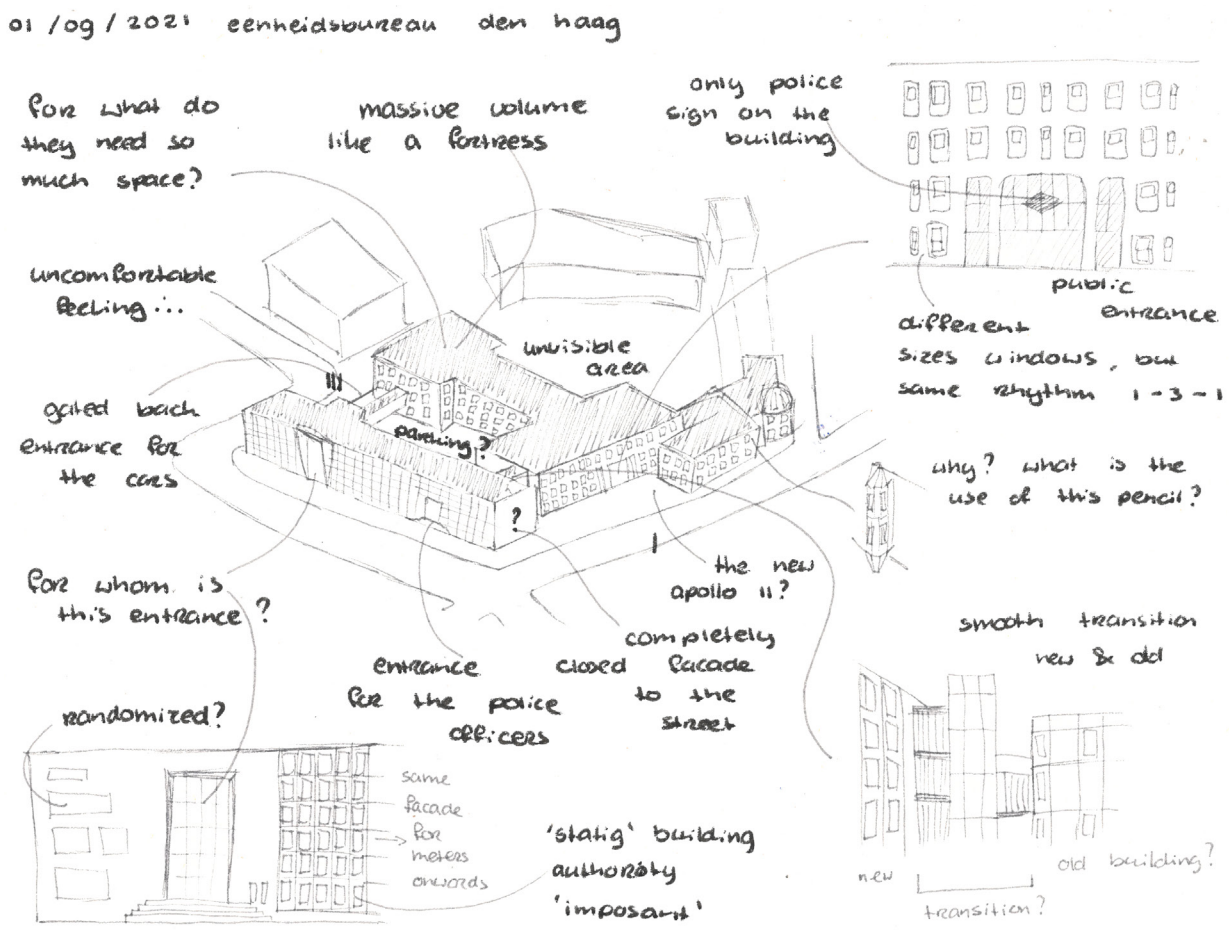

POLITIE


POLITIE



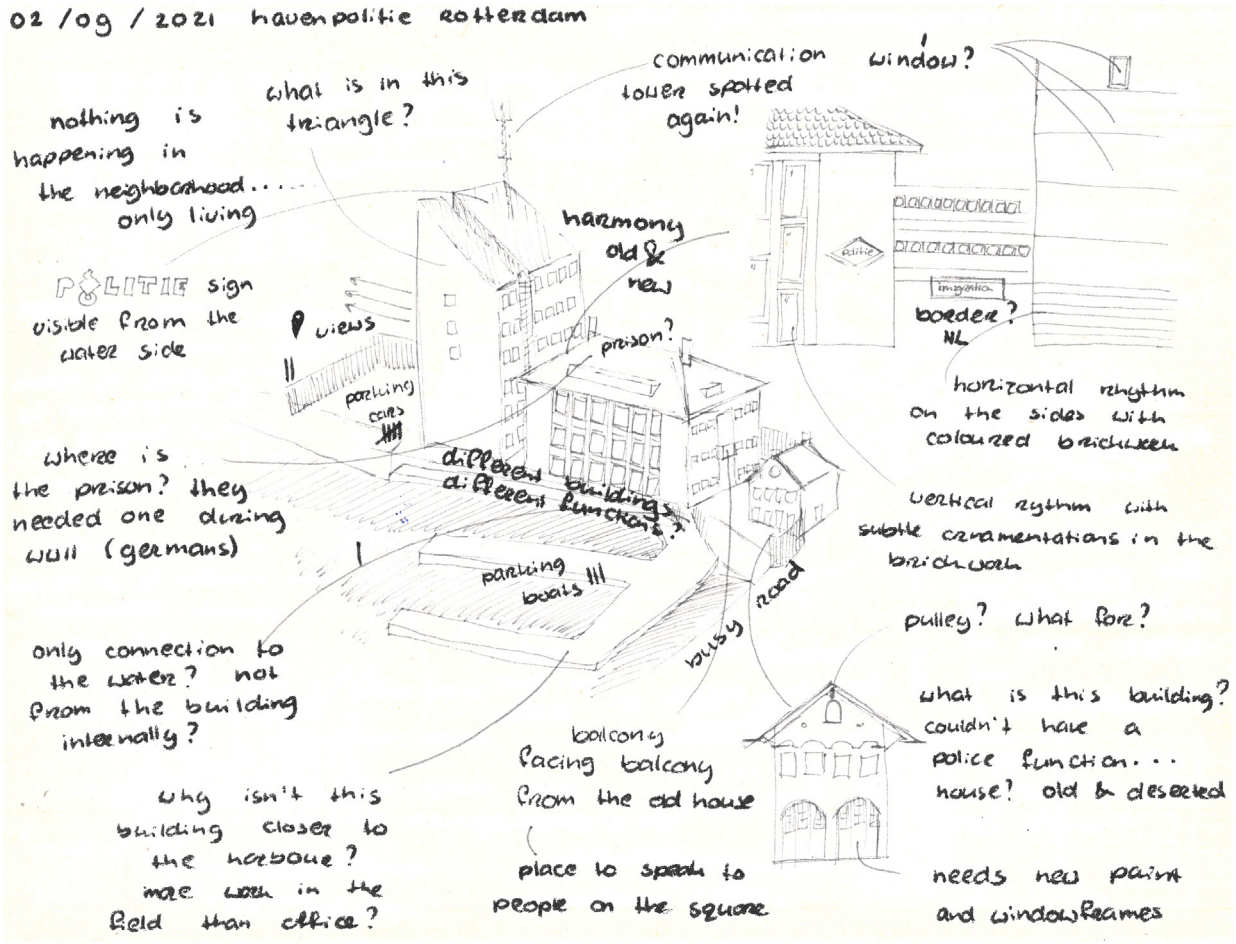
Pictures and drawing from location visit Havenpolitie, Rotterdam.


POLITIE

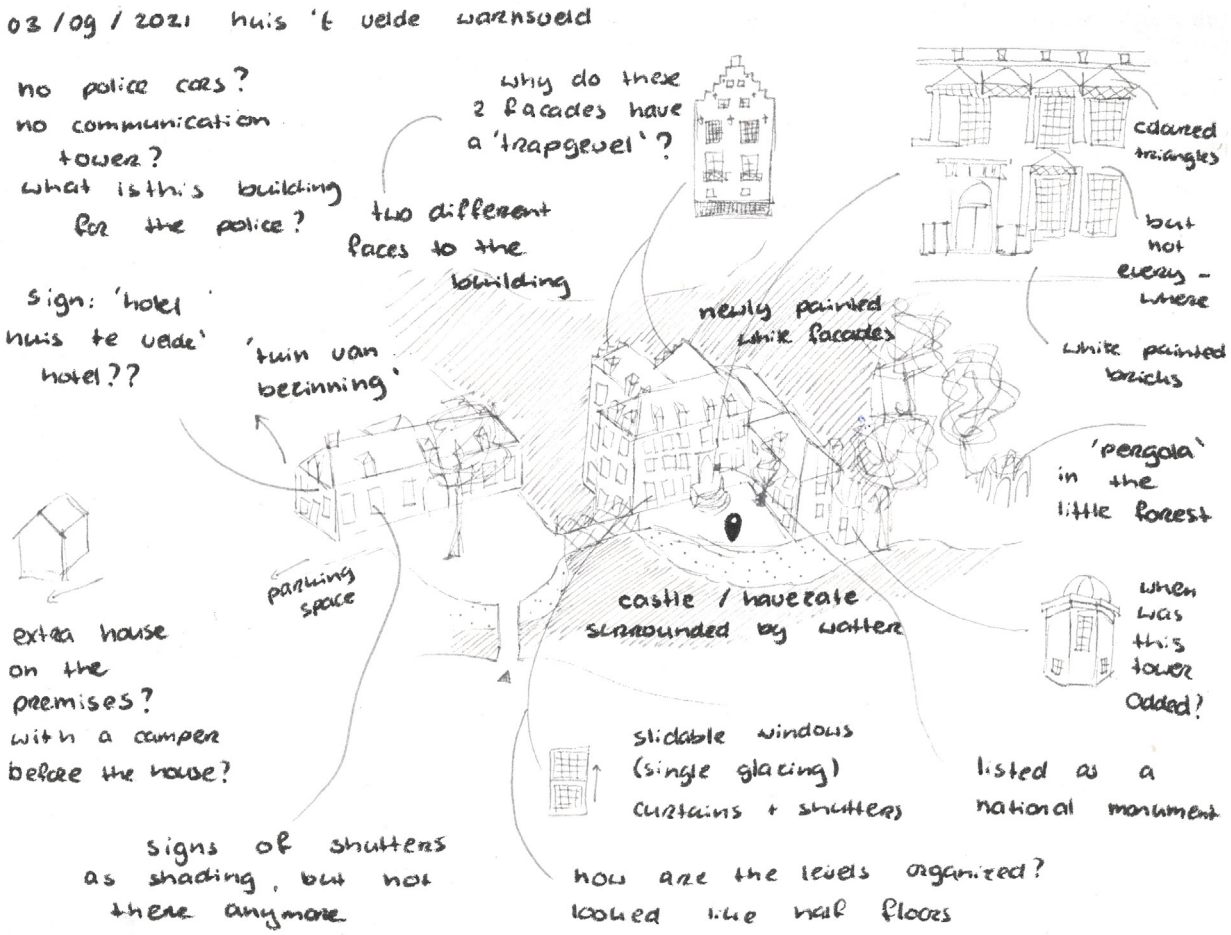


Pictures and drawing from location visit Eenheidsbureau, Den Haag.


Immigration



Pictures and drawing from location visit Havenpolitie, Rotterdam.



Pictures and drawing from location visit Huis 't Velde, Warnsveld.

RESEARCH PROCESS

1.3 Research into the Koudenhorn

1.3 RESEARCH INTO THE KOUDENHORN

1.3.1 LOCATION CHOICE

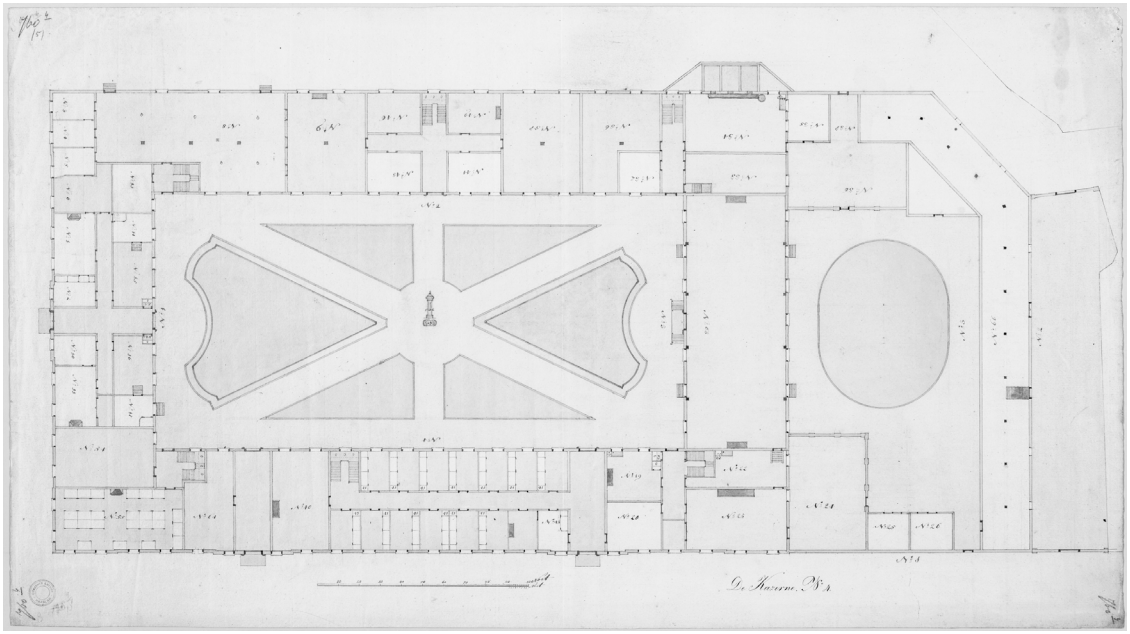
Out of the location visits conducted in the first week, the building of the Koudenhorn in Haarlem intrigued me because of its appearance, the history, the way it is maintained over time and its scale towards the city. Besides, for my personal research question - which will be elaborated on in chapters 1.5 and 1.6 - it is interesting to find a design solution for two different types of buildings.

1.3.2 HISTORICAL DEVELOPMENT

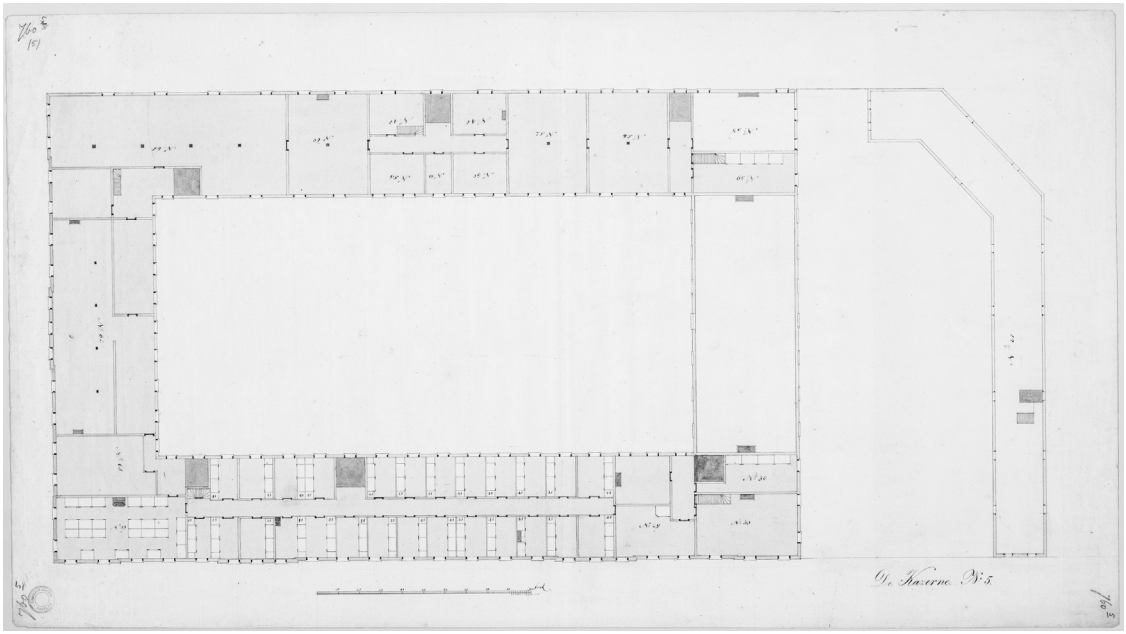
The care of the poor and the deprived in Haarlem dates back to the end of the 14th century. At that time, Haarlem was already a trading center and in this small society poverty arose as well. The care for this population of the city resulted in the many hospices and hofjes Haarlem is known for. Partially arranged by the municipality, but the biggest number of hofjes are created around 1600 by the different churches (Kurt, z.d.).

The Diaconiehuis at the Koudenhorn was built for the Dutch Reformed church. At the time, the church was in financial decline and the Vroedschap (early modern type of college) decided in 1767 to help and saw a vision in the establishment of a large Diaconate House. Three locations were considered for the construction, and eventually the Koudenhorn was chosen. On site of the former ox market, the new Diaconate was built in 1768-1770. The ox marked was relocated to another place in the city and several houses were demolished to realise this project. The building at the Koudenhorn was by far the largest building project in Haarlem at the time. The Koudenhorn was built to house 670 poor old people, 150 poor

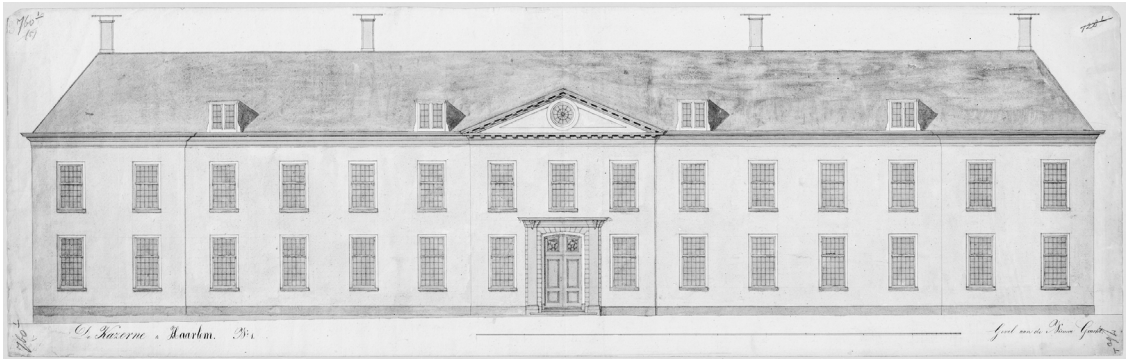
't Nieuwe Diaconie Huijs te Haarlem (Keun, 1771).



Ground floor plan Diaconiehuis (Smit, 1768a).



Second floor plan Diaconiehuis (Smit, 1768b).



Facade at Nieuwe Gracht (Smit, 1768c).

children and 80 commensals. However, it soon became clear that the building had too much space, so from 1786 onwards the building also housed the city's poor (Rijksmonumenten, 2020).

In the Napoleonic era the beautiful, spacious Diaconiehuis was desirable as barracks, which is why it was used by the French from 1810 onwards (Medema, 2004)W. A relocation of the various institutions and orphanages throughout Haarlem was the result. In September 1813, the Napoleonic empire began to collapse. In mid-November 1813, word got out in Haarlem that the French had left Amsterdam, and that is the moment when resistance in Haarlem also rose. On November 24st, the last French soldiers packed up and left Haarlem. Afterwards, the building continued to be used by the people of Haarlem for police and military purposes.

1.3.3 HISTORY POLICE

Within the first twenty years of 1900, fire broke out three times in the barracks on the Koudenhorn; in September 1912, December 1913 and February 1914. During the 2nd World War, the Koudenhorn was in the hands of the allies but the building survived the bombings within Haarlem. Afterwards it was used again as barracks and for police activities by the municipality of Haarlem .

In 1960 it was decided that the Koudenhorn barracks would be converted into a new police headquarter, how-ever this was not happening until 1967. In the meantime, the barracks were given over to a wide variety of activ-ities and different groups. Next to the classrooms for the police training, the building also housed different art-ists, a jazz band and a club of space fans (Medema, G). In one part of the peathouse the architect, Mr. W. Bol-lebakker -by Royal Decree in 1970 this name was changed to Bernson- set up his drawing office. On March 15, 1967, the flag was raised when it was announced that the Mayor and Aldermen had come up with a concrete plan to turn the Koudenhorn barracks into a police headquarter.

New building of the traffic police

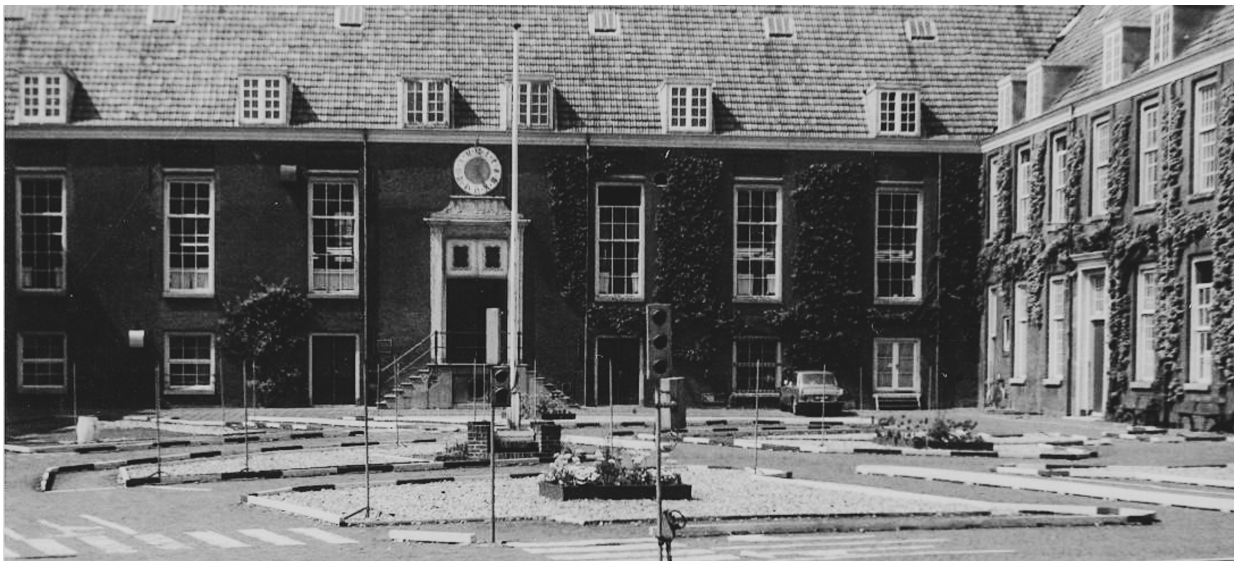
The site where the new building of the traffic police was to be erected, lay partly on the spot where the city walls had once stood and partly on the site of the old moat. It is undoubtedly a historic spot and not without symbolic meaning, that a new police headquarter was built here to defend the property of the citizens of Haarlem. In April 1968 the design for the new traffic police building was completed. It had a basement that would house a fallout room, a shooting range and a cinema. As a result of the deep foundation construction of the peathouse, there was a need to completely remove the old pile foundation during the construction of the traffic police (Noords Hollands Archief, 2020). On April 16, 1969, they started the construction of the traffic police.

Redesign Koudenhorn

During the construction of the traffic police, there were quite a few voices, also in police circles, who thought it would be much better to demolish the Koudenhorn and put a completely new building there. It took the insight, creative spirit, courage and optimism of a great architect to see an ultra-modern police station, fully adapted to the requirements of that time, in the grim and gloomy barracks full of broken windows. Although the new traffic police station, which was also attractive to the public, was scheduled to open in a few months' time, most people found it impossible to discern any rosy outlook in the dreary barracks of the Koudenhorn. People thought of the building as ugly and would rather see it destroyed so there was place for a new building. At

Officers at the police station on the Koudenhorn (Noord-Hollands Archief, 1920).

Koudenhorn 2, seen from the Nieuwe Gracht (Noord-Hollands Archief, 1930).



Courtyard Barracks Koudenhorn (Noord-Hollands Archief, 1966).

New building of the Traffic Police (De Boer, 1969).

Koudenhorn barracks; fire in future police station (Noord-Hollands Archief, 1973).

New construction of cell block and garage police station (Noord-Hollands Archief, 1975).

the same time, the old Diaconiehuis was registered as a monument on November 27th 1969, and the decision was made to repurpose the building for the police (Medema, 2004).

During construction work in the Koudenhorn, fire broke out again in 1970 and 1972. The Koudenhorn was completed in1975 and was redesigned with space for a detention ward, judicidal police, technical investigation office, surveillance department and immigration services.

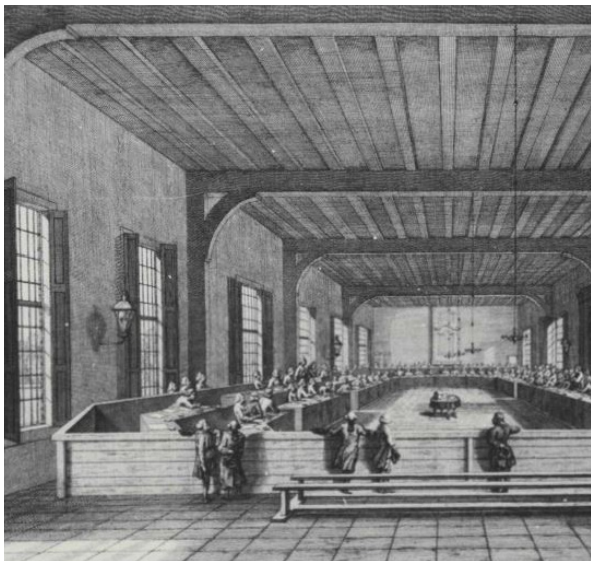
The severely outdated canteen was located in the original dining hall of the former Diaconiehuis. The architecture of the existing space was not to be affected, but the comfort had to be adapted to modern requirements and the existing space had to be arranged more efficiently. In order to achieve this, the existing floor plan was modified and a mezzanine floor was partially inserted. The most striking intervention is the installation of a mezzanine floor in the form of a semi-circle. The curved form is in strong contrast to the sober, symmetrical main form of the original space. Old and new flow together harmoniously.

Since the mezzanine floor was already an intervention of considerable size, Van der Veldt (interior) applied a lot of glass, creating a high degree of transparency throughout the design. It also fits the image the police have of themselves these days: an open organization. According to Van der Veldt, the introduction of the curved walls has a lowering effect on the threshold; after all, the police force wants to radiate friendliness (Uittenhout, 1997).

1.3.4 ARCHITECTURE KOUDENHORN

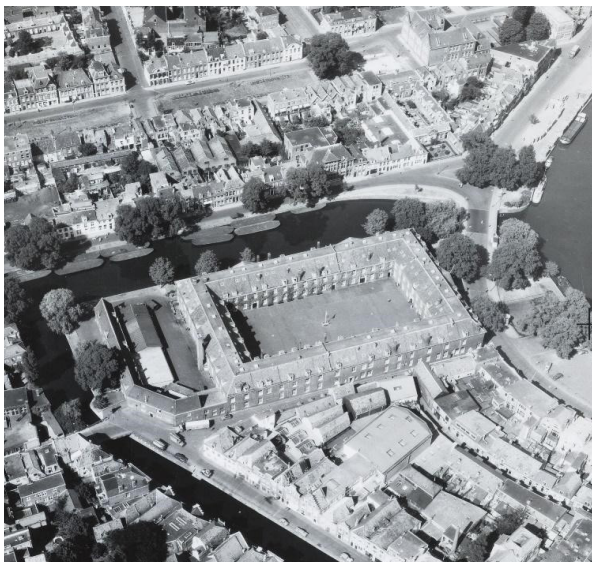
The Diaconiehuis was designed by Jan Smit (1720-1807) and was to be characterized, entirely in accordance with the wishes of the Vroedschap, by an austere brickclassicism. The wall planes of the two facades on the Nieu-wegracht and Koudenhorn were only interrupted by side and middle entrances. The façade on the Koudenhorn had a centralrisalit over three bays, crowned with a pediment. The long facade was in fact a doubling of this and had two pediments.

On the side of the Bakenessergracht stood, separated from the main building, a utilitarian building for the storage of peat and grain. On either side of the main entrance one could



Diningroom Koudenhorn (Van der Vinne, 1778).

New interior canteen (Pop-Jansen, 1997).



Aerial view Haarlem (Koninklijke Luchtmacht, 1959).

Haarlem (Noord-Hollands archief, 1979).

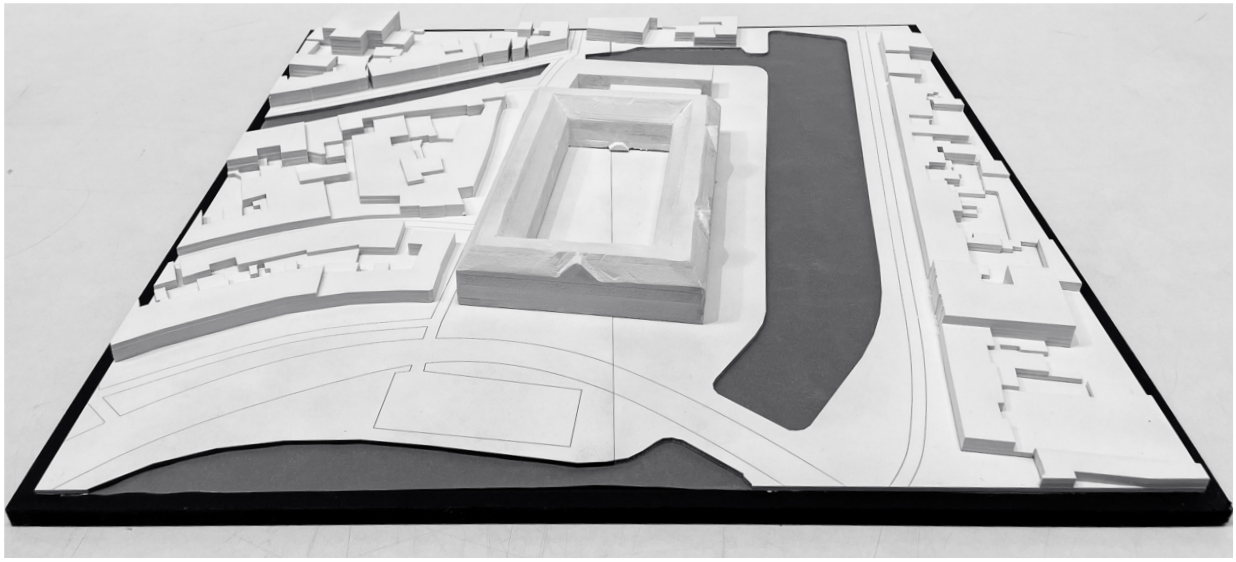
find the regents' quar-ters. The dining hall was located on the other short wing, which one could only reach through the entrance on the square. The long wings contained the sleeping quarters and workrooms. The entrances on the side of the Nieuwe Gracht were for staff, residents and those in need of care (Medema, 2004).

1.3.5 ARCHITECTURE TRAFFIC POLICE

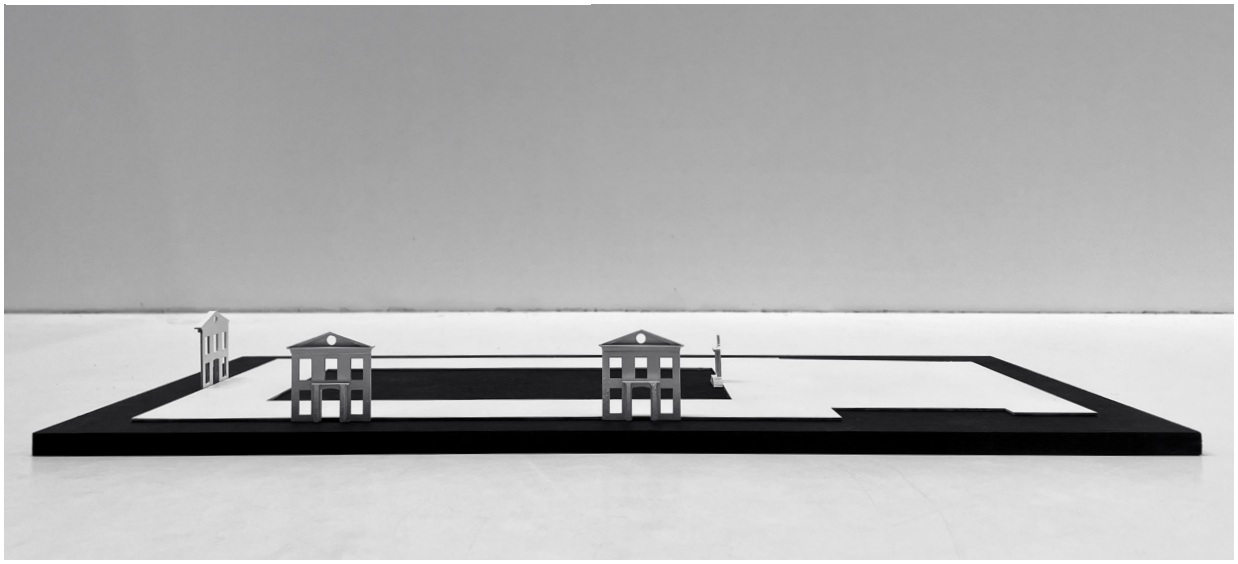
The building for the traffic police was designed by Willem Bollebakker/Bernson (1918-2020) with the principles of new objectivity. Construction and appearance are determined by the function of the building. New materials such as concrete and steel made it possible to develop new building structures that enabled a transparent and abstract architecture to be realized. Decoration is avoided and replaced by plain white plastered walls or glass walls (Het NIeuwe Insituut, 2009).

1.3.6 TIMELINE OF THE KOUDENHORN

Until 1756, ox market
1768 - 1770, building Diaconiehuis
1770 - 1810, used as a Diaconiehuis
1810 - 1813, Napoleonic empire
1813 - 1946, barracks and police activities
1946 - 1950, in the hands of the allies
1950 - 1960, barracks and police activities
1960 - 1968, police, artists, jazz band
1968 - 1972, new building traffic police
1969, registration as monument
1770 - 1775, redesign Koudenhorn
2014, interior redesign



Urban essence model.



Entrances essence model.

Materiality essence model.

1.3.7 ESSENCE MODELS

Urban Model

The Koudenhorn police station forms one large element in the urban fabric, contrasting with the grain size of the surrounding inner city building blocks. The building is surrounded by water on three sides. There is however no apparent relation between the use of the building and the location next to the water. On the western side there is a bike stall, the northern quay is used for private parking and on the east side a busy road and a parking lot separate the building from the water. Surrounded by the four wings of the main building there is a large and largely unused courtyard. The modern addition to the building on the western side consist of several volumes of different heights. All of the aspects mentioned above offer opportunities for improvement of the existing situation.

Entrances

The Koudenhorn police station has three monumental entrances on the outside of the building, 2 facing the Nieuwe Gracht and one of them oriented towards the Spaarne. The entrance towards the Spaarne provided access to the wing for the regents, while the other two entrances were used by the inhabitants of the building, staff and beggars. The parts of the facade of these entrances comes a bit forward compared to the rest of the facade and has five windows with a smaller rod division than all other windows of the building. Above the doors, two carved windows are situated and these whole parts of the façade are topped with a tympanum. The wing of the building alongside the Zakstraat has no entrances connecting with this street and could only be accessed via smaller entrances in the courtyard. The fourth element of this essence model are the steps connecting the courtyard with the dining room of the former Diaconiehuis, currently still used as canteen for the police. The entrance is decorated with steps and a clock above the door. The ornamented entrances are visible in the older part of the building, while the entrances of the new volume are applied in a function way and therefore do not contribute to this essence of the building.

Materiality

The old part of the Koudenhorn police station, built between 1768 and 1771, and the added volume, built in 1971, show a clear contrast in materiality. The old part is constructed of masonry walls, while the added part is made with a concrete facade. Next to the difference in materials, the contrast is enhanced by the use of texture and depth in the concrete volume and the size of the concrete elements compared to the bricks. The concrete is painted in white and light blue colours, while the brick of the old part remained their original colour. Despite these contrasting elements, the materiality shows similarities in the heavy feeling of the material and therefore building volumes.

When seeing the two buildings, one probably has a preference for one or the other. Interesting to know is that this public preference has changed over time. When the modern volume in 1971 was added, everyone loved this building and no one really understood why the former Diaconiehuis was transformed into a police station. People thought of the building as ugly and would rather see it destroyed so there was place to build a new building.

RESEARCH PROCESS

1.4 Spatial Building Typology

1.4 SPATIAL BUILDING TYPOLOGY

1.4.1 RESEARCH LINES IN HERITAGE

Within the studio of Vacant Heritage there are two directions of focus for research. Spatial Building Typology (SBT) as Basis for Re-design is coordinated by Hielkje Zijlstra and the role of materiality in the perception of heritage values is coordinated by Wido Quist. During the graduation project, everyone is asked to focus on one of these research lines.

1.4.2 MOTIVATION CHOICE SBT

Growing up watching the news every evening, it soon became clear to me that our generation needs to change the way we live. In the past decades, we keep using more materials than are available on this planet, resulting in the earth-overshoot day happening sooner every year. Climate change becomes more present every year, and even though everyone is aware of this problem, no one seems to take any action. That is why we as architects, and especially as heritage graduate students, need to focus on the existing building stock rather than creating new buildings.

When focussing on the existing building stock, it is important to develop innovative solutions to address the technical, architectural and social challenges that we are facing today. More and more people are living in urban areas, in which the demand for living space and resources are increasing. That is why it is a really important but also a very complex and difficult challenge to find a suitable design solution for all vacant heritage.

At the same time, I can not help but wonder why is it so complex and difficult? Is it not possible to make it easier to ourselves? To categorize different buildings and find generic solutions that can be applied to multiple buildings? When researching the typology of certain buildings, it should be possible to create a toolbox of options applicable for that specific typology.

When analysing the building on different scales, figuring out the historical development, the spatial configuration, the floorplans, the composition of the facade and the use of certain rooms, a clear understanding of the building will be formed. Figuring out the spatial aspects of a building, one would clearly understand how certain spaces were used and can be used in future redesigns, because the ability to change into different functions is a high quality.

When designing with the knowledge of the analysis from the spatial building typology, a set of clear solutions could be proposed for the redesign. Understanding how this research is done, all vacant buildings could be analyzed and potentially be transformed. Important for the future is the redevelopment of all vacant buildings, listed as heritage or not.

When having a clear vision on what could be done with all vacant buildings, cheaper designs with a lower embodied energy could be realised. With this in mind, a better future could and should be realised for everyone.

1.4.3 SPATIAL BUILDING TYPOLOGY

Spatial Building Typology (SBT) as basis for re-design is collective research that focuses on the spatial aspects instead of the function of a specific typology. “Focussing on the research into similarities and differences in the spatial characteristics of a collection of buildings, which were originally realized for one specific function (group), yields a series of spatial properties that can give direction

to the possibilities for redesign" (Heritage & Design TU Delft, 202, p.9).

The chair of Heritage & Design from the faculty of Architecture and the Built Environment of the Delft University of Technology, has done the same research on vacant department stores in the academic year of 2020-2021. This academic year, the research will focus on several police estates throughout the Netherlands which will become vacant in the coming years.

The police estates will be researched throughout four scales, with three (or four) aspects linked to each scale level. The different buildings will be worked out in drawings and text based on the Haussmann method (Jallon & Napolitano, 2017). Research into the following scales and levels will be done:

1. Inner City
   1.1 Introduction
   1.2 Historical development
   1.3 Network

2. Urban Block
   2.1 Block information
   2.2 Streets
   2.3 Accessibility

3. Building Object
   3.1 Spatial lay-out
   3.2 Structure
   3.3 Spatial relations
   3.4 Sections

4. Building Envelope
   4.1 Configuration
   4.2 Composition
   4.3 Materiality

From the 10 locations of vacant police estate for this graduation studio, we have decided as a group to research into the following 8 buildings. Our group researched the Koudenhorn and the Rotterdam Harbour police. All images and drawings in this chapter are conducted from the SBT research.

Havenpolitie, Rotterdam

Koudenhorn, Haarlem

Witte de Withstraat, Rotterdam

Eenheidsbureau, Den Haag

Eenheidsbureau, Eindhoven

Eenheidsbureau, Groningen

Politiebureau, Middelburg

Huis 't Velde, Warnsveld

1.4.4 HAARLEM

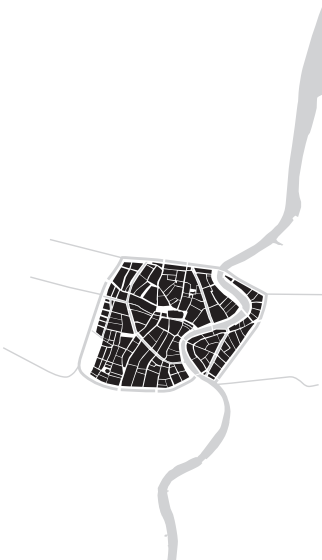
1.2 Inner city - Historical Development

Haarlem initially grew along the west bank of the river Spaarne. The police station at the Koudenhorn is situated at the edge of the oldest part of the city, along the Nieuwe Gracht which formed the border of the city before the centre expanded northwards in the 17th century. After the defensive works of the 17th century were demolished, Haarlem experienced many new developments (Gemeente Haarlem, z.d.).

1800

1300

1900

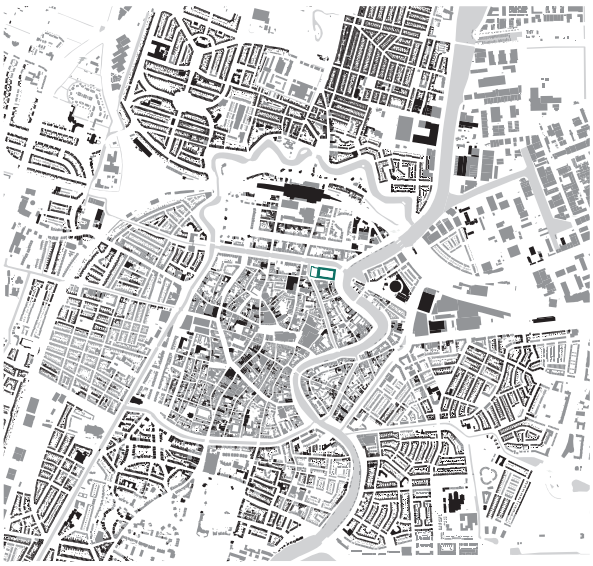


1500

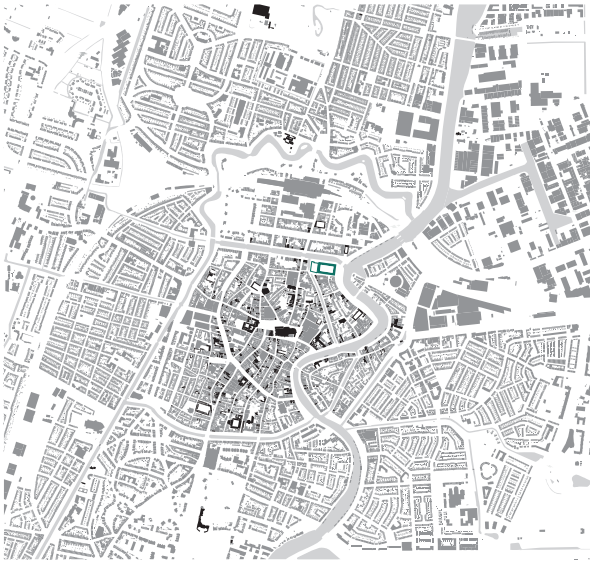
2000

1.2 Inner city - Building Age

The old centre of Haarlem is mostly concentrated around the Grote Markt, which has been there since the 10th century. Due to its function as a garrison town and provincial capital, Haarlem grew during the 19th century. This was also when our case study, the police station at Koudenhorn, was transformed from an orphanage into barracks.

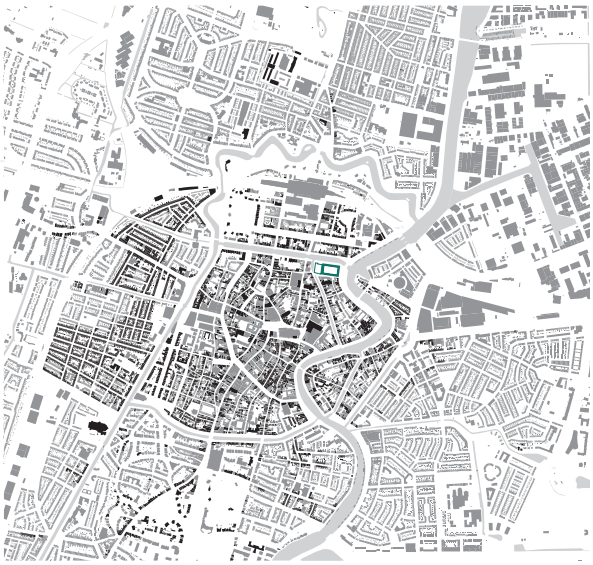


Before 1950

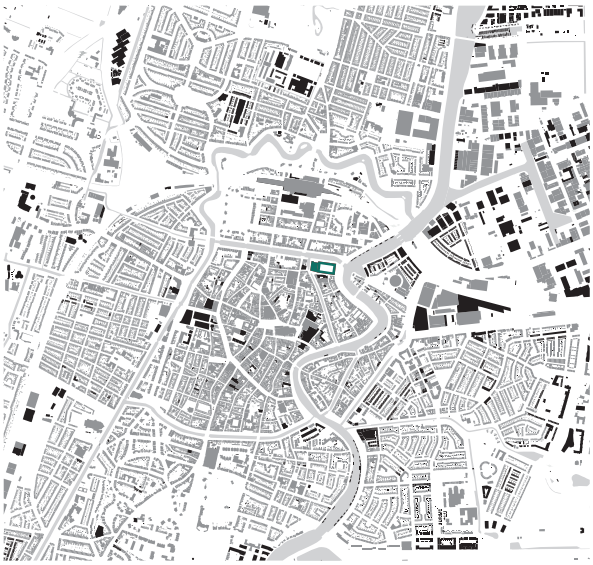


Before 1800

Before 2000



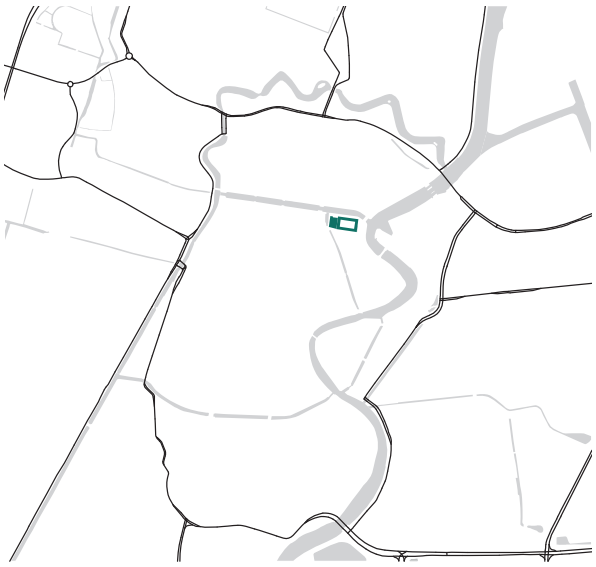
Before 1900



After 2000

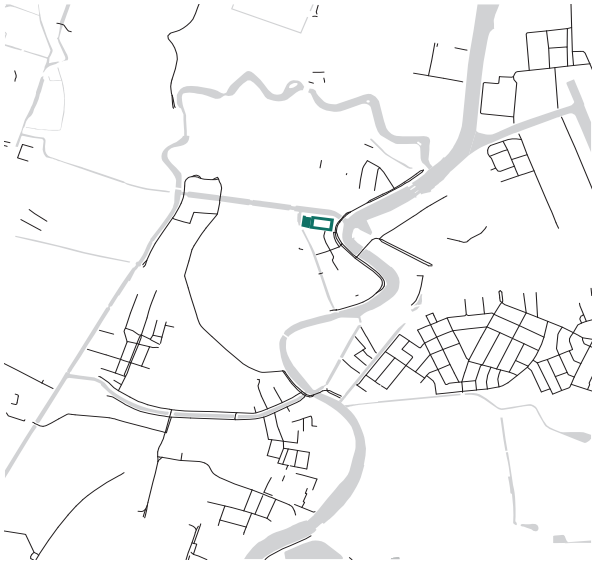
1.3 Inner city - Networks

Because of its dense inner city, the roads that belong to the tertiary network in the city centre are mostly narrow streets or alleys. Roads along the canals are generally wider than others, leaving space for car parking along the sides. The secondary network connects these smaller streets to the primary network, which runs along the Spaarne and most of the larger canals such as the Nieuwe Gracht and the old ramparts.



Primary roads

Greenery (grey) and Public squares (black)



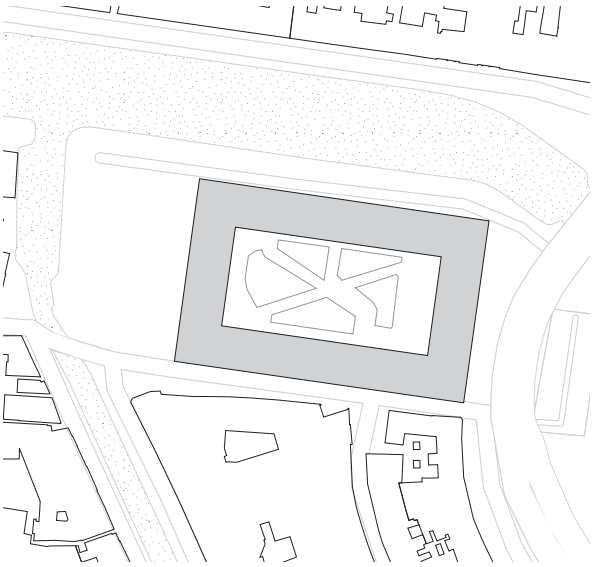
Secondary roads

Roadnetwork

Tertiary roads

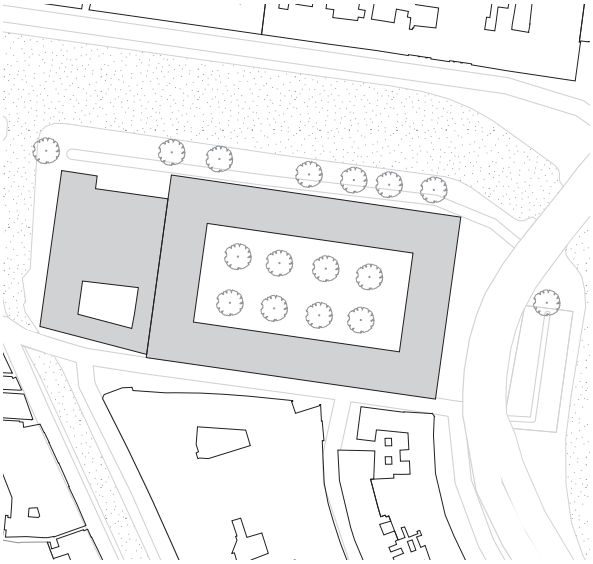
2.1 Urban block - block information

Before the building block of the Koudenhorn was build, there was an ox market located until 1756. From 1768-1771 the diaconiehuis was built and from 1786 onwards the building also housed the city's poor. In 1810 the building was put into use as barracks, the Koudenhorn retained this function until 1960, in 1971 the police headquarters was established in the old barracks, and a new building has been build next to it (Noord Hollands Archief, 2020).

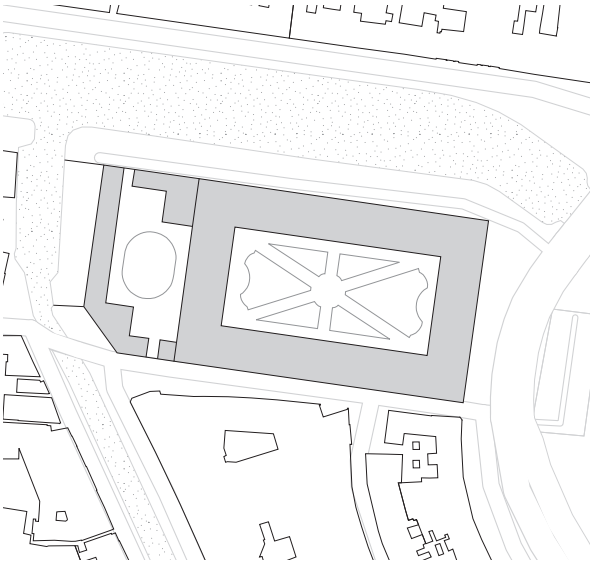


1968 - 1775

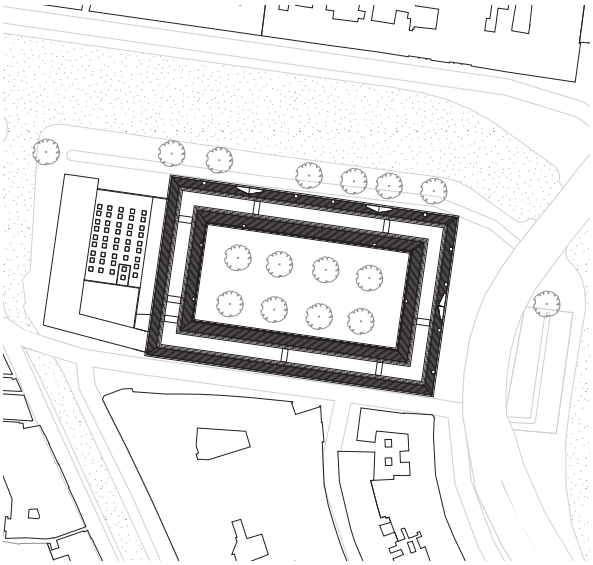
1700 - 1770



1775 - 2021



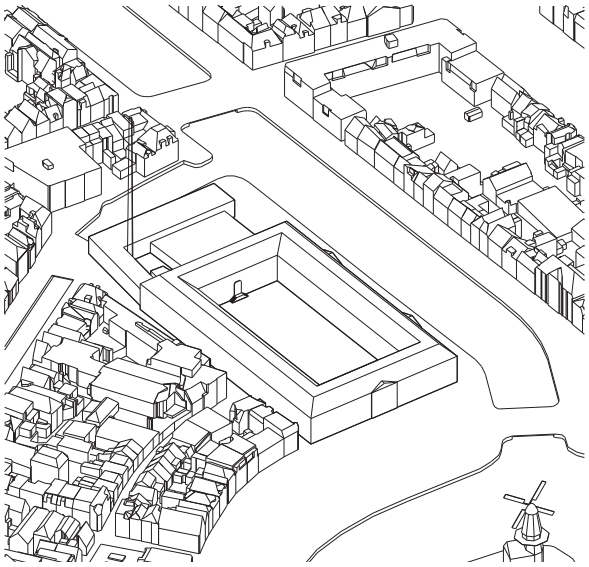
1770 - 1968



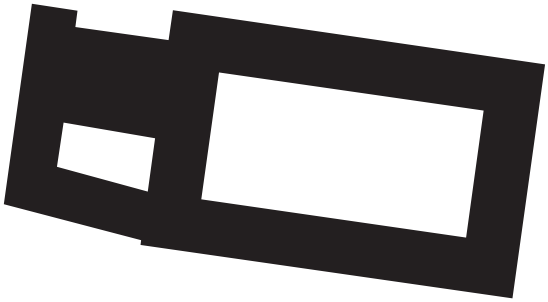
Roofstructure

2.1 Urban block - block information

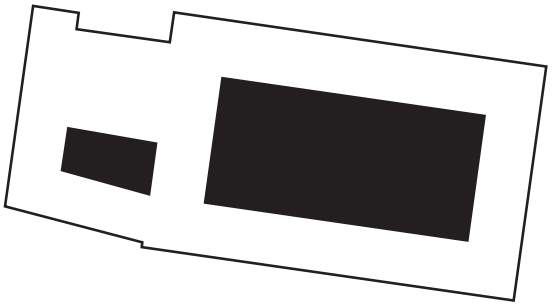
The Koudenhorn police station forms one large element in the urban fabric, contrasting with the grain size of the surrounding inner city building blocks. Surrounded by the four wings of the main building there is a large courtyard. To get a better understanding of the size of the urban block, it can be compared in size to the old market square in the inner city of Delft.



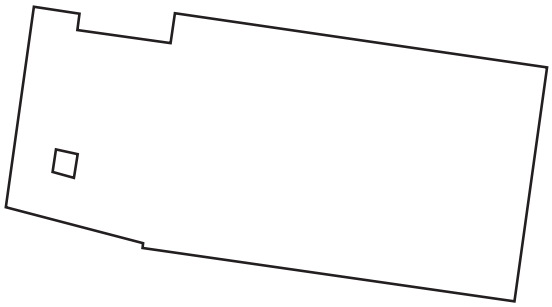
Birds eye view



5451 m² built area



2519 m² empty area

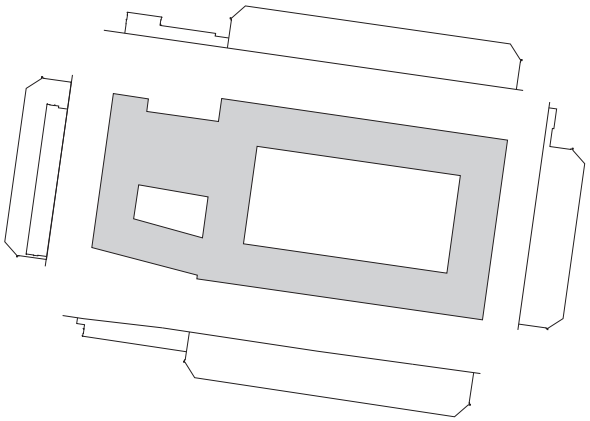


2 parcels

7970 m2 police real estate

2.2 Urban block - streets

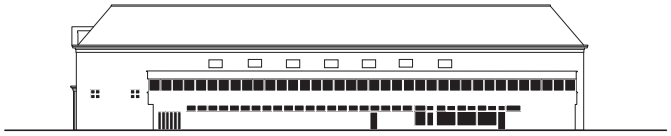
The three monumental entrances on the Nieuwe Gracht and Koudenhorn are distinctives elements in the facade not only due to the ornamentation, but also the difference in windows compared to the other openings of the building. The use of openings in the newer volume is different than the openings in the older part, with two large entrances and horizontal strip of windows on the first floor.



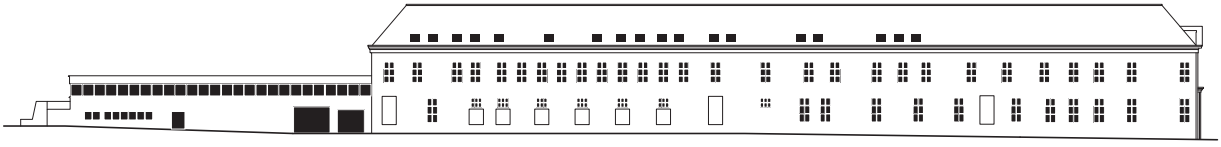
Streetscapes

East facade

North facade



West facade



South facade

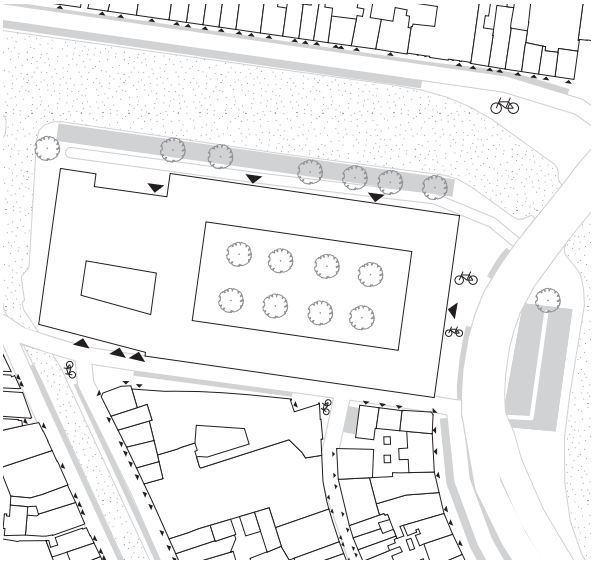
2.2 Urban block - streets

There is a sidewalk in front of the building's main entrance, the Koudenhorn road which is part of one of the main motorized traffic arterties of the city. To the north the plot is defined by the wide canal of the Nieuwe Gracht. The Zakstraat at the southern side of the building is quite narrow in relation to the height of the surrounding buildings.

2.3 Urban block - accessibility

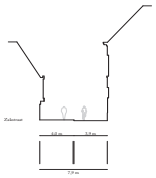
There is a small parking area in front of the building. Only the main entrance is publically accessible, the other entrances are for the police only.

Location of streetsections

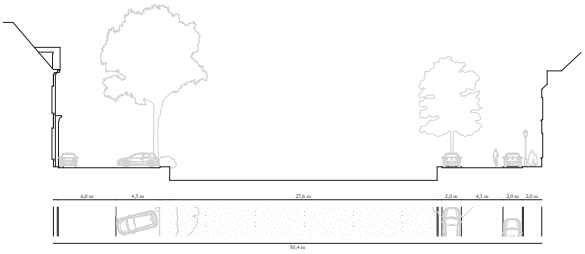


Parking and entrances

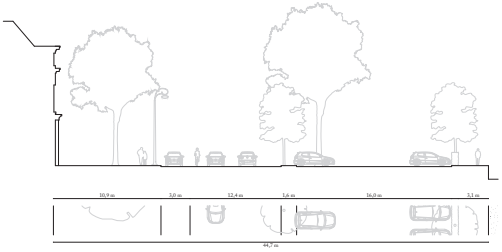
Public (white), semi-public and private (dark grey)



Zakstraat



Nieuwe Gracht



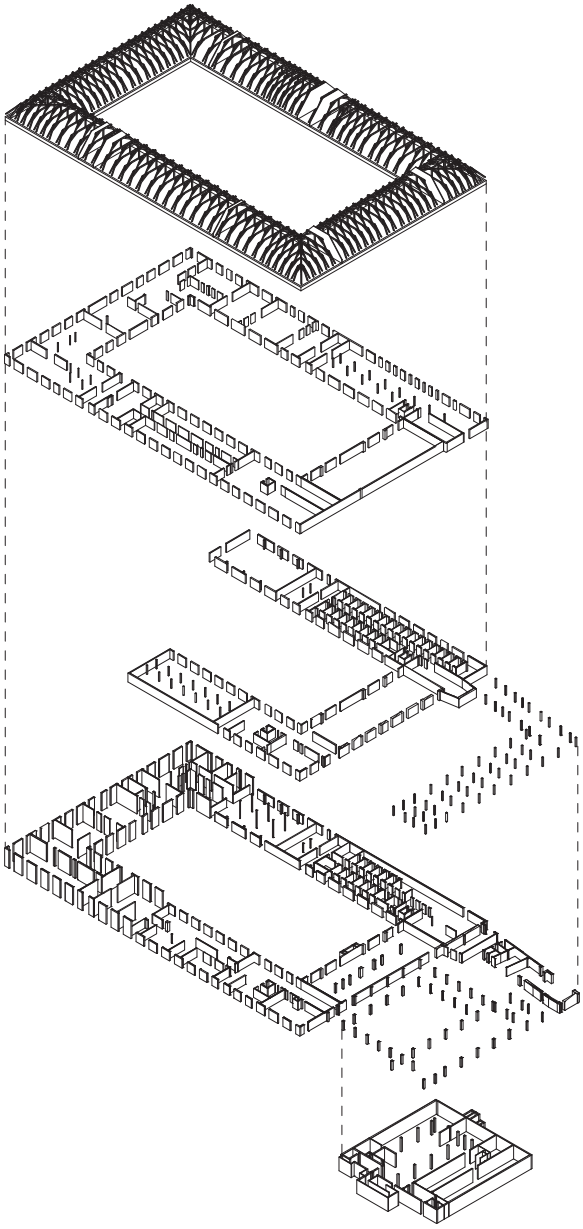
Koudenhorn

3.1 Building object - spatial lay-out

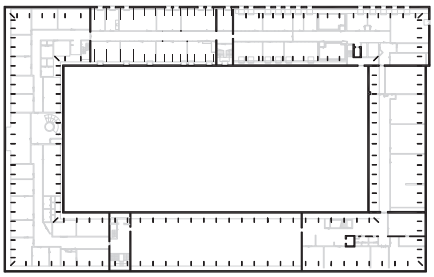
During the renovation in 1971, the internal spatial lay-out of the original Koudenhorn changed drastically. Both building volumes have hallways that connect the different spaces within the building,

3.2 Building object - structure

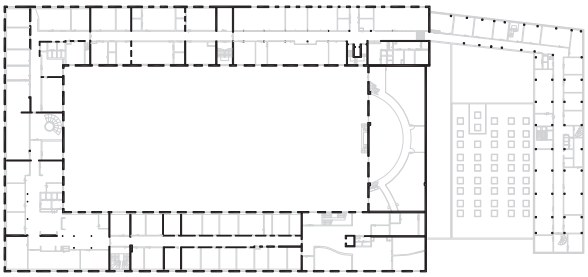
The original building of the Koudenhorn has a structure of masonry walls, whereas the building of the traffic police consists of an open structure with columns.



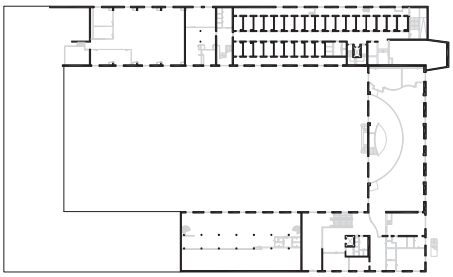
Load bearing structure



Second floor

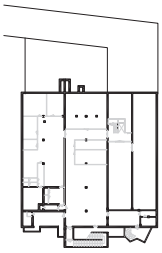


First floor



Enteresol

Ground floor



Basement

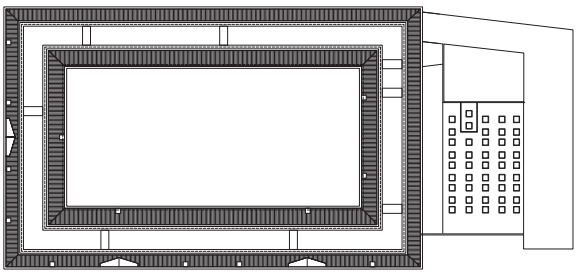
3.3 Building object - Spatial relations

Only the main entrance is publically accessible, the other entrances are for the police only. Both volumes have hallways that connect the different spaces within the building, There are a few cores located throughout the building for vertical circulation.

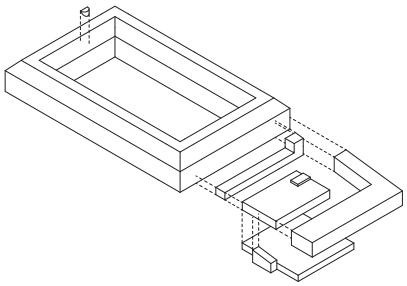
3.4 Building object - sections

In the sections, it becomes clearly visible that there are different storey heights throughout the building. The window openings are placed symmetrical in the facades, but they do not always relate in a logical way to the different floor levels.

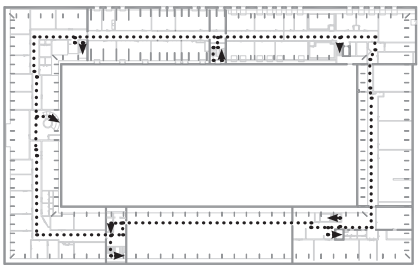
Sections



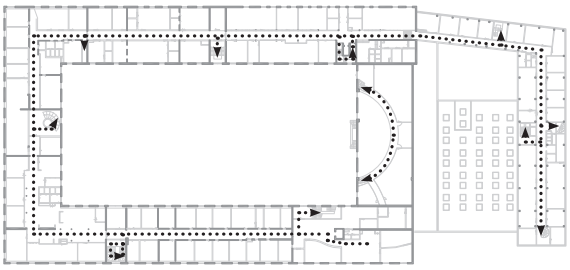
Roofstructure



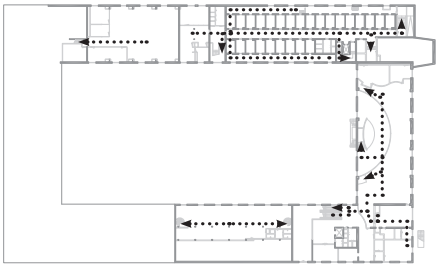
Building volume



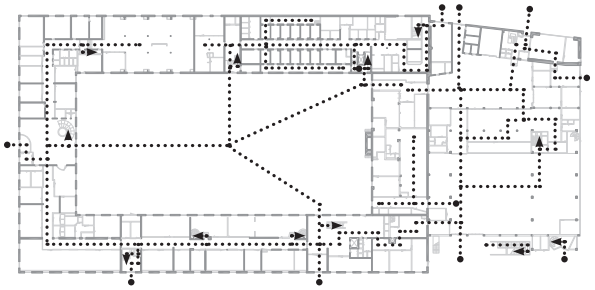
Circulation second floor



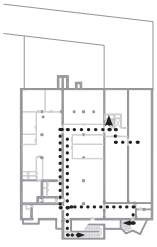
Circulation first floor



Circulation enteresol



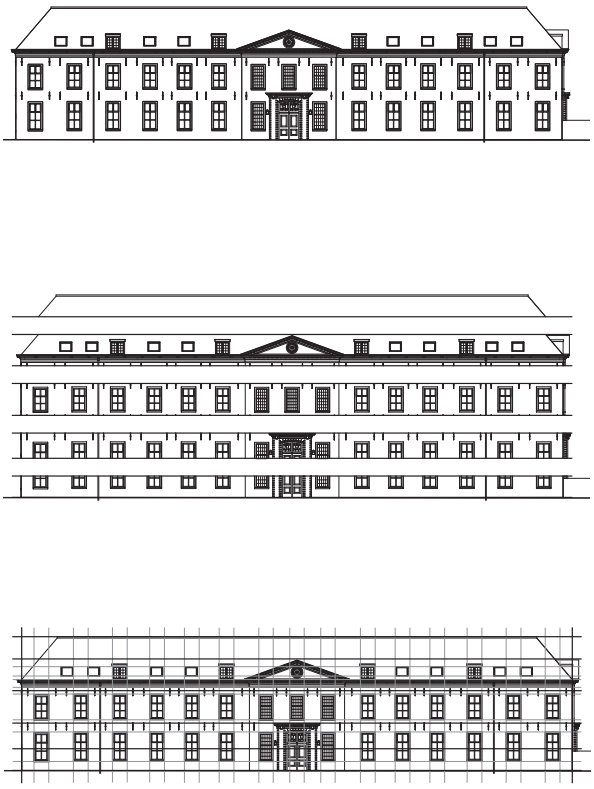
Circulation ground floor



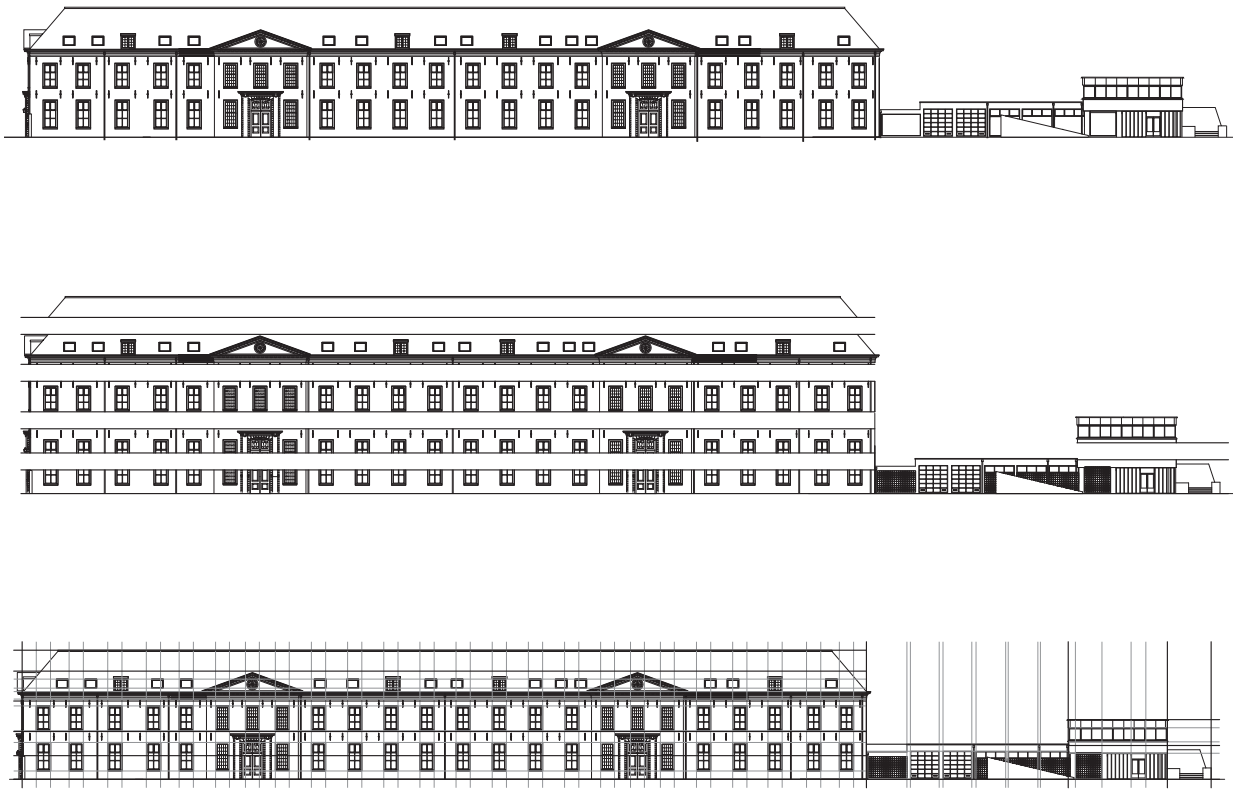
Circulation basement

4.1 Building envelope - configuration

Technically, the police building at the Koudenhorn features 13 different facades. The 5 exterior facades of the whole building, the 4 facades of the courtyard in the Koudenhorn and the 4 facades of the smaller patio within the in 1971 added addition. The original building has a strong identity throughout the whole facade, both on the outside of the building as for the facades in the courtyard. The entrances on the outside are emphasized with more details and a tympanum above the entrance. The addition to the side has a completely different identity because of the rhythm, colours, openings and materials used in the facade. Besides, the old building has a pitched roof on both sides and the new building has a flat roof.



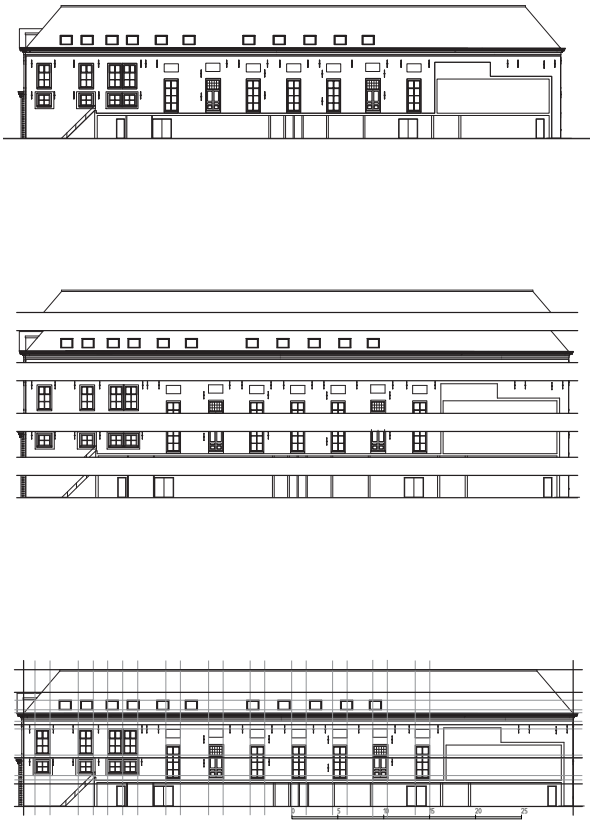
East facade



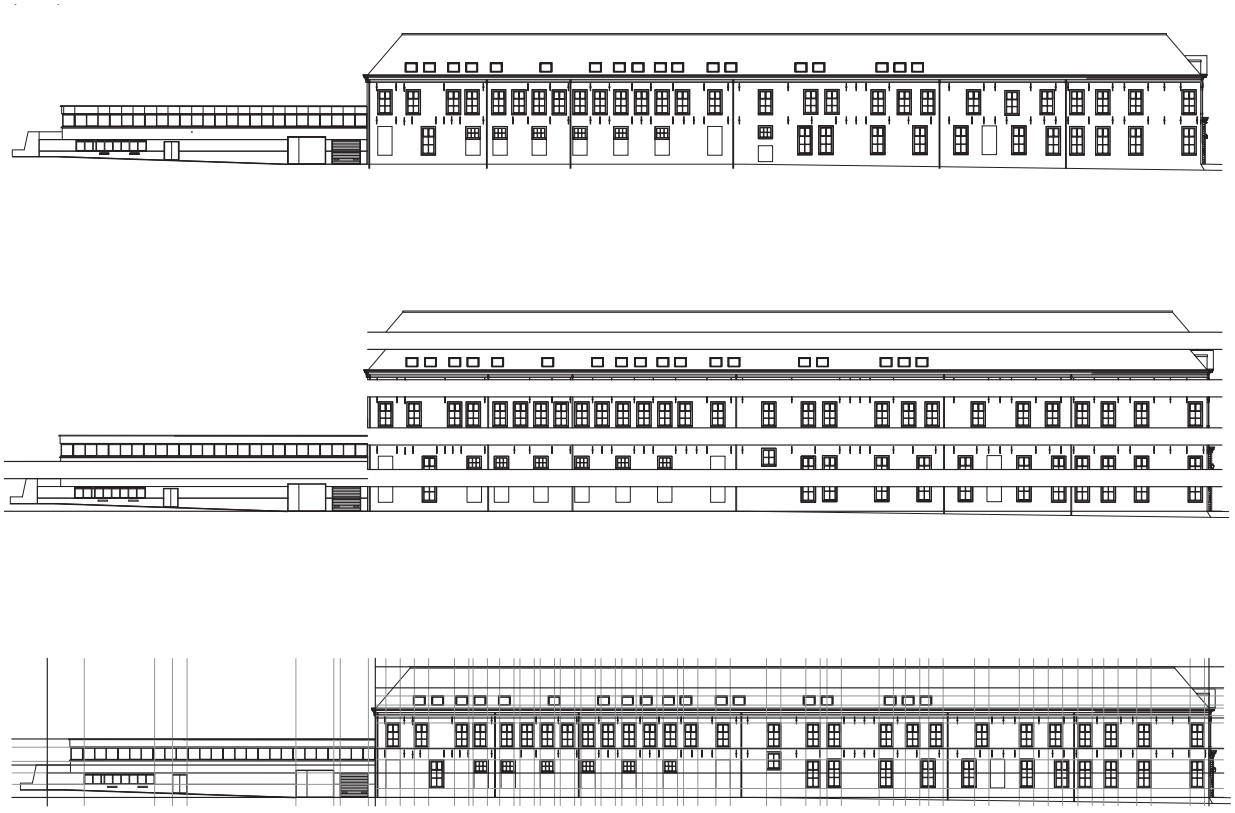
North facade

4.2 Building envelope - composition

The facade of the main building is divided between the breakfronts which empasize the entrances and the parts of the facade in between. The two lines of window frames are vertically and horizontally aligned. On the south facade window openings have been moved and completely or partially closed to facilitate changesin use of the interior. This has lead to several misalignments between the top and bottom windows, upsetting the original composition. The composition of the modern extension is made up by the difference between the openness of the windows of the first floor and the closed ground floor.

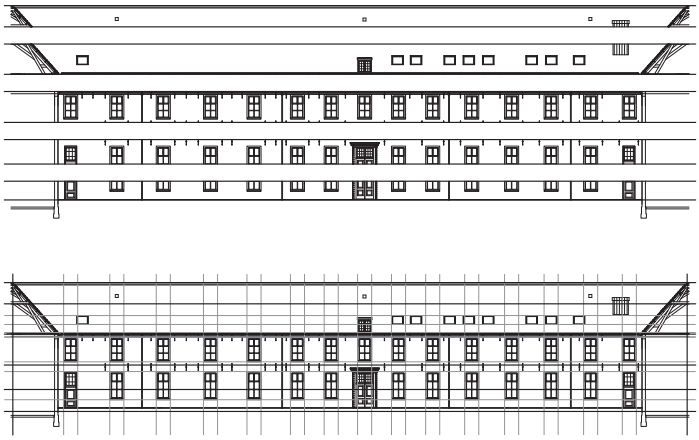


West facade

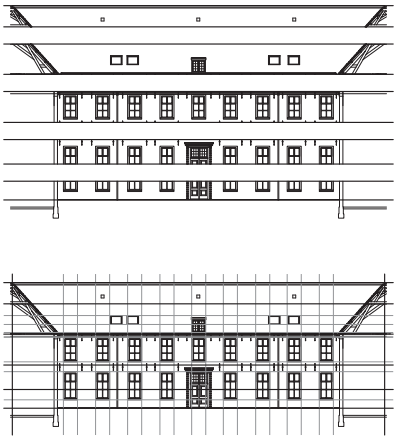


South facade

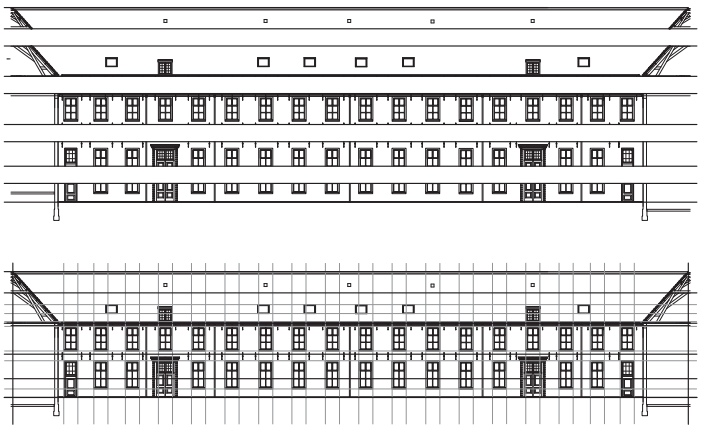
4.2 Building envelope - composition



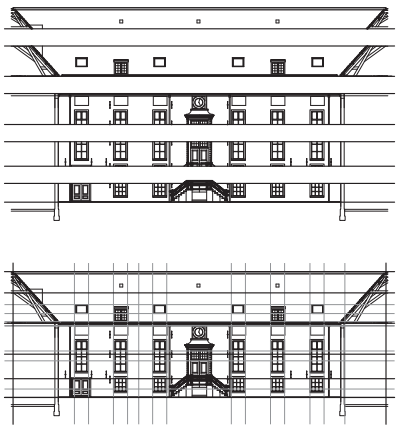
Interior North facade



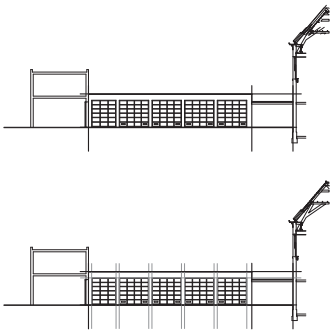
Interior west facade



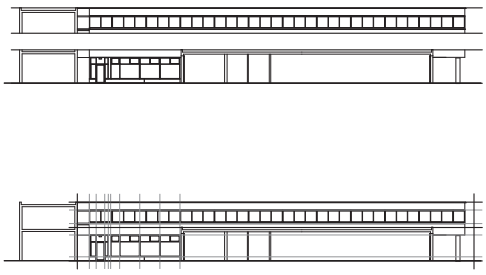
Interior south facade



Interior east facade



Interior south facade

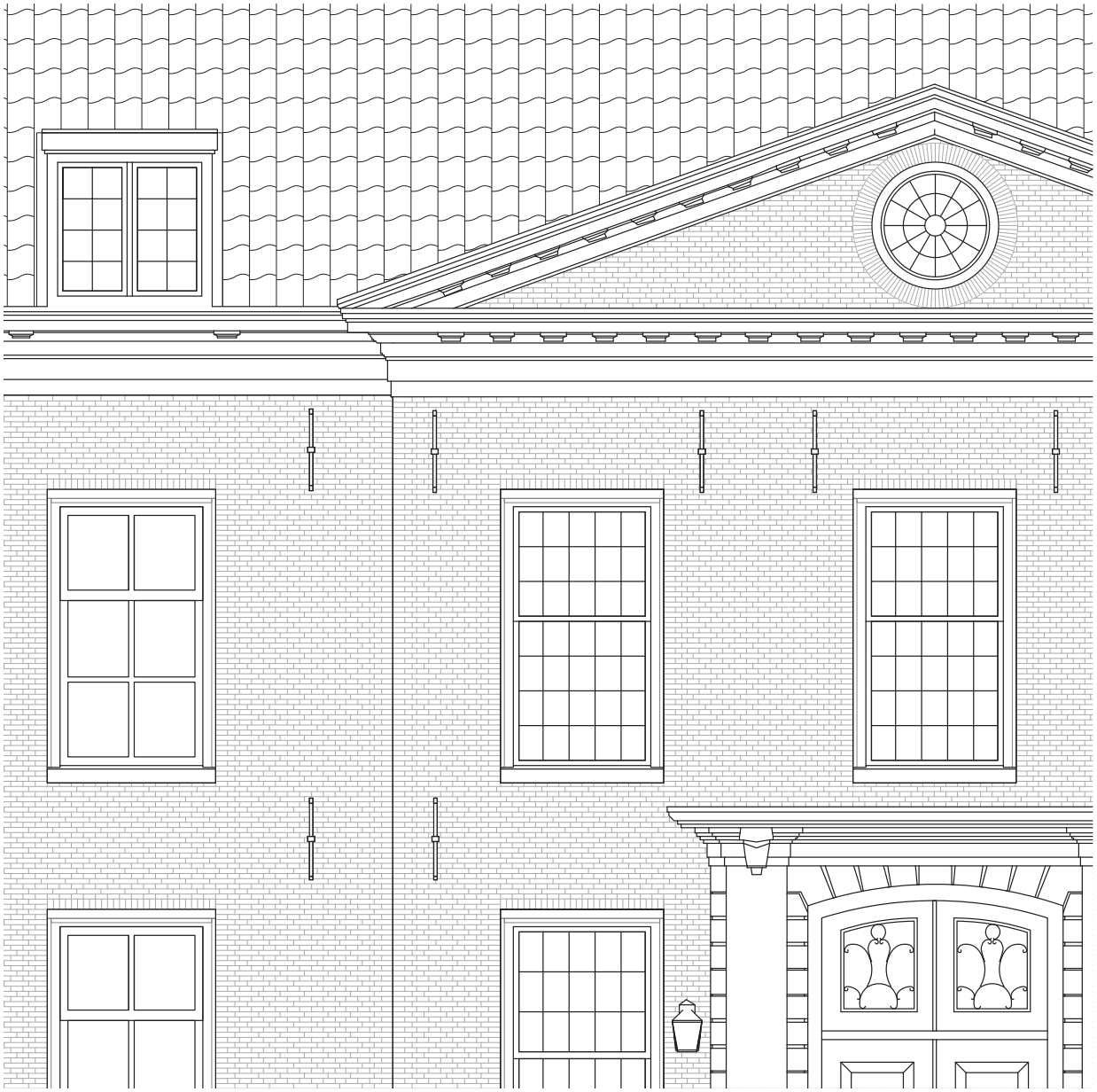


Interior east facade

4.3 Building envelope - materiality

The windows of the breakfronts consist of smaller window panes, making them more pronounced and adding to the ornamental character. The pediments with oculus window draw even more attention to the breakfronts. The semi-columns and cornice around the entrance doors emphasize the entry points to the building. The many-layered eaves form the boundary of the top side of the facade.

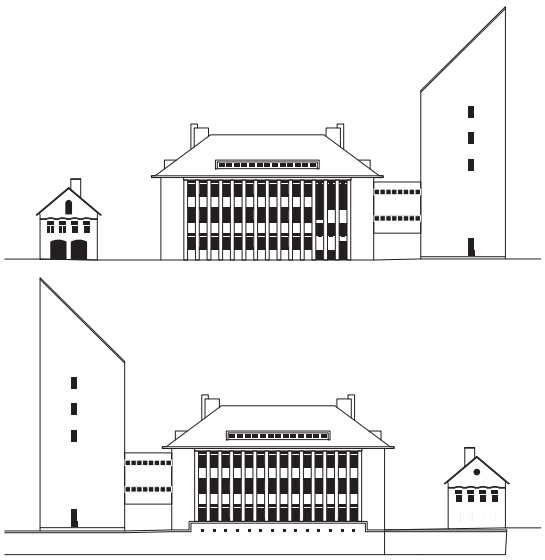
Components



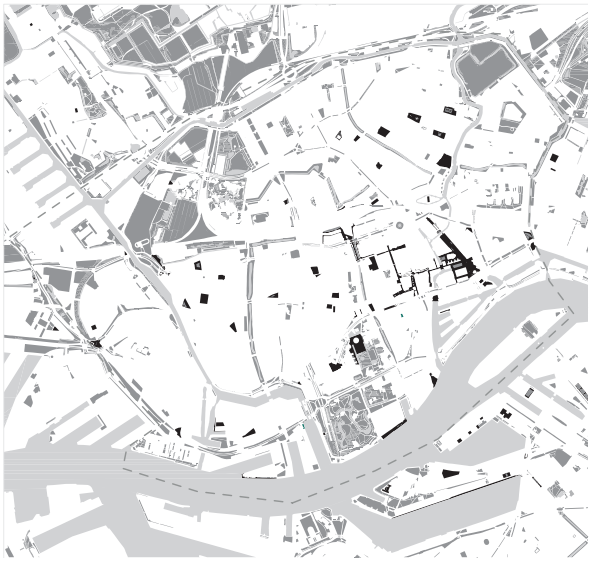
Materiality

1.4.5 ROTTERDAM

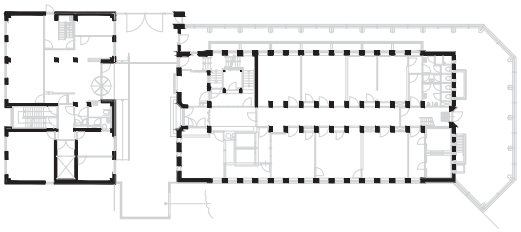
Besides the Koudenhorn police station, our group also researched into the Rotterdam Harbour Police. The same four scales of Inner City, Urban Block, Building Object and Building Envelope are investigated in order to be able to compare these drawings to the other vacant police estates.



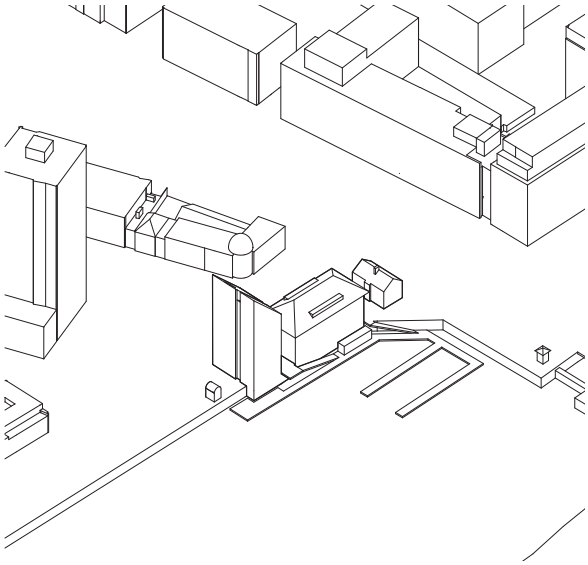
West facade (top) and East facade (bottom)



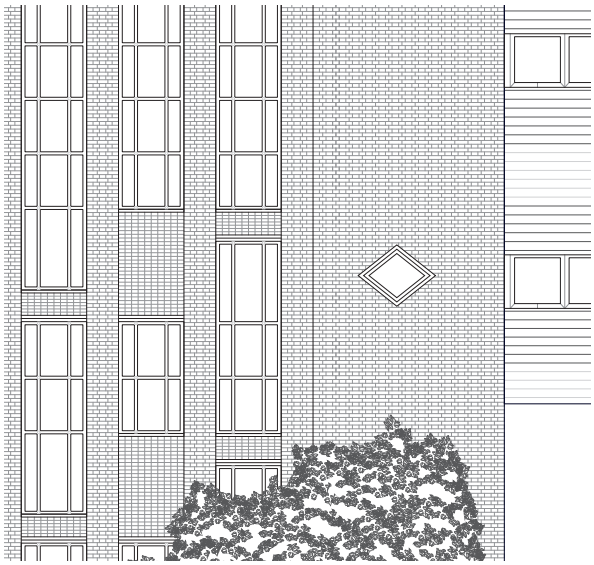
Greenery (grey) and Public squares (black)



Ground floor



Birds eye view



Materiality

RESEARCH PROCESS

1.5 Individual Research

1.5 INDIVIDUAL RESEARCH

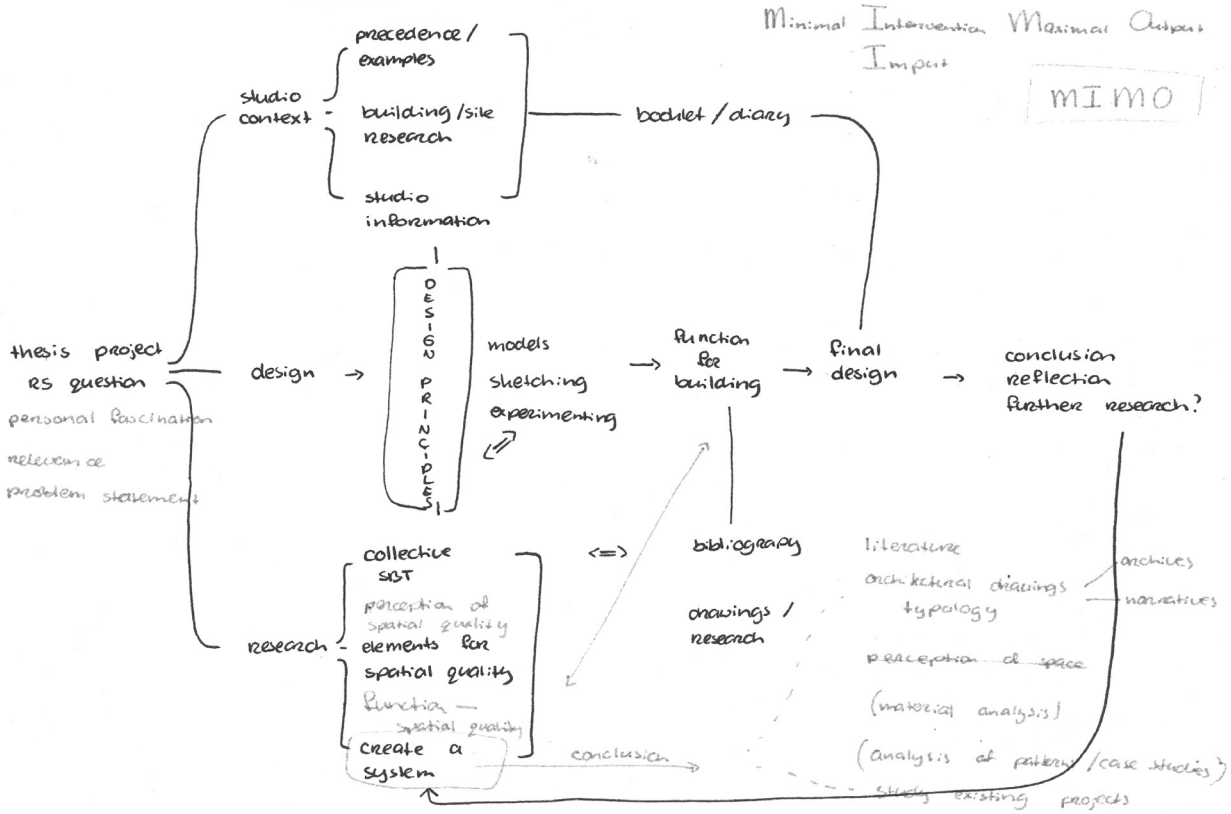
1.5.1 INITIAL THOUGHTS

The motivation to choose Spatial Building Typology as a research direction within the graduation studio (see 1.4.2. Motivation Choice SBT) is similar to the initial thoughts I had for my individual research.

Because of a sustainability point of view, it is important that all vacant heritage will be transformed in the future. It is a really important but also a very complex and difficult challenge to find a suitable design solution for all vacant heritage. When at the same time, I can not help but wonder why is it so complex and difficult? Is it not possible to categorize different buildings and find generic solutions that can be applied to multiple buildings? To create a toolbox of options applicable for that specific typology. A toolbox that can be used to be able to realize minor interventions that result in a maximum impact. Therefore, the next draft questions have been made:

How could the spatial qualities of a building be used for finding a new function for a redesign?

- *Which elements define the spatial qualities of a building?*
- *Which spatial qualities are convectively linked to certain functions and why? Can this be changed?*
- *Could all the spatial qualities of the existing building stay intact, to be able to use as less materials as possible for the intervention?*
- *Could a system for spatial interventions be created to transform all vacant heritage?*



Research diagram; a system for spatial intervention..

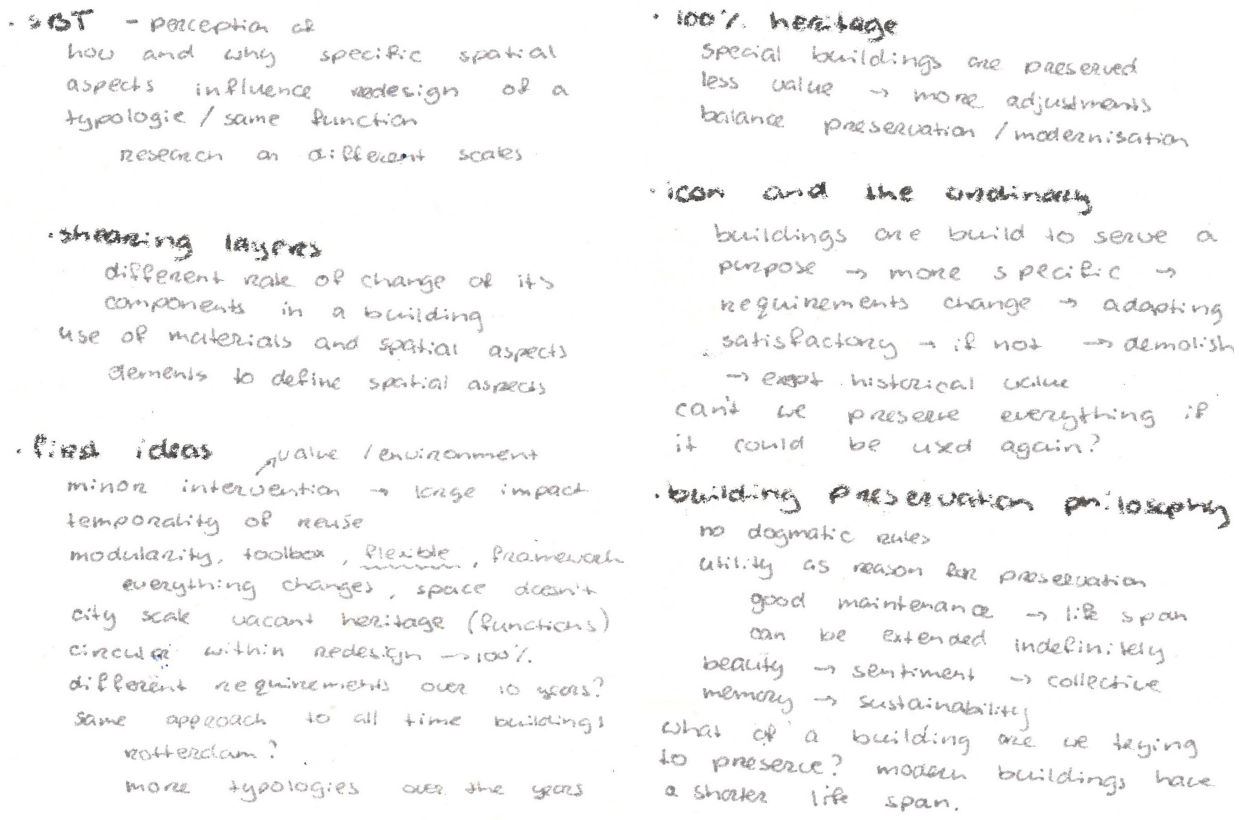
1.5.2 LITERATURE RESEARCH

Researching into the spatial qualities of a building, the use of the building over a certain period of time and finding a suitable function for a certain typology seemed like the perfect combination in order to find a way of considerations to be used when redesigning vacant heritage taking sustainability into account as the main starting point.

Starting with reading into literature like Icon and the Ordinary (Henket, 1998), Shearing Layers (Brand, 1995), 100% heritage for a more sustainable future (Pereira Roders & Pottgiesser, 2020) and Building Preservation Philosophy (Earl, 2003), a better understanding of the research topic was formed. The main interest for this research is creating 100% heritage, where every vacant building deserves a second chance. To be able to get a clear understanding of why not every building deserves a second chance at the moment, literature research into building preservation was done. The preservation of buildings originated from sentimental reasons and after a while also because of mere beauty (Earl, 2003). Nowadays the sustainability reasons are becoming more and more important.

Besides, there is also the challenge of the ever-rising typologies. Because buildings are often built to serve a specific purpose, every building was built with its own requirements (Henket, 1998). With all these typologies it is difficult to find a generic approach for vacant heritage. At the same time Brand (2003) also describes in his shearing layers that the space plan of a building is only to be existed for about 10 years.

Combining this literature research, the interest in the use of space and materials use arose. The use of a building can change over



Literature research.

time, and therefore researching into finding a specific function during redesign might not be the best approach. But focussing on a redesign where minimal intervention is possible, while at the same time having the maximal output possible seemed interesting. Taking the existing spaces as a starting point and using as little material as possible. With this new research direction, the research question changed as well.

How could the spatial qualities of a building be used for finding a new function for a redesign?

changed to:

How could the existing spatial qualities of a building be used in its optimal form to create minimal interventions?

1.5.3 FEEDBACK

After presenting the research question to the group and receiving feedback on the draft version for the research plan, the main point was to narrow it down. To find a specific focus for research and have a clear understanding of what can be achieved within the design.

Besides, the question arose whether the research was not more about the societal aspects. About how we are using our buildings and the way we live instead of the spatial qualities of a building. Maybe it is about taking all the different stakeholders into account and developing design scenarios. To focus on the cultural aspects and redesign society. These aspects could then be related to the spatial aspects to be able to develop a system or generic solution for redesigning vacant heritage. The research question therefore changed.

How could the existing spatial qualities of a building be used in its optimal form to create minimal interventions?

changed to:

How could we use the existing spatial qualities of a building to create a design tool for minimal interventions?

1.5.4 RESEARCH DIRECTION

After reading into different literature and figuring out that the research was indeed more of a societal question the research question changed again.

How could we use the existing spatial qualities of a building to create a design tool for minimal interventions?

changed to:

How could the space plan of a monument like the Koudenhorn be redesigned to accommodate changes in use over time?

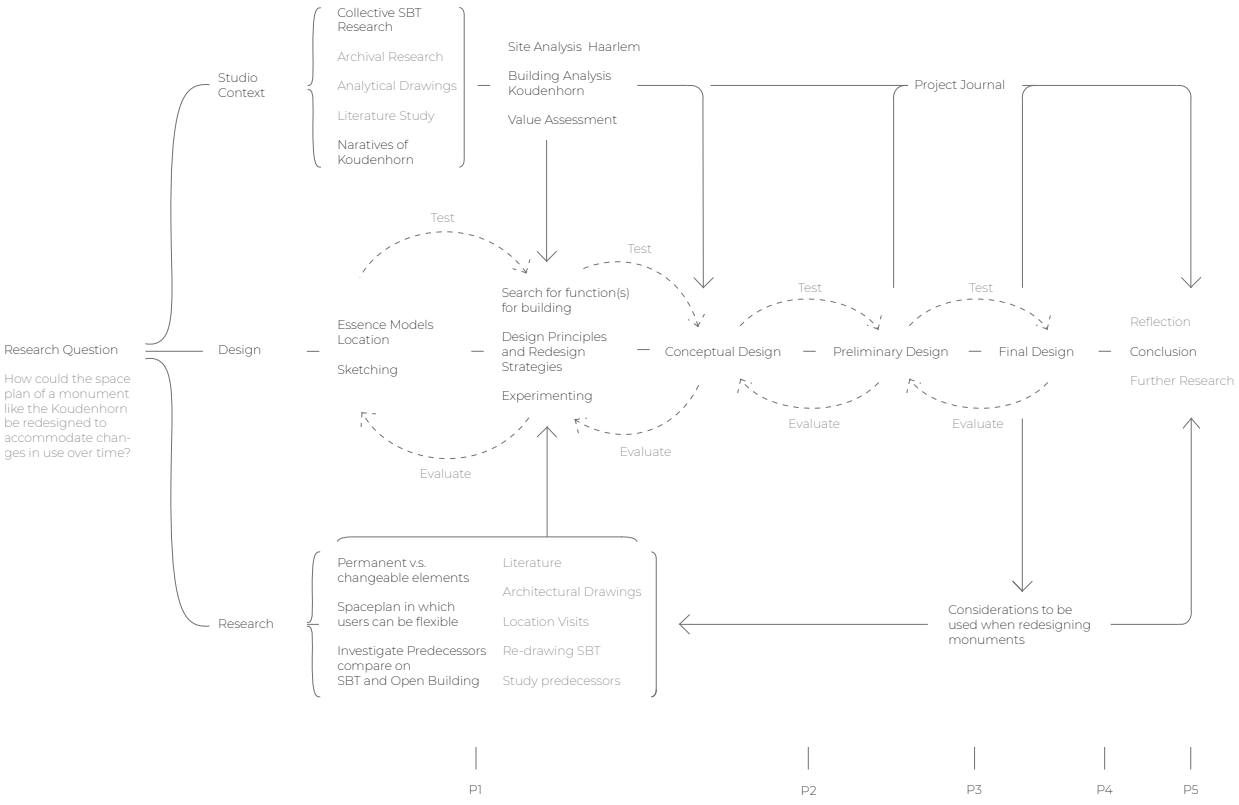
Because the interest is about figuring out a way to design a building capable of accommodating the change. The possibility of changes in use from a permanent structure. A design in which the user is able to adapt over time. In this way, the building can be used differently over time without architectural interventions every time the requirements change. Architects are given the task to give form to a building that is going to be used for years to come, even when the use of a building is dynamic. Yet buildings are often built to serve a specific function, therefore it is interesting to research into the characteristics that contribute to the ability of a building to remain effective over time.

Especially after the lecture on the open building by the studio of Architectural Engineering I was intrigued by the open building strategies to keep buildings alive indefinitely (Asselbergs, 2021). And I questioned whether it is possible to redesign a space plan to accommodate changes in use over time because the open building principles are only used for designing new buildings.

At the same time, this change in research direction reminded me of the lecture by Alexandra den Heijer (2021) about how we as people are using our buildings, and how we should change from designing flexible buildings to using buildings as a user in a flexible way.

1.5.5. METHODOLOGY

To be able to answer the research question, literature research will be done on the permanent elements of a building. The same literature will be utilized to research the basic principles needed in a floor plan for users to be able to be flexible. Besides literature research, case studies will be investigated. In the transformation projects chosen, there was a specific focus on the space plan when redesigning the original building.



Research diagram; permanent space // changeable use.

Het Predikheren by Korteknie Stuhlmacher Architecten (Kramer, 2020).

Tate Modern by *by Herzog & de Meuron* (Godliman, 2013).

Central Library by Zecc Architecten (Hummel, 2020).

Burgerweeshuis by WDJ Architecten (Aldershoff, 2015).

LocHal Library by Braaksma & Roos (Bollaert, 2019).

The Orange Complex by MVRDV (Oberti, 2019).

RESEARCH PROCESS

1.6 Individual Research Plan

1.6 INDIVIDUAL RESEARCH PLAN

1.6.1 PREFACE

Growing up watching the news every day, it soon became clear to me that our generation needs to change the way we live. We live in an environment where it is normality to buy or make something new once it is broken and we forgot how to give a new purpose to things. When at the same time, climate change has become more present every year and we have been using more materials than are available on this planet (Global Footprint Network, 2021). We need to adjust to the time we are living in, and that is why we as architects need to focus on the existing building stock and find a second life for them.

When designing a building, it is the task of the architect to give a definite form to something for an unpredictable amount of time. These buildings are built in an ever-changing society and before we know it, the requirements of a building need to change. Designing in a flexible way is something most architects come up with, but to become more sustainable, we as the users of the building, need to become more flexible.

Of course, this is a very ambitious starting point for a research, and as a result there probably will not be one clear set of dogmatic rules. Nonetheless, that is not the aim of this research, it should rather provide a series of considerations to be used when redesigning vacant heritage.

1.6.2 INTRODUCTION

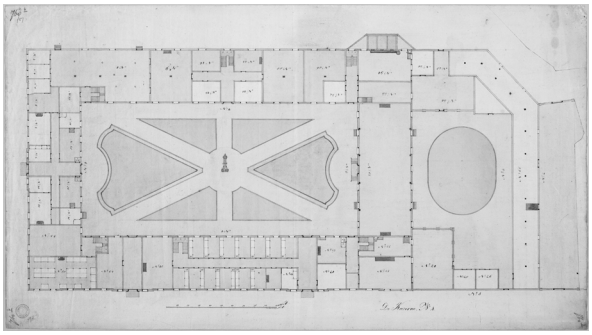
Change. The only constant in our life, the only thing we could be sure of is change. Times are changing, the way we live together changes over time as well as the buildings we live in. All buildings are built to serve a purpose, and if the requirements alter, new typologies emerge (Kuipers & Jonge, 2017). Especially since the beginning of the twentieth century, a lot of the buildings we know today have been built, housing all sorts of new and specific functions. This resulted in an architecture in which the function was defining the form of the building. In comparison to the older typologies like churches, all these new functions have a limited lifespan. These buildings were not built for eternal durability, but for economical and dynamic changes (Henket, 1998). And once buildings become functionally, technically and economically obsolete no one wants to take care of them anymore.

The preservation of heritage is not, as it often looks, a recent phenomenon. From the sixth century onwards, Rome already preserved its own ancient monuments, but the growing popularity of preservation is something from the nineteenth century (Earl, 2003). Originally because of the beauty of a building, mere sentiment or for preserving the collective memory. And even though these motives are still applicable today, sustainability reasons are becoming more and more important.

Only old and valuable buildings are always 'accepted' to be preserved, but since this is often around 1% of the building stock from a country, it only makes sense to start having a look at preserving all vacant heritage (Cultureel Erfgoed, 2021). Especially since 75% of the existing building stock is from the 20th century, so it is crucial to find a solution to be able to preserve all these buildings when it is needed (Henket, 1998). Or as Anne Lacaton and Jean-Philippe Vassal would say "Never demolish, always transform" (2007, p. 22).

Transforming vacant heritage because of a sustainability point of view is precisely the reason why this research here is conducted, as part of the vacant heritage graduation studio. The design challenge of the graduation studio focuses on vacant police estate in the Netherlands. Because of the formation of the National Dutch Police in 2013 and the digitalisation of their work, a lot of the police buildings become obsolete or do not fit within the requirements needed. That is why approximately 700.000 square meters of real estate will be divested (Politie Bouwmeester, 2021). For this research specifically, a redesign proposal for the police office Koudenhorn in Haarlem will be made. The Koudenhorn building, originally designed as a Diaconiehuis, was built in 1771 and changed in function over time. Two centuries later, in 1971 a new volume was added on the side when the whole ensemble was used by the police (Noord Hollands Archief, 2020). To make these two different buildings more sustainable for the future, it would be interesting to design an architecture that is resilient in accommodating change in use over time.

The research itself consists of two parts, the individual research on the topic of redesigning vacant heritage while taking the flexibility of the user in mind as a starting point. The second element of the research is collective research on the Spatial Building Typology of several police estates throughout the Netherlands which will become vacant in the coming years. The combination of this research will provide a framework that will be used and reflected on during the design process.



Ground floor plan Diaconiehuis (Smit, 1768a).

Ground floor plan Koudenhorn police office (Spatial Building Typology collective research, 2021).

1.6.3 PROBLEM STATEMENT

Designing a building for the future means giving definitive form to something for an unpredictable amount of time. Taking this into account, adaptability is one of the keywords coming to mind when facing the unpredictable. Many studies into flexibility focus on the changeable, movable elements and the variations in floorplans. Architecture that takes the changeable as a departure point when designing are for example the Rietveld-Schröderhuis, the Nakagin Capsule Tower and Le Corbusier's five points of architecture. Besides, there is also architecture that proceeds from the permanent space like the examples written down in the book *Frame and generic space* by Leupen (2006), or the open building concept principles developed by John Habraken. Within these designs, the permanent more durable components of the building, like the structure, functions as a frame in which the user can change its infill over time. Designing from the permanent, in which the people that are using the building need to be more flexible instead of designing a flexible building will be the starting point for this research.

The next question will be how this principle could be adapted to the existing building stock since the above-mentioned concepts are only used for designing new buildings. When looking at an existing building, one could always dissect the same layers as described in the concept of shearing layers by Brand (1995). In which the site, structure and skin of a building have a long lifespan, whereas services, space and stuff need to be more adaptable. To me it seems logical that stuff and services often change throughout the years, to be compliant with the global pressure to modernise. But why is the space within a building to exist for only 10 years? Would it not be possible to take the existing space as a starting point when redesigning, to change the way we use the building, that the people using the building need to be more flexible? How much and how often do we want to change a building, if the requirements of users change so fast, that it perhaps cannot be used anymore within a few years? Would it not be better to prevent future architectural interventions, by redesigning an existing building in such a way that it can be variously used and interpreted over time.

Using the permanent as a starting point could create a different approach on redesigning vacant heritage. One could say that the task given to architects is to design buildings that are constantly subject to change. Buildings change over time, their requirements change, the way people use the buildings change. But as Leupen (2006) describes, the changeable could also occur within the permanent. A strict program will eventually lose its relevance over time and therefore is the use of a building never definitive, it will

always be organic and changeable. Thus, the following research question is formulated:

How could the space plan of a monument like the Koudenhorn be redesigned to accommodate changes in use over time?

The outcome will not only be used for the design proposal but it will also be reflected on during the design process. The answers from this research could provide new insights into the principles architects are using when transforming vacant heritage. It should provide a series of considerations to be used when redesigning vacant heritage. However, there should also be room for chance, since the outcome of this research will change as well over time.

The following sub-questions are formulated for this research:

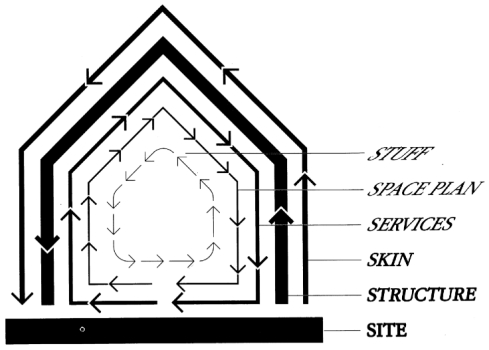
- *Which elements of a building are permanent and which elements offer room for change?*
- *Which basis needs to be provided in a space plan for users to be able to be flexible?*
- *How could the open building principles be used when redesigning vacant heritage?*

1.6.4 THEORETICAL FRAMEWORK

This research will use existing literature as a framework in order to be able to answer the research question. It starts from getting an understanding of the different elements of a building, taking the different layers of Brand into account (1995). As seen in the image, structure, site and skin have a long lifespan and services, space plans and stuff a relatively young lifespan.

These layers are then used in the book *Frame and generic space* by Leupen (2006) to explain which layers are the permanent, more durable components of a building and the layers in which change can take place. He also adds access as a layer, since it influences the way a permanent structure can be used. Leupen describes the frame of the buildings as the permanent components, within which change can take place. The generic space is the frame in which change can occur. The principles written down in this book will be used together with the open building concepts (Habraken, 2003) to get a clear understanding of designing a space plan in which the user can be flexible.

This combination of literature will form the main theoretical framework for this research. The intended outcome is to provide a series of considerations to be used when redesigning the space plan of a monument to be able to accommodate changes in use over time.



Shearing Layers of Brand (1995).

1.6.5 METHODOLOGY

As mentioned before, this research will focus on the permanent elements of a building as a starting point for the redesign. To be able to define which permanent elements define a building and how they could influence the redesign process, literature research into the elements that define the space plan will be done to answer the sub-question: *Which elements of a building are permanent and which elements offer room for change?* For this literature research, the books *How Buildings Learn: What Happens After They're Built* (Brand, 1995), *Frame and generic space* (Leupen, 2006), *Architecture, form, space*

& order (Ching, 1979) and *Designing from Heritage: Strategies for Conservation and Conversion* (Kuipers & Jonge, 2017) will be used.

The same literature will be utilized to formulate an answer to the sub-question: *Which basis needs to be provided in a space plan for users to be able to be flexible?* For this question, it is also interesting and relevant to research into the open building concept principles developed by John Habraken (2003), a way of designing buildings in which architectural interventions are not needed when a new use is required.

Besides literature research, case studies will be investigated to be able to answer the sub-question: *How could the open building principles be used when redesigning vacant heritage?* We often learn best from our predecessors, within redesigned heritage those buildings show that it is possible to keep vacant heritage 'alive'. To create a frame of reference, research into transformation projects will be done, in which there was a specific focus on the space plan when redesigning the original building.

The case studies selected for this part of the research do all have a monumental status like the Koudenhorn, are mainly transformed within the permanent components of a building like the shell and structure and do have characteristics that resemble open building principles.

The case studies differ in their way of redesigning the space plan, something that is interesting to compare for this research.

The formal monastery was built starting in 1650, it changed in function in the 19th and 20th century for military purposes and since the transformation in 2019 by Korteknie Stuhlmacher Architecten it is used as a library (ArchDaily, 2020b).

Het Predikheren by Korteknie Stuhlmacher Architecten (Kramer, 2020).

Built in 1932, the building was made for maintenance and repair of railway locomotives. The transformation by CIVIC Architects and Braaksma & Roos Architecten in 2019 houses new functions like a library, co-working spaces and room for public events (ArchDaily, 2019).

LocHal Library by Braaksma & Roos (Bollaert, 2019).

Originally built in 1919, the building served its purpose as a post office until 2011. Transformed by Rijnboutt Architecten it currently houses a library, restaurant and a few stores (ArchDaily, 2020a).

Central Library by Zecc Architecten (Hummel, 2020).

Each of the case studies will be researched based on a site visit and an analysis will be done focusing on the change in space plan during the redesign process. The drawing method of Hausmann (Jalon & Napolitano, 2017) introduced by the collective Spatial Building Typology research will be used to map the important features on the scale of the buildings themselves, to be able to compare the case studies with the Koudenhorn in Haarlem.

The outcome of this research will feed into the design process, and the findings within the design process will be reflected on and implemented in the research. The focus within the design process will be mostly on the scales of the building and its context, to figure out its spatial configuration and the permanent frame in which change in use can take place. During the design process, additional information will be gathered about the Koudenhorn building and a value assessment will be made. Floorplans, sections and interior impressions will be used to share the design visions throughout the project.

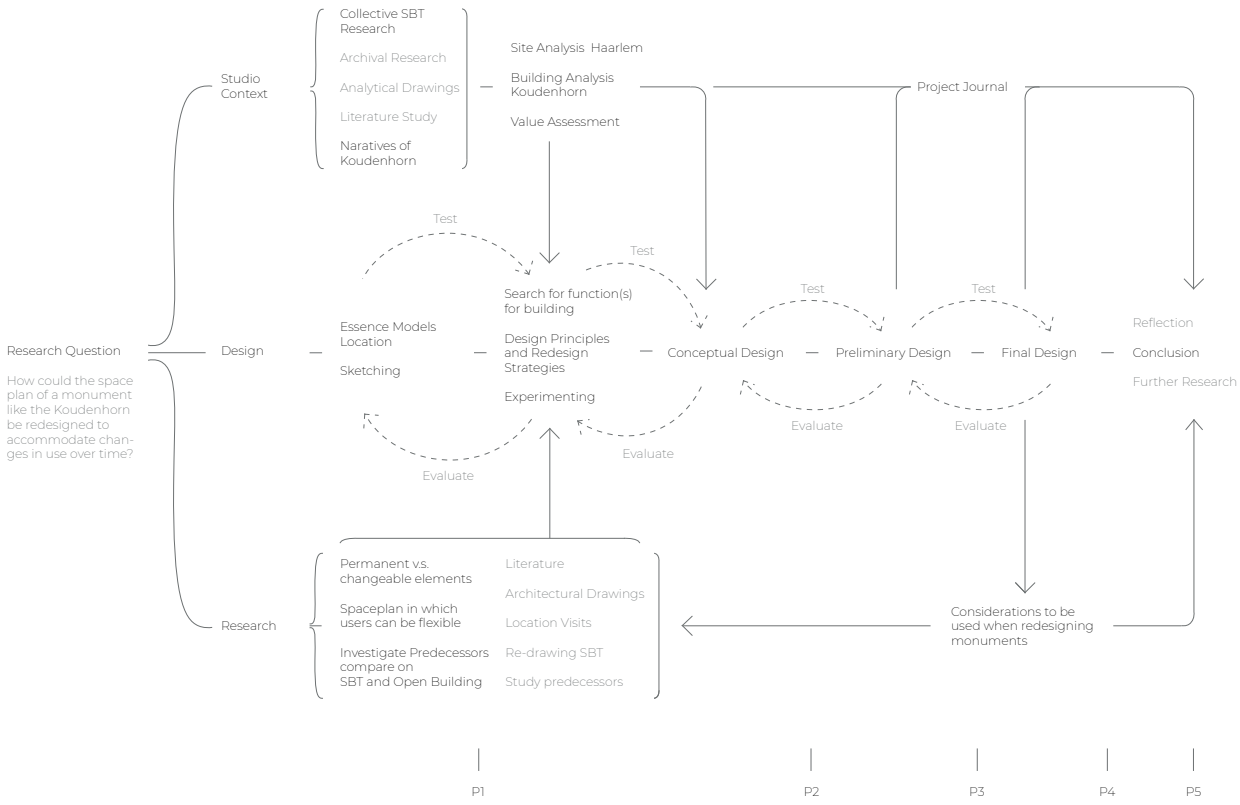
It is not sure that the methodologies used will provide a clear answer to the research question. However, the research conducted here should provide new insights and a series of considerations to be used when redesigning the Koudenhorn in Haarlem. Besides, there should also be room for chance, since the outcome of this research will change as well over time.

1.6.6 RELEVANCE

We live in an environment where it has become a normality once buildings become functionally, technically and economically obsolete that no one wants to take care of them anymore. Only old and valuable buildings are always ‘accepted’ to be preserved, but since this is often around 1% of the building stock from a country, it only makes sense to start having a look at preserving all vacant heritage, especially since 75% of the existing building stock is from the 20th century.

Transforming vacant heritage because of a sustainability point of view is precisely the reason why this research here is conducted. Specifically focussing on designing an architecture that is resilient in accommodating change in use over time, redesigning a building in which the user needs to become more flexible. On the scale of the vacant heritage graduation studio, the Koudenhorn in Haarlem, which consists of two buildings from different eras, will be redesigned with the principles from the outcome of this design. On a larger scale, a series of considerations could be provided to be used when redesigning vacant heritage.

A way of designing buildings in which architectural interventions are not needed when a new use is required, is not a new concept. Research and designs have been made in this field, however it has never intentionally be used when redesigning vacant heritage, therefore researching into these principles and figuring out how they can be used when redesigning space plan is relevant.



Research Diagram for the vacant heritage graduation studio.

RESEARCH PROCESS

1.7 P1 Presentation and Reflection

1.7 P1 PRESENTATION AND REFLECTION

1.7.1 PRESENTATION

We live in an environment where it is normality to buy or make something new once it is broken and we forgot how to give a new purpose to things. While at the same time, climate change has become more present every year and we
have been using more materials than are available on this planet (Global Footprint Network, 2021).

Taking the sustainability challenges of today into account, focussing on designing an architecture that is resilient in accomodating change in use over time is an interesting starting point for research. Redesigning a building in which the user needs to become more adaptable instead of designing flexible buildings.

For this graduation studio specifically, the focus will be on the redesign of the space plan of the Koudenhorn in Haarlem. This building is chosen because of its appearance, history, the way it is maintained over time and its scale towards the city. At the same time, it is also a challenge to conduct this research on the Koudenhorn building, since the interior spatial layout has been completely redesigned during the renovation in 1770 - 1775.

1.7.2 FEEDBACK

It is important to look critically at the current literature and frameworks used. Shearing Layers from Brand (1995) is already quite old and outdated, therefore it can be relevant to *rebrand* the layers of Brand. At the same time, the interpretation from the open building principles on these layers can be relevant to use for the research.

At the same time, it is also good to think about whether this is spatial research and not social research. If the user should be more adaptable to a building, is it not relevant to look for social literature. Research on how spaces are used, what is the user and use of a building.

Besides, this research of adapting the user and not the subject is quite challenging for the Koudenhorn in Haarlem since the building already has been changed many times over the years. Why is this redesign proposal better, how does open building add to this design and how does it work in the transformation process.

1.7.3 REFLECTION

Starting on these topics in the first weeks of the graduation studio, the main challenge was to scale the research direction down. Starting with finding a generic solution for all vacant heritage was a very ambitious goal. When at the same time the values of every building differ and each building needs to have another approach during redesigning. Therefore it was important to figure out the main interest in redesigning vacant heritage and how the research question could be changed to achievable and realistic research that could be implemented in the design.

Also for finding an answer to the research question, it is important to come up with a good methodology. Research into the chosen case studies might not be the most effective way to answer the questions. Therefore the methodology needs to be changed. At the same time, research by design might be an interesting methodology.

CHAPTER 2
PROVISIONAL RESEARCH AND CONCEPTUAL DESIGN

PROVISIONAL RESEARCH AND CONCEPTUAL DESIGN

2.1 Building Analysis

2.1 BUILDING ANALYSIS

2.1.1 COLLECTIVE RESEARCH

Besides the collective Spatial Building Typology research that was conducted in the first quarter of the graduation studio, a new focus was put on the building analysis of the Koudenhorn in the second quarter. To be able to get a better understanding of the context and urban development of the Koudenhorn as well as the building object itself, the architecture and the building typology, specific research into the building was done together with everyone else that is working on a redesign proposal for the Koudenhorn building in Haarlem.

2.1.2 RESULTS BUILDING ANALYSIS

The results of the collective building analysis are combined in the booklet Building Analysis Koudenhorn Haarlem. However, the most important outcomes that relate to this graduation project are explained below.

2.1.3 CONTEXT AND DEVELOPMENT

Demography

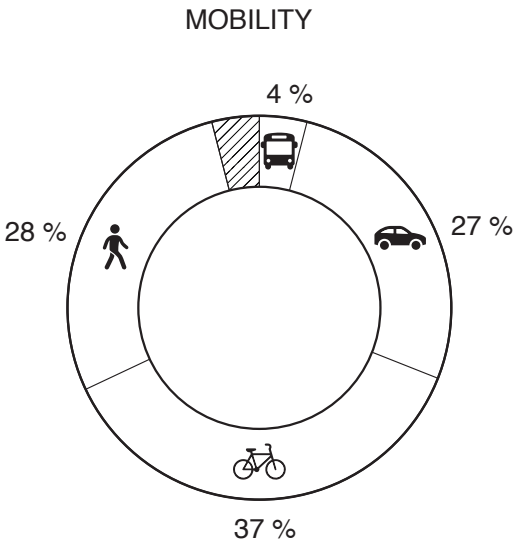
Because houses in Amsterdam are scarce and expensive, more and more former Amsterdammers chose Haarlem. House prices in Haarlem have therefore risen. This also explains why Haarlem has such a large group of inhabitants between the age group of 25 and 65. Haarlem is also one of the cities in the Netherlands with the highest percentage of journeys done on foot (CBS OV, 2014).

Public Transport

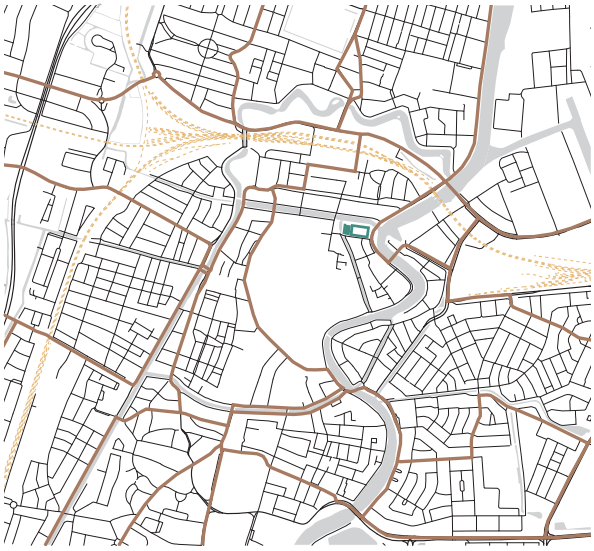
While the city center of Haarlen is car-free, the busstops are located along the edges of the city center (marked green in the drawing). A larger busstation is located on the square in front of the train station (marked yellow in the drawing). This busstation is within 10 minutes walking distance from the Koudenhorn, so even without any busstops closeby, the building is still good accessible.

Hofjes in Haarlem

Haarlem is known for its many courtyards dotted throughout the centre, although many of these courtyards are hidden away inside urban blocks. The police station at Koudenhorn houses a courtyard, but in this case it is completely closed off from the public.



Demography of Haarlem (AlleCijfers, 2021).



Public Transport in Haarlem (QGIS, z.d.).

The hofjes of Haarlem and their building age (TU Delft, z.d.).

0 100M

The care of the poor and the deprived in Haarlem dates back to the end of the 14th century. Haarlem was then already a trading center and in this small society poverty arose. The care expressed itself mainly in a private sense, but the city of Haarlem itself also contributed. In the early years (1431-1593), mainly many hospices and hofjes were founded, to which a few old men's homes were added later. Around 1600 even more hofjes arose, mainly because every church created their own hofjes back then (Kurt, z.d.).

The Koudenhorn was built in 1768-1770 on the site of several houses that were demolished. In 1786 the poor of the almshouse, the poor of the almshouse and the workhouse were moved here as well.

Legenda

- 14th Century or earlier
- 15th Century
- 17th Century
- 18th Century
- 19th Century
- 21st Century

City skyline

Looking west from the Spaarne out over the city skyline, it becomes clear that the city centre consists mainly of lowrise buildings, with a few exceptions. This is because the inner city of Haarlem is a protected cityscape; an area in a town or village with a special cultural-historical character. The protection is intended to preserve the cultural-historical identity of an area and to use it in developments.

Municipal Documents

The vision of the municipality of Haarlem for 2045 elaborates on six main topics; a climate proof city, energy transition, strengthening of the social tissue, improving the attractiveness as living and working city, Haarlem as a healthy city for humans and animals and the Haarlem as sustainable and accessible city (Gemeente Haarlem, 2021).

In the document Stationsgebied Haarlem 2040 is written down (Urahn I stedenbouw & strategie, Goudappel Coffeng, & APPM Management consultants, 2021) that the area surrounding the station will connect the greenery and parks of the former defence line with the historic inner city. Which results in a second important road towards the city center. This street, the Jansstraat, is located next to the Koudenhorn building.

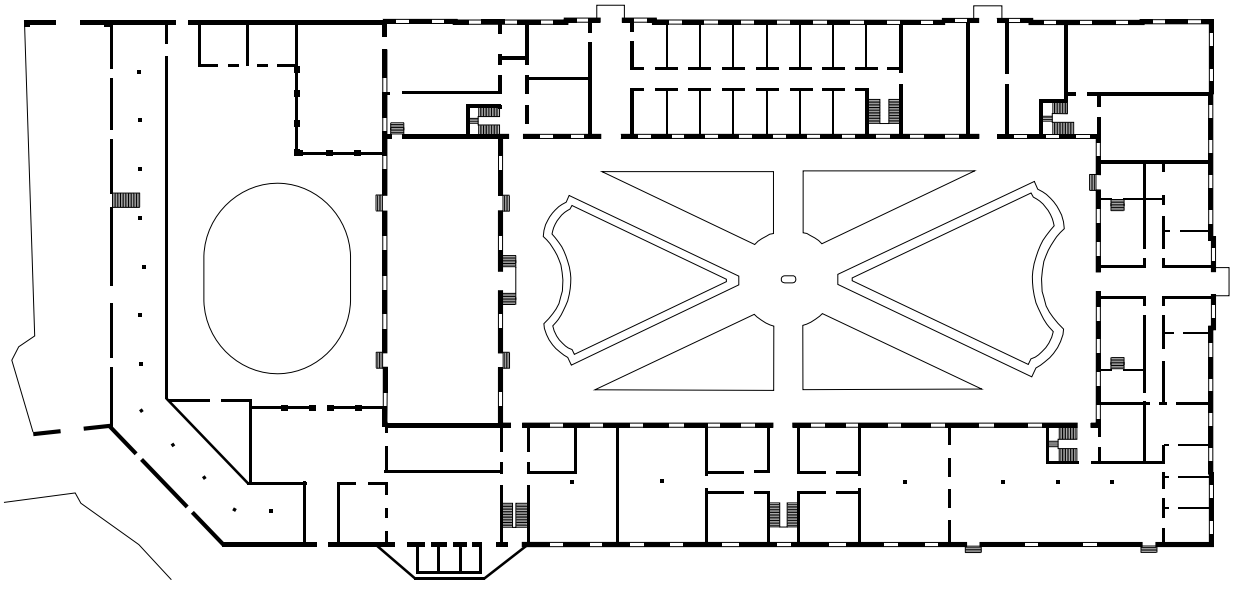
2.1.4 BUILDING OBJECT

Old Floorplans

The main entrance to the building was located in the east facade. On either side of the main entrance one could find the regents' quarters. The dining hall was found on the other short wing, which one could only reach through the entrance on the square. The long wings contained the sleeping quarters and workrooms. The entrances on the side of the New Canal were for staff, residents, and dependents (Medema, 2014). On the side of the Bakenessergracht, separated from the main building, was a utilitarian building for the storage of peat and grain.

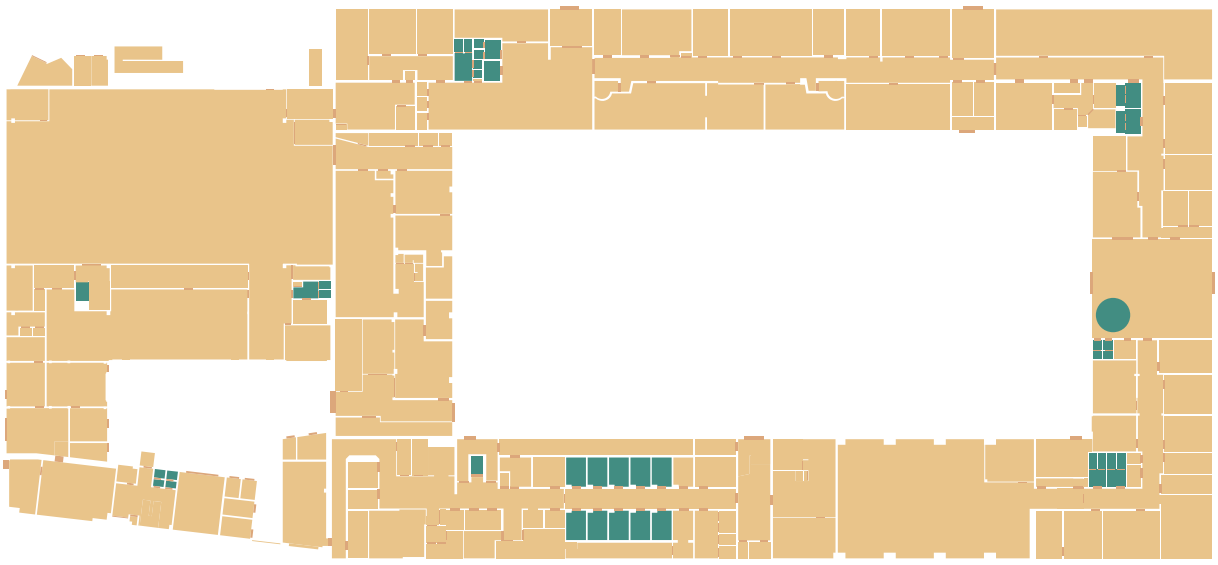
Fixed and free spaces

The floorplans indicate the fixed (blue) and free spaces (red) in the floorplan of the Koudenhorn building. In these drawings, the fixed spaces are the wet spaces, such as toilets and vertical cores for the elevators. In the older volume, those fixed spaces are

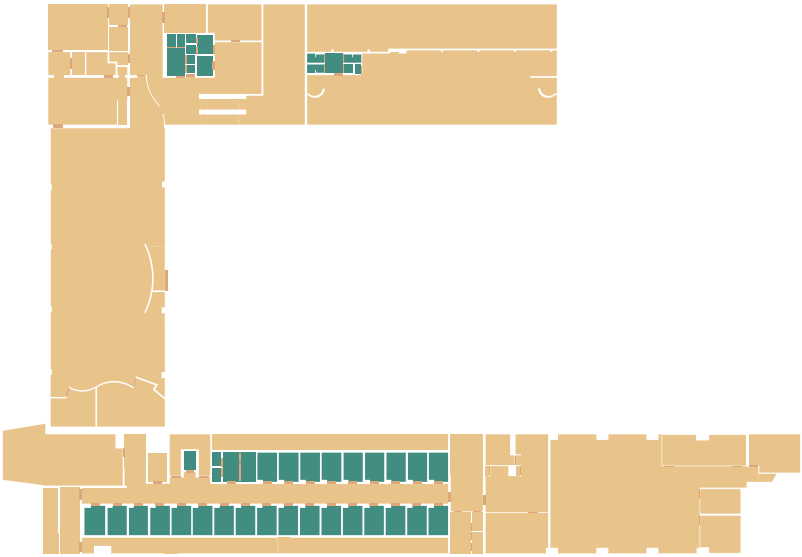


Ground Floorplan based on Municipal drawings out of 1768.

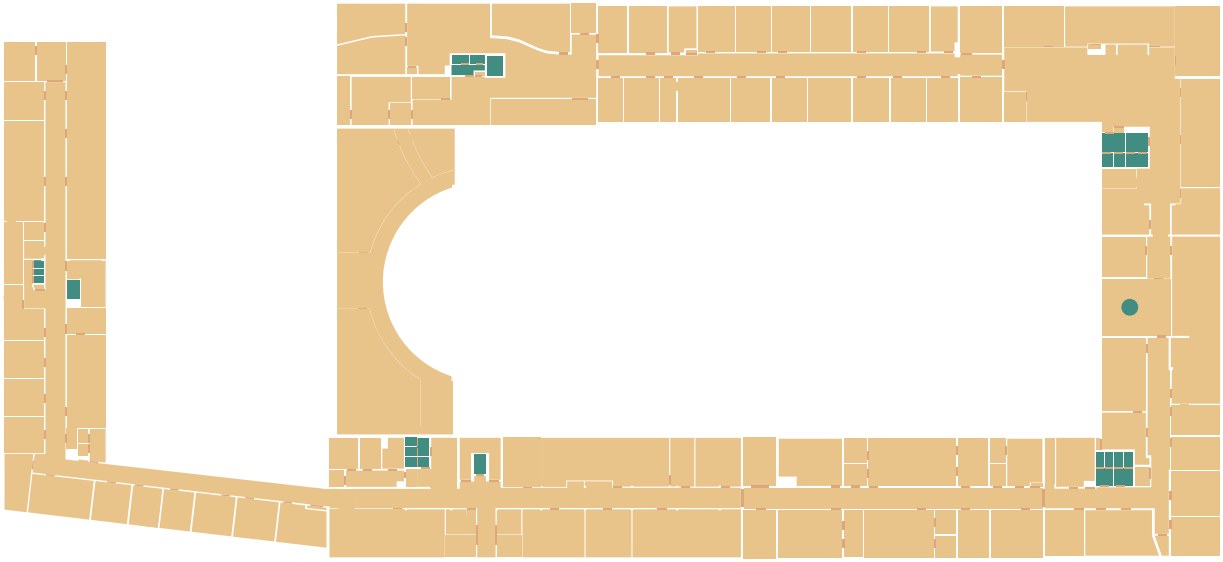
0 20M



Ground Floor



Entresol



Second Floor

0 15M

mostly located close to the corners of the building were the multiple wings meet. Next to the wet spaces and elevator cores, the cells are also included in the fixed spaces. Not only due to the pipes and ducts for these spaces, but also due to amounth of concrete used for these spaces.

2.1.5 BUILDING TECHNOLOGY

Loadbearing structure

The structural floorplans on the following page are showing the structural elements on the related level and the floor system of the level above.

In the old building the original exterior and interior masonry walls are still used in the new structural system that is added in the 70s. These walls are coloured in dark red in the floorplan. In addition, concrete columns and beams are added to carry the load of the new concrete floors. At some places steel columns are used to create large open spaces. For example on the top-left of the building, where six HE500M steel columns are placed to create the sports hall. Another exemption can be found on the right side of the building, where the dining hall is located. Here original wooden beams are carrying the wooden floor. It is unlikely that the wooden beams are spanning approximately 13 meters, but the available drawings were not showing a clear system of columns underneath it. During an upcoming site visit this could be clarified.

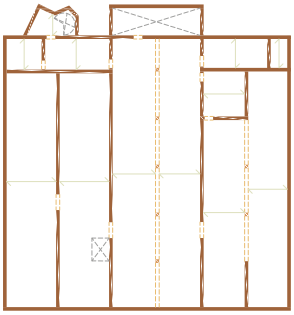
On some of the building an extra floor (entresol) is added as shown in the top drawing on this page. Here the same system of concrete columns and beams as on the previous floor is continued. In the dining hall a new floor is added with the use of a steel frame of columns and beams. Part of the structure is resting on the exterior masonry walls. In this hall the original wooden portal frames are also visible and in the drawing coloured in dark yellow.

In the roofstructure, wooden portals are spanning the full width of the building and are placed on the exterior masonry walls. The portals are meeting each other and the corners, where a double wide portal is bringing the load to the structural walls. At some places the masonry walls are reaching to the top and providing extra stability to the roof.

2.1.6 CONCLUSIONS BUILDING ANALYSIS

Out of the building analysis, some results are important for choosing a new program for the building, whereas other results are more important for my individual research.

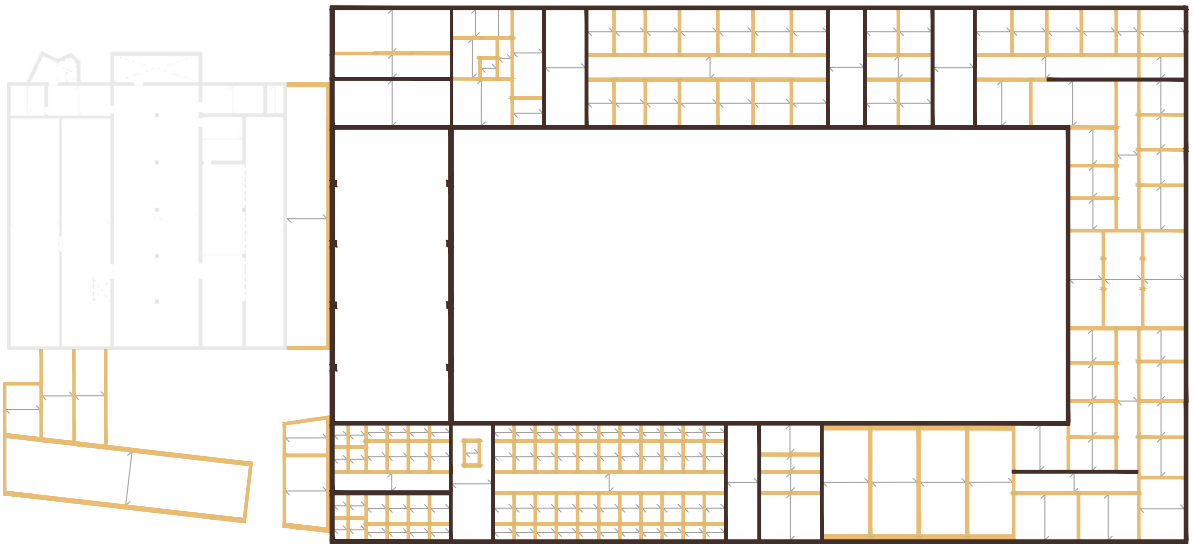
Regarding the individual research, an understanding of the loadbearing structure of the original building is really important. However, it was hard to figure out how the loadbearing structure of the whole building worked. During the interior renovation of the Koudenhorn in 1770-1775, almost all interior walls and structural elements were demolished and a new structure was added according to the new spaces needed in the building. Because this was poorly documented, the structural drawings are based on quite some assumptions.



Basement

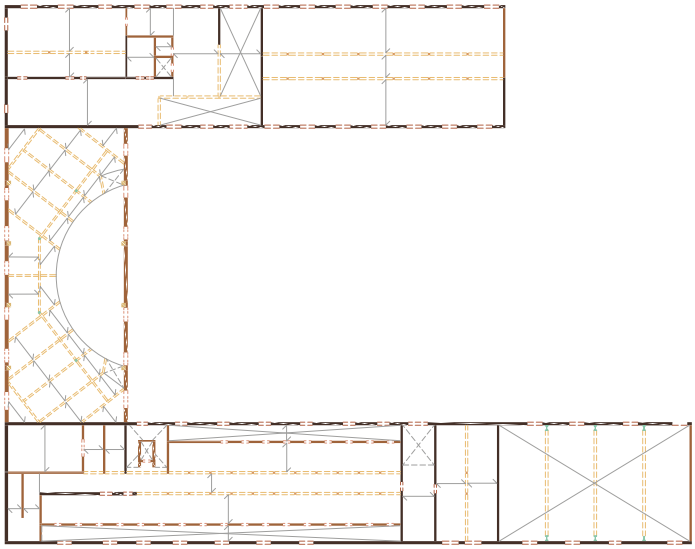
Original structural wall
Wooden beam
Structural wall
Concrete column
Concrete beam
Steel column
Span concrete floor
Span wooden floor

Legenda

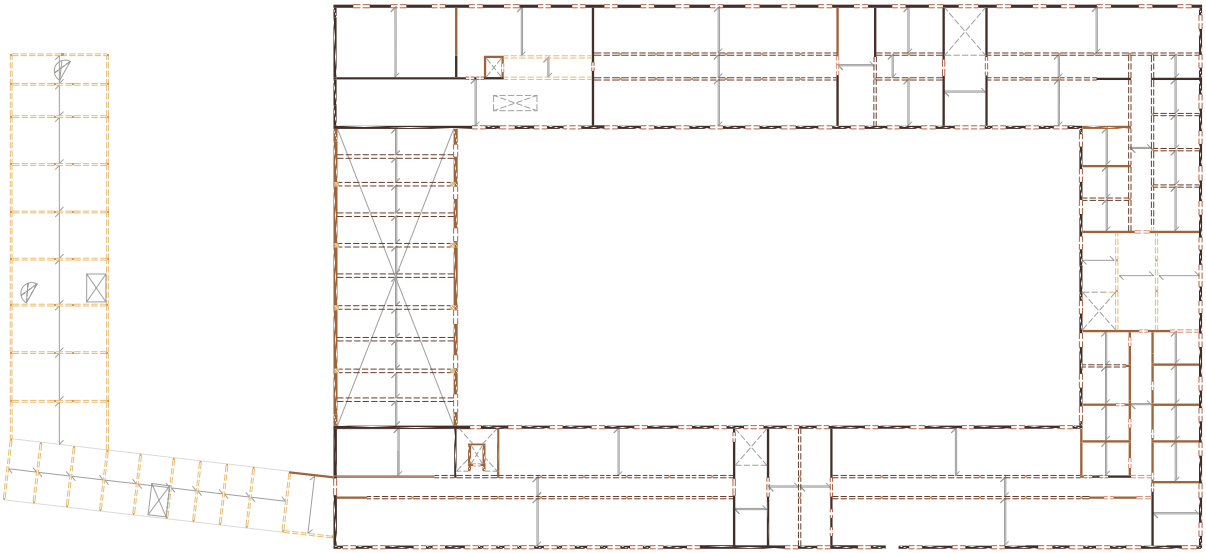


Foundation

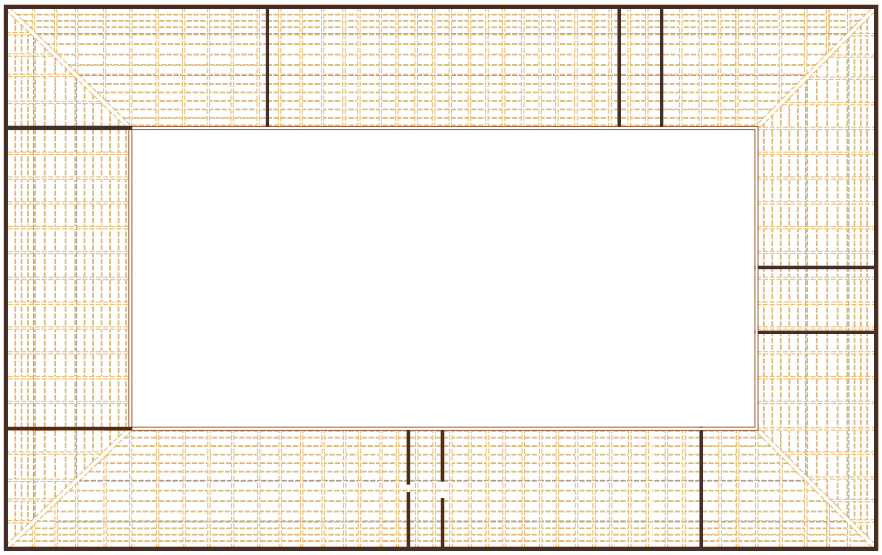
Ground floor



Entresol



First Floor



Roofstructure

0 15M

PROVISIONAL RESEARCH AND CONCEPTUAL DESIGN

2.2 Value Assessment and Transformation Framework

2.2 VALUE ASSESSMENT AND TRANSFORMATION FRAMEWORK

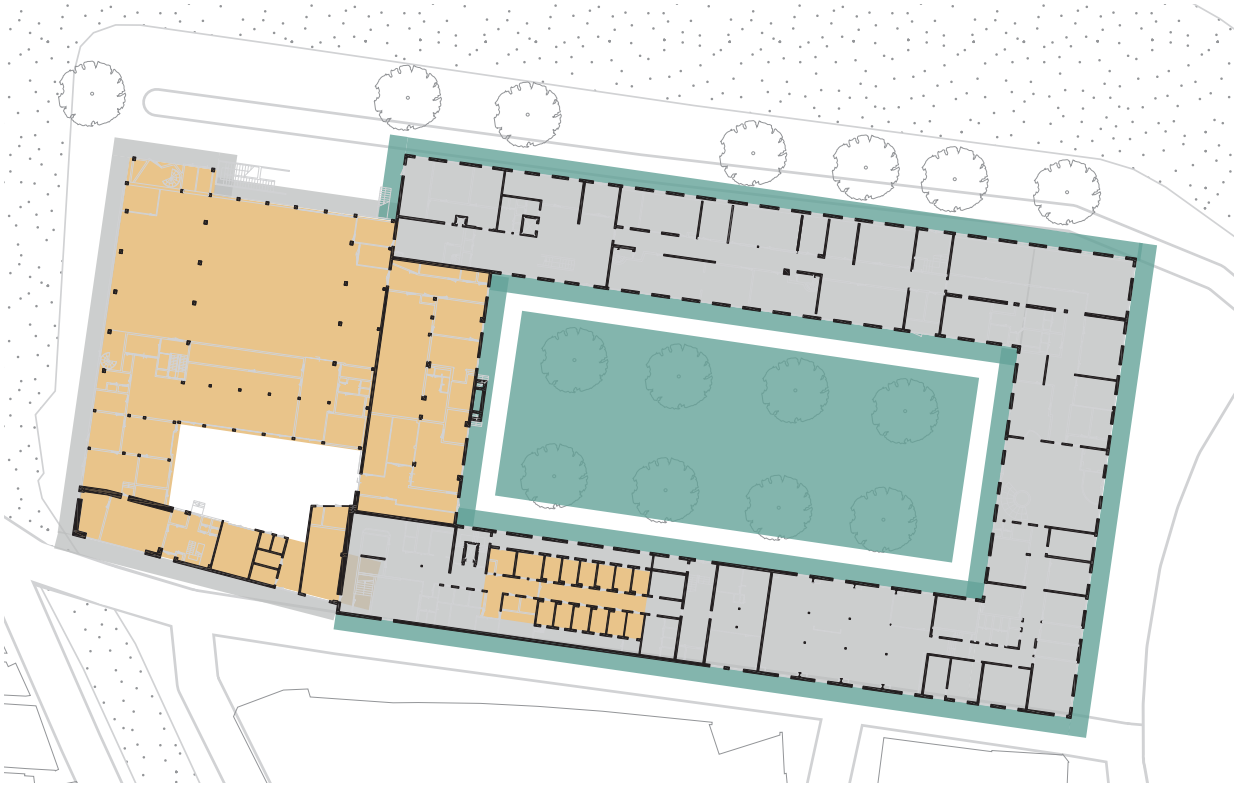
2.2.1 VALUE ASSESSMENT

Combining the building analysis with the research into the Koudenhorn building (which can be found in subchapter 1.3) the value assessment based on the layers of Brand and Riegl as described ed by Kuipers and de Jonge (2017) can be filled in as seen on the next pages.

2.2.2 TRANSFORMATION FRAMEWORK

As can be seen in both the value assessment and the transformation framework, the Neoclassical facades of the original Koudenhorn building with their harmony, symmetry and monumental entrances are of high value. The interior of the Koudenhorn has been renovated in 1770-1775 and has a lower value than the original structure which is still visible in the canteen. However, the added holding cells during the renovation are of high value because these show, just like the canteen, the different uses of this building throughout time. The structure of the Traffic Police, which is likely to be designed oversized, is of value for the transformation framework. This structure can be easily adapted and more volume can be placed on the building. However, the facades of this volume are of low value.

Other important things to take into account are the protected cityscape of Haarlem and the location of the building in the city.



Legenda

Koudenhorn building
High Value
Average Value
Low Value

Transformation framework of the Koudenhorn.

High Value Average Value Low Value	Age	Historical	Commemorative
Surroundings	Located next to the Spaarne and the Nieuwe Gracht.	Located in the historic city centre of Haarlem.	Protected historic city scape of the inner city of Haarlem.
Site	Build on the former defensive works of Haarlem, from the 14th century.	Neoclassical form defines the character of the building.	
Skin	Original masonry exterior walls in the facade of the Koudenhorn.	Neoclassical facade with harmony and symmetry.	Monumental entrances with a pediments and tympanums.
Structure	Original structure of canteen is maintained.		
Space Plan	Original architecture of canteen is maintained.	Courtyard design from when it was a Deaconhouse.	
Surfaces			
Services			
Stuff			Original clock from 1770 in courtyard.
Spirit of Place	Build as a Deaconhouse in 1768 with public funding.	Barracks during the Napoleonic empire from 1810-1813.	

Value assessment based on the layers of Brand and Riegl as described by Kuipers and de Jonge (2017).

Use	New-ness	Artistic / Expression	Rarity
The Koudenhorn is one of the many courtyards Haarlem is known for.			When build, by far the largest building project in Haarlem at the time.
	Newly added Traffic Police instead of peathouse in 1968-1775.		
Decorum, sober look on facade in relation to the original function.	The facade of the Traffic Police is from concrete painted in white and blue.	Openings in the facade create the harmony and symmetry.	
	Complete new interior structure and new volume between 1968-1775.		Complete new structure within the Koudenhorn.
	Complete interior transformation Koudenhorn in 1770-1775.		Basement Traffic Police houses a shooting range and a cinema.
No knowledge because of lack interior visit.			
No knowledge on this topic.			
			Holding cells in the Koudenhorn building.
Different uses throughout time, but it kept a societal function.			

PROVISIONAL RESEARCH AND CONCEPTUAL DESIGN

2.3 Program

2.3 PROGRAM

2.3.1 PROGRAM WORKSHOP

During the program workshop a lot of questions arose for choosing a suitable new function for the Koudenhorn building in Haarlem. The most remarkable topics will be discussed here.

Societal questions: the world around us is changing in a fast rate, climate change has become more presen and we have been using more materials than are available.

Program & existing structures: The location of the Koudenhorn has a rich and interesting historical development, the building is part of the protected city view, it is located in the old city center but does not really interact with the fibrant inner center. Both daily and specific functions are located nearby, everything is accessible by bike or foot. A new program could be a compination of specific, daily and living functions.

Building level: the building is 16.500 m^2, devided in 13.000 m^2, for the Koudenhorn and 3.500 m^2, for the verkeerspolitie building. In relation to BK city, the building is approximately twice as small. Main spaces are the dining hall and the courtyard within the Koudenhorn. Other new suitable functions within this typoloy could be offices, school, elderly housing, housing or a hotel.

Initial thoughts on adding volume or demolishing elements of the exising building can be seen in the drawings above. Newly added volume could be added on the structure of the verkeerspolitie. The interior lay-out of the verkeerspolitie is quite suitable for redesign because of its structure of columns. Transformation possibilities within the older Koudenhorn building are mainly to be found in the interior lay-out.

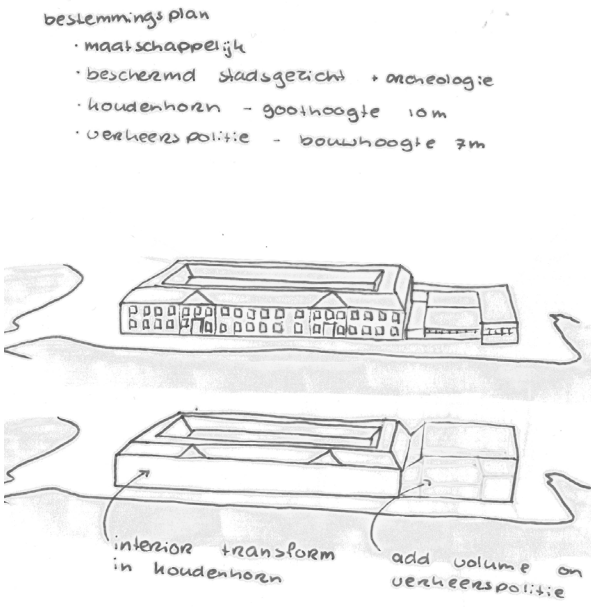
Personal point of view: interest in transforming (by origin private) vacant buildings to a public function like a museum, library, theater, restauarant, hotel, school or other cultural functions.

Choice of program: because of its location and the large FSI of the building, a combination of functions would be ideal. For this different scenarios could be made.

Scenario 1: living for elderly and youth, with space for working. This goes back to the original function of the Diaconiehuis.

Scenario 2: living with place for a public/city office, a space that could be flexible used for different people/companies.

Scenario 3: space for living in combination with public functions (museum or hotel).



Initial ideas on adding volume.

Legenda

- Koudenhorn building
- Culture and education
- City center - shops
- Dwellings
- Mixed use
- Societal functions
- Businesses

The different functions in the city center of Haarlem (QGIS, z.d.).

0 100M

2.3.2 WHAT IS NEEDED IN HAARLEM

The municipality of Haarlem wants to focus on adding, mixing and condescending of dwellings in the inner city (Gemeente Haarlem, 2021). These developments should complement the current neighbourhoods with their mix and character. At the same time, more space for the cultural sector should be created. Besides, the aim to strengthen the so-called 10-minute networks is an important goal to enhance the social connection in the neighbourhoods. To create clusters of facilities for social interaction like sports, education or leisure.

During the location visit, it was noticeable that the building was not located at the most vibrant location of the inner city of Haarlem. However, the Koudenhorn building is located near one of the future vibrant axes from the city centre of Haarlem towards the station (Urahn I stedenbouw & strategie, Goudappel Coffeng, & APPM Management consultants, 2021).

2.3.3 CONCEPTUAL IDEA

The Koudenhorn was originally designed to house people, with spaces for sleeping quarters, workrooms and a dining hall. The monument will be a building for the citizens of Haarlem again with space for dwellings, flex office spaces, F&B and culture. It will not be a touristic attraction, but a building that focuses on the needs and requirements of the neighbourhood.

Current Size: 16.500 m²
Added Volume: 2.500 - 3.000 m²
New Function: Mixed-use building with room for dwellings, flex office spaces, F&B and culture.

The Koudenhorn will be redesigned taking the sustainability challenges of today into account, focussing on designing an architecture that is resilient in accomodating change in use over time. Redesigning the building in which the user needs to become more adaptable instead of designing flexible buildings.

For this design, a combination of dwellings, flex office spaces, F&B and culture will be added to the building. The dwellings will house different types of target groups like social housing, families and senior citizens. They will share a private courtyard together and will have communal spaces. The flex office spaces, F&B and culture will be clustered on the other side of the building. The office spaces can be rented, used for start-ups or for organizing events. The F&B and culture hub is a collective place for music and dance.

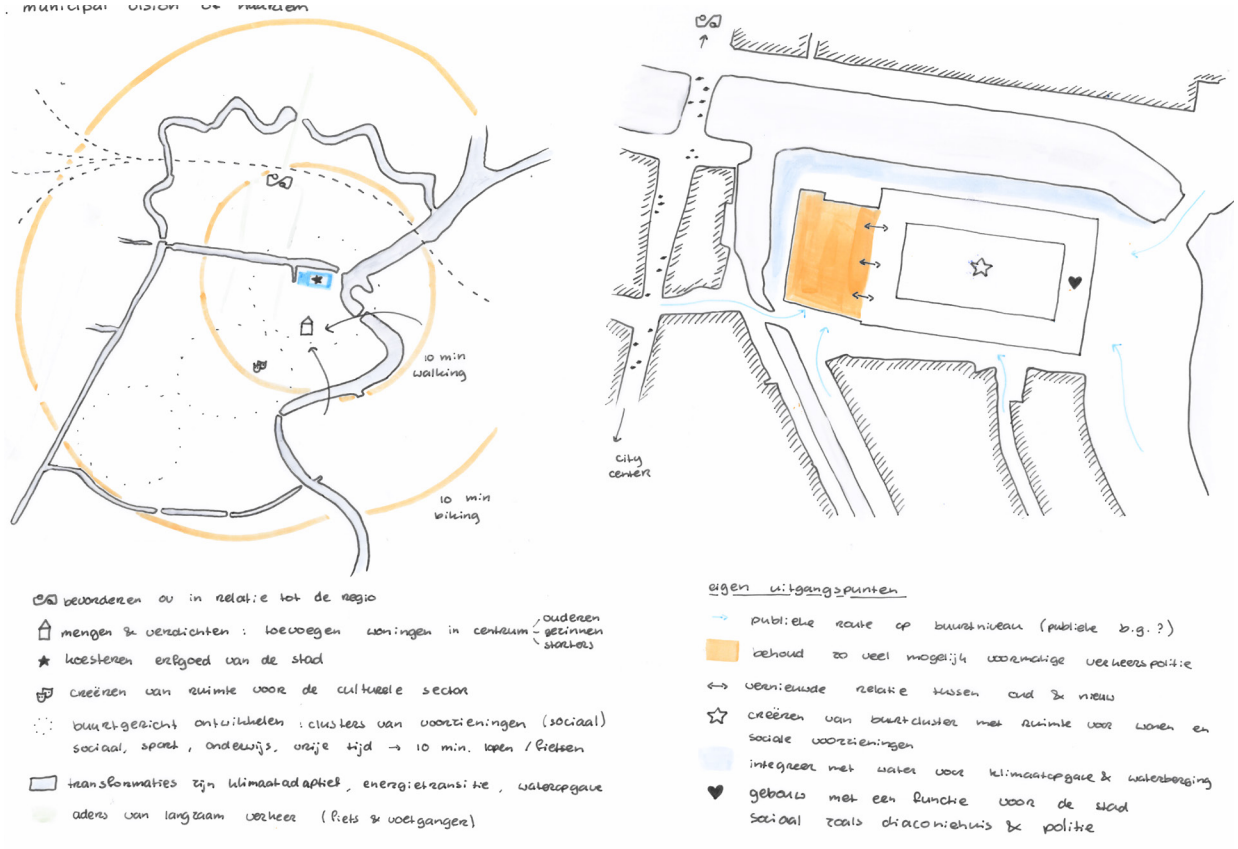
The design approach will take the heritage values of the buildings into account. During the redesign process, it will be important to redesign the space plan in such a way that it can be used in a different way over time. With this concept, the building could be kept alive indefinitely.

2.3.4 INDIVIDUAL RESEARCH

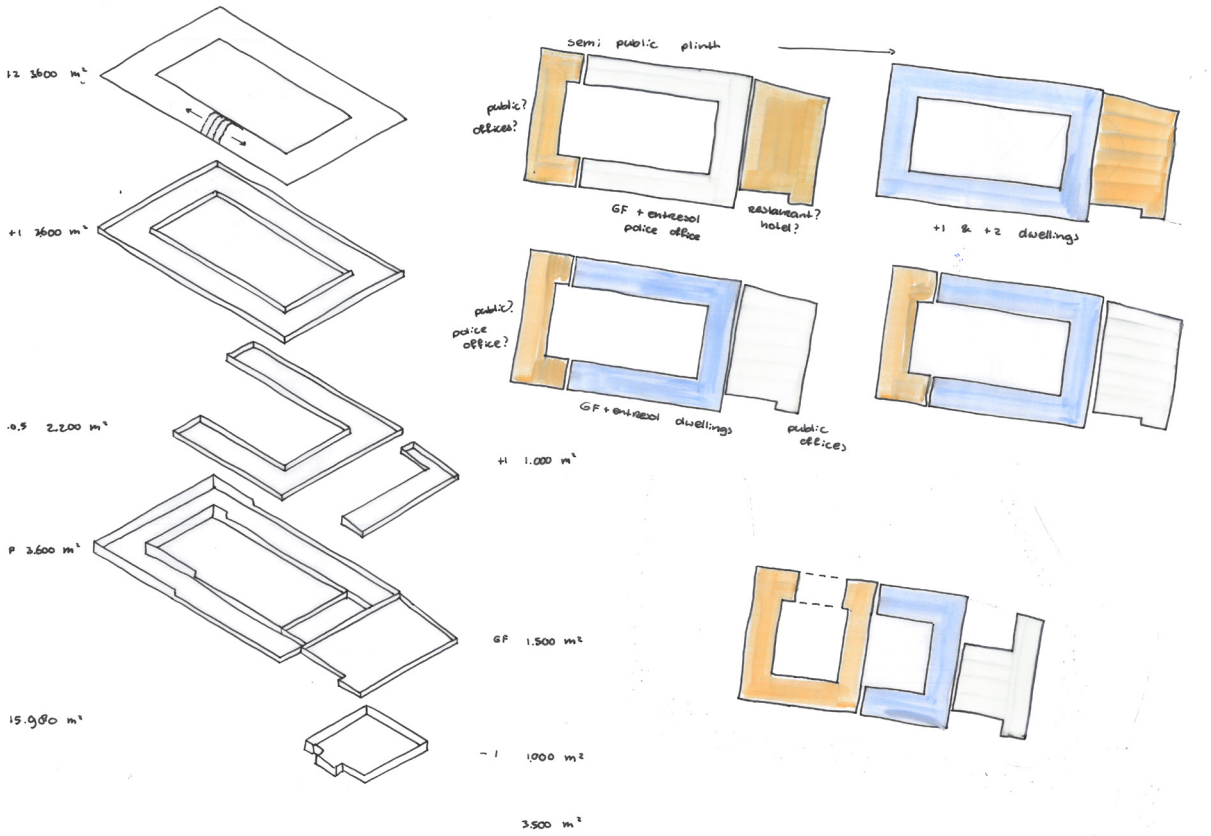
Finding a suitable new program for the Koudenhorn building seemed contradictory when the research focus for this graduation project is to redesign a space plan that can accommodate changes in use over time. Nevertheless, together with the progress made in the individual research (subchapter 2.4) and the initial design (subchapter 2.5) a suitable mixed program was found.

2.3.5 A MIXED USE PROGRAM

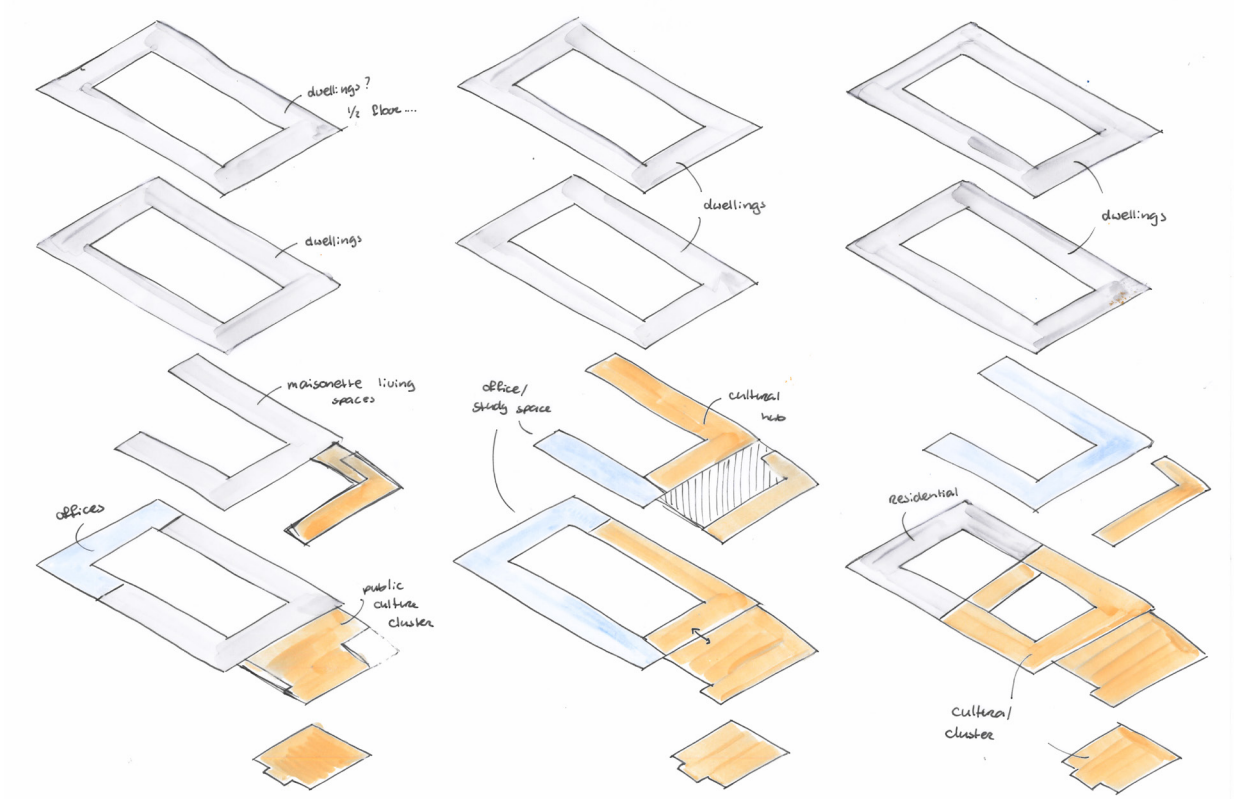
Looking into references where a mixed-use program is used, it became soon clear that the Koudenhorn building is large in its seize. And because it has the seize of an urban block, it could almost be functioning as a little village on its own. Combining housing with other functions often results in a 80%



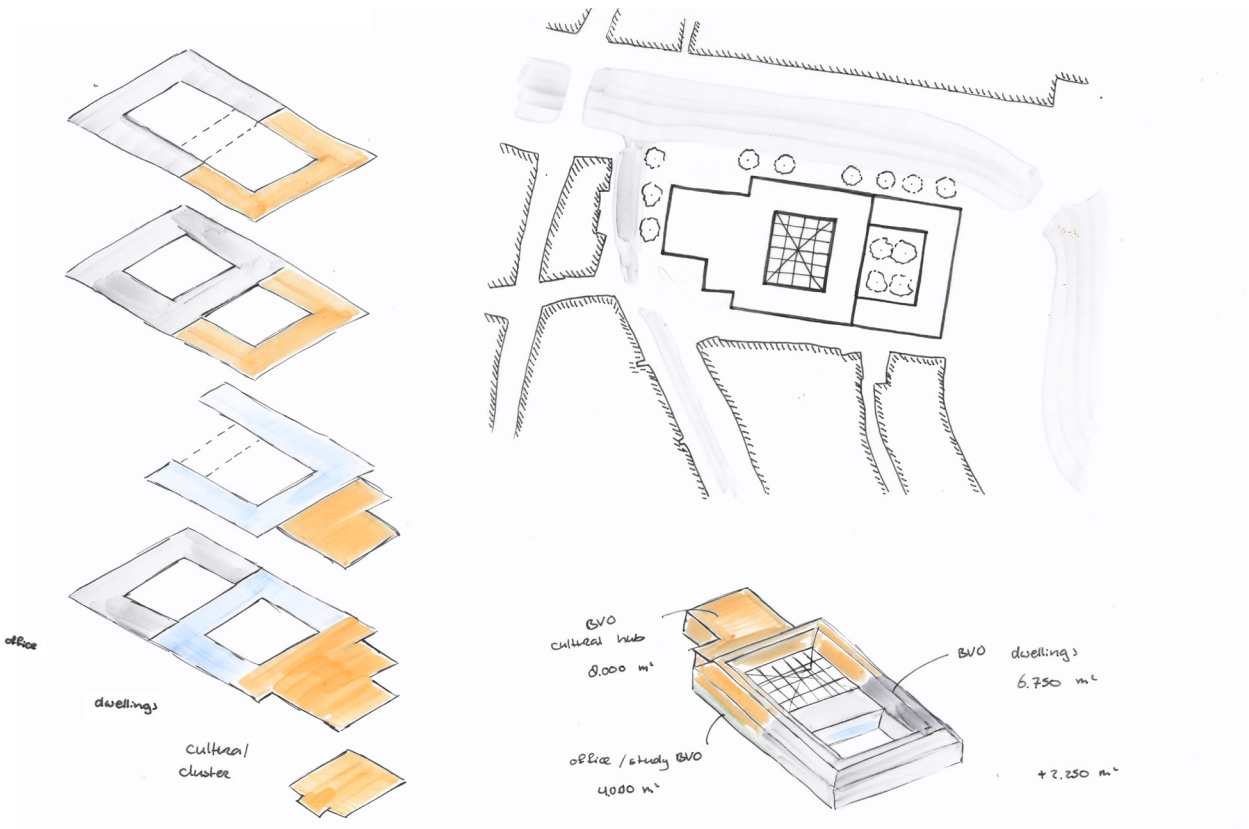
Vision municipality of Haarlem and own starting points.



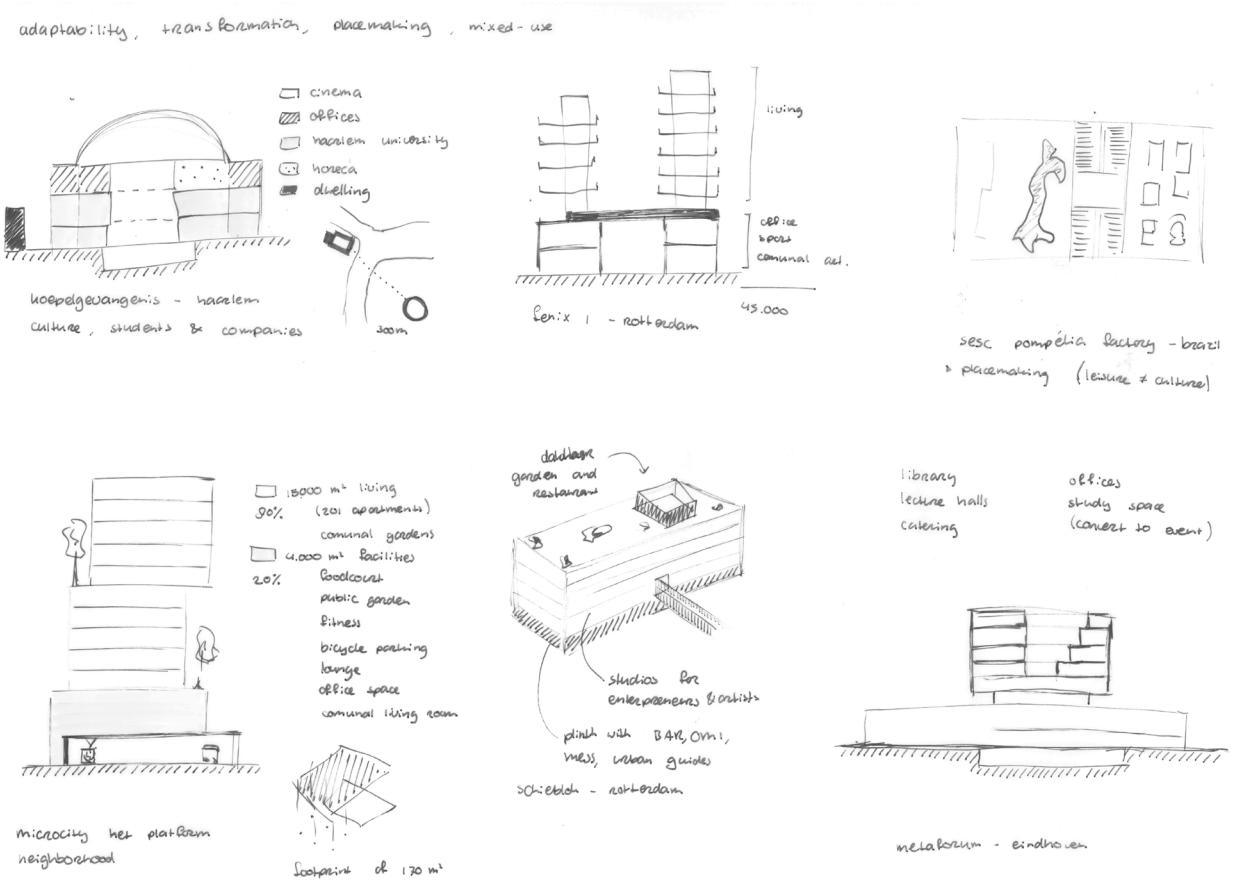
Division of the new program.



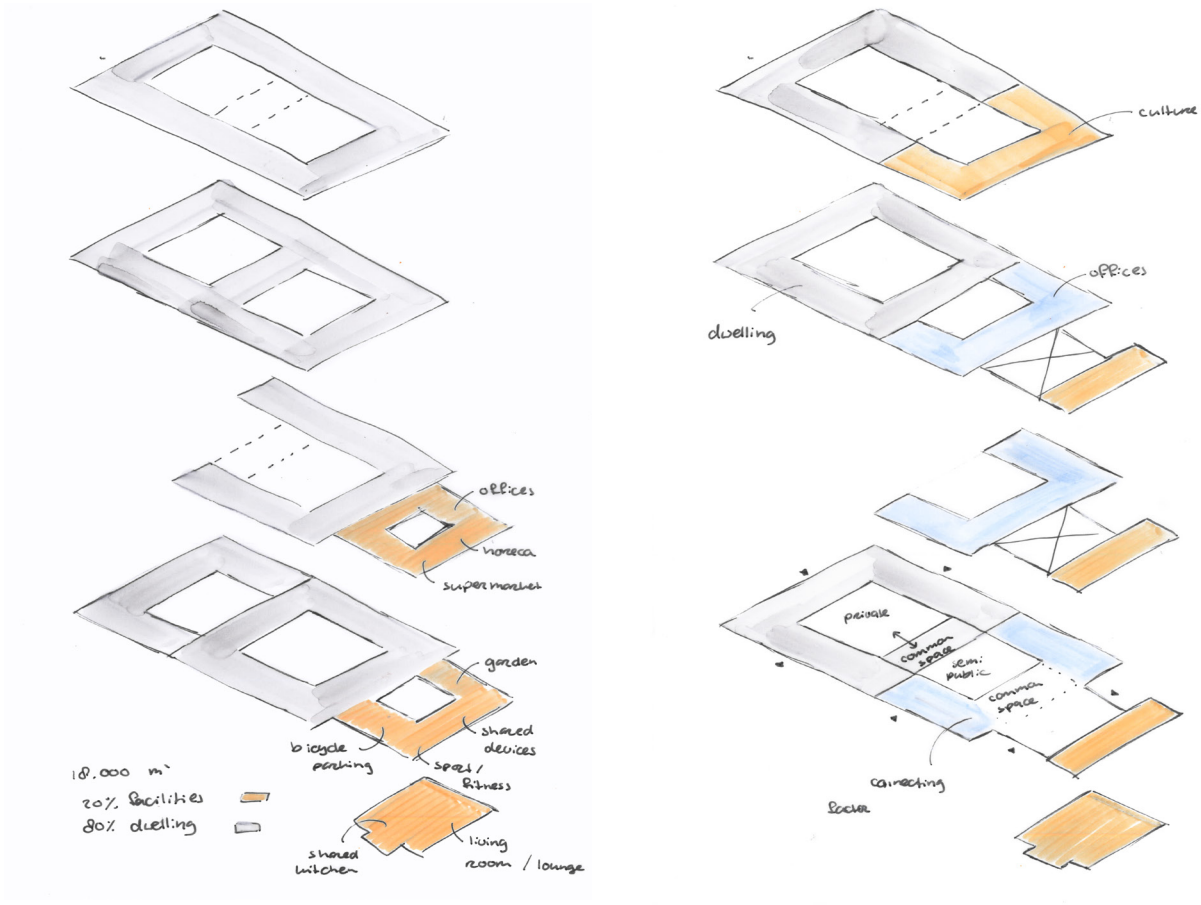
Division of the new program.



Division of the new program.



Program references.



Division of the new program.

to 20% ratio, which would mean in the case of the Koudenhorn that the old building will be redesigned to housing and the building of the verkeerspolitie to other functions.

However, during the individual research and initial design process it became clear that this building should have a different approach for deviding the program into the building. Looking into the seizes of different functions a conclusion was made to house all cultural functions in the newer volume of the verkeerspolitie. Because this building has an overseized concrete structure, new volume is also added on top of the building. In this volume there will be room for placemaking when the current functions are not applicable anymore to the neighborhood.

The building of the Koudenhorn will be devided in housing on the one side and flexible office spaces and F&B on the other side. To devide these two functions a volume is placed in the courtyard. The idea is to redesign the space plan in such a way that the spaces can be used in an adaptable way in the future. The line between housing and offices is vague and can shift whenever people want.

PROVISIONAL RESEARCH AND CONCEPTUAL DESIGN

2.4 Individual Research

2.4 INDIVIDUAL RESEARCH

2.4.1 RESEARCH QUESTIONS

For this graduation studio the following research question was formulated:

How could the space plan of a monument like the Koudenhorn be redesigned to accommodate changes in use over time?

To be able to answer the research question, the following sub-questions were formulated:

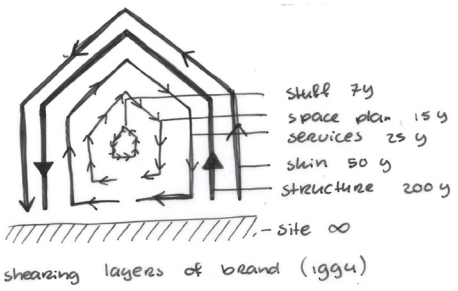
- *Which elements of a building are permanent and which elements offer room for change?*
- *Which basis needs to be provided in a space plan for users to be able to be flexible?*
- *How could the open building principles be used when redesigning vacant heritage?*

2.4.2 LITERATURE RESEARCH

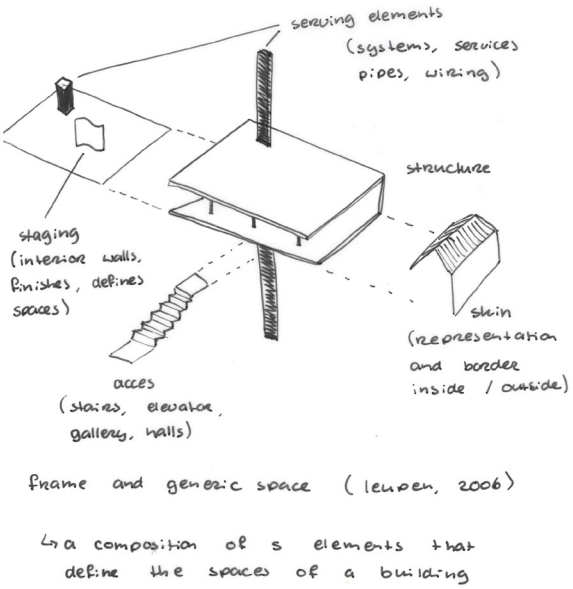
Literature research into the elements that define the space plan was done to answer the sub-question: Which elements of a building are permanent and which elements offer room for change? For this literature research, the books How Buildings Learn: What Happens After They're Built (Brand, 1995), Frame and generic space (Leupen, 2006), Architecture, form, space & order (Ching, 1979) and Designing from Heritage: Strategies for Conservation and Conversion (Kuipers & Jonge, 2017) were used. The same literature was utilized to formulate an answer to the sub-question: Which basis needs to be provided in a space plan for users to be able to be flexible?

Even though all this literature was relevant for my research, it was also important to look at it critically. For example, Shearing Layers from Brand (1995) is already quite old and outdated, therefore it can be relevant to *rebrand* the layers of Brand. Especially the space plan that is to exist for only 15 years is something that should not be the case anymore. This is exactly why it was also interesting and relevant to research into the open building concept principles developed by John Habraken (2003).

Out of the combined literature research, it became clear in every building eighter staging, access, structure skin or the serving elements are the permanent frame in which change can take space. Most buildings are designed in such a way that skin or structure is permanent.



Layers described by Brand.



Layers described by Leupen.

2.4.3 CASE STUDY RESEARCH

Besides literature research, it was the initial idea to investigate case studies to be able to answer the sub-question: How could the open building principles be used when redesigning vacant heritage? We often learn best from our predecessors, within redesigned heritage those buildings show that it is possible to keep vacant heritage 'alive'.

To create a frame of reference, an overview of transformation projects was made, in which there was a specific focus on the space plan when (re)designing the (original) building. The case studies researched are eighter newly built or mainly transformed within the permanent components of a building like the structure, skin or roof and do have characteristics that resemble open building principles. The case studies differ in their way of (re)designing the space plan, depending on the permanent structures in which the (re)design took place.

Together with the conclusions from the literature research, different frameworks in which adaptations were made can be distinguished as seen in the drawing on the next page, when looking into the case studies. A side note needs to be made that these frameworks are not the same as the loadbearing structure of the buildings. The framework shows that, even though the use of these buildings changed, the framework remained.

1. Structure

(Re)designing taking the structure as a permanent element of the building is an approach that often can be seen within the open building designs. Super lofts in Amsterdam designed by Marc Koehler Architects is a good example. The KB Building in Arnhem transformed by HofmanDujardin + Schipper Bosch can be seen as a good example of a transformation project.

2. Skin

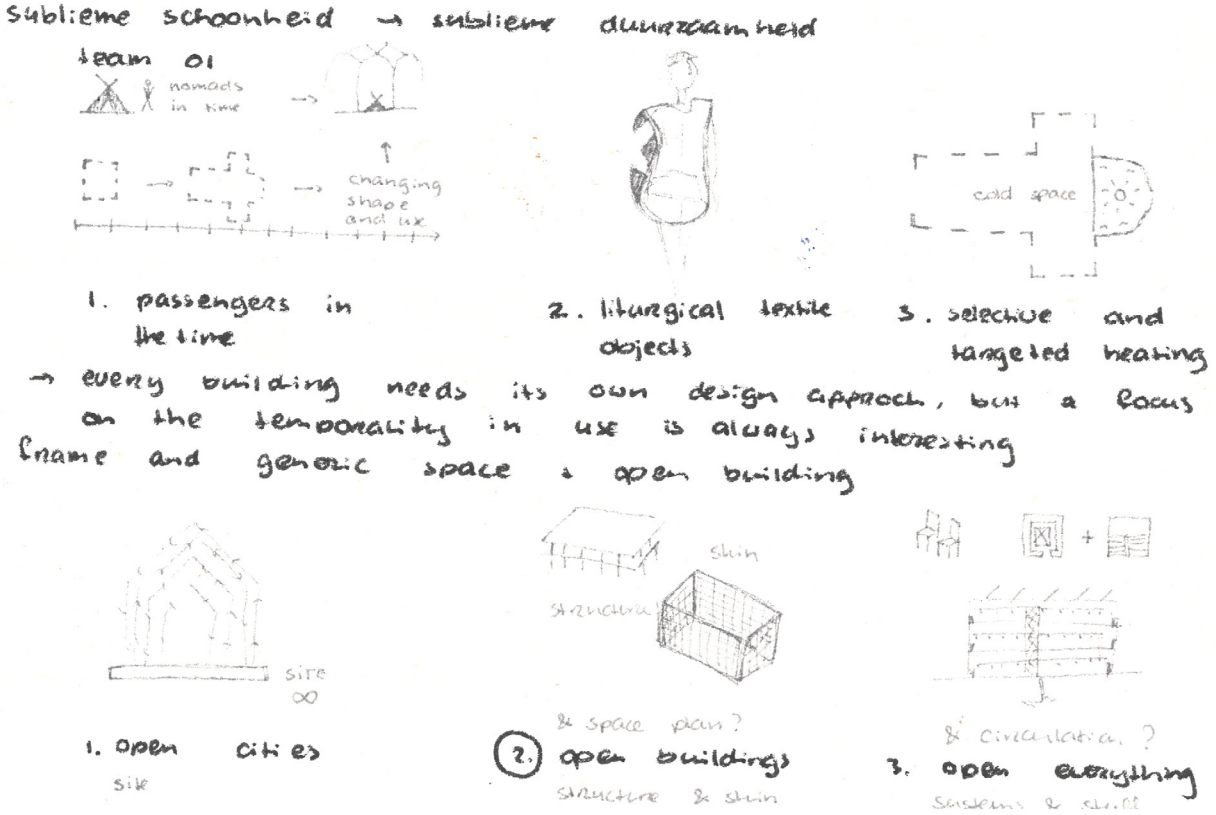
Examples of transformation projects in which the skin was the permanent element in which change took place during the redesign are for example the Burgerweeshuis in Amsterdam and St. Jobsveem in Rotterdam, both renovated by WDJ Architect.

3. Roof / 4. Hall

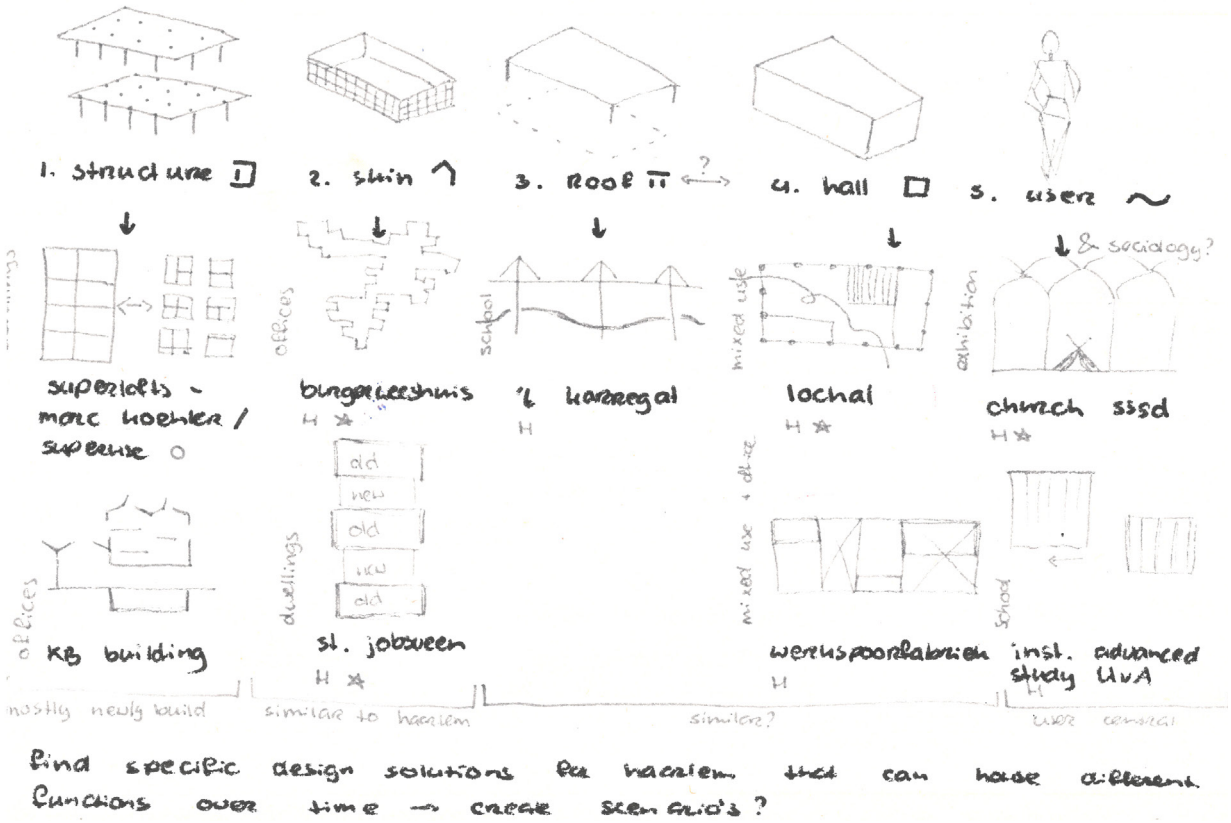
A redesign under a roof or within a hall is quite similar. Within both frameworks, the buildings often have large and high spaces in which change can take place. Example of the roof as a framework is 't Karregat in Eindhoven designed by Van Klingeren. Redesigns in which the hall is a framework are Lochal in Tilburg redesigned by CIVIC architects + Braaksma & Roos architectenbureau and the Werkspoorfabriek in Utrecht redesigned by Zecc Architecten.

5. User

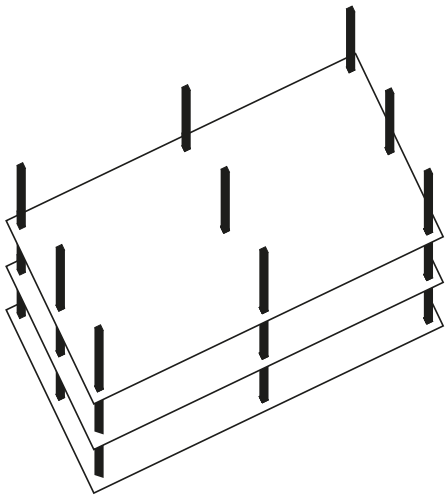
Something that was not specifically mentioned in the literature is a redesign in which the user is central. Examples however can be found in the document Sublieme Schoonheid, Sublieme Duurzaamheid (College van Rijksadviseurs & Rijksdienst voor Cultureel Erfgoed, 2021). All proposals are made for several churches in the Netherlands. Explained is that we are just passengers in time, so the focus of the redesign is temporary. Therefore users of the buildings could wear liturgical textile objects, or specific spaces could be heated instead of the whole building.



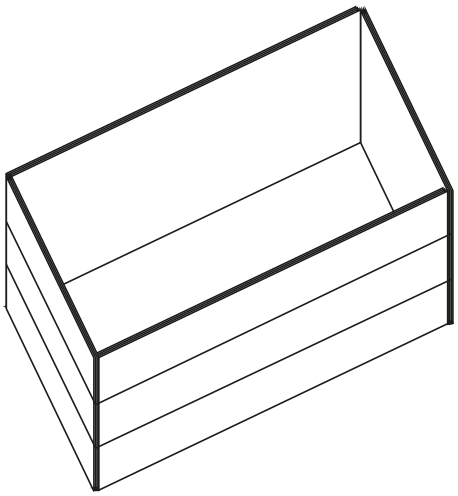
Research into case studies.



Different frameworks in which change can take place.

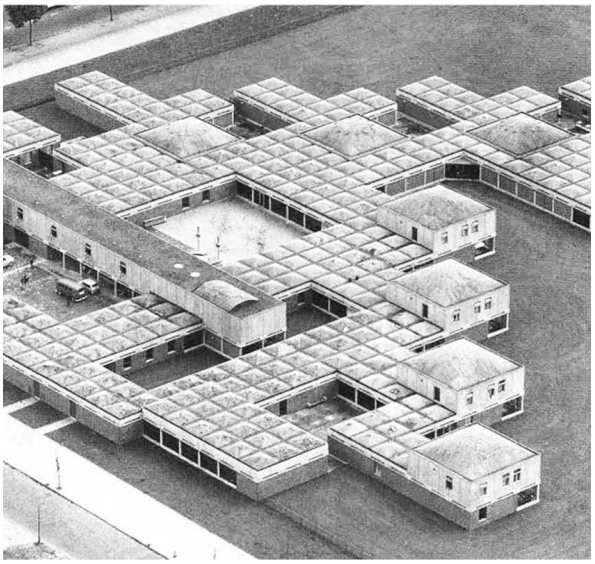


Strucrure



Skin

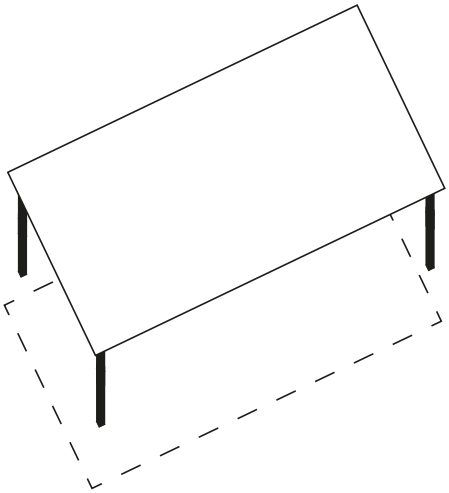
KB Building by HofmanDujardin + Schipper Bosch (Van Roon, 2020).



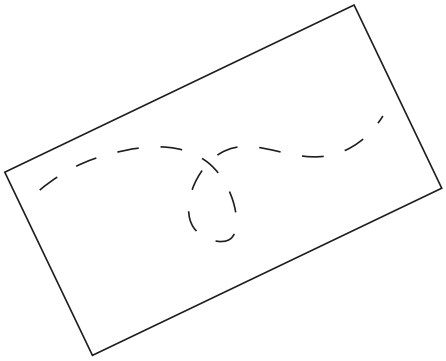
Burgerweeshuis by WDJ Architecten (KLM Aerocarto Schiphol 1960).

Superlofts by Marc Koehler (Hannema, 2017).

St. Jobsveem by WDJ Architecten (Musch, n.d.).



Roof / Hall



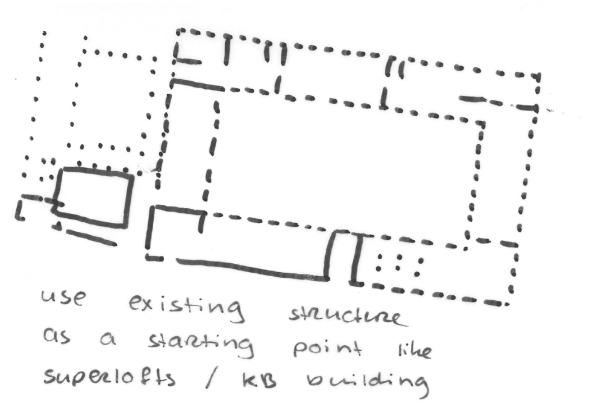
User / Placemaking

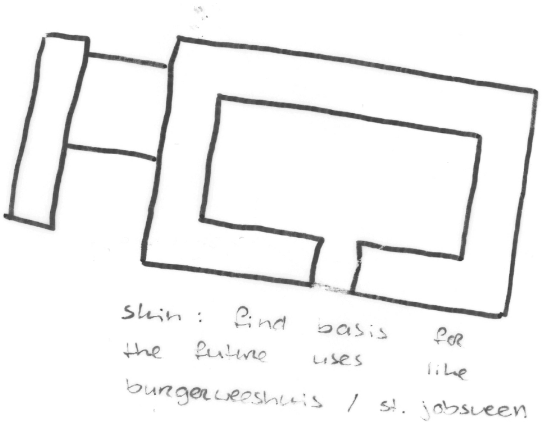
LocHal Library by Braaksma & Roos (Bollaert, 2019).

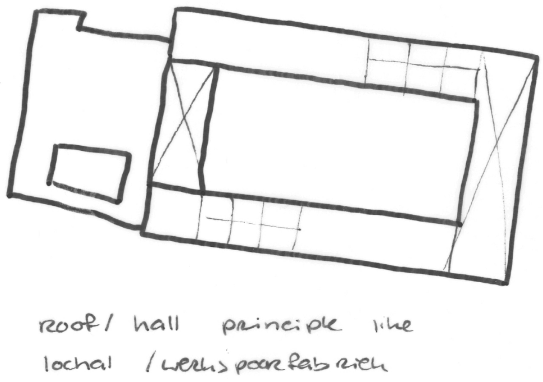
Sublieme Schoonheid, Sublieme Duurzaamheid (CRa & Rijksdienst voor Cultureel Erfgoed, 2021)

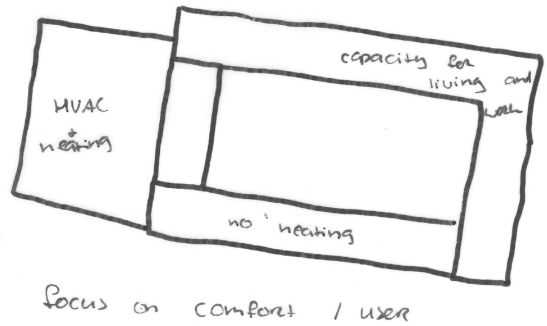
'T Karregat by van Klingeren (Versnel, 2003).

SESC Pompéia Factory by Bo Bardi (Finotti, n.d.)









Four frameworks in redesign.

2.4.4 INTERVIEWS

To be able to find an answer to the research question, it was important to come up with a good methodology. Finding the different case studies gave some insights, but it was not clear what to research and compare the case studies on exactly. A first conclusion however was made, it became clear that there are different frameworks in which adaptations were made. These frameworks show that, even though the use of these buildings changed, the frameworks remained.

Research into the case studies gave some insights but was not the most effective way to be able to answer the subquestions. Therefore the research scope needed to be adapted a little bit. After rethinking the methodology and during the debate with Wessel de Jonge (2021) the first idea came to add interviews with architects to the research.

Thijs Asselbergs

After the lecture on open building principles by the studio of Architectural Engineering (Asselbergs, 2021), I asked Thijs Asselbergs the question of why these principles are only used for new build buildings and why they have not been tested during redesigns of vacant heritage. It was hard to answer the question, but he mentioned that in order to use the open building strategies to keep buildings alive indefinitely it is important that the function follows the form of a building, taking into account that different functions can be linked to the same seizes. Because the function of an open building is to be able to change in function. Therefore it can be challenging to adapt these principles to a building that has already been built for a specific function. Besides, the capacity to adapt is directly related to the design of the load-bearing structure of a building. This is something that often cannot be influenced anymore during a redesign. Another

approach that is interesting within the open building is over space, to be able to meet the requirements of future users spaces could be over designed in a way that more functions would fit in a certain space.

Wessel de Jonge

During the debate with Wessel de Jonge (2021) other interesting topics arose as well. Since there are so many ordinary buildings build in the 20th century, it is really difficult to save all buildings. Especially since there is a difference in designing and the use of materials between modern and traditional heritage. Because some buildings from the 20th century were initially built to have a short life span, these materials therefore often have a fast decay. It is because of these reasons, that it is almost impossible to find one generic approach to preserve all vacant heritage.

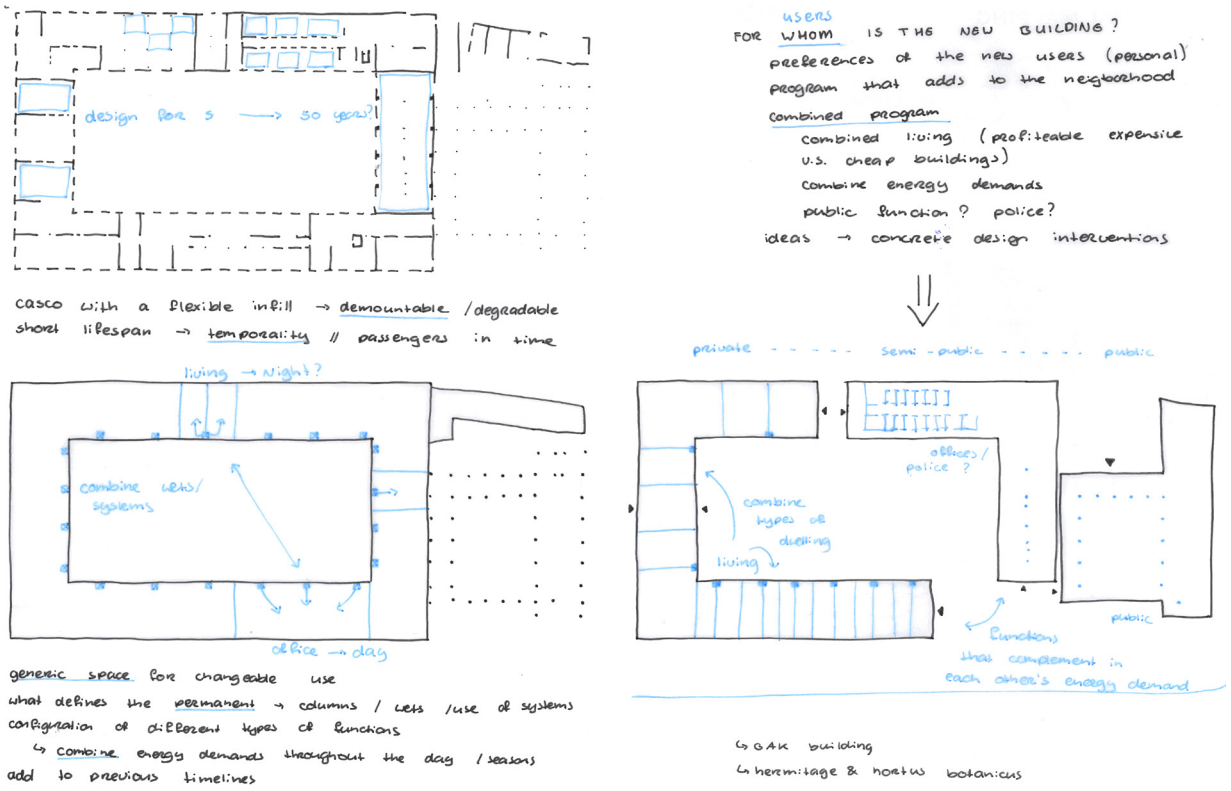
A few days after the debate, I had a 1-to-1 talk with Wessel about this topic in relation to the individual research conducted for this graduation studio. Looking at the literature research and different frameworks out of the case studies, we concluded the following three different design approaches to this research:

1. Redesign an adaptable infill in an existing casco in which the infill has a short lifespan and is therefore demountable or biodegradable. When the use change, the infill can be removed.
2. Redesign the infill in an existing casco in which the infill has a permanent location. This relates to the generic space that often can be found in the open building principles. The GAK building in Amsterdam transformed by WDJ Architecten is a good example for this approach.
3. Redesign the building in a way that the permanents, such as the loadbearing structure, wets and other systems, are located at smart places throughout the building. Locate them in such a way that throughout the time the spaces can be used in different ways if needed. With this, it is also relevant to look at the energy demands of the different functions throughout the day/seasons. Maybe it would possible for these functions to share one energy concept like the Hermitage and Hortus Botanicus in Amsterdam.

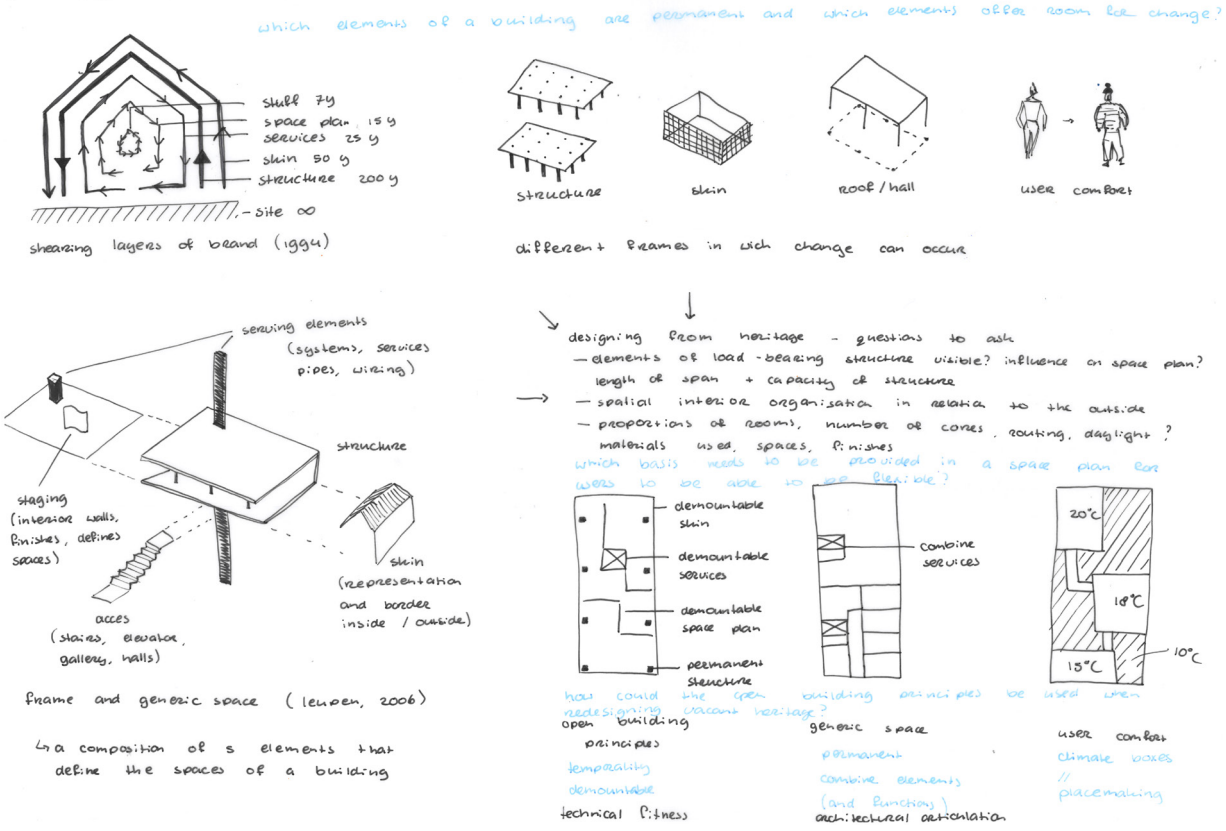
Besides, Wessel mentioned that next to the research that was already done, research by design was the best approach to continue with this research.

Initial conclusions

The original idea was to interview multiple architects, but the answers from the literature research, the case studies and the first two interviews were all quite similar. Therefore it was important to combine all the knowledge gathered in the research and to make some initial conclusions before moving forward with the research itself and focus on the research by design. These conclusions can be found in the drawing on the next page.



Three different design approaches as discussed with Wessel de Jong.



Initial conclusions from literature research, case study reasearch and interviews.

2.4.5 RESEARCH BY DESIGN

After reading into the literature, investigating the case studies and interviewing 2 architects, the main conclusion is that the combined research is a good basis to focus on research by design for this graduation studio. Answers to the research question can only be formulated by implementing the outcome of the sub-questions in the floorplans of the Koudenhorn building and figuring out what suits best. Therefore there are no definitive answers yet to the research and design question. There will be a lot of challenges and limitations for redesigning the space plan of the Koudenhorn to accommodate changes in use over time, which will be investigated up upon until P4. Since the research and design are intertwined, the relevant outcomes for the design process itself can be found in subchapter 2.5, but the first results can be found in the drawings on the next page.

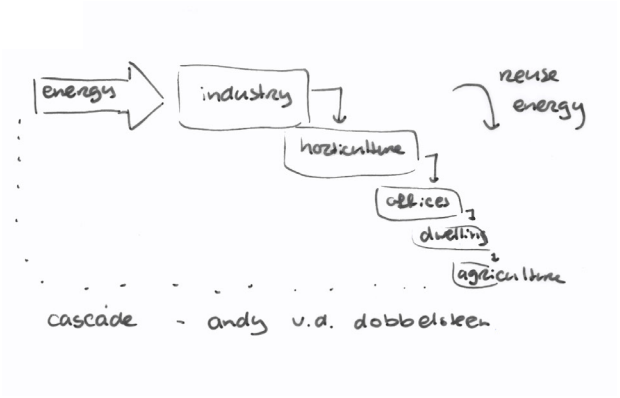
As Andrea Prins (2021) confirms what this research up until now has concluded, is that there are different ways of designing adaptable buildings. The first is designing a floorplan with moveable elements to be able to change the function over time. The second is the open building principles, a design approach to the structural parts of a design and its infill. A good example she mentioned for this is the SAWA building in Rotterdam designed by Mei architects and planners, in which the systems are laid in gravel instead of concrete, their location can change over time. As a third design approach, she mentioned the design of a floorplan in which all sizes are the same, in this design, there is a lot of room for placemaking and individual interpretations of use by the users.

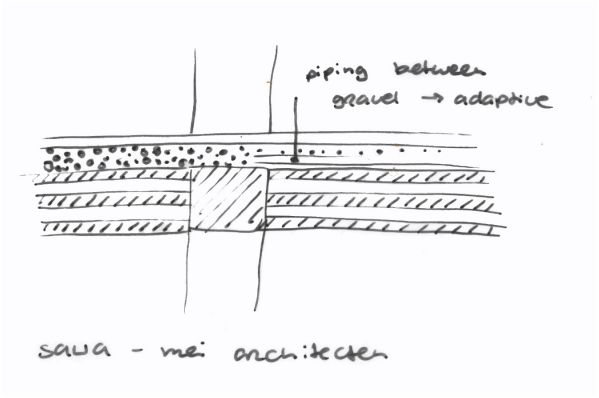
The sizes needed for different functions could be one of the starting points for a redesign, when optimizing this the user could easily adapt apt to a building. Looking into the grid used for the open buildings, the same sizes are often used for designing the floorplans.

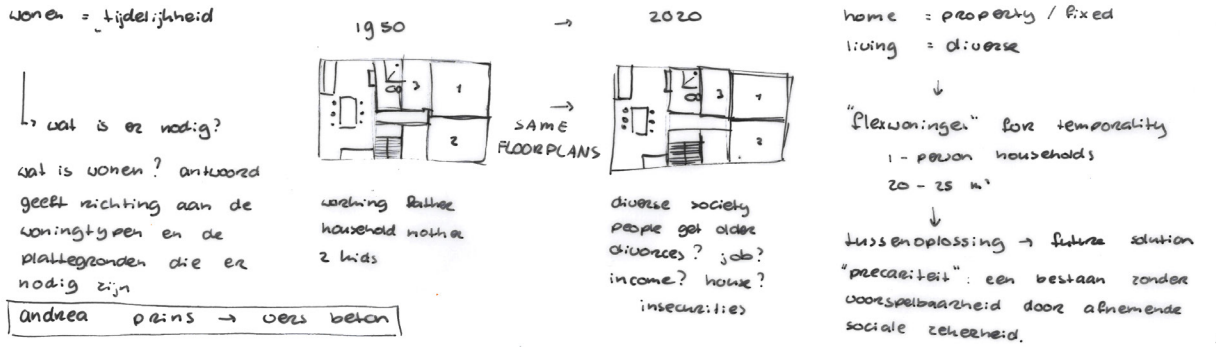
The next challenge is to figure out which framework and which design approach is suitable for the Koudenhorn building. This research of adapting the user and not the subject is quite challenging for the Koudenhorn since the space plan of the building already has been changed many times over the years. Why this redesign proposal is better, how the open building principles add to the current design and how it works in the transformation process will be interesting topics to figure out.

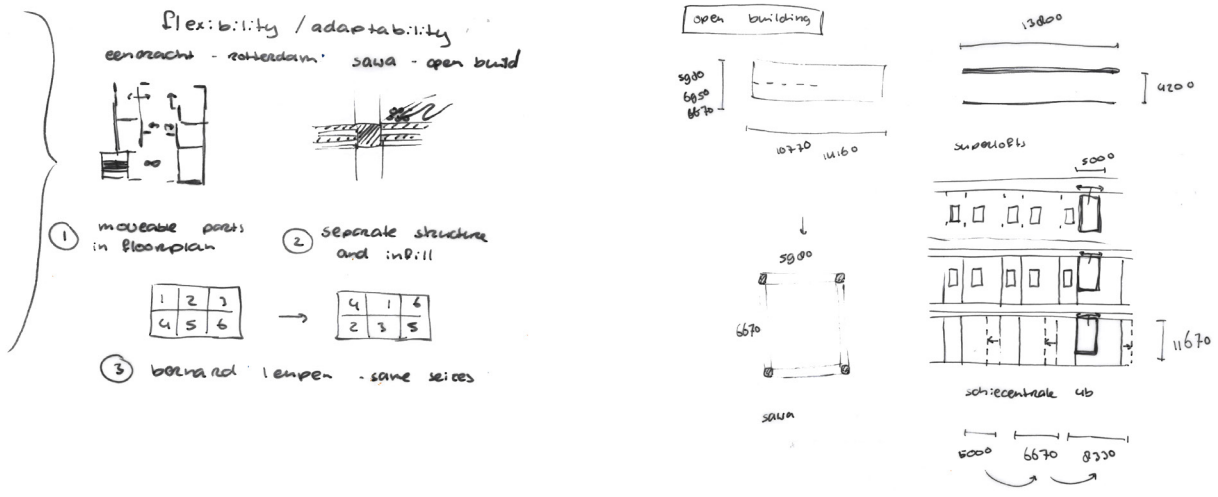
Besides, it is important to have an understanding of the loadbearing structure of the original building. However, it was hard to figure out how the loadbearing structure of the whole building worked. During the renovation of the Koudenhorn in 1770-1775, almost all interior walls and structural elements were demolished and a new structure was added according to the new spaces needed in the building. Because this was poorly documented, it was hard to get started on the design process since this is a crucial element in both the research and the design.

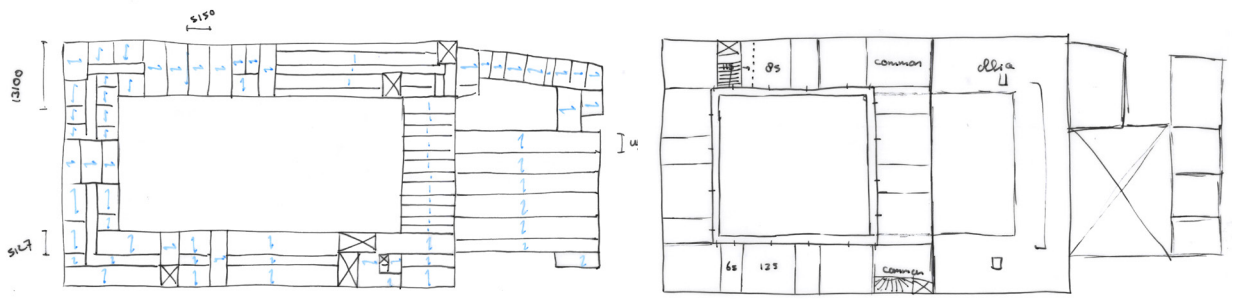
At the same time, questions arose whether the space plan should be able to be used in such an adaptable way that every function should be possible, or that the change could take place between functions that are similar or do have similar sizes.











First results research by design.

2.4.6 CONCLUSIONS

Up until now, only initial conclusions can be formulated. Because the research shifted to research by design, there are no definitive answers yet to the research and design question: How could the space plan of a monument like the Koudenhorn be redesigned to accommodate changes in use over time? There will be a lot of challenges and limitations for redesigning the space plan of the Koudenhorn, which will be investigated up upon until P4.

Different approaches could however be tested during the redesign. Because each building is different, every building will need its own approach. The initial conclusions made are generic conclusions from literature, case study research and interviews. During the research by the design phase, it will become clear which approach is best applicable for the Koudenhorn building in Haarlem.

There are 4 different frameworks that can be distinguished in which, even though the use of these buildings changed, the framework remained the same. These frameworks are structure, skin, roof/hall and the user.

There are also three different design approaches that can be used within these frameworks.

1. Redesign a building with an adaptable infill, in which the infill has a short lifespan and is therefore moveable, demountable or biodegradable.

2. Redesign the space plan of a building creating a generic space in which the user can be adaptable using the open building principles. For this specific sizing of rooms is important in order to use spaces in different ways or create placemaking.

3. Redesign the building in a way that the permanent elements are located at smart places throughout the building. Locating the systems and vertical elements in such a way that functions can change and energy demands throughout the building work together.

2.4.7 SPATIAL BUILDING TYPOLOGY

For the individual research, it was the initial idea to research and redraw the case studies using the drawing method of Hausmann (Jalon & Napolitano, 2017) introduced by the collective Spatial Building Typology. Using this method, the case studies could be easily compared to the Koudenhorn building in Haarlem.

Since the methodology of the research for this graduation studio shifted towards research by design, the comparison to the SBT results is not so relevant anymore. However, SBT was chosen, because it focuses on the spatial aspects instead of the function of a specific typology, something that is still aligned perfectly with my interest in designing an architecture that can accommodate change over time. The conclusions of the SBT research could still help to be able to formulate answers to my research question on a larger scale for the redevelopment of vacant police estate.

PROVISIONAL RESEARCH AND CONCEPTUAL DESIGN

2.5 Initial Design

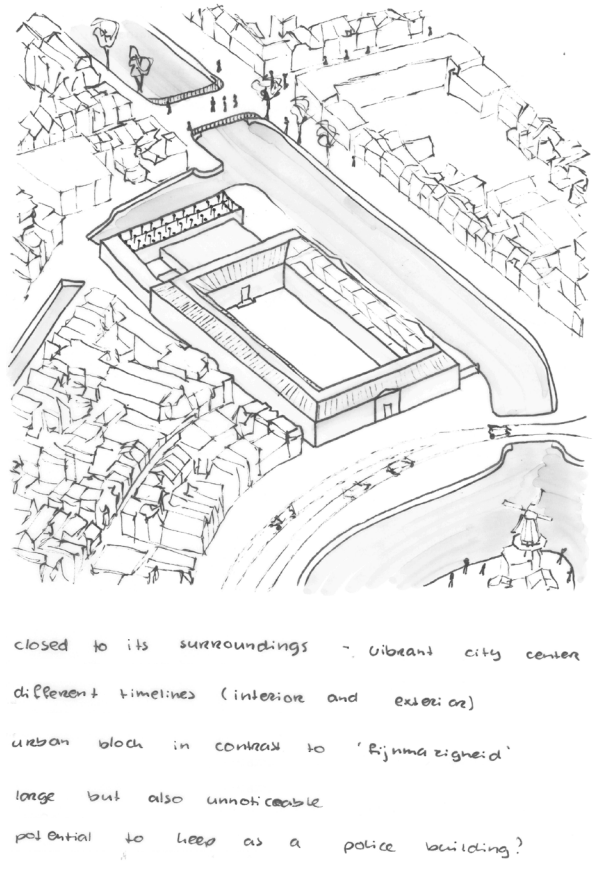
2.5 INITIAL DESIGN

2.5.1 INITIAL DESIGN PRINCIPLES

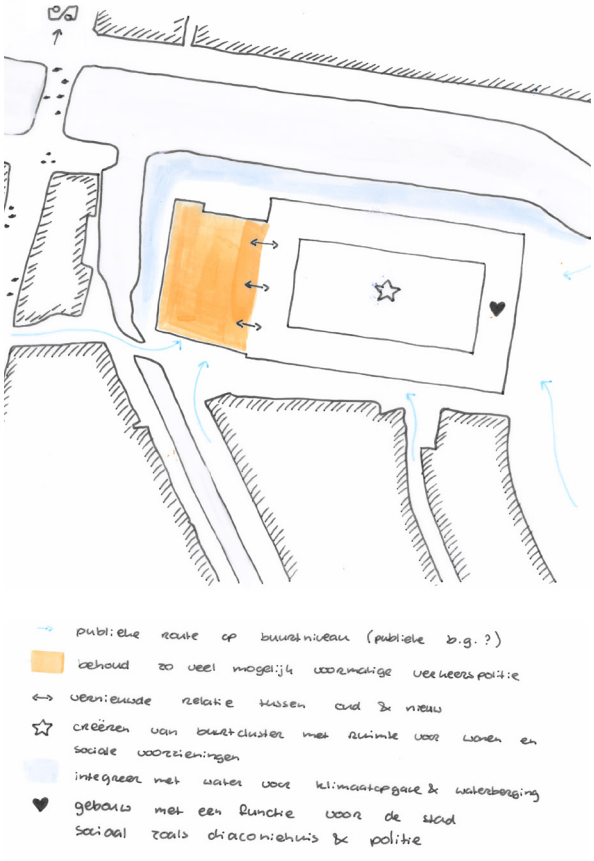
Out of the value assessment, transformation framework, building analysis, program research and individual research the first initial design principles could be concluded.

In the current situation, the Koudenhorn building is closed off to its surroundings, even though Haarlem has a vibrant city centre. The building has the size of a complete urban block, which is in contrast to the grain size of the buildings surrounding the Koudenhorn. Despite the building being one of the largest buildings of the inner city of Haarlem, it is rather unnoticeable. Besides, different time layers can be found within the interior and exterior of the two different building volumes. The municipality of Haarlem wants to focus on adding, mixing and condescending dwellings in the inner city (Gemeente Haarlem, 2021). These developments should complement the current neighbourhoods with their mix and character. At the same time, more space for the cultural sector should be created. Besides, the aim to strengthen the so-called 10-minute networks is an important goal to enhance the social connection in the neighbourhoods. To create clusters of facilities for social interaction like sports, education or leisure.

The Koudenhorn building, originally designed as a Diaconiehuis, was meant for the citizens of Haarlem. It changed in function overtime to barracks and eventually a police office, both served for the greater good of the public. The new redesign for the Koudenhorn should also be a building for the citizens of Haarlem. A mix in functions is therefore ideal, a place for dwellings, flex office spaces, F&B



Portrait of the Koudenhorn.



Design principles.


POLITIE

and culture will be added to the building. The dwellings will house different types of target groups like social housing, families and senior citizens. They will share the courtyard together and will have communal spaces. The flex office spaces, F&B and culture will be clustered on another side of the building. The office spaces can be rented, used for start-ups or for organizing events. The F&B and culture hub is a collective place for music and dance.

The Koudenhorn will be redesigned taking the sustainability challenges of today into account, focussing on designing an architecture that is resilient in accomodating change in use over time. Redesigning the building in which the user needs to become more adaptable instead of designing flexible buildings. The design approach will also take the heritage values of the buildings into account. During the redesign process, it will be important to redesign the space plan in such a way that it can be used in a different way over time. With this concept, the building could be kept alive indefinitely.

A renewed relationship between the old and new volumes is needed, as well as to keep as much of both volumes as possible because of sustainability and materiality use reasons. For this, it is important to have an understanding of the loadbearing structure of the original building. However, it was hard to figure out how the loadbearing structure of the whole building worked. During the renovation of the Koudenhorn in 1770-1775, almost all interior walls and structural elements were demolished and a new structure was added according to the new spaces needed in the building. Because this was poorly documented, it was hard to get started on the design process since this is a crucial element in both the research and the design.

2.5.2 LOCATION VISIT

Before being able to continue with the design process, a better understanding of the Koudenhorn building and its surroundings was needed. Therefore a second location visit was planned since the first location visit was done before the choice was made with which building this graduation project would be proceeded with. Pictures can be seen on the next pages.

During the location visit, it was noticeable that the building was not located at the most vibrant location of the inner city of Haarlem. However, the Koudenhorn building is located near one of the future vibrant axes from the city centre of Haarlem towards the station (Urahn I stedenbouw & strategie, Goudappel Coffeng, & APPM Management consultants, 2021). Again the size of the building was noticeable to its surroundings, both in footprint and in the height of the Koudenhorn building. Also, the materiality and use in the colour of the newer volume for the Traffic Police are remarkable when walking in the neighbourhood. Besides the aesthetic of the building as a whole is quite sober and lacks ornamentation when compared with other buildings in the inner city of Haarlem.

2.5.3 PROCESS

Even though the first design principles could be concluded out of the research done, the main focus point of this graduation studio is still research by design. Therefore it will still be relevant to focus on the different research topics throughout the design process.

Volume studies

The first step within the design process was to implement the design principles on the building of the Koudenhorn starting with volume studies. By doing so, the relation of the urban block to the surroundings could be figured out. Out of the location visit, it


Sanitair
Dakbedekking
Verwarming
Elektra
Onderhoud


POLITIE


POLITIE

became clear that the Koudenhorn building is quite close to its surroundings. This does not necessarily need to be a bad thing, but it should be something that needs to be taken into account during the redesign. At the moment the building only has a few entrances, from which one of them is public and the others are hidden away, If the building is to be transformed for a public function, the entrances are an important element for the design.

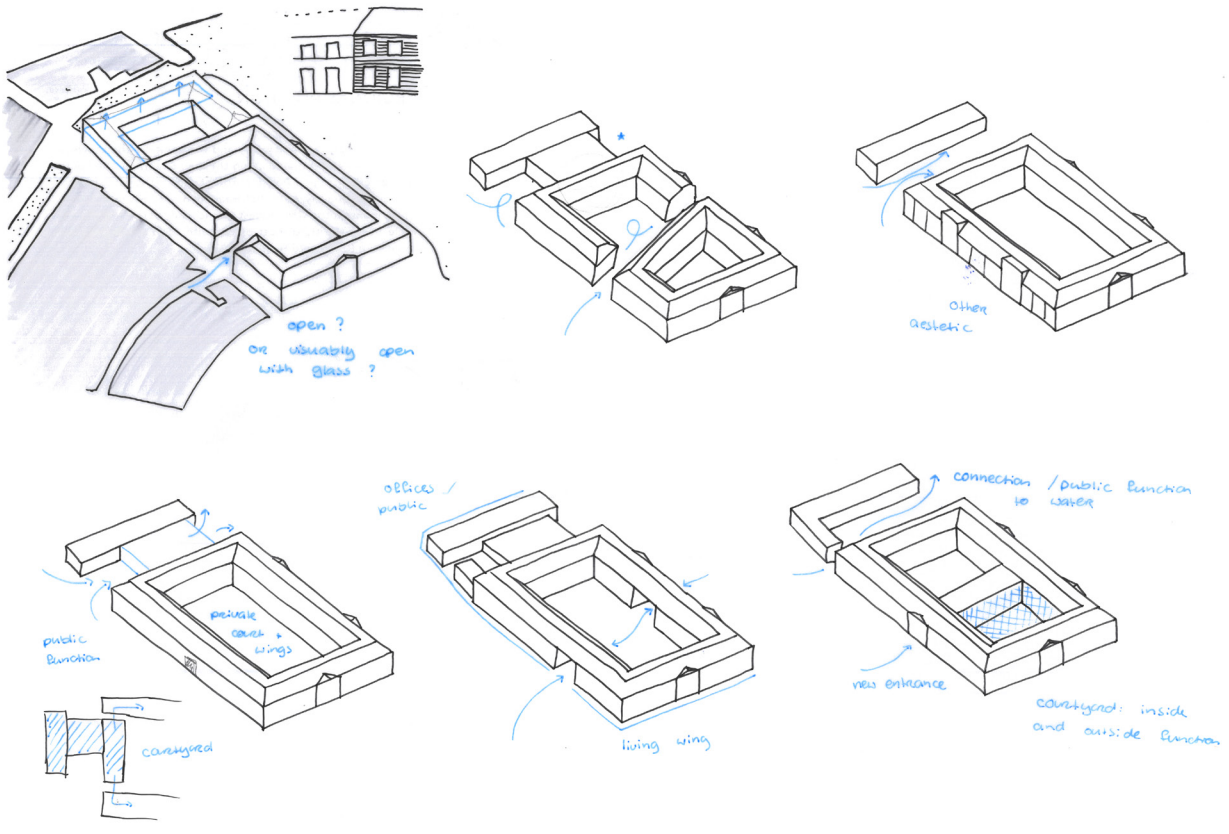
Taking into account that the building will probably change in use, the location of these entrances are relevant as well. Looking into the routing of people using the building, it becomes clear that most people will enter the building from the city centre, at the side of the volume of the Traffic Police. The main entrance is located on a busy road which is not really used by pedestrians or cyclists. Besides, there is an alley on the south side of the building which offers potential for the location of a new entrance.

Creation of courtyards

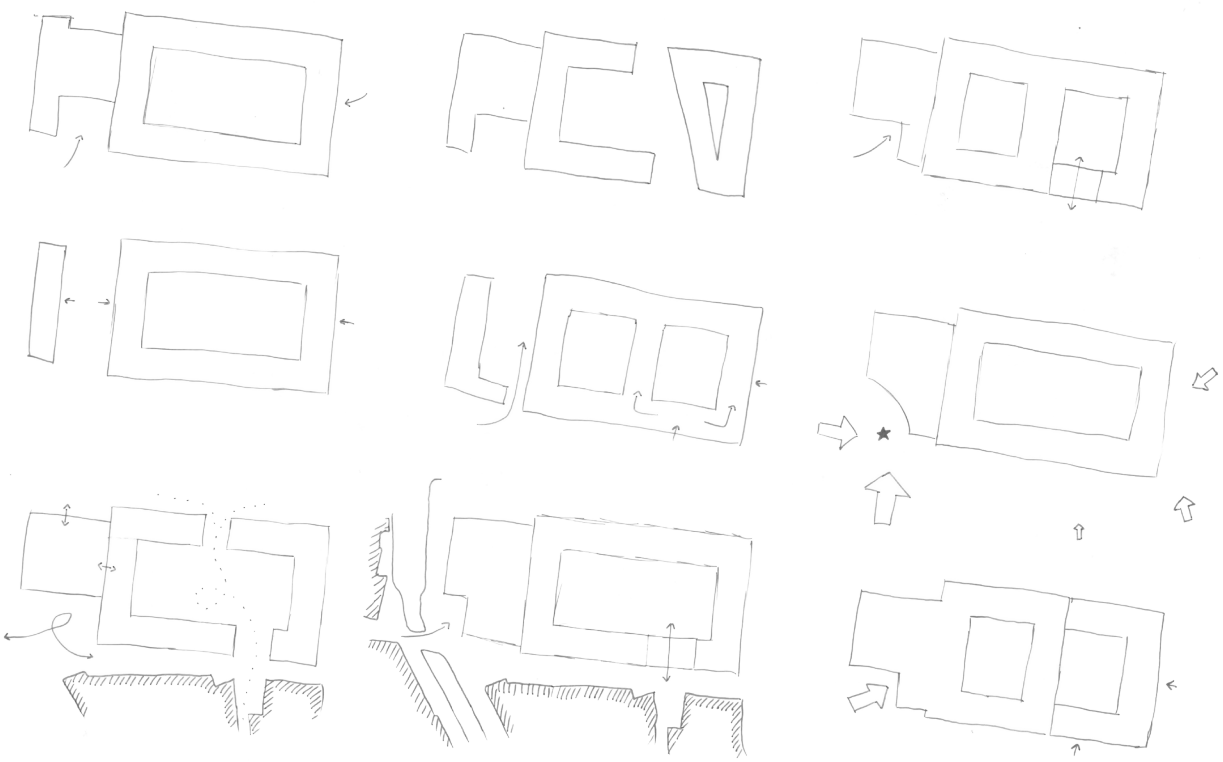
Adding volume to the urban block in order to densify the city centre is only possible within the courtyard, next to the water or on the volume of the Traffic Police in order to obey the rules for the protected cityscape of Haarlem. Separating the courtyard of the Koudenhorn in multiple courtyards will create a division in the building for different programs and the different courtyards themselves also could have contrasting characters.

Location of the program

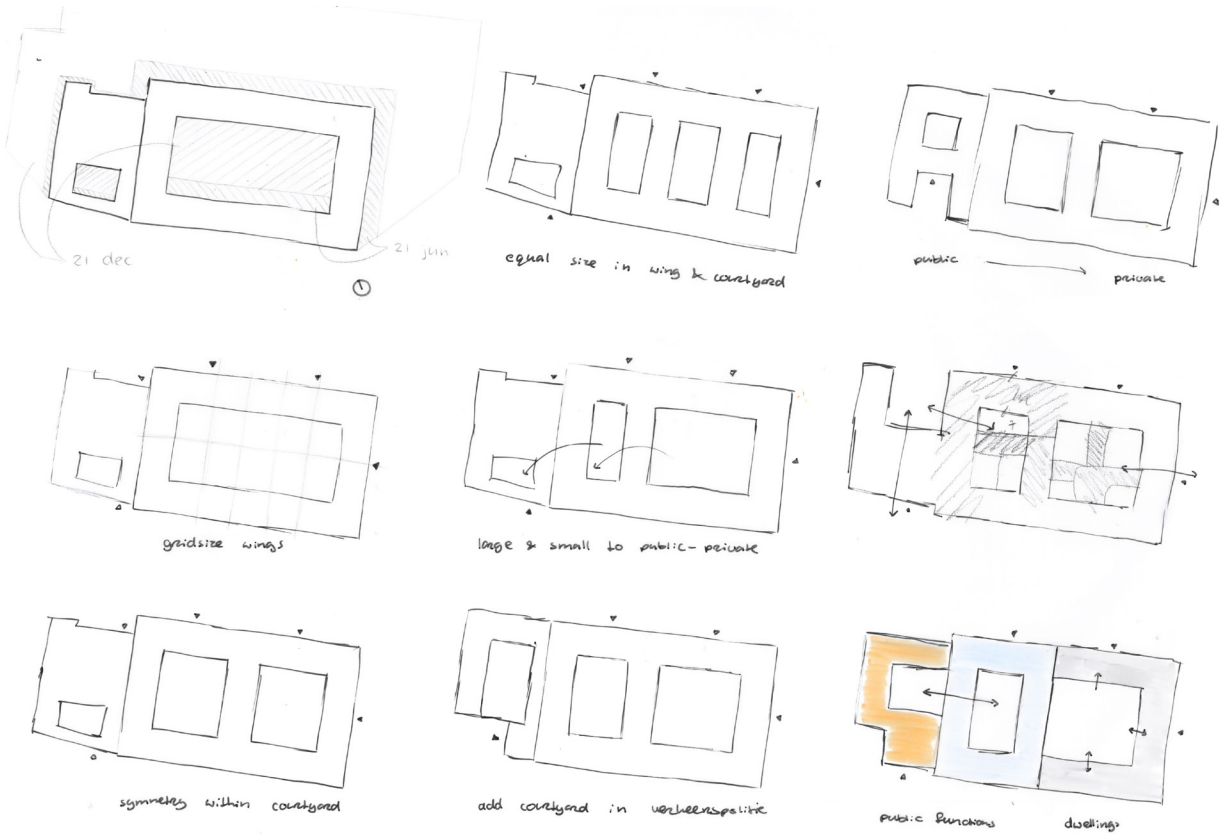
Finding a suitable new program for the Koudenhorn building seemed contradictory when the research focus for this graduation project is to redesign a space plan that can



First volume studies.



First volume studies.

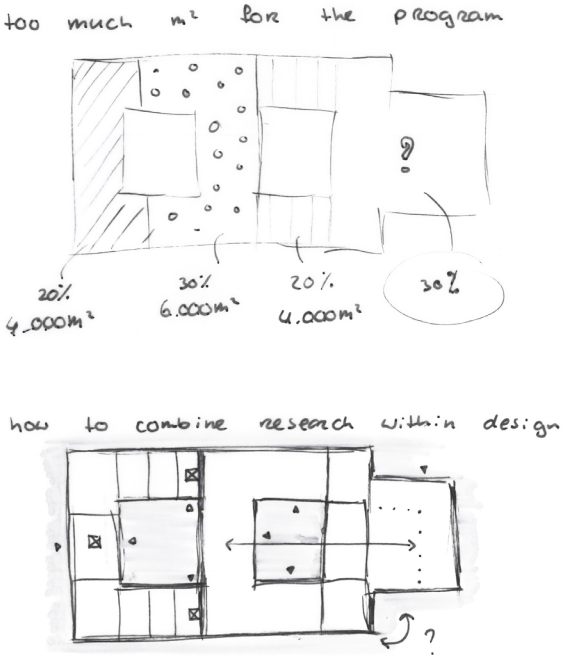


Studies on devision of the courtyard.

accommodate changes in use over time. However, based on the program research the most suitable use for the Koudenhorn building at the moment is a mix of functions, a place for dwellings, flex office spaces, F&B and culture will be added to the building.

In relation to the new program for the building, each courtyard or volume could have its own identity and use. A private courtyard that can be used for dwellings. Another courtyard that is semi-public for the offices and F&B and a third public courtyard that relates to the cultural program of the building. For this, research into different types of courtyards was done.

Looking into the routing and possible new entrances for the building, it makes the most sense to put the public functions in the building for the Traffic Police, since most people will approach the building from this direction. The semi-public functions like the flex offices will be located between the cultural spaces and the dwellings, so therefore this use can be found in the middle of the redesign.



Challenges in the redesign.

Redesign of the floorplans

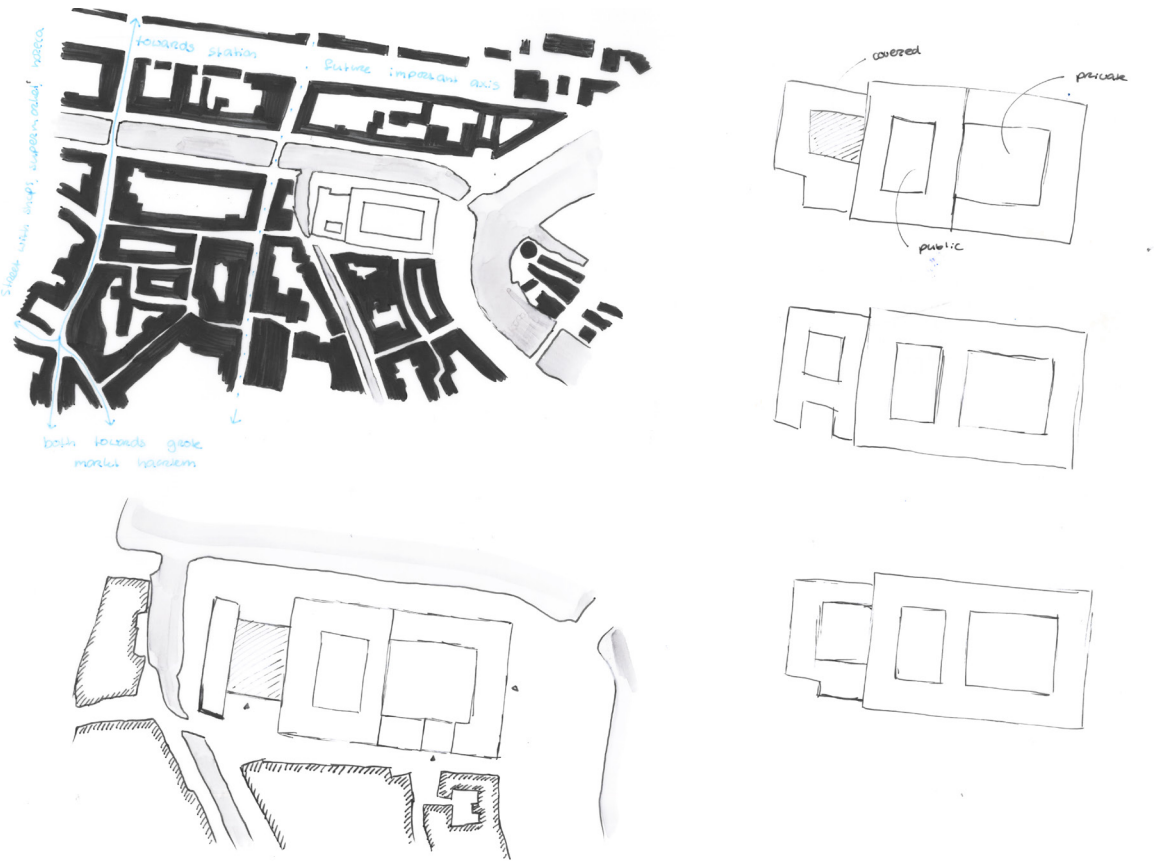
Initially, it was the idea to complete the individual research before diving into the design and therefore starting on the floorplans. However, throughout the research process, it became clear that this graduation project should be focused on research by design. Nevertheless, some results from the research were still crucial to be able to start on the floorplans.

For the individual research, three different design approaches were distinguished that can be used within the frameworks of structure, skin, roof/hall and the user. 1) Redesign a building with an adaptable infill. 2) Redesign the space plan of a building creating a generic space in which the user can be adaptable using the open building principles. 3) Redesign the building in a way that the permanent elements are located at smart places throughout the building.

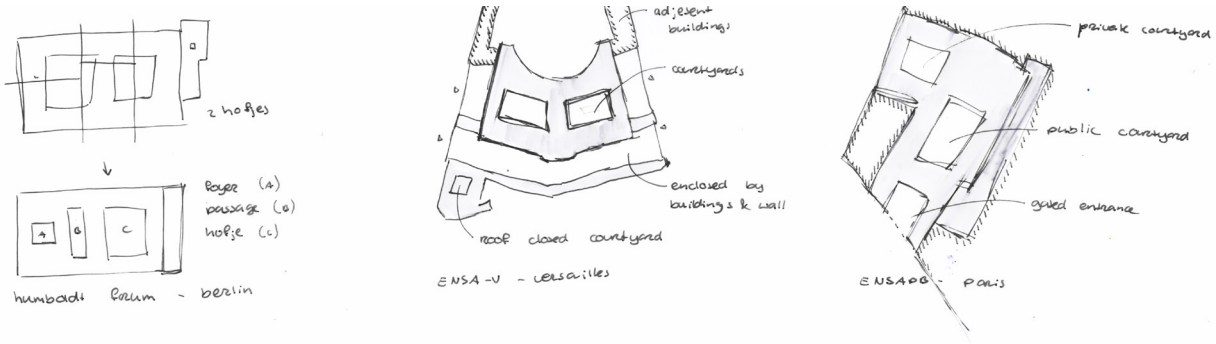
To be able to figure out which design approach is best applicable to the Koudenhorn building, one of the most important things was to get an understanding of the structure of the current building. Unfortunately, this was one of the hardest things to figure out with the building analysis since the complete interior of the building, including the structure, changed during the renovation in 1770-1775.

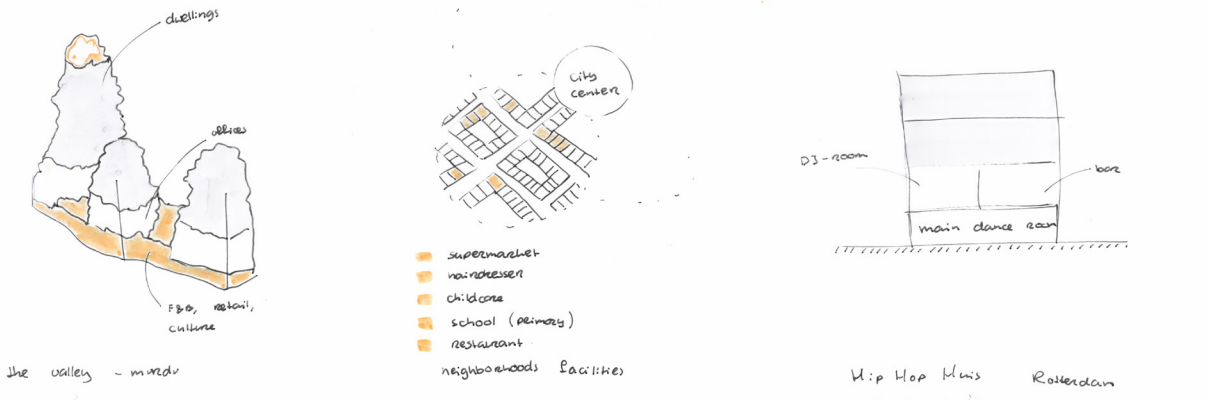
Next to this, another important starting point was the research into the sizes of rooms for different types of uses, which can be seen in subchapter 2.4. Questions arose whether the spaceplan should be able to be used in such an adaptable way that every use should be possible, or that the change could take place between the uses that are similar or do have similar sizes.

It became soon clear that this building should have a different approach for dividing the



Location of courtyards, entrances and the changed volume for the Verkeerspolitie.



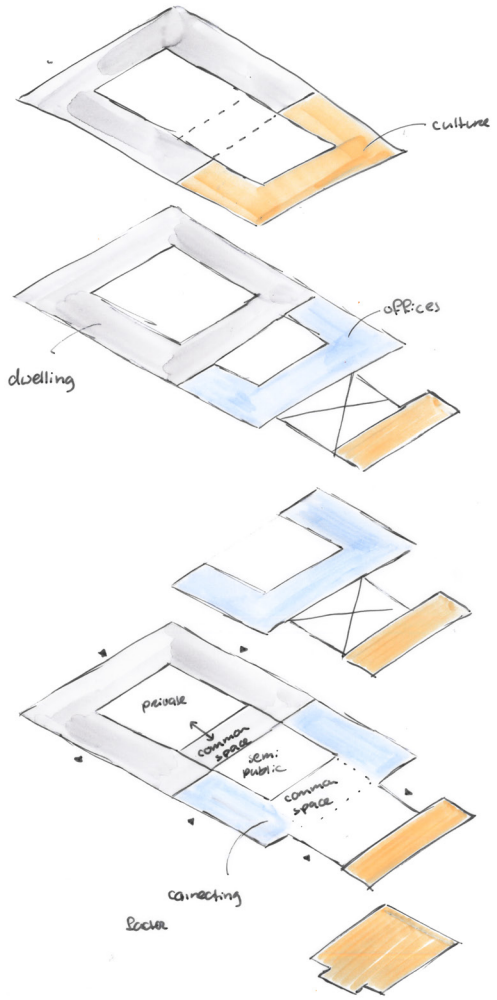


Research into case studies for courtyards and devision of program.

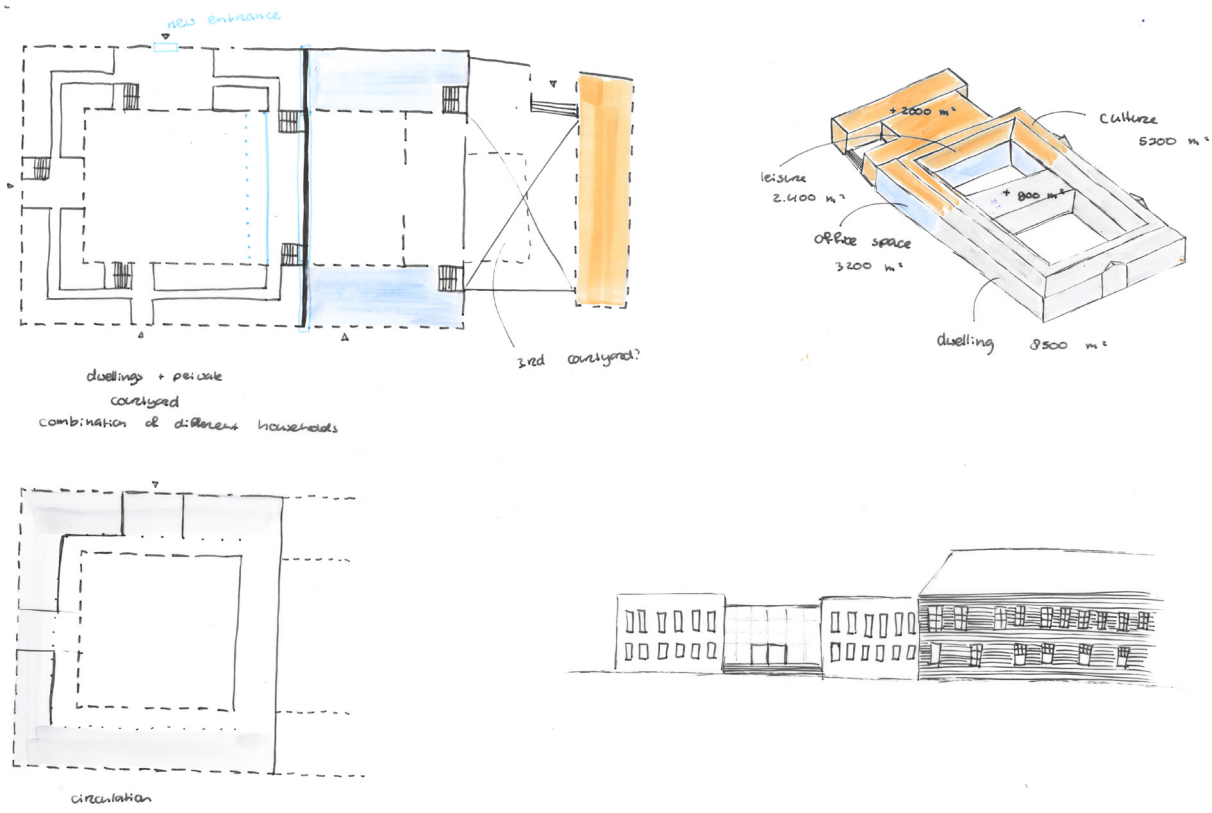
program into the building. Looking into the seizes of different functions a conclusion was made to house all cultural functions in the newer volume of the Traffic Police. Because this building has an oversized concrete structure, the new volume could also be added on top of the building. In this volume, there will be room for placemaking when the current functions are not applicable anymore to the neighbourhood. The older volume of the Koudenhorn will focus on the concept of open building and will house the offices and dwellings since these uses have approximately the same sizes in the floorplan. The separation of these uses can change over time if it is needed.

Initial design proposal

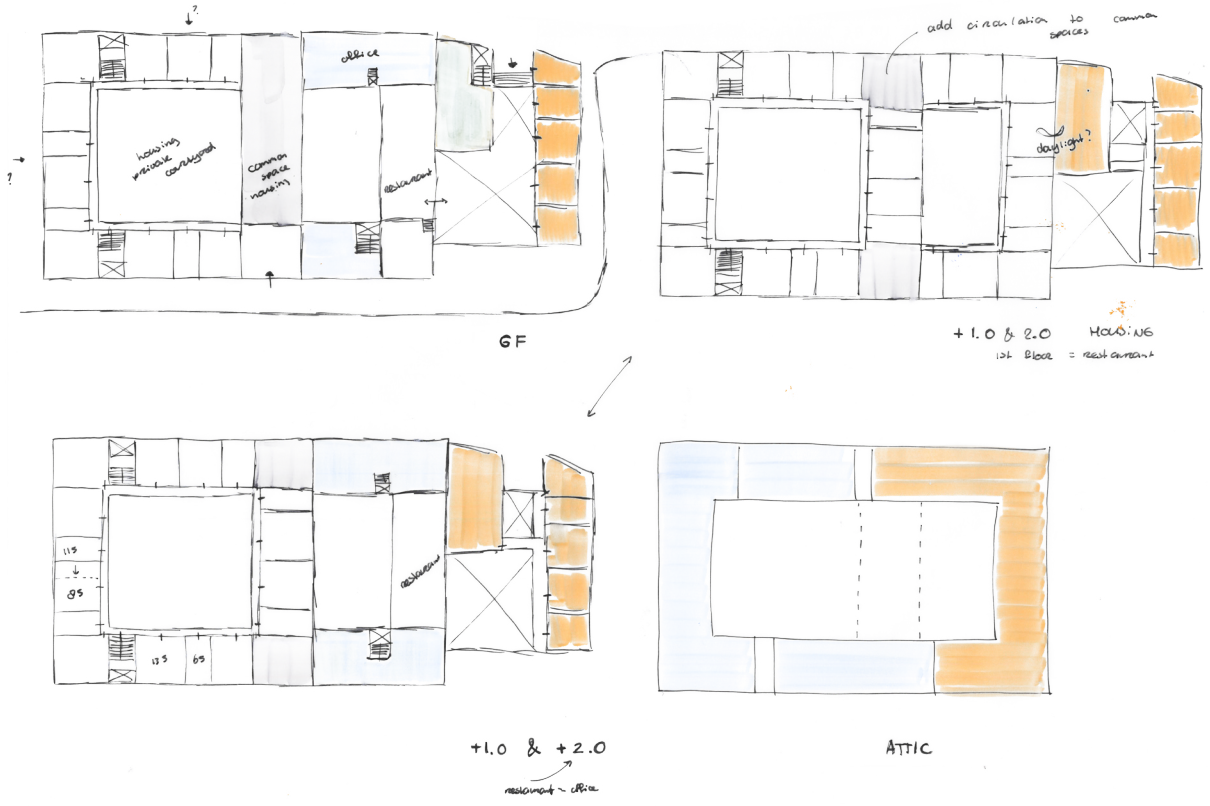
Having researched the open building principles, two different typologies seemed suitable for the Koudenhorn building. Since the Koudenhorn is a monument, not that much can be changed about the facades. In relation to this, eighter loft apartments or dwellings connected to a gallery seemed to be the best approach. The dwellings will house different types of target groups like social housing, families and senior citizens. They will share a private courtyard together and will have communal spaces.



Division of the new program.

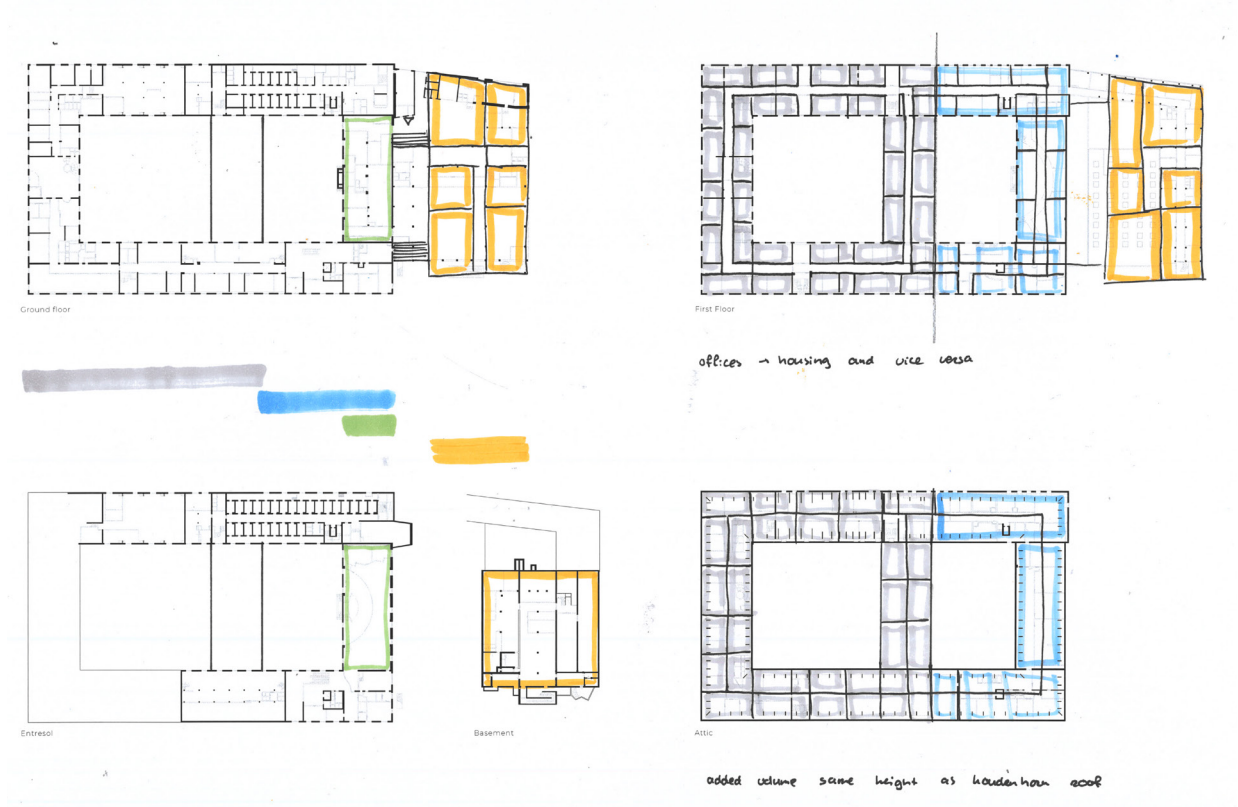


Routing and devision of program within the floorplans.

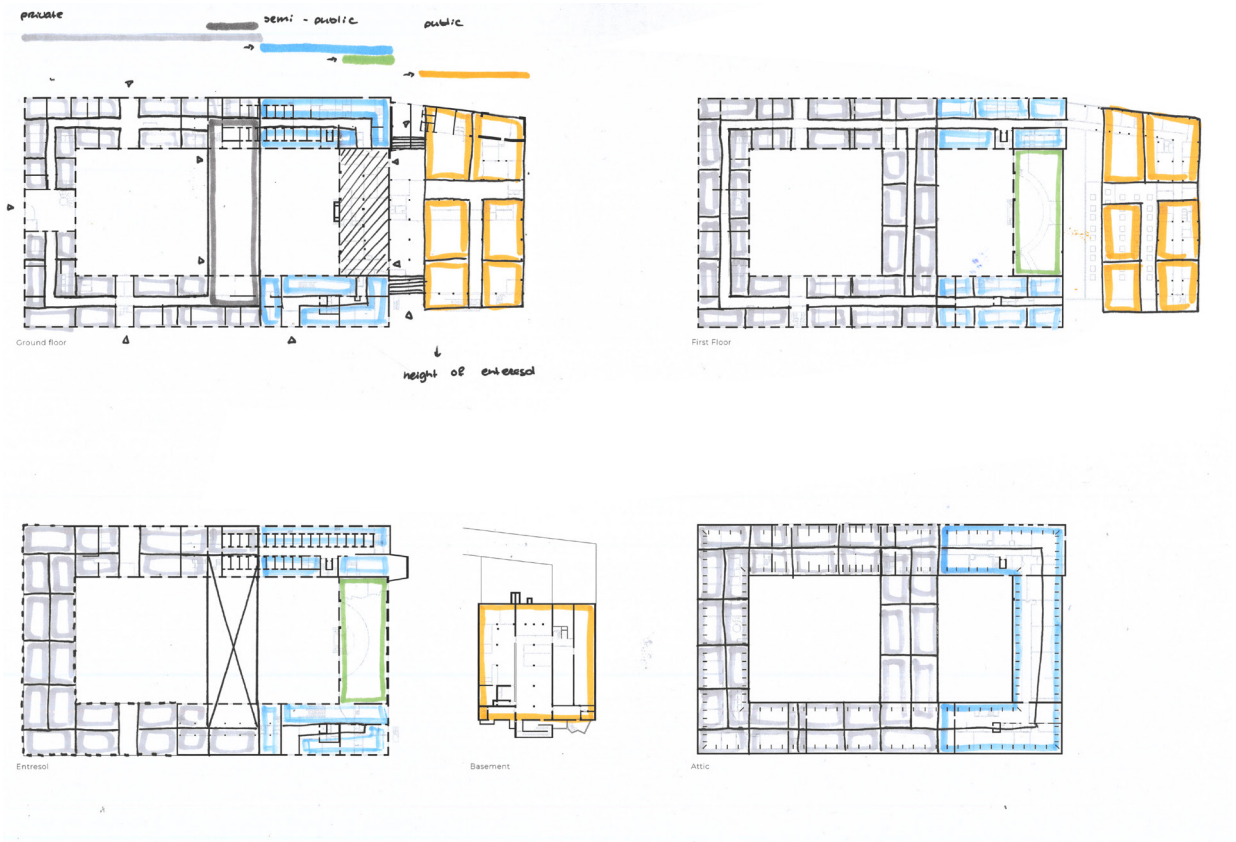


Routing and devision of program within the floorplans.

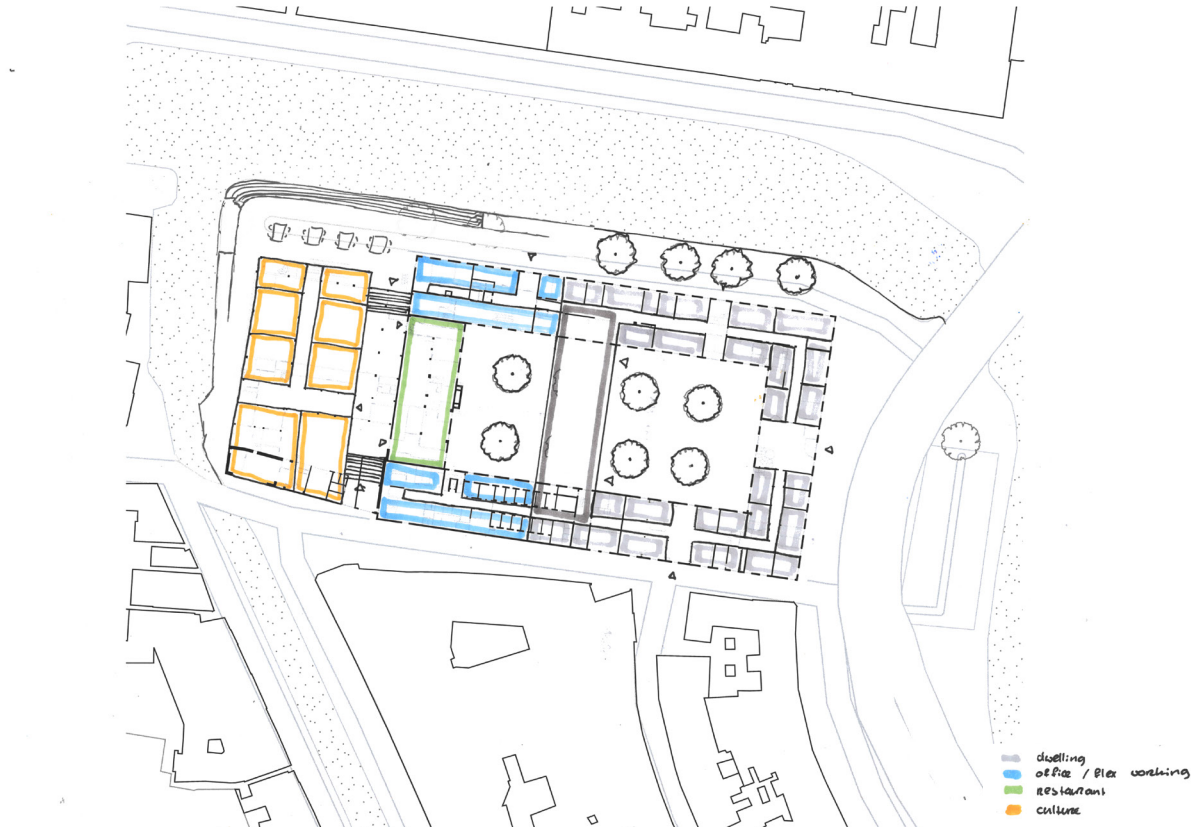
Devision of program within the floorplans.



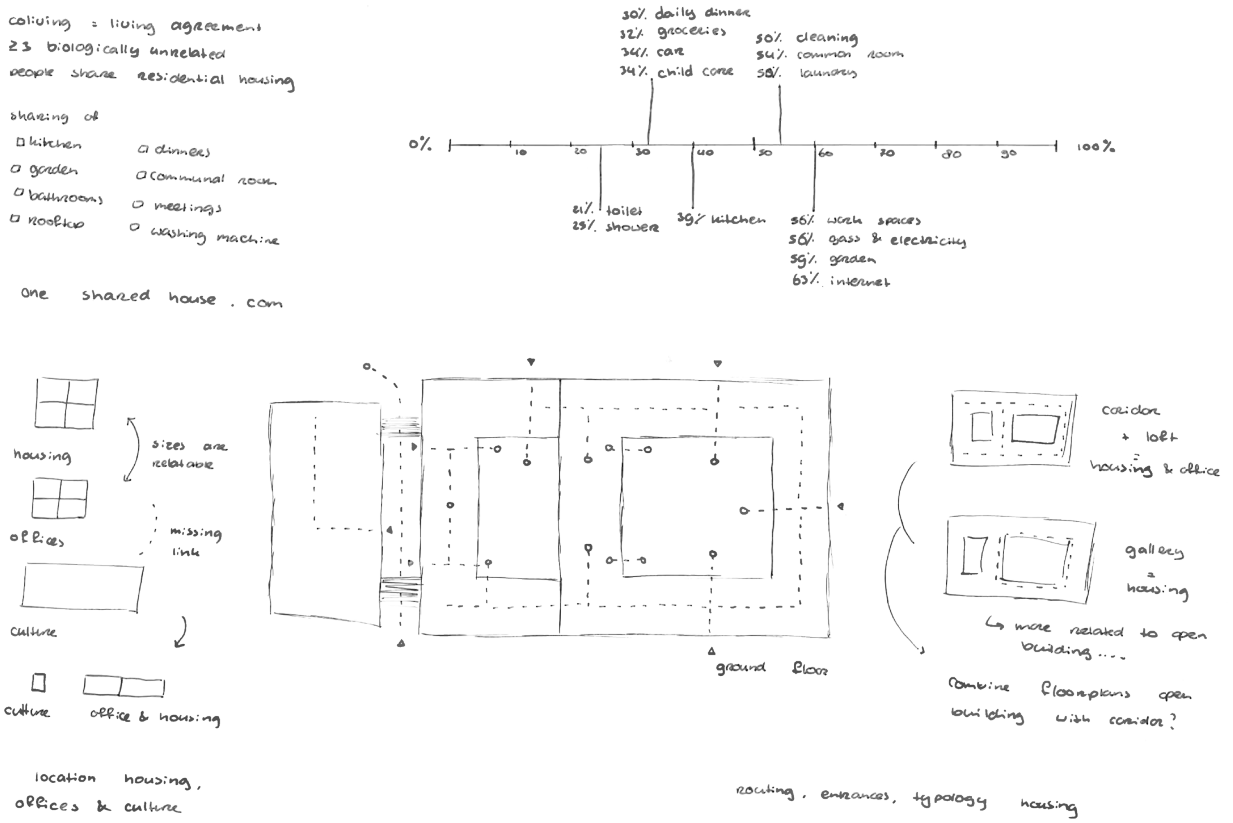
Devision of program within the floorplans.



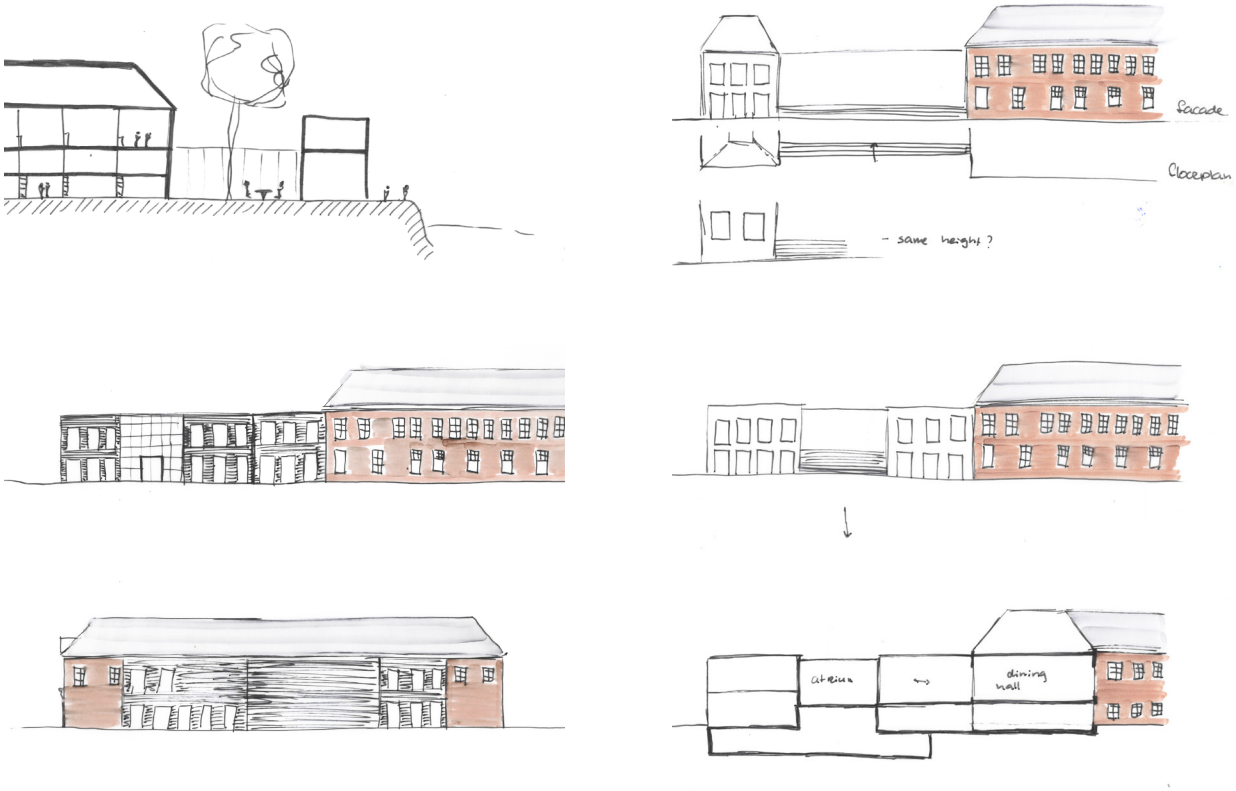
Devision of program within the floorplans.



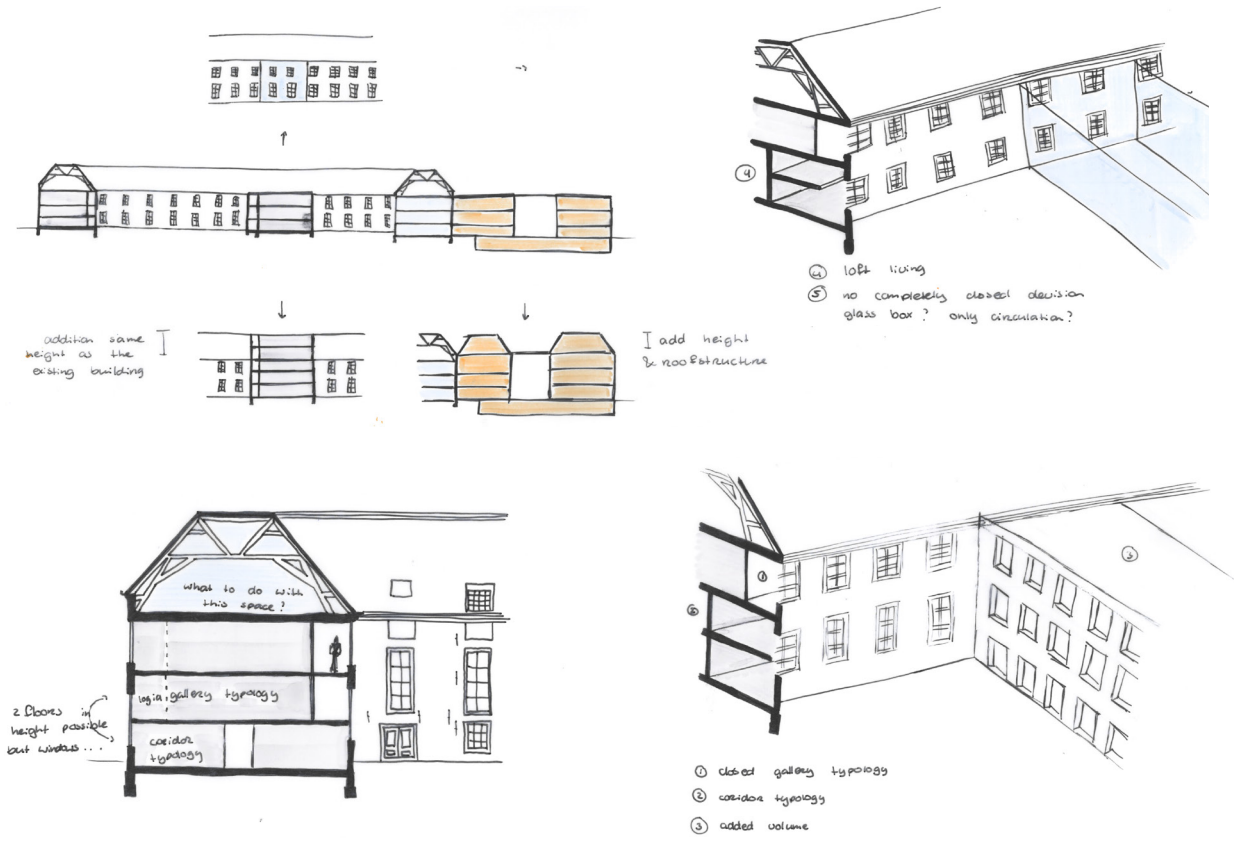
Devision of program within the floorplans.



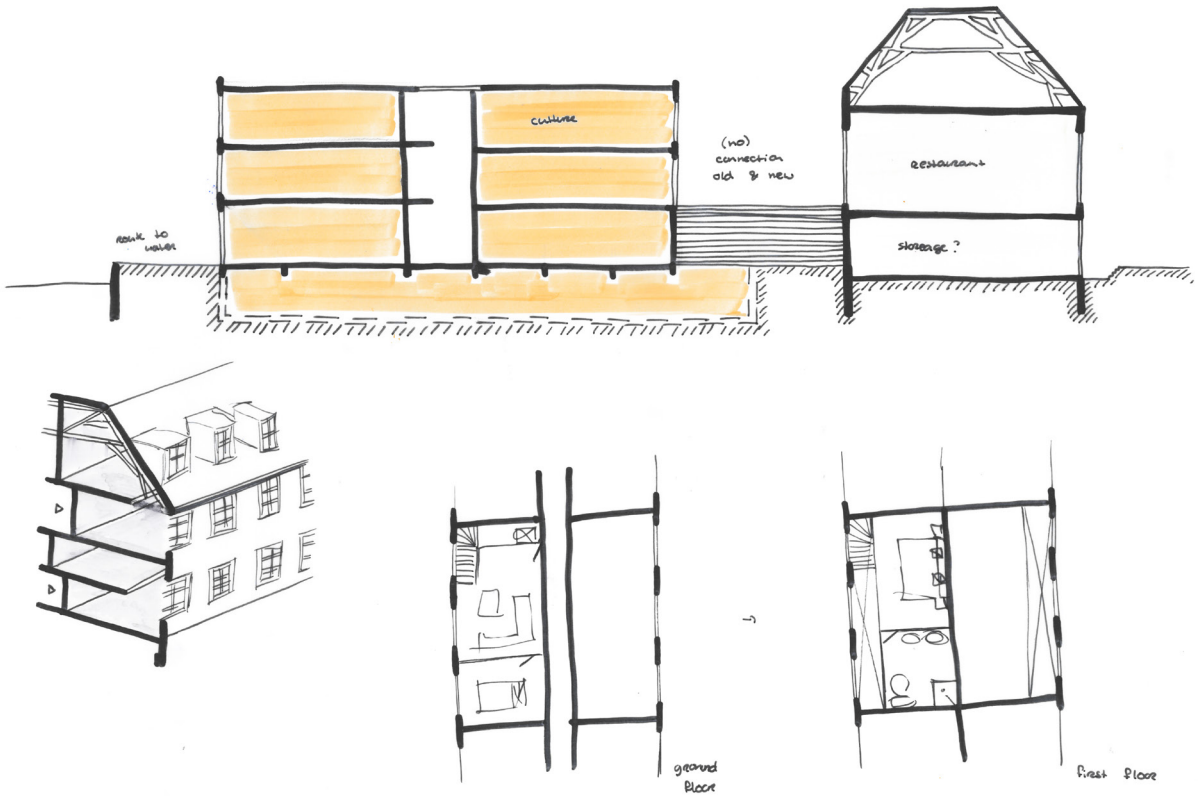
Studies on community living and sizes of different typologies.



Studies on facades and sections.



Studies on sections with different typologies and routing.



Studies on sections with different typologies and routing.

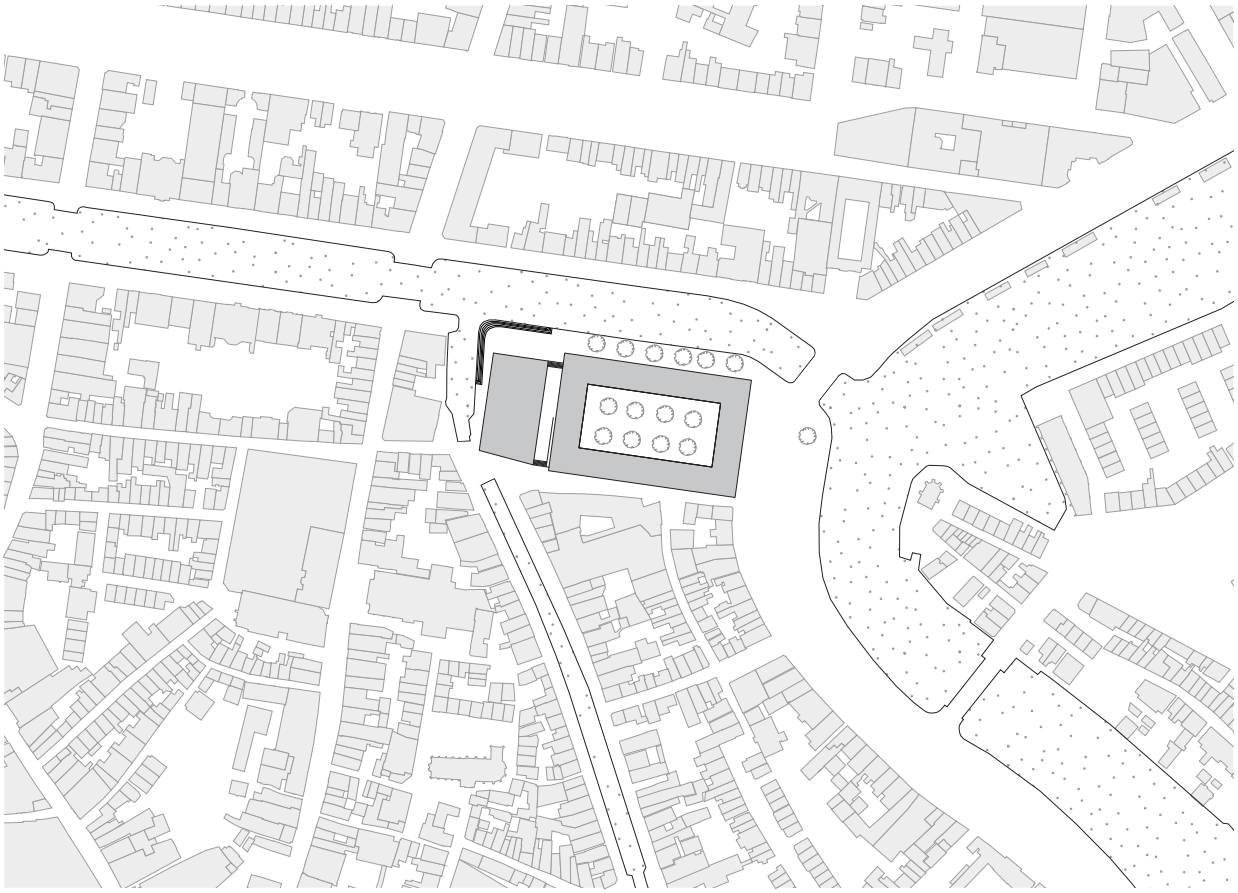
2.54 INITIAL DESIGN CONCLUSIONS

While combining all the research and design progress, a conclusion was made to remove the added volume in the courtyard. In relation to the research topic of this graduation project, the placement of the courtyard did not make sense because it creates a clear division between functions. Since the building will be able to house different uses over time, this division will be changeable and will not be a clear line within the building. Besides, the extra added volume would cause difficulties with daylight and in designing a generic routing that can be used for different future functions.

However, a clear division between the old building of the Koudenhorn and the new volume of the Verkeerspolitie is created by making a clear distinction between the different volumes. A gap between the two volumes will be realized to ad a public route towards the water.

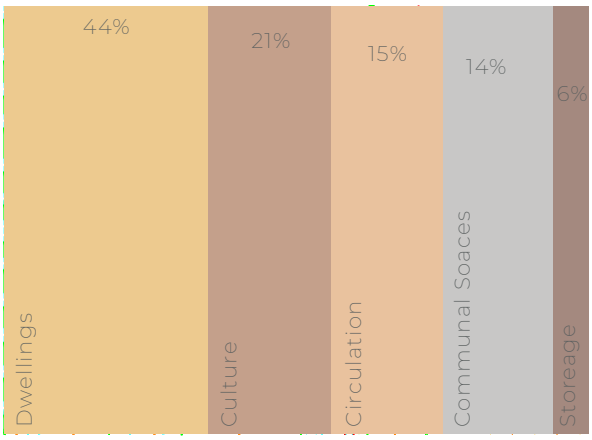
The Koudenhorn will be a building for co-living and culture, to enhance the social characteristics of a courtyard. To improve the social connections and social support of the neighbourhood, a cluster with communal spaces will be created. The building will house a shared workspace, laundry room, common room a kitchen as well as a communal garden. Research has proven that people are most willing to share these spaces (Pereya & Repponen, z.d.).

Besides, as can be seen on the next pages, initial ideas for the changeable floorplan, building technology and the energy concept have been formed.

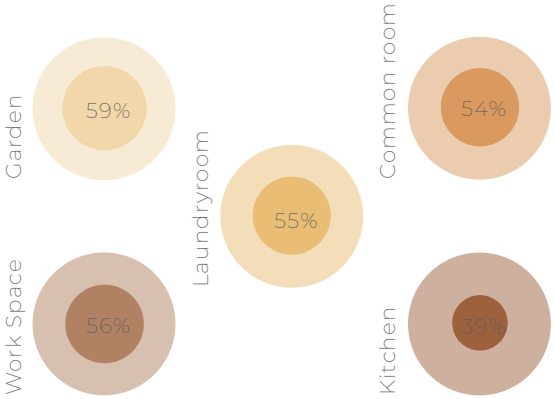


Urban surroundings.

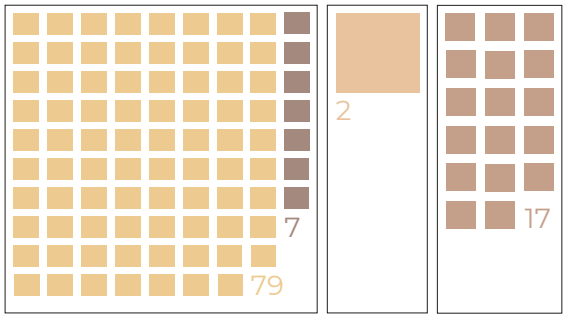
0 100M



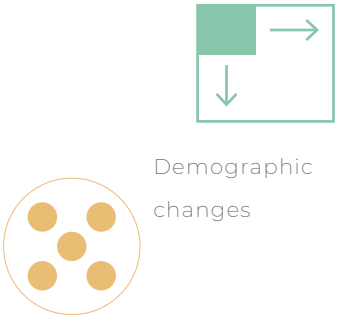
Devision in program.



Co-living shared spaces.



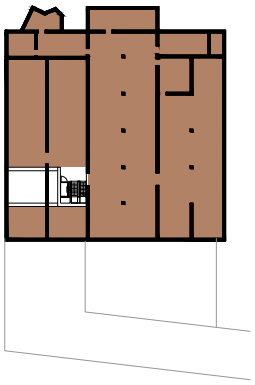
Changeable and permanent spaces.



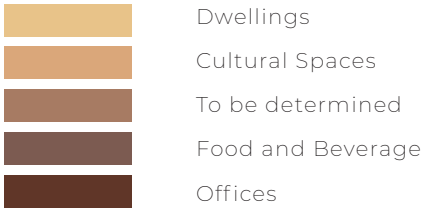
Societal challenges.

Starter	Young couple	Family	Elderly
5 - 10 years	5 - 10 years	20 - 30 years	20 - 30 years
Apartment size of 30 m²	Apartment size of 50 m²	Apartment size of 80 m²	Apartment size of 50 m²
Transportation by public transport	Transportation by bike	Transportation by bike	Transportation by electrical bike
High engagement	Medium engagement	Involved engagement	High engagement
Needs: work spaces	Needs: work spaces, close facilites	Needs: space and play area	Needs: garden and common room

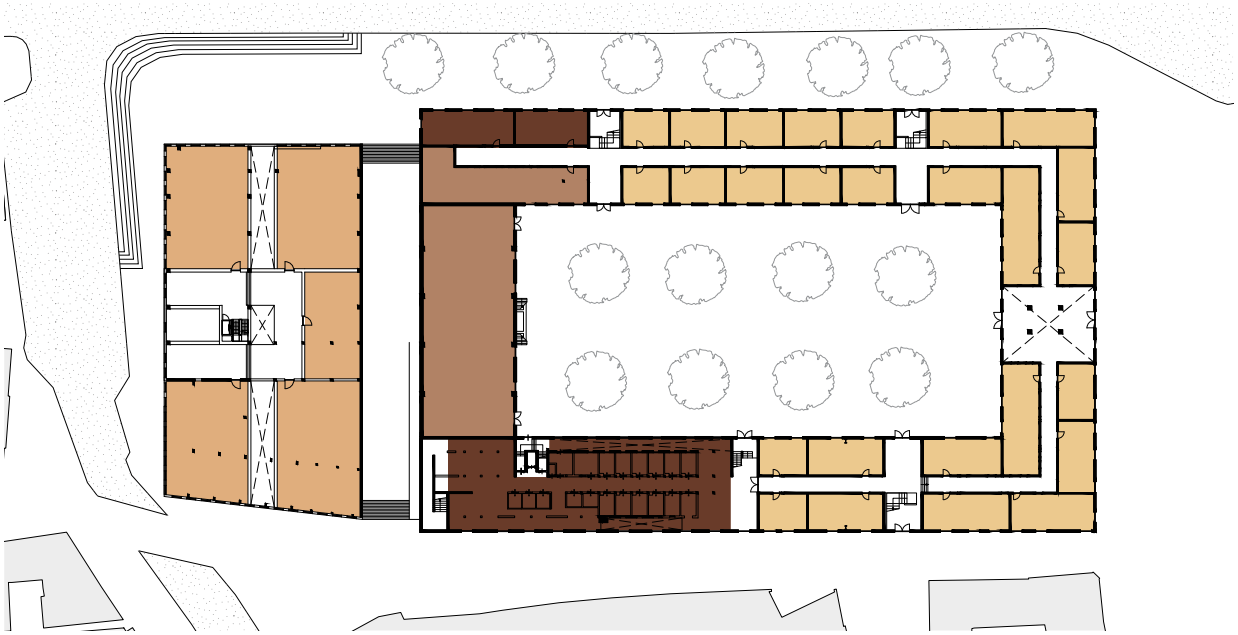
Program of requirements.



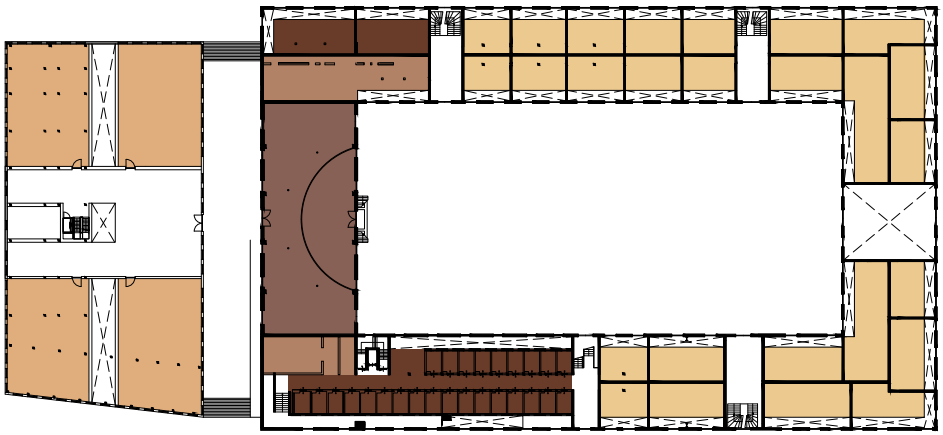
Basement



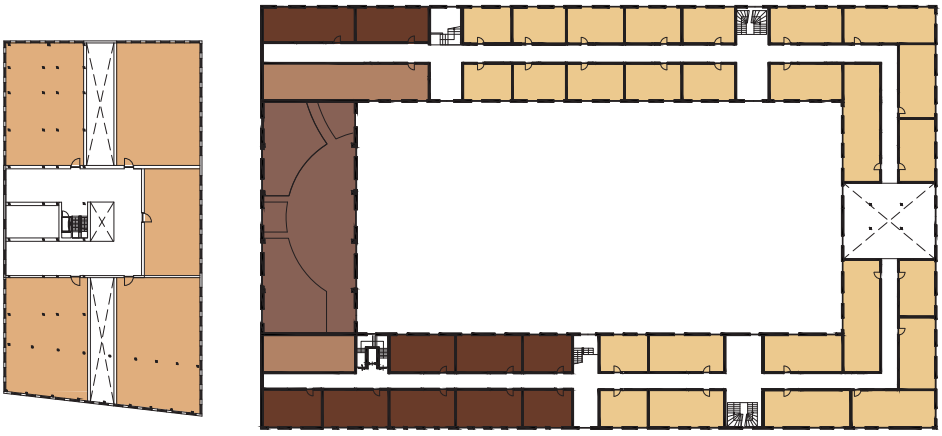
Legenda



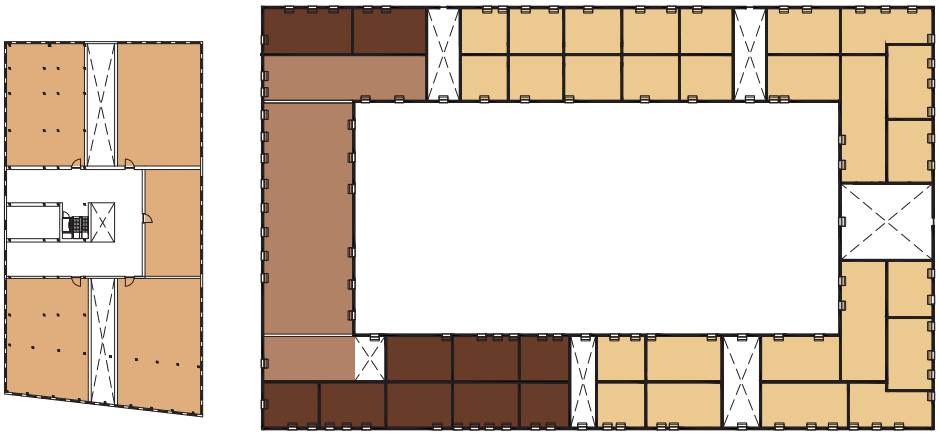
Ground floor plan



First floor plan (entresol)



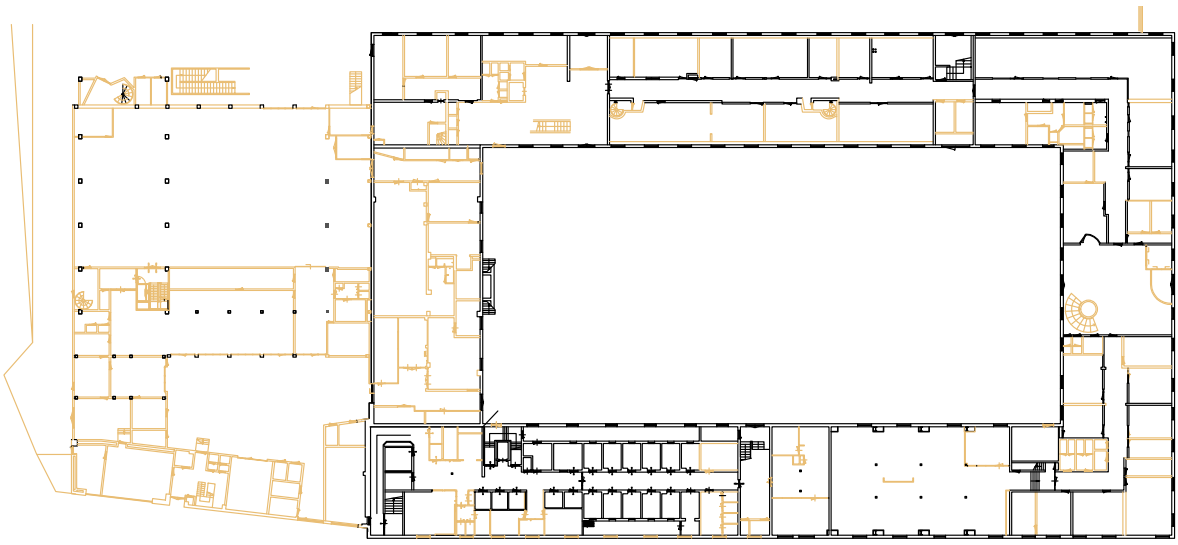
Second floor plan



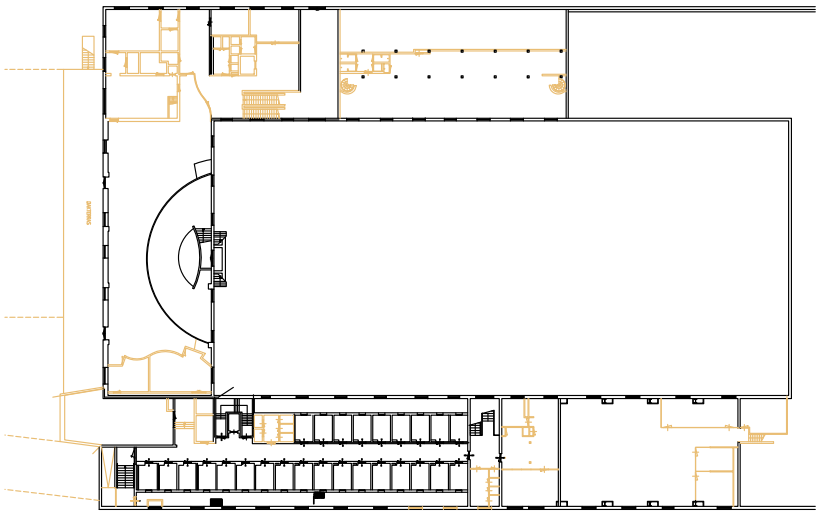
Attic

Elevation and section North facade

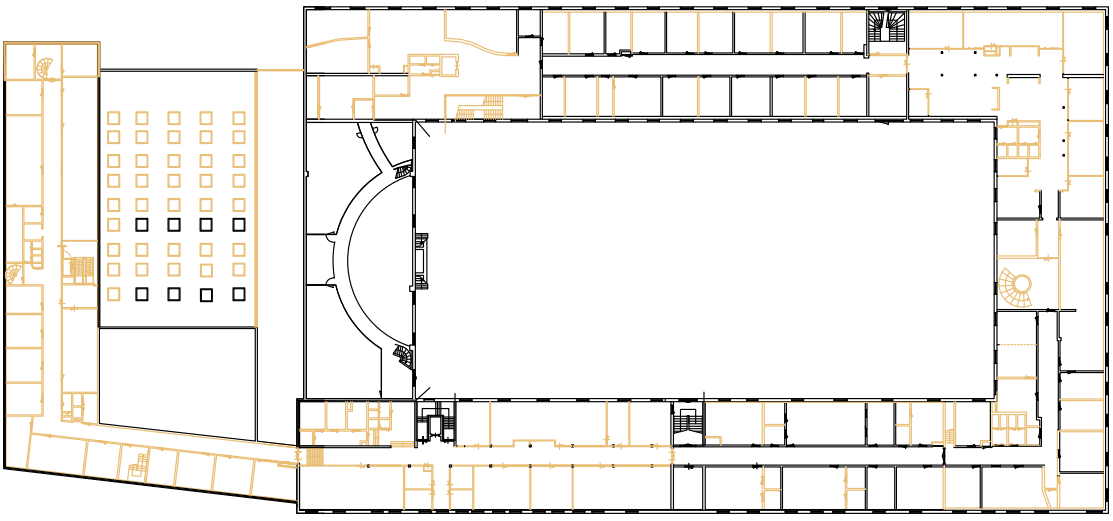
0 20M



Demolition plan - ground floor

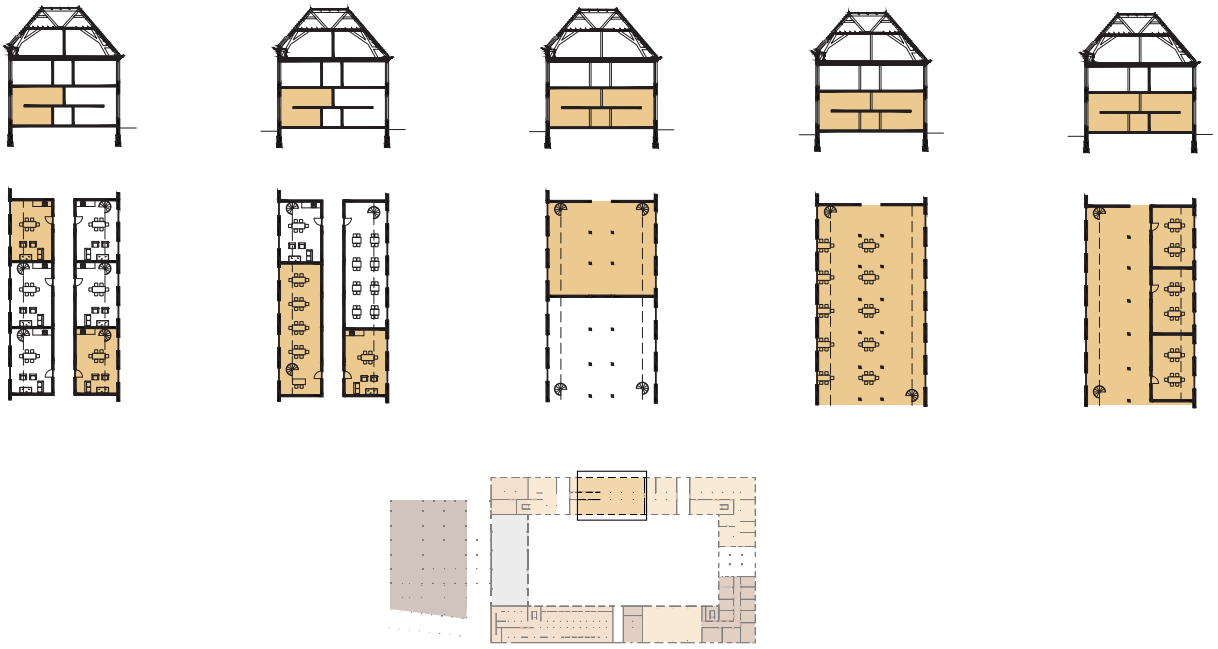


Demolition plan - entresol



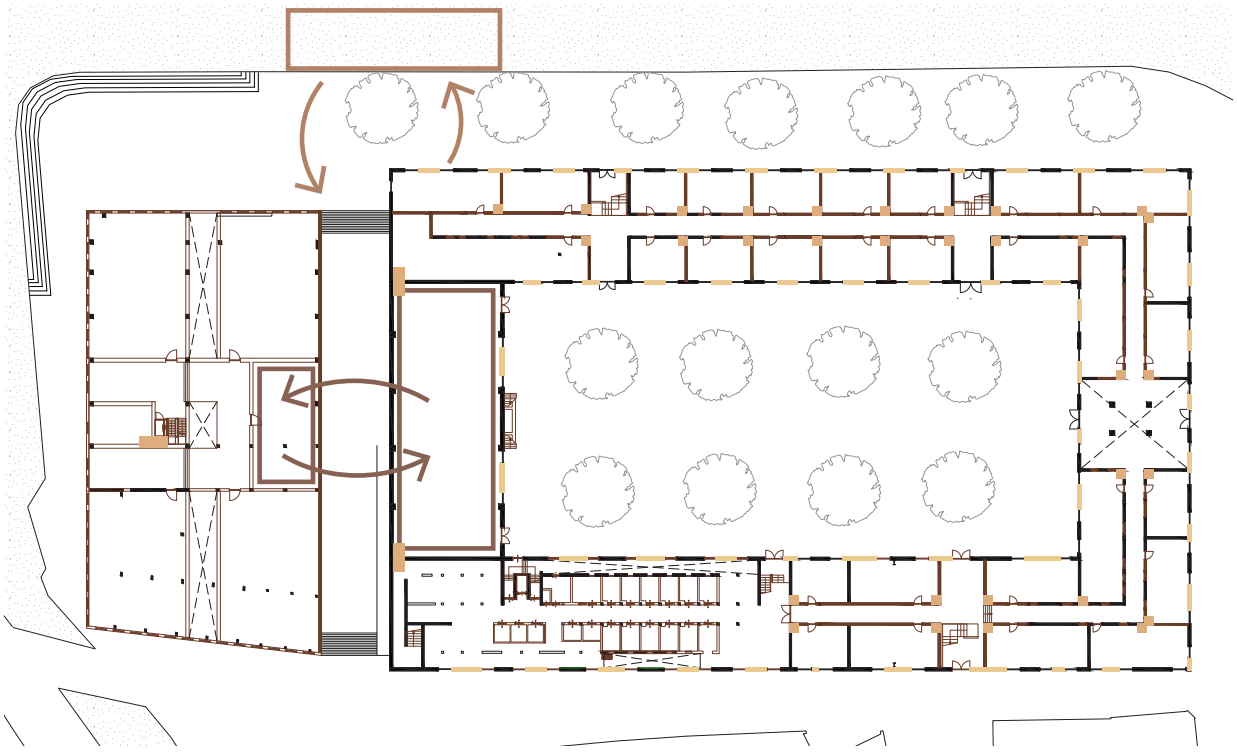
Demolition plan - first floor

0 20M



Research by design - changeable typologies

0 20M



Legenda

- Existing structure
- New non-loadbearing walls
- Combine energy demands
- Use water for heating/cooling
- Permanent shafts for systems
- Decentralized ventilation

First ideas on building technology

0 20M

PROVISIONAL RESEARCH AND CONCEPTUAL DESIGN

2.6 P2 Presentation and Reflection

2.6 P2 PRESENTATION AND REFLECTION

2.6.1 BUILDING ANALYSIS

Out of the building analysis, some results are important for choosing a new program for the building, whereas other results were more important for my individual research.

Regarding the individual research, an understanding of the loadbearing structure of the original building is really important. However, it was hard to figure out how the loadbearing structure of the whole building worked. During the interior renovation of the Koudenhorn in 1770-1775, almost all interior walls and structural elements were demolished and a new structure was added according to the new spaces needed in the building. Because this was poorly documented, the structural drawings are based on quite some assumptions.

Combining the difficulties to get an understanding of the structure of the building and missing out on the interior visit because of illness it was hard to get a grasp on the complete building analysis of the Koudenhorn.

2.6.2 TRANSFORMATION FRAMEWORK

The Neoclassical facades of the original Koudenhorn building with their harmony, symmetry and monumental entrances are of high value. The interior of the Koudenhorn has been renovated in 1770-1775 and has a lower value than the original structure which is still visible in the canteen. However, the added holding cells during the renovation are of high value because these show, just like the canteen, the different uses of this building throughout time. The structure of the Traffic Police, which is likely to be designed oversized, is of value for the transformation framework. This structure can be easily adapted and more volume can be placed on the building. However, the facades of this volume are of low value.

2.6.3 A MIXED USE PROGRAM

Looking into references where a mixed-use program is used, it became soon clear that the Koudenhorn building is large in its size. And because it has the size of an urban block, it could almost be functioning as a little village on its own. Combining housing with other functions often results in an 80% to 20% ratio, which would mean in the case of the Koudenhorn that the old building will be redesigned to housing and the building of the Traffic Police to other functions.

However, during the individual research and initial design process, it became clear that this building should have a different approach for dividing the program into buildings. Looking into the seizes of different functions a conclusion was made to house all cultural functions in the newer volume of the Traffic Police. Because this building has an oversized concrete structure, the new volume is also added on top of the building. In this volume, there will be room for placemaking when the current functions are not applicable anymore to the neighbourhood.

The building of the Koudenhorn will be divided into housing on the one side and flexible office spaces and F&B on the other side. To divide these two functions a volume is placed in the courtyard. The idea is to redesign the space plan in such a way that the spaces can be used in an adaptable way in the future. The line between housing and offices is vague and can shift whenever the users want it to be shifted.

2.6.4 INDIVIDUAL RESEARCH

Up until now, only initial conclusions can be formulated. Because the research shifted to research by design, there are no definitive answers yet to the research and design question: How could the space plan of a monument like the Koudenhorn be redesigned to accommodate changes in use over time? There will be a lot of challenges and limitations for redesigning the space plan of the Koudenhorn, which will be investigated up upon until P4.

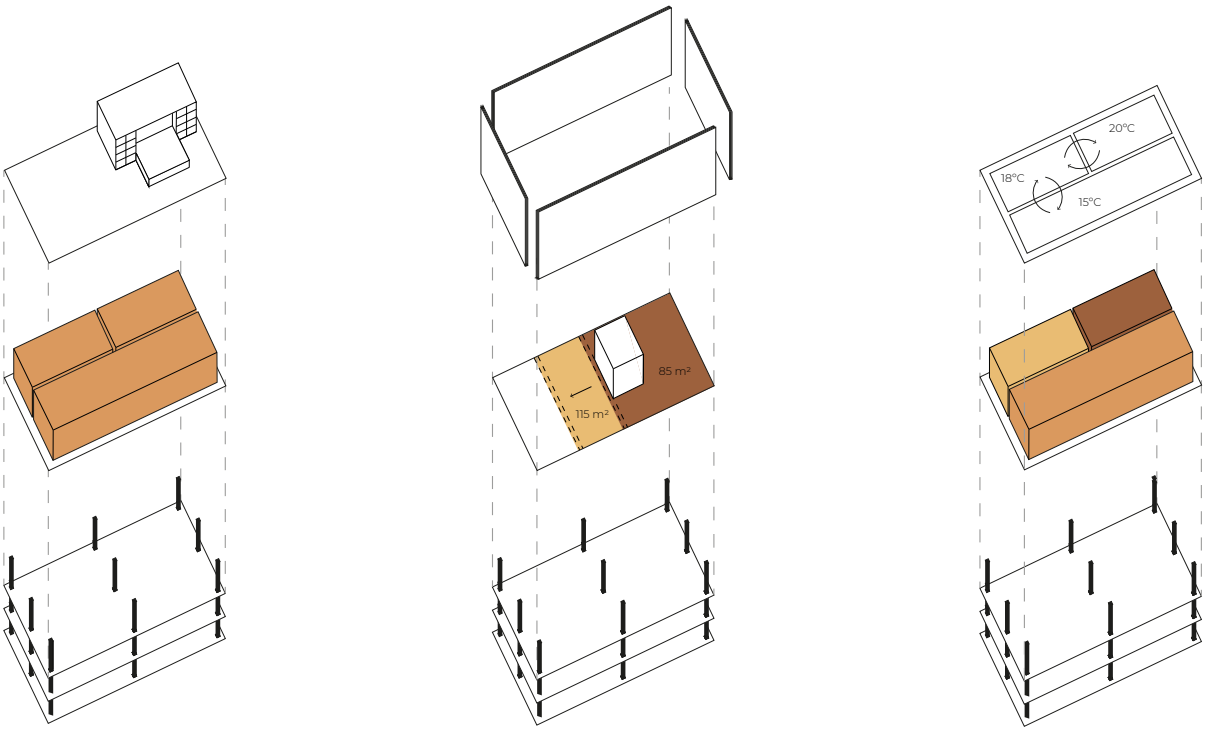
Different approaches could however be tested during the redesign. Because each building is different, every building will need its own approach. The initial conclusions made are generic conclusions from literature, case study research and interviews. During the research by the design phase, it will become clear which approach is best applicable for the Koudenhorn building in Haarlem.

There are 4 different frameworks that can be distinguished in which, even though the use of these buildings changed, the framework remained the same. These frameworks are structure, skin, roof/hall and the user. There are also three different design approaches that can be used within these frameworks.

1. Redesign a building with an adaptable infill, in which the infill has a short lifespan and is therefore moveable, demountable or biodegradable.

2. Redesign the space plan of a building creating a generic space in which the user can be adaptable using the open building principles. For this specific sizing of rooms is important in order to use spaces in different ways or create placemaking.

3. Redesign the building in a way that the permanent elements are located at smart places throughout the building. Locating the systems and vertical elements in such a way that functions can change and energy demands throughout the building work together.



Three design approaches for the different frameworks.

Besides, it is important to have an understanding of the loadbearing structure of the original building. However, it was hard to figure out how the loadbearing structure of the whole building worked. During the renovation of the Koudenhorn in 1770-1775, almost all interior walls and structural elements were demolished and a new structure was added according to the new spaces needed in the building. Because this was poorly documented, it was hard to get started on the design process since this is a crucial element in both the research and the design.

At the same time, questions arose whether the space plan should be able to be used in such an adaptable way that every function should be possible, or that the change could take place between functions that are similar or do have similar sizes.

2.6.5 REFLECTION DESIGN

Answers to the research and design question can only be formulated by implementing the initial conclusions from the research into the design process. However, since the main focus of this graduation studio is research by design, the definitive answers can only be given at the end of the graduation studio. There will be a lot of challenges and limitations for redesigning the space plan of the Koudenhorn to accommodate changes in use over time, which will be investigated up upon until P4.

For the coming period, it is important to research into where the limitations for the adaptability/user within the design lay, to be able to redesign the floorplan in such a way that it can accommodate changes in use over time. For this, the chosen typology will be crucial as well as finding a solution for the corner houses. Besides, the location for the permanent elements such as the wets and the shafts need to be chosen smartly. At the same time, all of this needs to be suitable for the current structure of the building and ideas for the building technology and energy concept need to be formulated.

At the same time, it keeps being important to reflect on why this redesign proposal is better than the previous interior redesign. How do the open building principles add to this design and how does it work in the transformation process. What does this design add to the timeline of the building itself?

2.6.6 UPCOMMING CHALLENGES

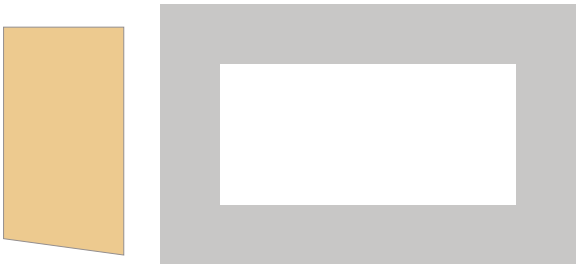
For Msc4 there will be some particular challenges that will need extra attention when working on them.

1. This graduation project focuses on designing an architecture that is resilient in accomodating change in use over time, redesigning a building in which the user needs to become more flexible. However, research into social literature could still be done. How are spaces used, will it be necessary to change in the future and what does the change mean are interesting questions. Literature from Kevin Lynch about What Time is this Place (1972/2009) could be used for this.

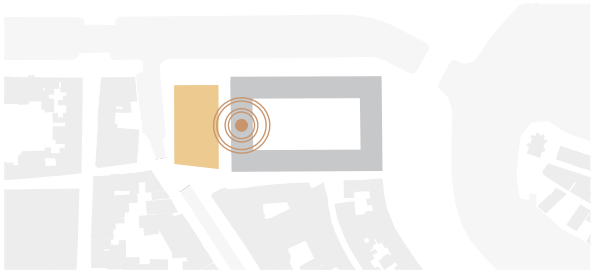
2. Figure out the limitations in designing changeable spaces because of the diverse structure, the placement of window openings, the height differences (in buildings, between both buildings), the corners of the building that need to be treated as exceptions, the fact that dwellings need individual outdoor area, the renewed thermal line and the building needs to become wheelchair accessible.

3. Logically place systems, shafts, try to combine energy demands and functions.

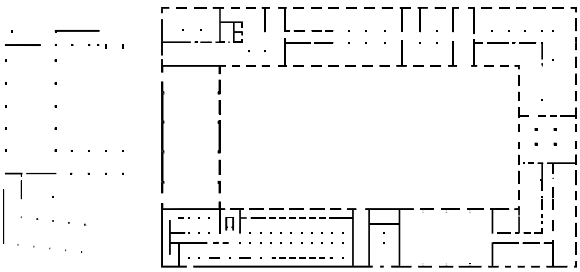
Enhance 10-minute network.



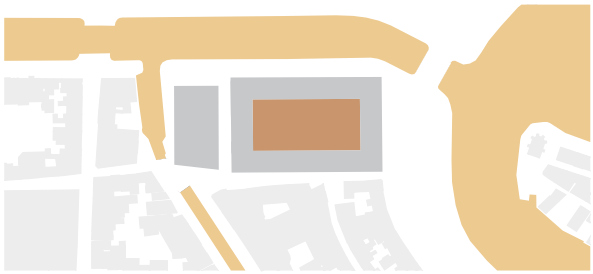
Renewed relationship between old and new.



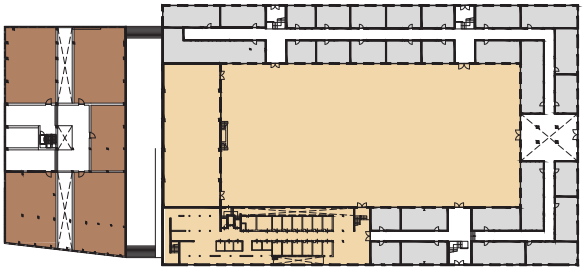
Social connection in the neighborhood.



Keep existing structure from both volumes.



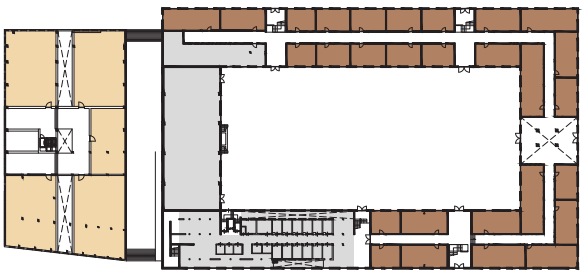
Create relation with water and courtyard.



Public, semi-public and private areas.

Adding volume to the side.

Balance in facades.



Different approaches for future change.

Design starting points.

4. Design urban surroundings, facades and different housing typologies.

5. How much extra volume can the building of the Verkeerspolitie handle?

2.6.7 FEEDBACK

Having presented the upcoming challenges during my P2 presentation, it soon became clear that the main feedback from the tutors was directly related to these challenges.

Design Feedback

In redesigning a space plan to accommodate a change in use, what will be the limit of the building in adapting for the future? Even though it is aimed to design a building that can accommodate different uses, every function still needs specific requirements like a private outside space for dwellings. Therefore the change in function will result in some challenges during design.

Designing a completely new building with the open building principles is easier, than applying it in an existing building because of the existing structure and window openings for example. Besides, there are also spatial challenges concerning the existing values of the building. The current dining hall and holding cells have a high value, will not be changed during the redesign and are therefore not compliant with the open building principles.

Building Technology

There is a start on the energy concept which looks convincing and the structure offers interesting challenges. But why not remove all structures to create a space plan that can be more adaptable? However, it feels contradictory to completely remove all interior time layers to pursue a design approach that seems the most future proof at the moment. This perception can change while at the same time, it is valuable to keep and show the different layers of the building.

Research

Out of the individual research, three initial conclusions for redesign approaches that contribute to a longer life of space were formulated. Currently, there is a strong focus on redesigning the space plan to create a generic space, while it is interesting to keep focussing on the other two strategies as well. At the same time, it is also crucial to start thinking about the design of the dwelling typologies and how these spaces can change in use.

General feedback

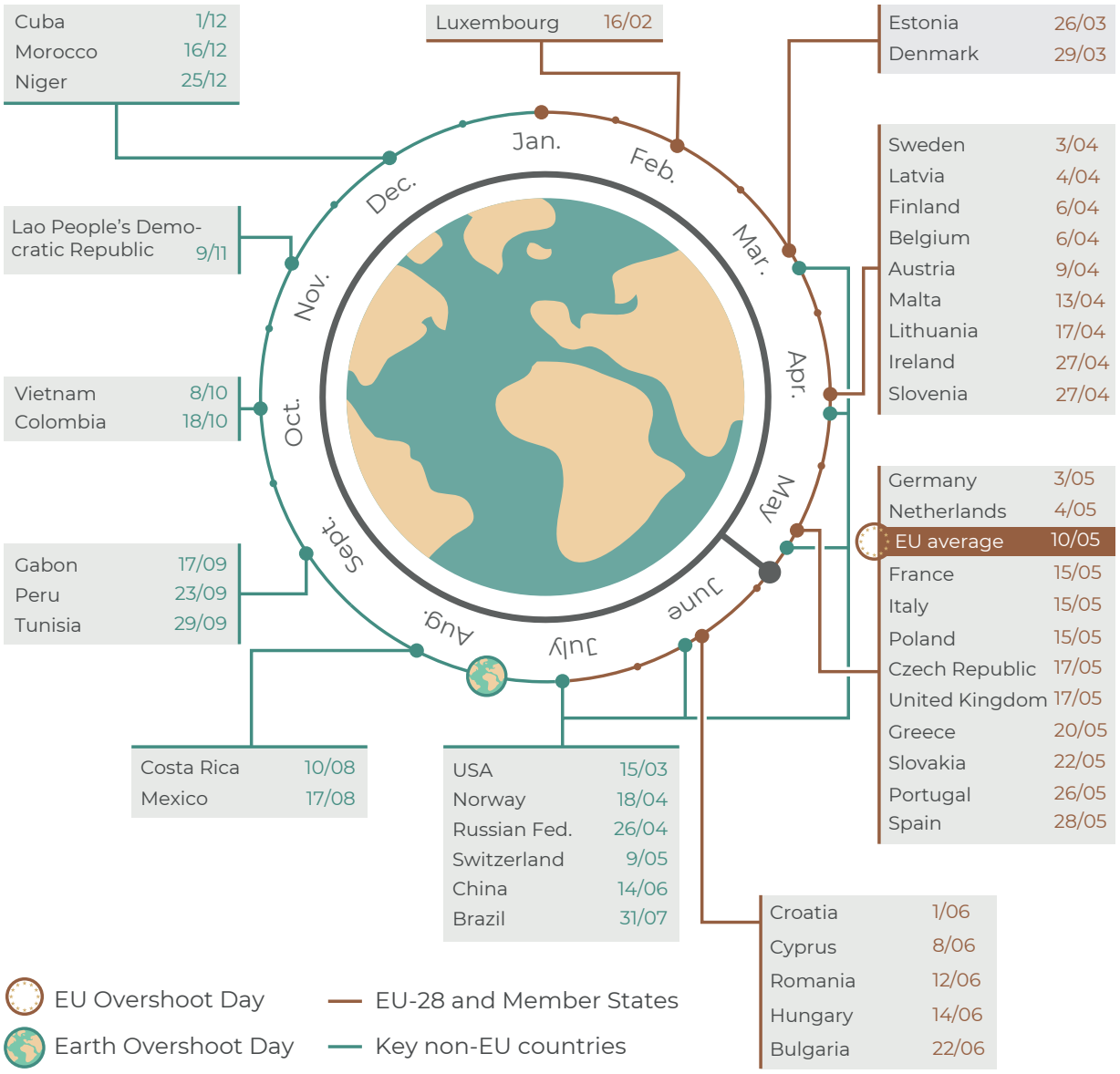
For the implementation of the research, it is relevant to think about the perspective of the user and it is important to figure out where the limitations and exceptions are, besides it is okay if the research sometimes does not work out because that offers new challenges.

CHAPTER 3
PROGRESS PRELIMINARY DESIGN

PROGRESS PRELIMINARY DESIGN

3.1 Research Progress

3.1 RESERACH PROGRESS



Earth Overshoot Day across the EU and the world (Global Footprint Network, 2021).

3.1.1 SUMMARY INITIAL OUTCOMES

We live in an environment where it is normality to buy or make something new once it is broken and we forget how to give a new purpose to things. While at the same time, climate change has become more present every year and we have been using more materials than are available on this planet, which becomes shockingly visible in research done by the Global Footprint Network (2021). Therefore, we need to adjust to the time we are living in and focus on the existing building stock rather than designing new buildings.

When designing, an architect has the task to give a definite form to something for an unpredictable amount of time. Because of this, there is a growing number of typologies where the function is often defining the form of a building. With as a result that it becomes normality once buildings become functionally, technically or economically obsolete no one wants to take care of them anymore. But what if the solution is to focus on a redesign

taking adaptability as the main starting point. To create architecture that takes the changeable as a departure point for redesigning within the permanent.

To redesign a building in such a way that it can be variously used and interpreted over time, was the starting point for this graduation studio. A redesign within the permanent in which the users need to become more flexible, because the use of a building is never definitiveandwillalwaysbeorganicandchangeable.

After having conducted literature research, looking into case studies and doing interviews the initial outcome of the research was that there are three ways of redesigning within the different permanent frameworks (structure, skin, roof/hall, user) a building can have. These are 1) redesign with an adaptable infill, 2) redesign the space plan by creating a generic space, 3) redesign with a focus on energy demands and the user.

Redesigning a building by creating an adaptable infill (1) or with a focus on energy demands and the user (3) are strategies that have been used and developed already within vacant heritage. Therefore, the challenge for this graduation studio will mainly focus on redesigning the space plan by creating a generic space. This, however, is something that will need to be developed further during research by design. It could result that this approach will not be possible throughout the whole building, which will result in using the other strategies as well. A clear understanding of the building, its opportunities, challenges and limitations are therefore needed.

3.1.2 RESEARCH BY DESIGN

While the construction sector is dominated by private interest, academic research can operate without market pressure. Therefore it is relevant to focus and research into sustainable development and figure out how it can be beneficial for the construction sector. Acknowledging the design as research on its own, in which there is a specific task, research areas, a hypothesis with opportunities and a clear conclusion in terms of a spatial organisation, could help generate a set of considerations to be used when redesigning (Van Duin & Claessens, 2009).

As written down in Architecture, Building and Planning (1998), research by design can be seen as a scientific activity, when the following three criteria are applied:

3.1.3 KOUDENHORN BUILDING

Implementing the conclusions of the individual research within a redesign of vacant heritage is already a challenge on its own, but the Koudenhorn building makes this challenge even more difficult and

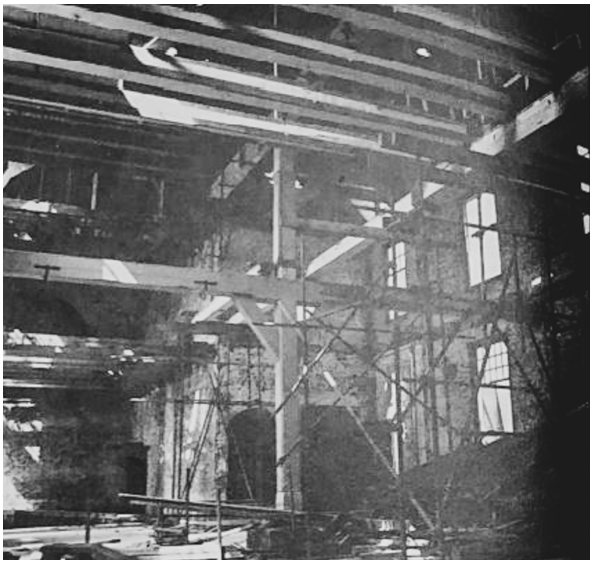
> 1. The design should provide a solution for a class of problems.
>
> 2. For a design to be recognised as research, it needs to be accompanied by a written analysis with notes on the various steps within the process. The modes of thought and rules used in the process must be documented.
>
> 3. The design must generate new knowledge or alternate skills, or demonstrate how existing knowledge and skills have been used to generate a new and unique design or can be applied to design variants (Van Duin, 1998, p. 31).

therefore also very interesting.Looking at the different permanent frames (paragraph 2.4) in which a generic space can be created the framework of structure is most applicable for the Koudenhorn building. During the building analysis came to light that the internal structure of the Koudenhorn has

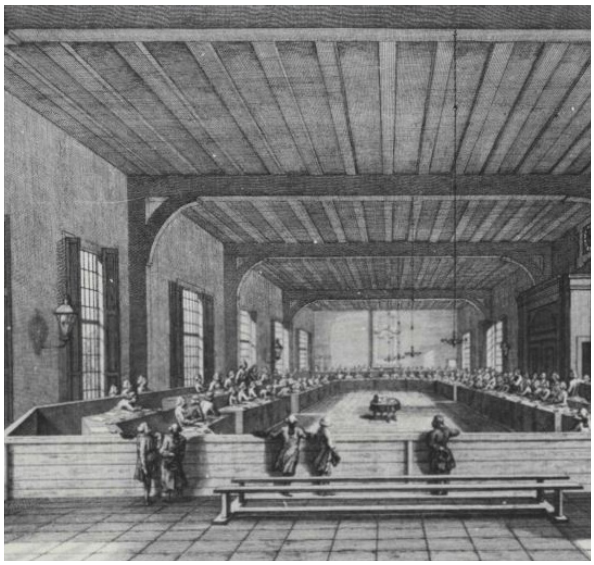
changed drastically over time. Out of the construction drawings of 1771 becomes clear that there was a logical and systematic way behind the complete structure of the building. The drawings of 1971, however, show that there were a lot of interventions that resulted in many differences within the construction. As can be seen in the pictures, almost everything on the inside of the Koudenhorn was demolished and new construction was added. Only the dining hall was an exception to this radical way of redesigning. The new construction in 1971 is a good example of a design in which the function is defining the form of the building, or rather the structure. Different functions for the police office are clustered, which results in segments throughout the building which each its own suitable construction.

To reflect on the design process, it is important to realise what this design proposal's influence is in relation to the current design. Why would this design proposal be better than what is already there? Because no is also an option, maybe the design proposal is only suitable for certain parts of the building.

Redesign Koudenhorn 1970 (Van Den Hurk, Jansen & Post, 1971)



Redesign Koudenhorn 1970 (Van Den Hurk, Jansen & Post, 1971)



Dining hall Diaconiehuis 1771 (Pop-Jansen, 1997).

Redesign dining hall 1975 (Pop-Jansen, 1997).

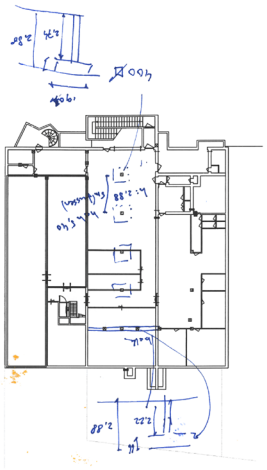
3.1.4 LOCATION VISIT

Up until the P2, no interior visit was conducted yet. Therefore it was hard to formulate conclusions for the value assessment. Luckily, towards the P3 an interior visit was scheduled for the Koudenhorn building and the findings and photographs can be found below.

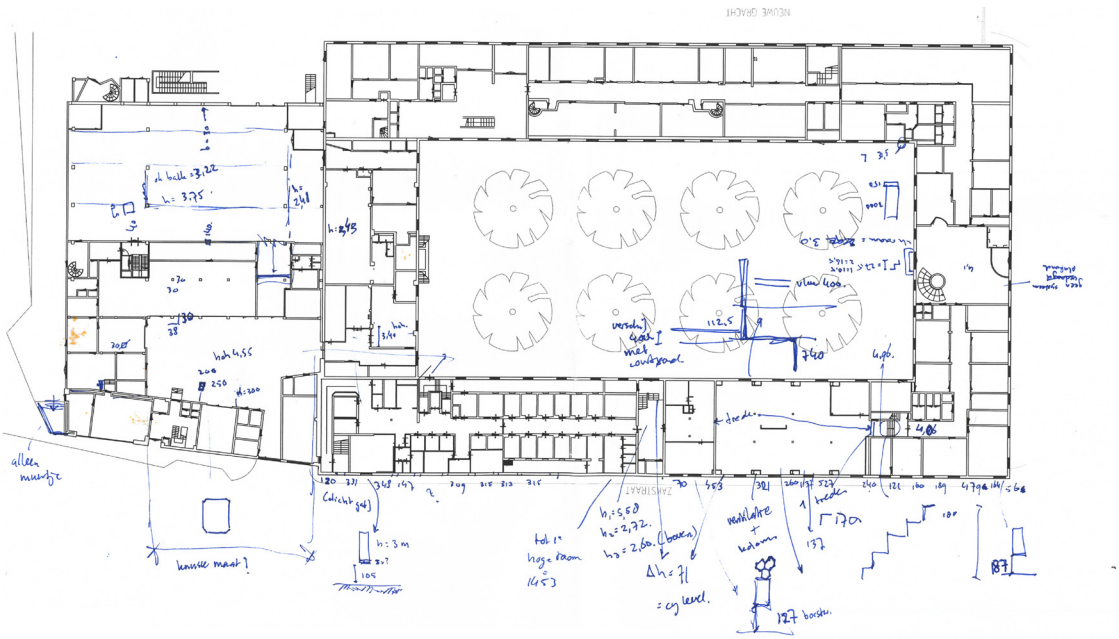
Mainly noticeable was the incoherence between the received drawings at the beginning of the graduation project and the current situation in the Koudenhorn building.

Luckily it became clear after the location visit how the internal loadbearing structure was built and at the same time, we could collect a clear overview of all measurements. This data was then collected to create a shared Revit model with the group.

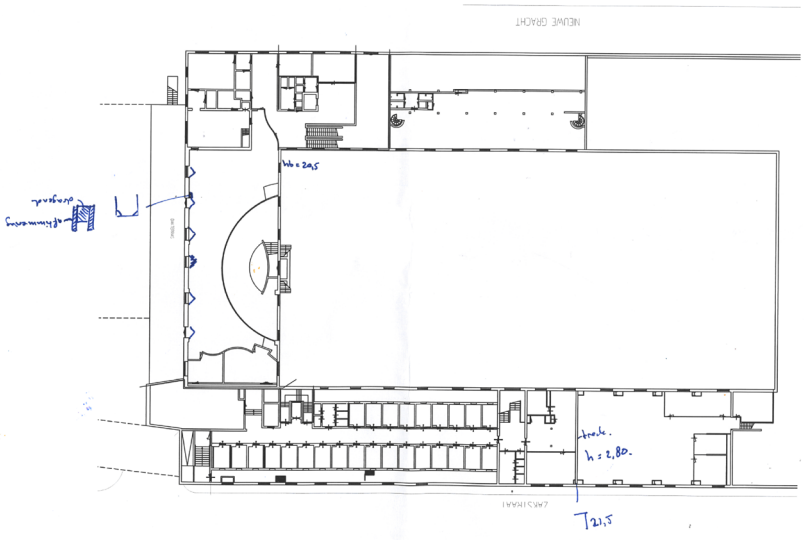
The location visit helped a lot during the next phases of the design process. After finally having collected all the necessary data, a better starting point for the current building was created.



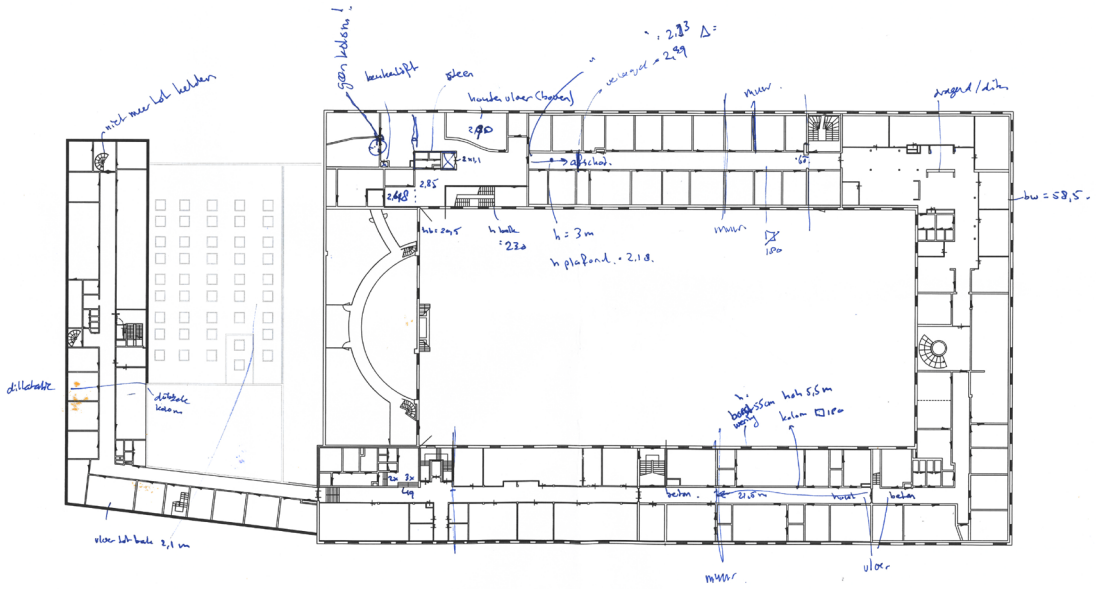
Basement



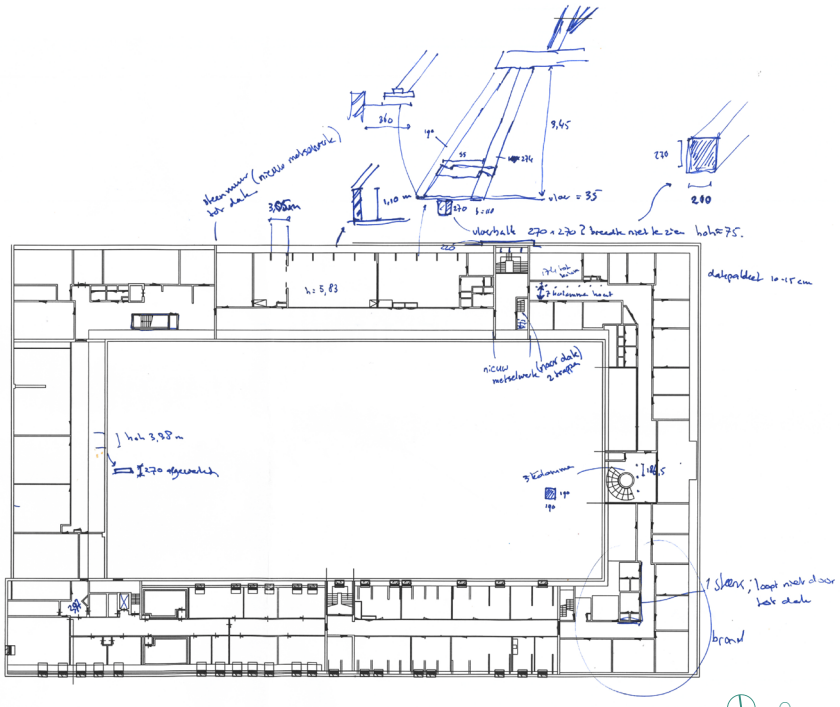
Ground floor



Entresol

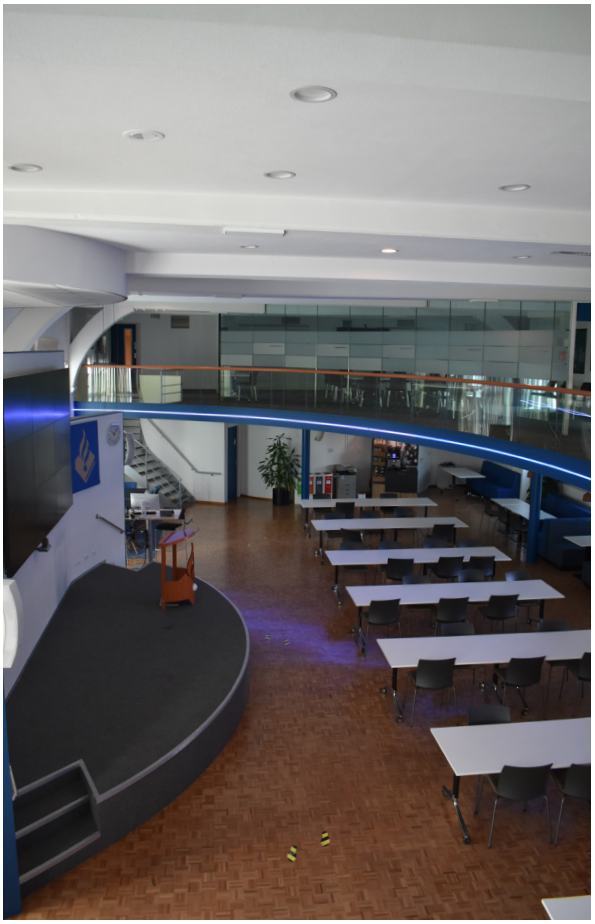


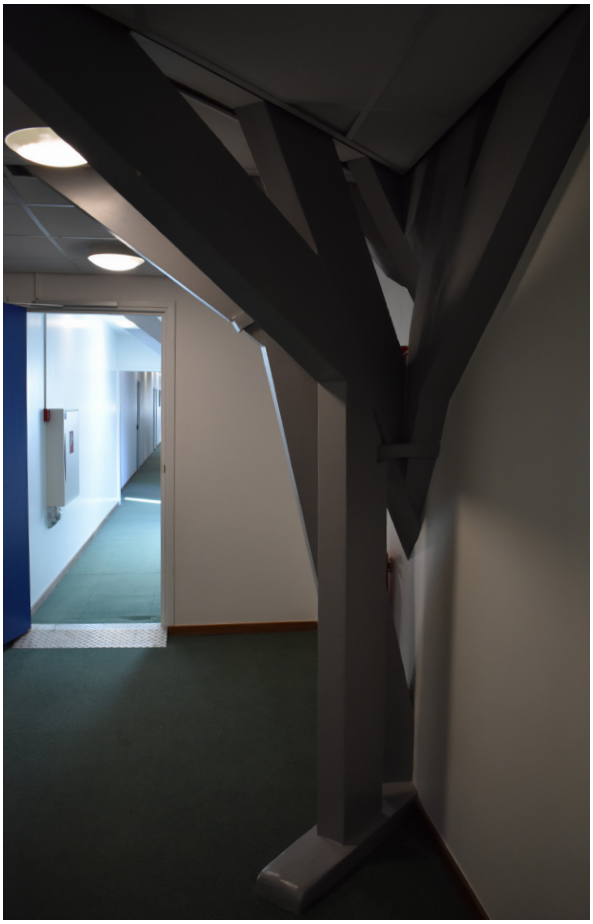
First Floor



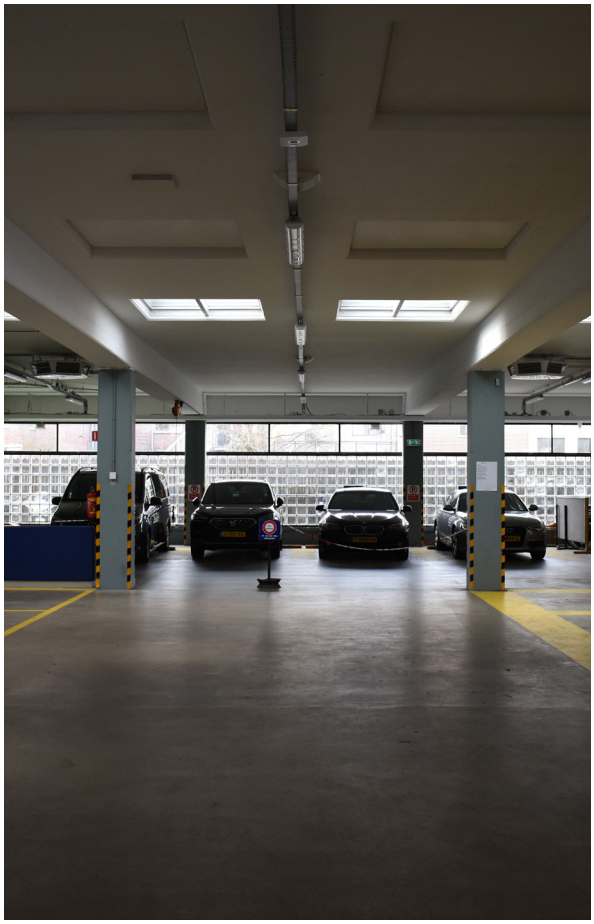
Second Floor

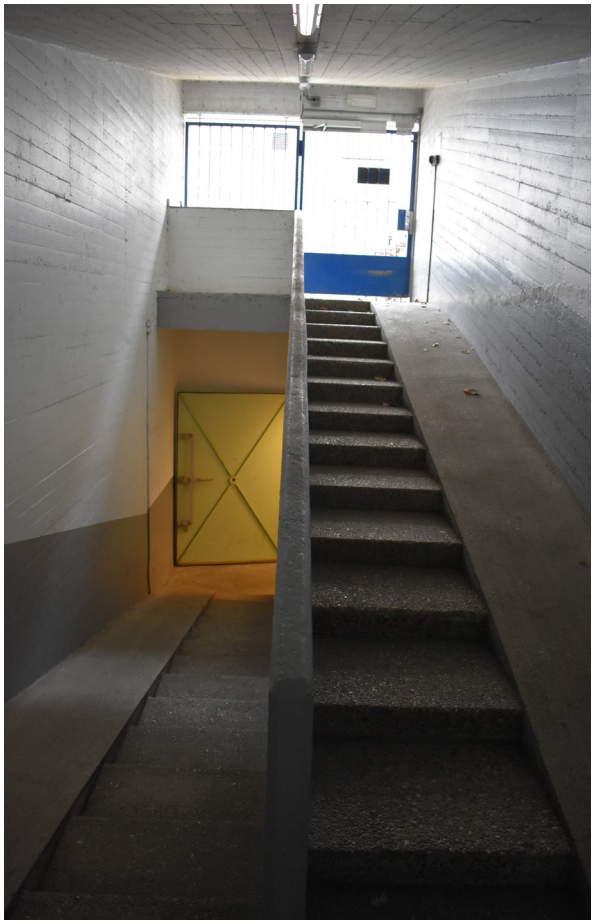
0 15M






DIPA
systeemwanden





PROGRESS PRELIMINARY DESIGN

3.2 Architectural Design and Building Technology

3.2 ARCHITECTURAL DESIGN AND BUILDING TECHNOLOGY

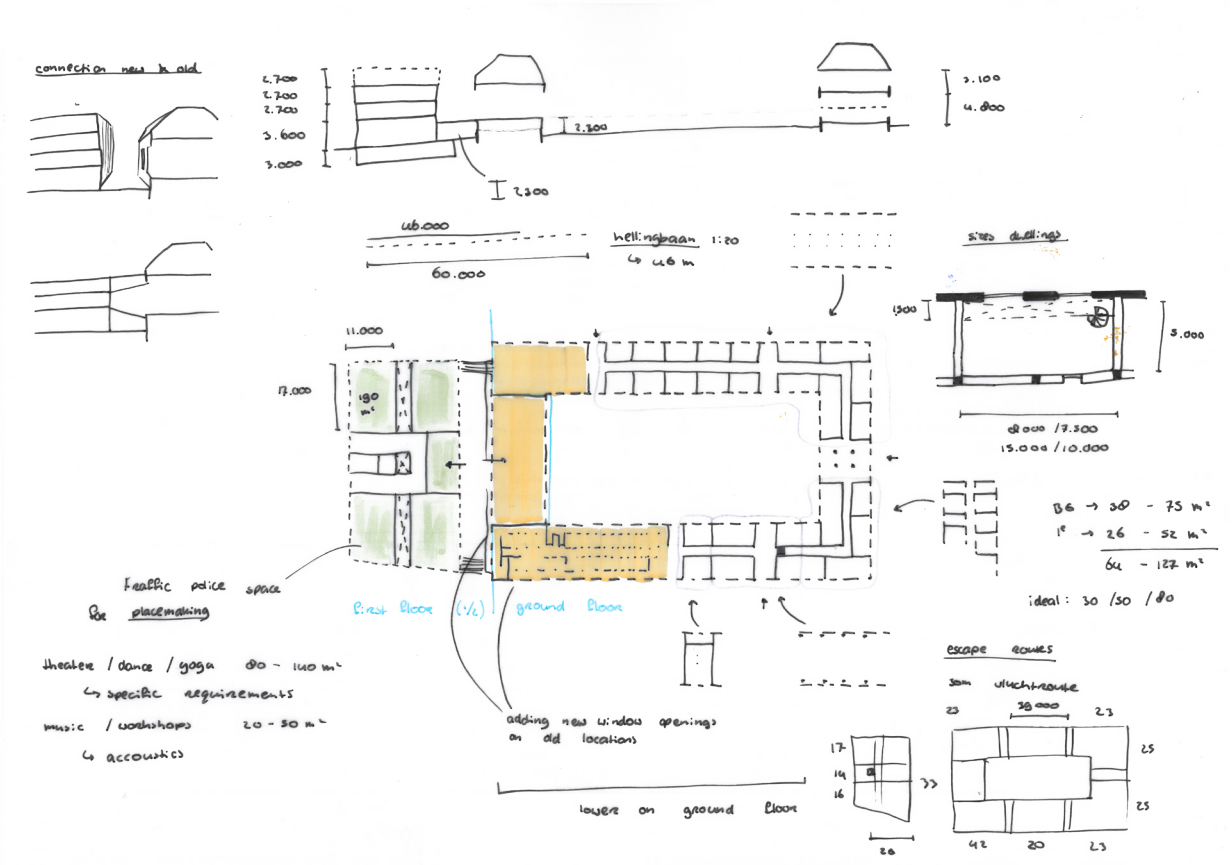
3.2.1 RESEARCH AND DESIGN

After having a better idea of the load-bearing structure of both buildings, it became easier to figure out which program was best suited for the buildings and where. Even though the main goal of the design proposal is to offer an example of a redesign in which the space plan could still accommodate changes in use over time, a division of functions was created.

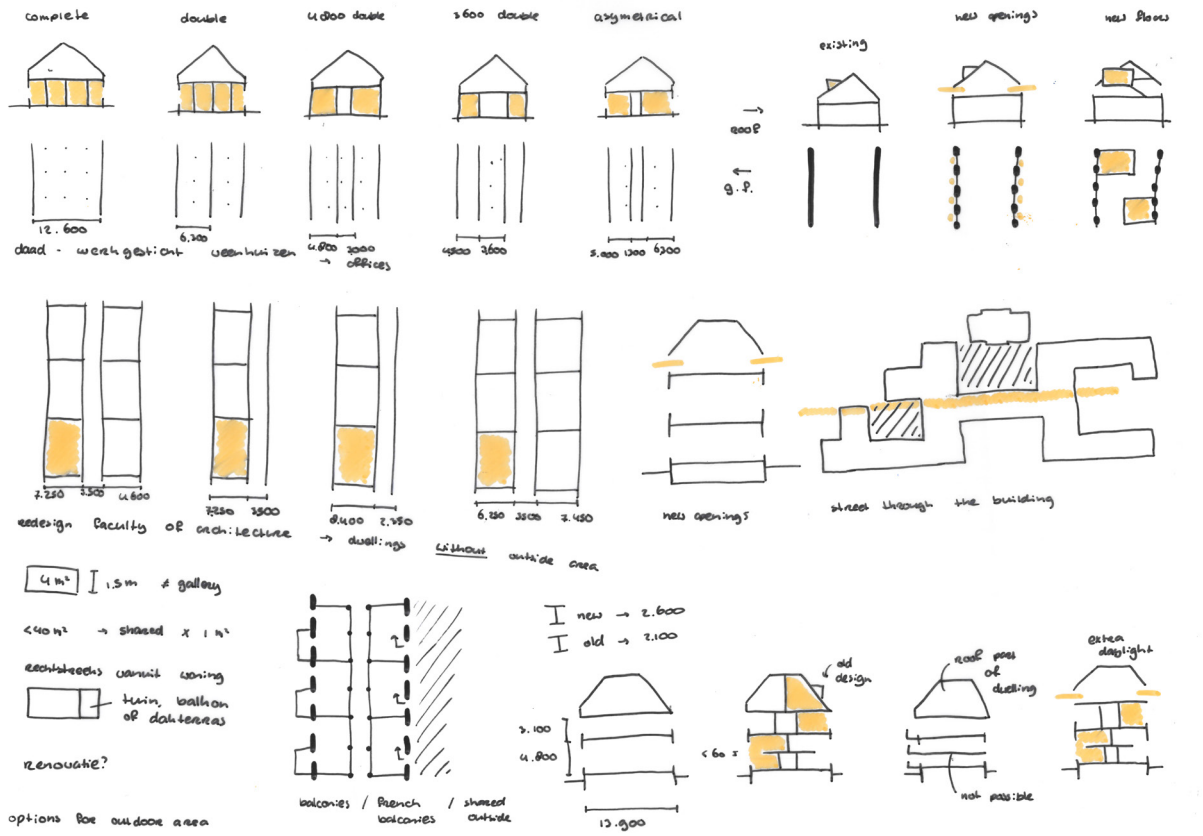
Because of a shortage of dwellings in Haarlem, the original Koudenhorn building will make a place for housing. The internal load-bearing structure offers room for an internal hallway and split-level dwellings will be created on the ground floor in combination with the existing entresol. Other parts in the Koudenhorn like the holding cells or the canteen show clearly different uses of this building throughout time, therefore these spaces will be kept and the user will need to be adaptable to these spaces.

The main idea is to redesign the space plan in such a way that the spaces can be used in an adaptable way in the future. Shafts will be placed at smart locations and dwellings can be easily adapted to offices if needed for example.

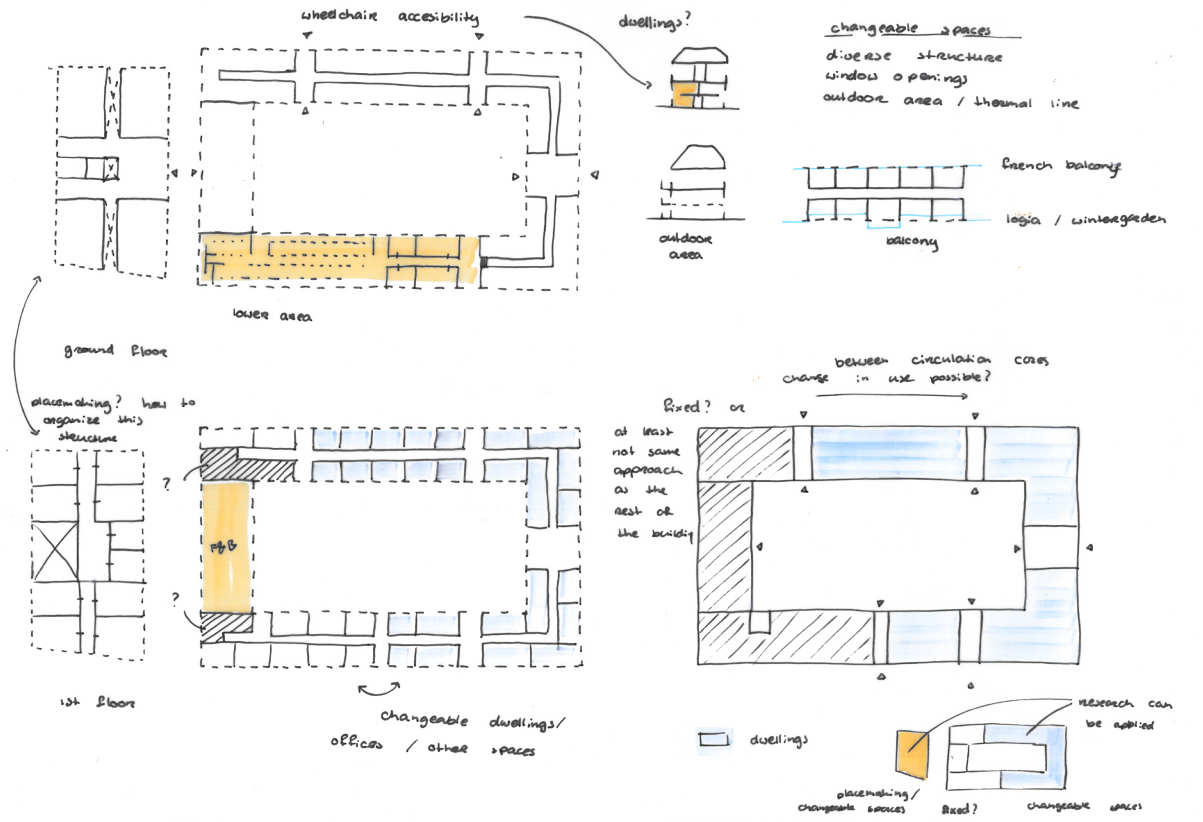
Different approaches should however be tested during the research and design phase. Because each building is different, every building will need its own approach. Therefore the traffic police building will have a different approach and the focus will be more on place-making.



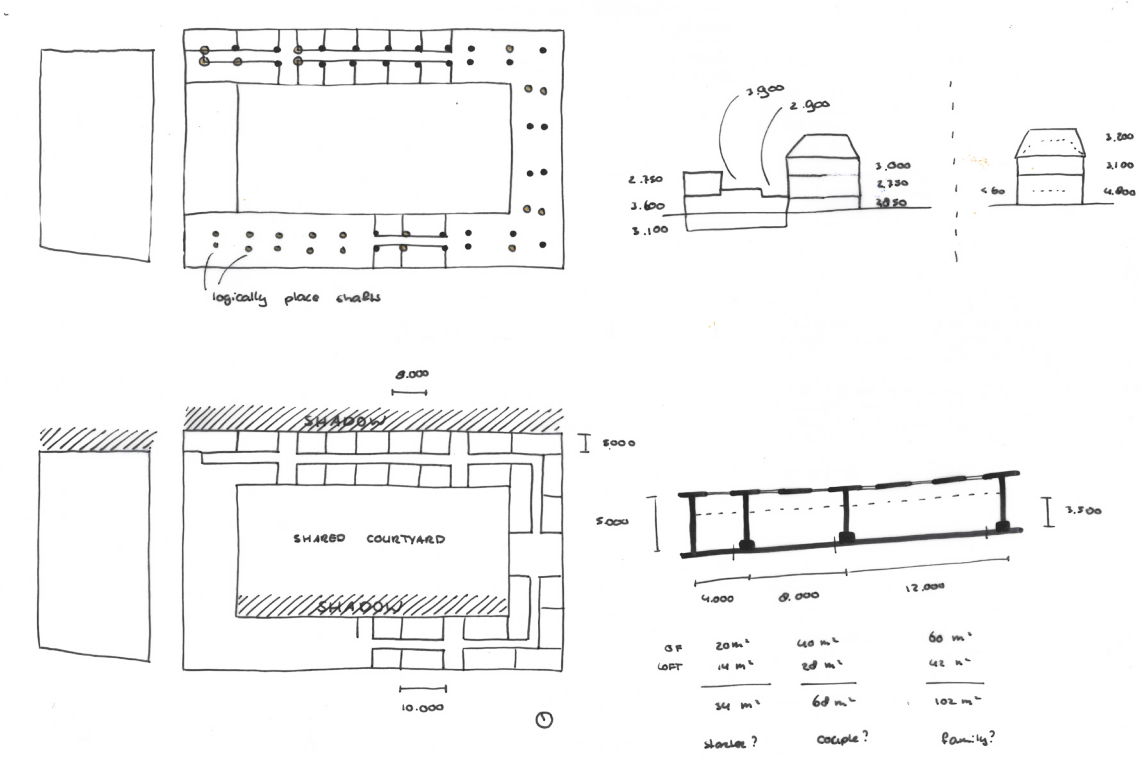
Location of different typologies.



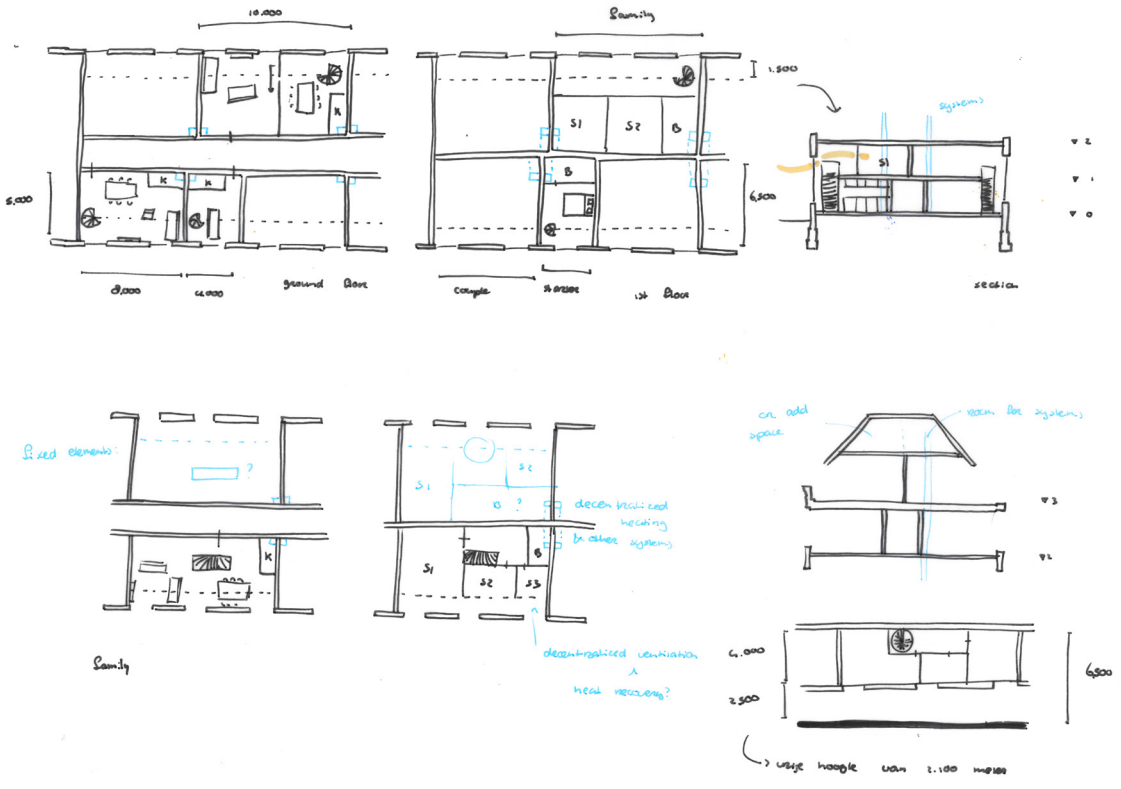
Different typologies, changeable spaces.



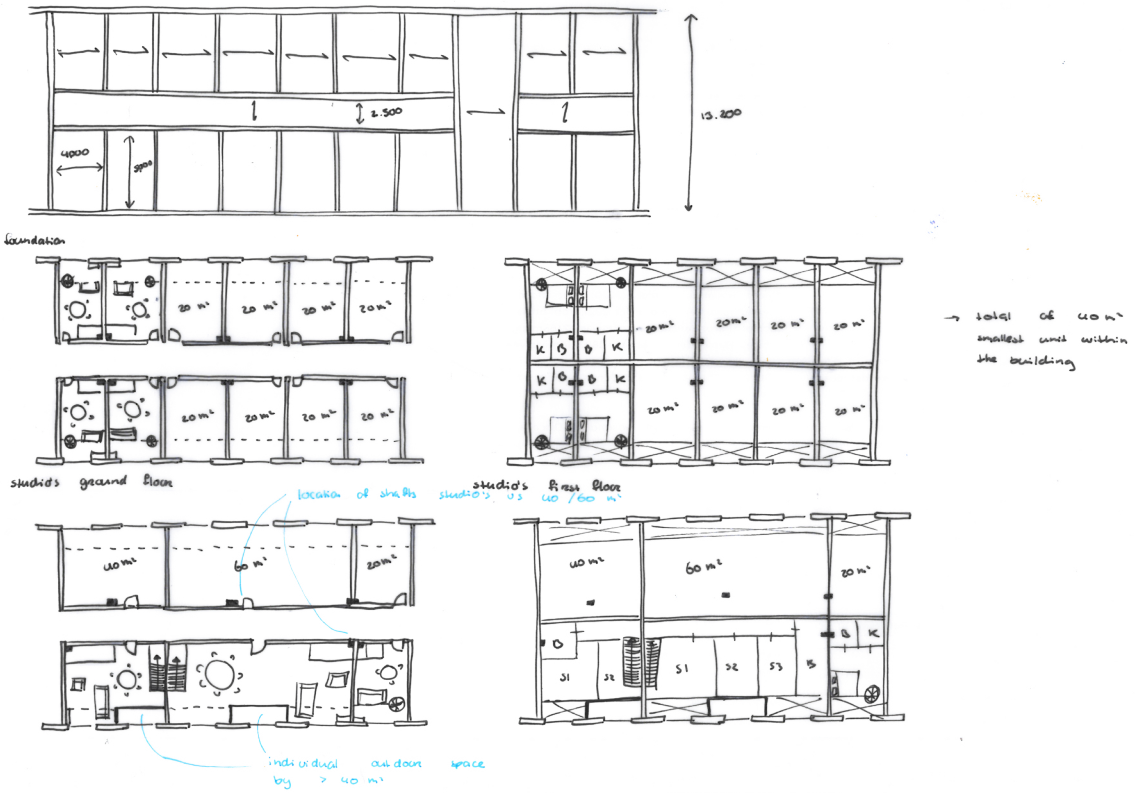
Location of different typologies.



Location of different typologies based on load-bearing structure.

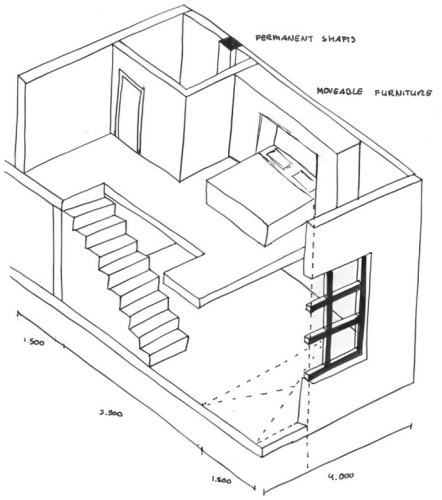


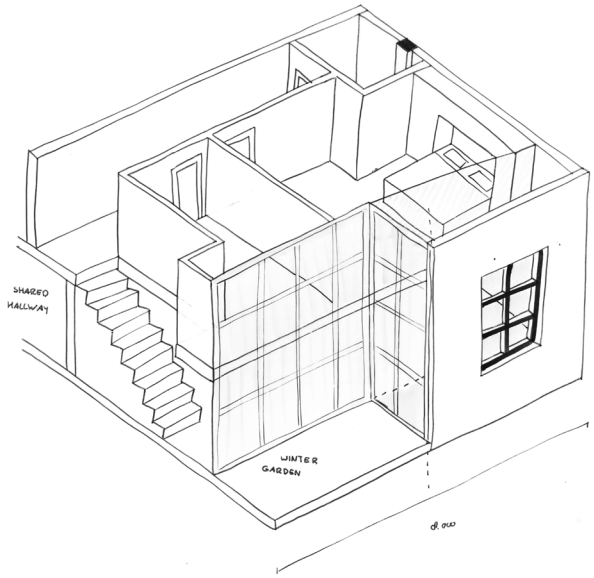
Sizes of dwellings and location of shafts.

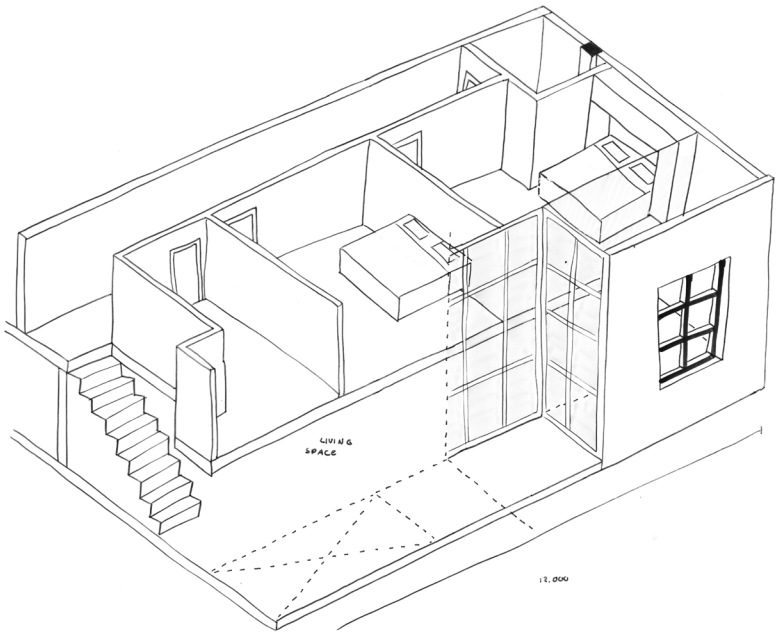


Different typologies.

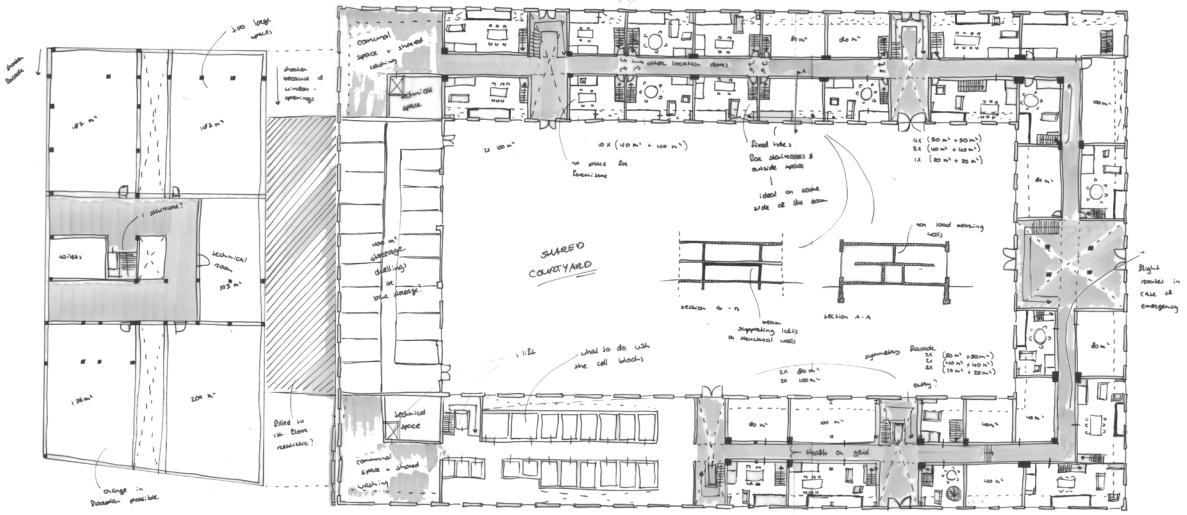
Different housing typologies.



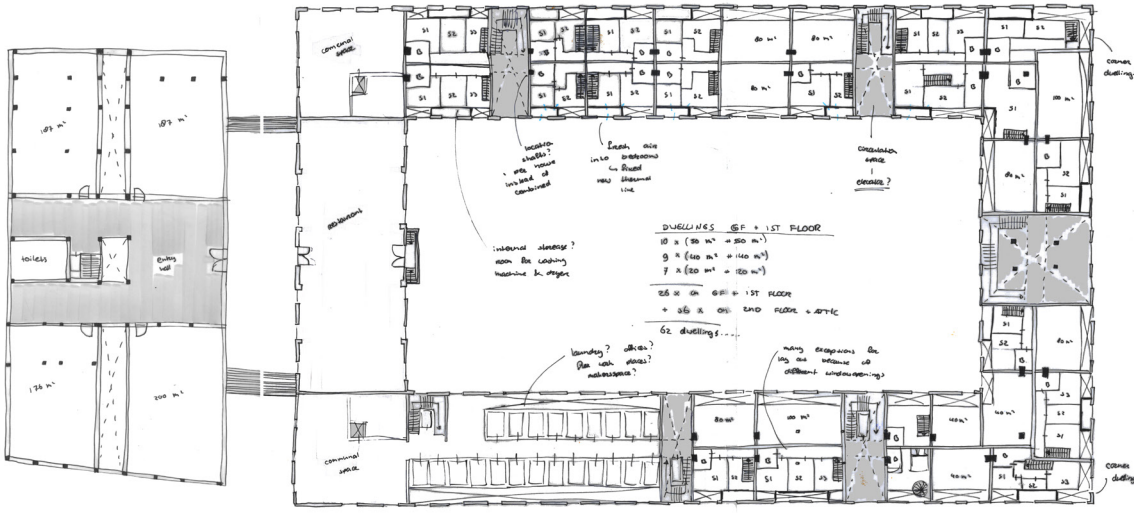




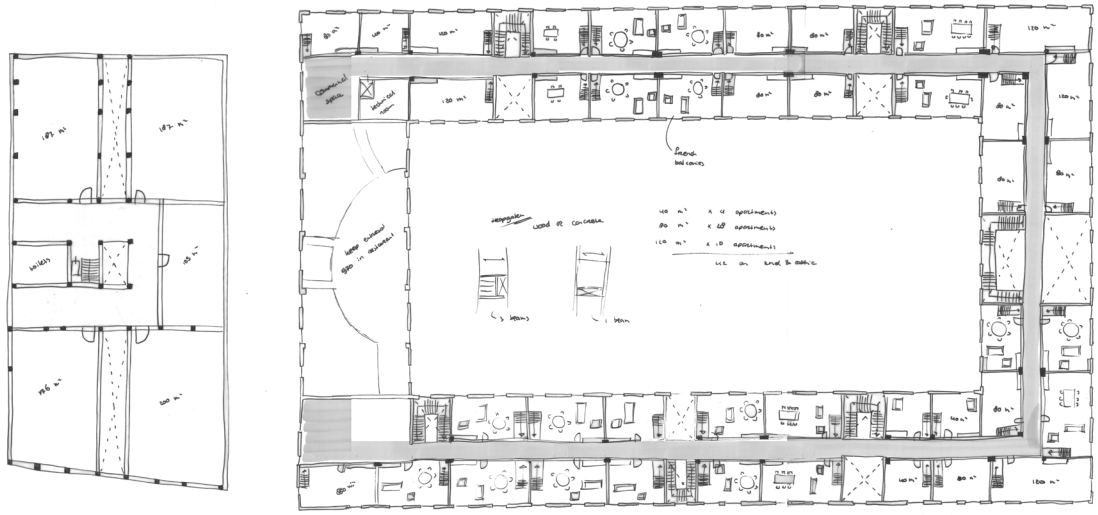
Different housing typologies.



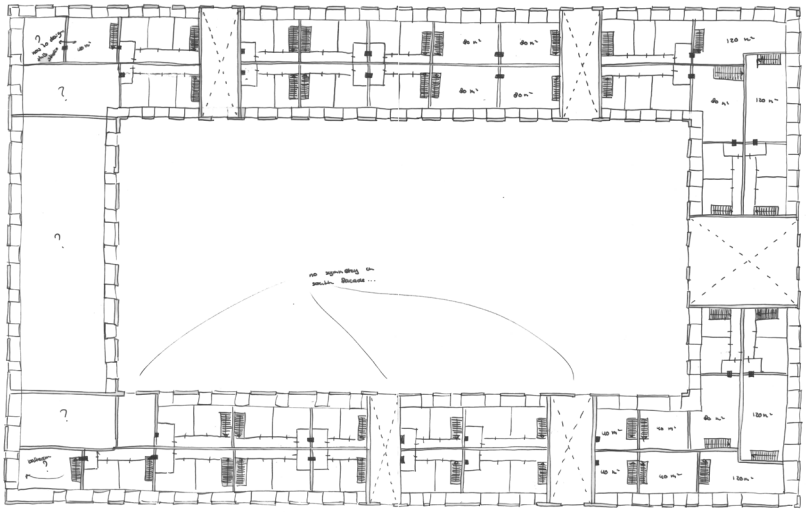
Ground Floor



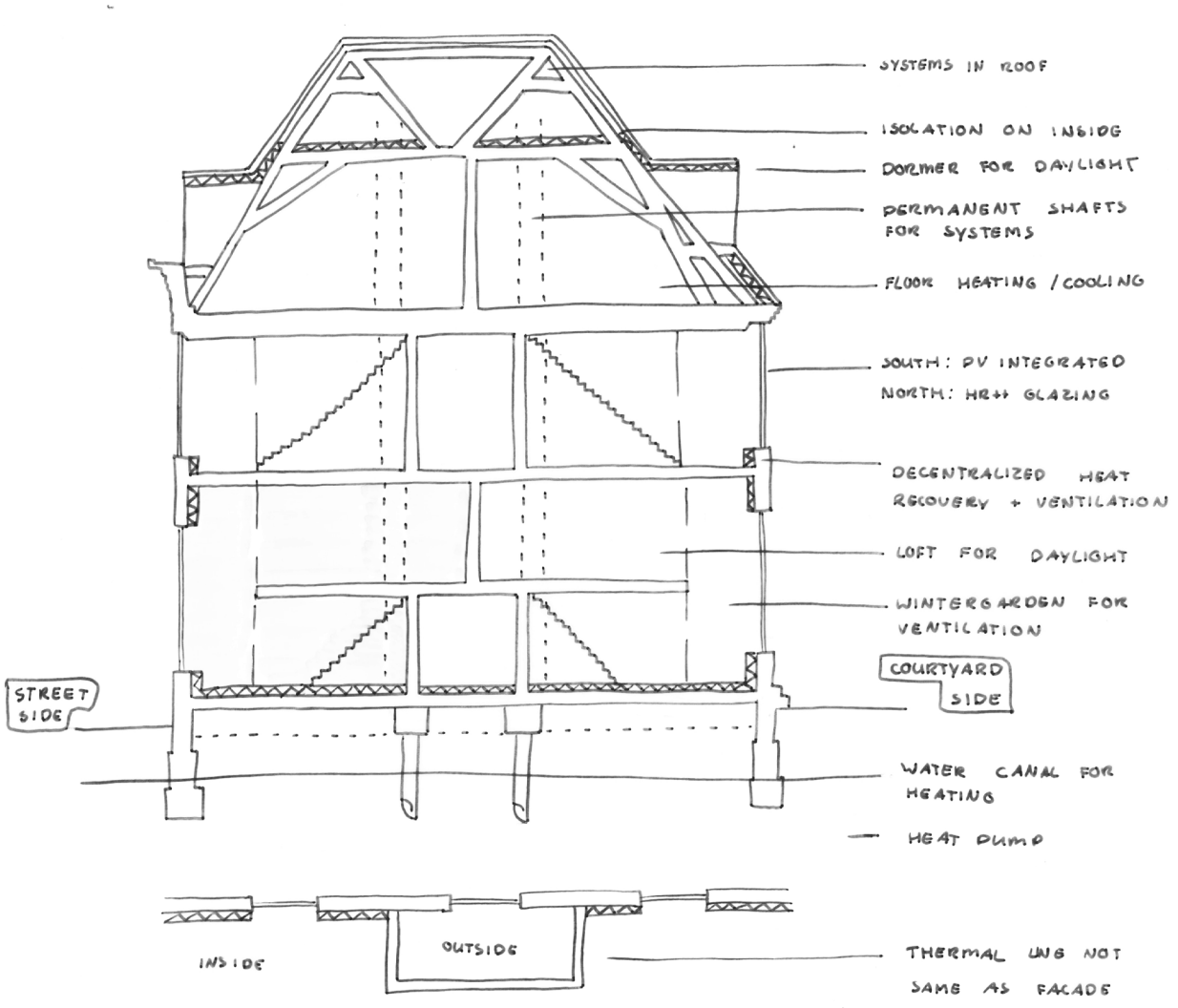
Entresol



First Floor



Second Floor



Section Building Technology

PROGRESS PRELIMINARY DESIGN

3.3 P3 Presentation and Reflection

3.3 P3 PRESENTATION AND REFLECTION

3.3.1 REFLECTION RESEARCH

The research and design phase has had its ups and downs. The research conducted focussed on creating an adaptable architecture, which was mainly focused on newly build buildings. Besides, out of the conclusions of the research, it became clear that a flexible floorplan was created by having a load-bearing structure based on columns and beams. The Koudenhorn building has a different load-bearing structure throughout the whole building with both columns and beams as well as fixed walls. Therefore it is sometimes difficult to relate this to a redesign project in which every part of the building is different and a generic approach can not be done. Sometimes it can be seen as doubtful whether the research is integrated within the design, no can also be an answer.

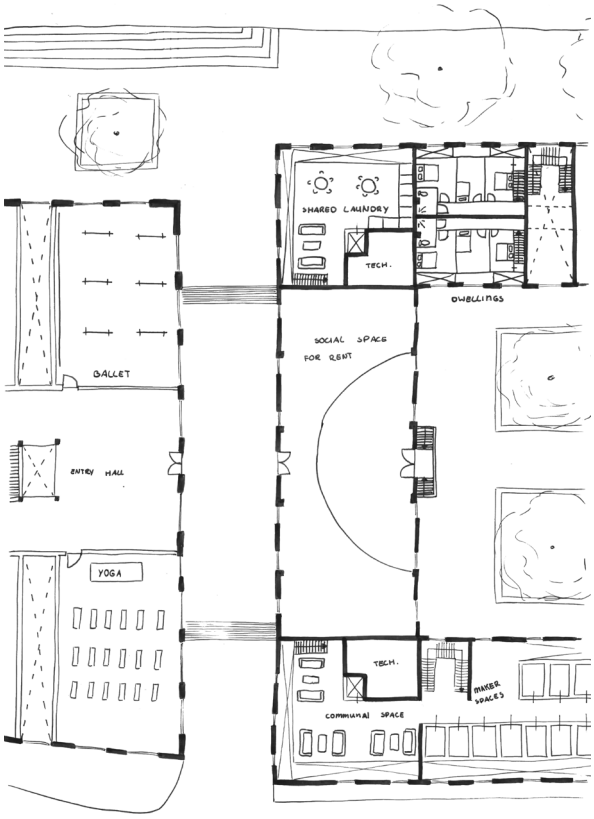
3.3.2 REFLECTION ARCHITECTURE

Integrating the outcome of the research was the main goal in the P3 phase, but it is noticeable that this also became the main driver of the project. However, it is also important of course to keep focussing on the architecture of the redesign, the way new spaces are created and how new and old are related to each other. Figuring out the relation between the interior and the exterior, the materiality and colours are therefore important topics to investigate into.

3.3.3 REFLECTION BUILDING TECHNOLOGY

This can also be seen in the progress of the building technology aspect of this project. Because the implementation of the research in the design has been a journey on its own, the building technology aspects have not been worked out yet. Thinking about which elements are going to be removed during the redesign and what will happen with these materials, but also which new structure and materials will be added to the building. In relation to this, it is also of importance which materials are added and how, whether elements are placed in a demountable way or not.

The redesign proposal for the traffic police has not been worked out yet, clear conclusions on which parts will be demolished or which parts will be kept need to be made. Besides, is it needed to add a new structure to create extra space? When redesigning the traffic police it is also interesting to create a new relationship between the interior and the exterior of the building as well as the relation to the water. Since the traffic police will be a building for cultural functions, it should get a new aesthetic that opens up to the surroundings.



Focus points of the graduation project.

CHAPTER 4
FINAL DESIGN PROPOSAL

FINAL DESIGN PROPOSAL

4.1 Architectural Design

4.1 ARCHITECTURAL DESIGN

4.1.1 REDESIGN PROPOSALS

Continuing with the design process it became soon clear that a division in the redesign for the Koudenhorn and the Verkeerspolitie needed to be made. Both buildings have a different approach for their redesign because of their load-bearing structure and besides, different functions will be located there in the future.

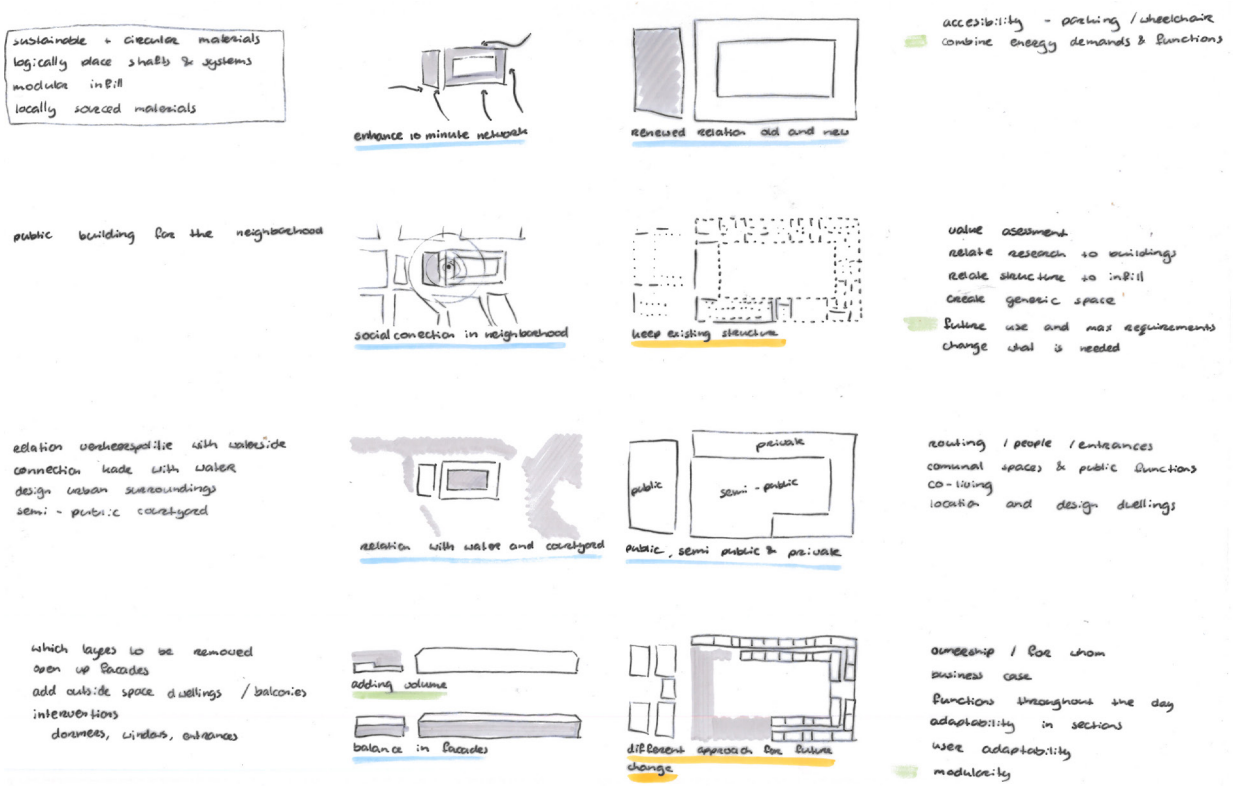
4.1.2 REDESIGN KOUDENHORN

For the progress of the redesign of the Koudenhorn it was essential to investigate the different dwelling typologies that can be fitted inside the building. Because of the rhythm in the facade (openings) of the existing building and the difference in internal load-bearing structures, eventually, a clear logic for the different sizes of dwelling typologies could be created. Of importance was that the ground floor and existing entresol are used to create split-level dwellings and the 1st and 2nd floors are also combined to create dwellings. Because of this, hallways are made on the ground floor and the 1st floor to be able to enter all the dwellings. Besides, the shafts connected to the kitchen or bathroom are placed in such a way that different types of dwellings can be connected to them on different storeys.

4.1.3 REDESIGN VERKEERSPOLITIE

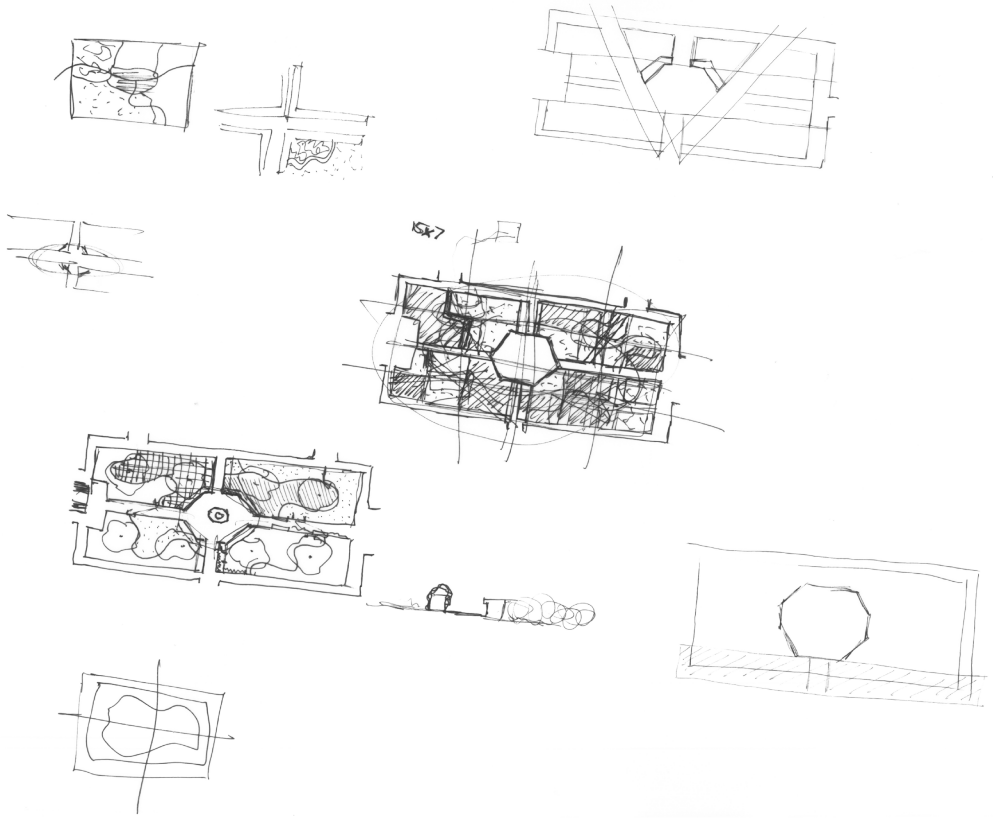
The redesign for the Verkeerspolitie was, up until this moment, a bit underdeveloped in the design process. The current building does not fit well in the surroundings and a better relation should be created. For this, the relation to the water, to the neighbourhood and to the materiality of the surroundings is important. Therefore, volume studies have been done to figure out what is best suited to the neighbourhood. However, during this process, it was important to relate these volume studies to the research conducted for this graduation studio. A spectrum was created on the one side keeping the building as it is and making sure the user needs to be adaptable to the building versus the other side that focusses on redesigning the building in such a way that it is most future-proof and therefore adaptable in the future.

Proposal urban surroundings.

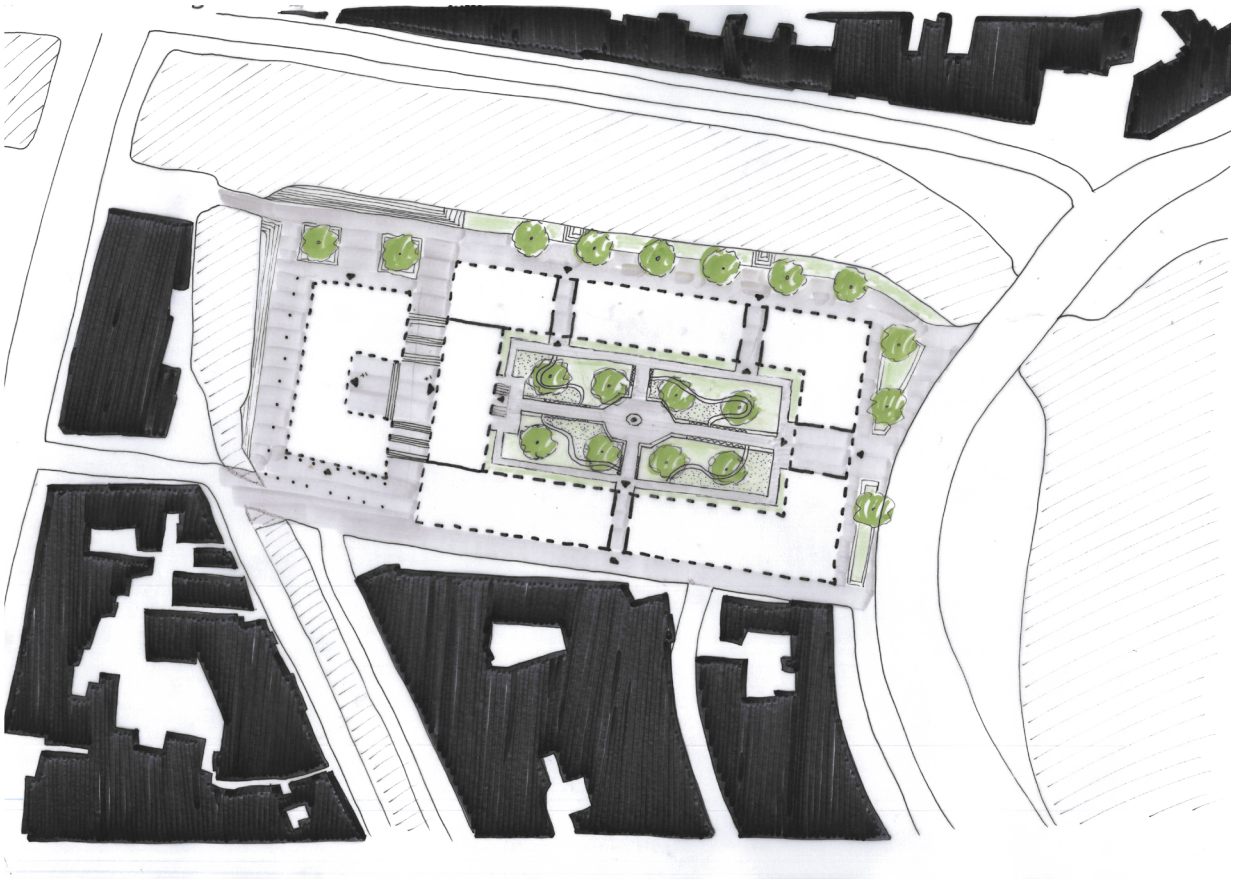


Design starting points in relation to the research outcomes.

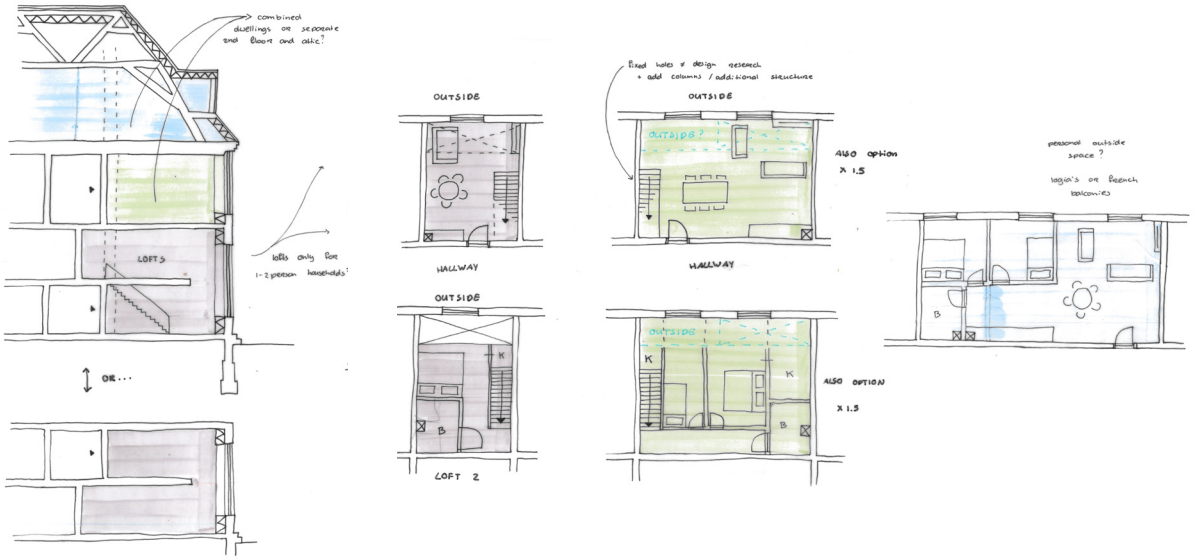
Focus point in the design.



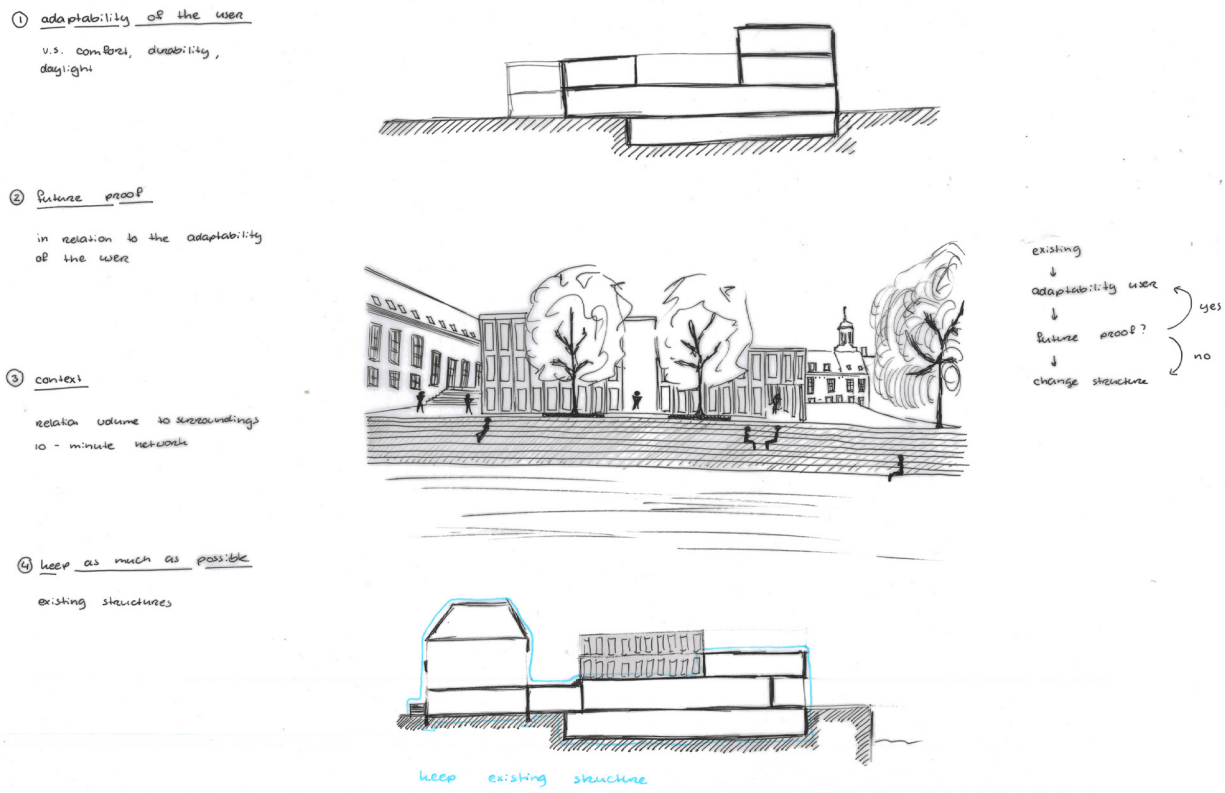
Research into devision courtyard.



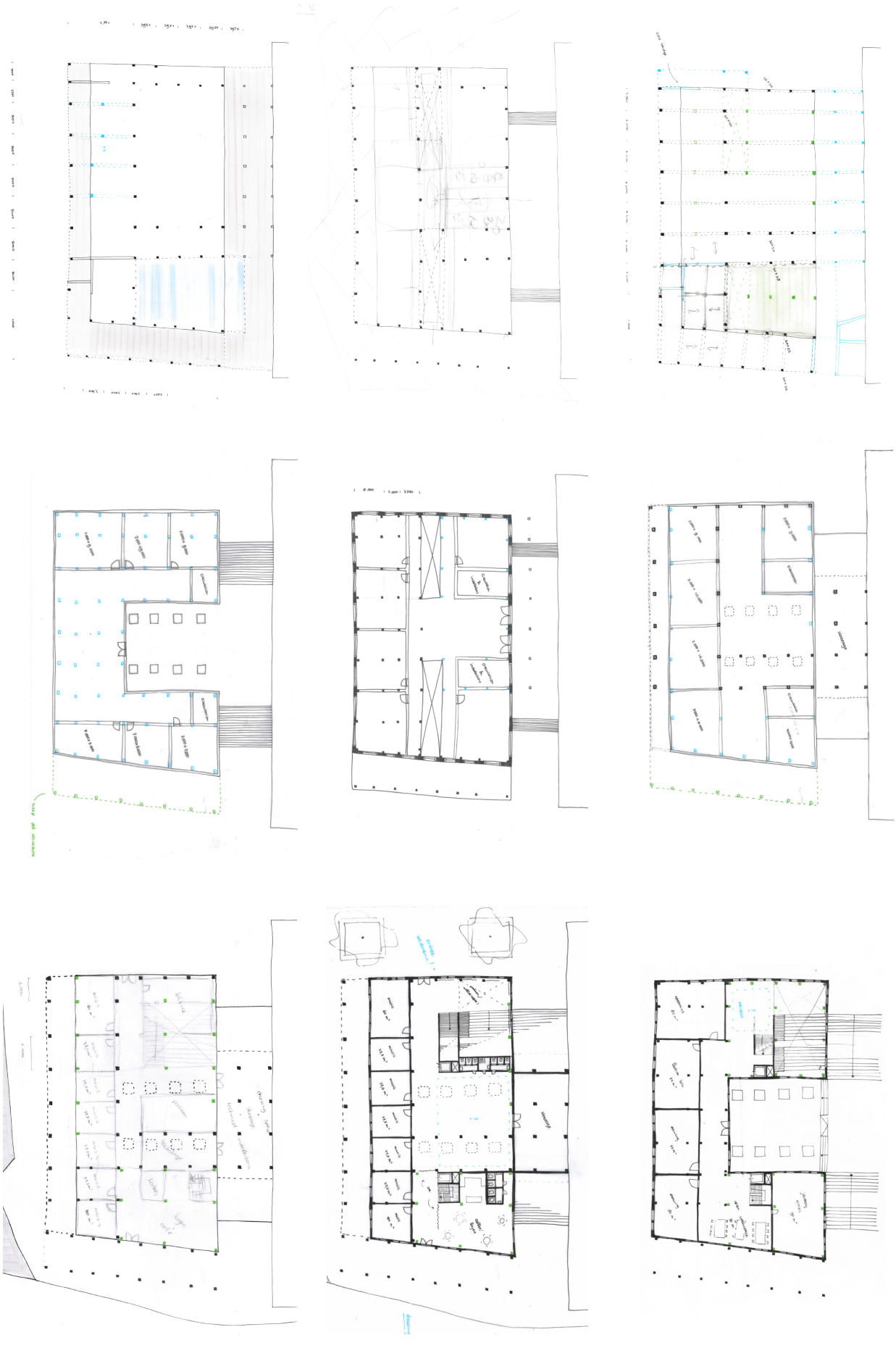
Final design courtyard.



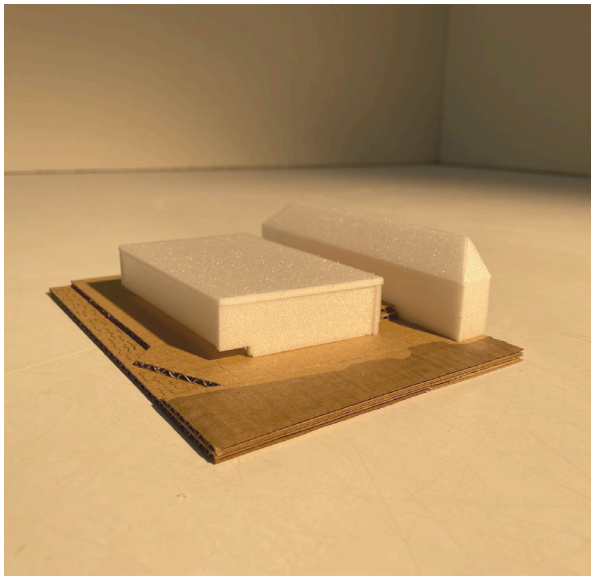
Proposal dwelling typologies within the Koudenhorn.

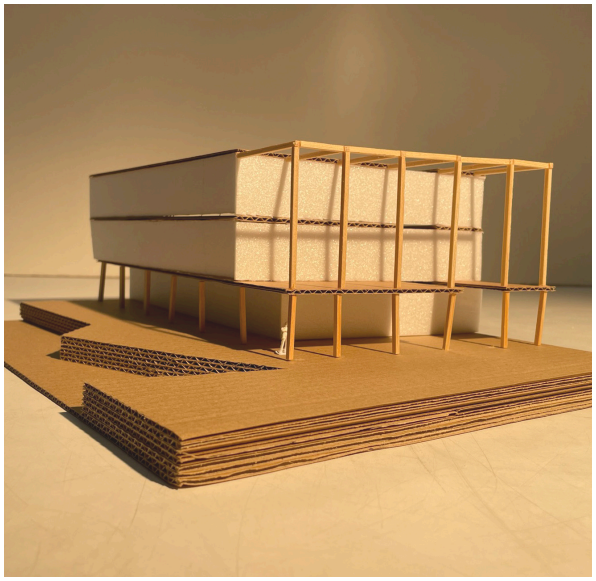


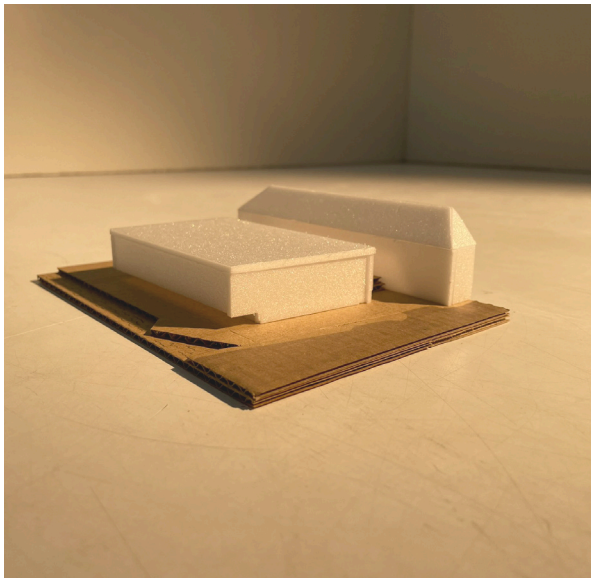
Design starting points for the Verkeerspolitie.

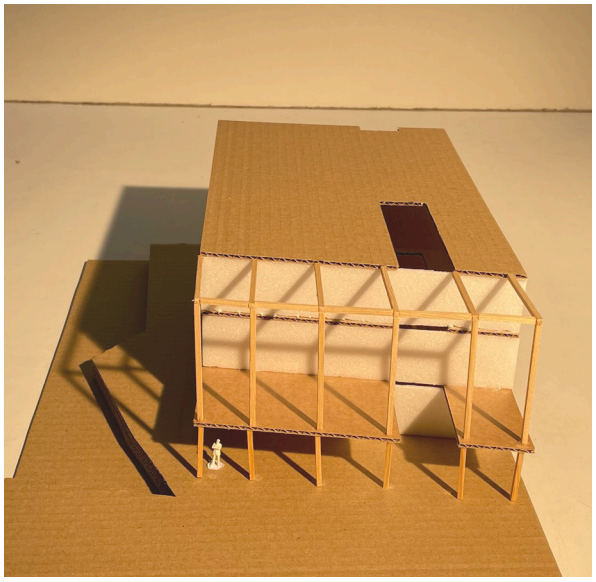


Research into adaptability of the structure from the Verkeerspolitie.



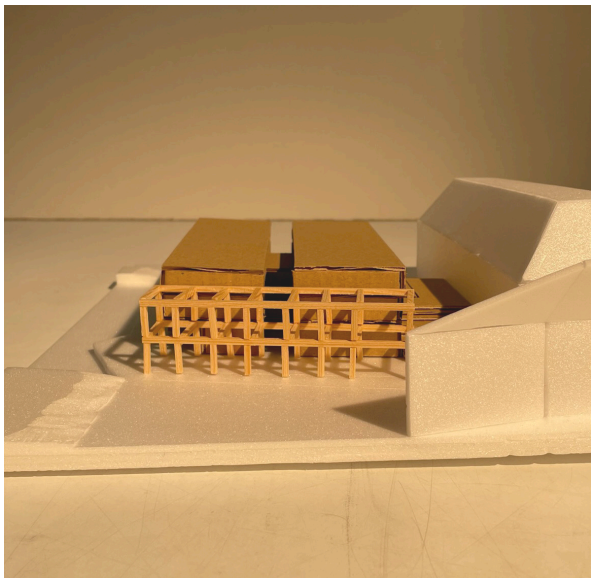


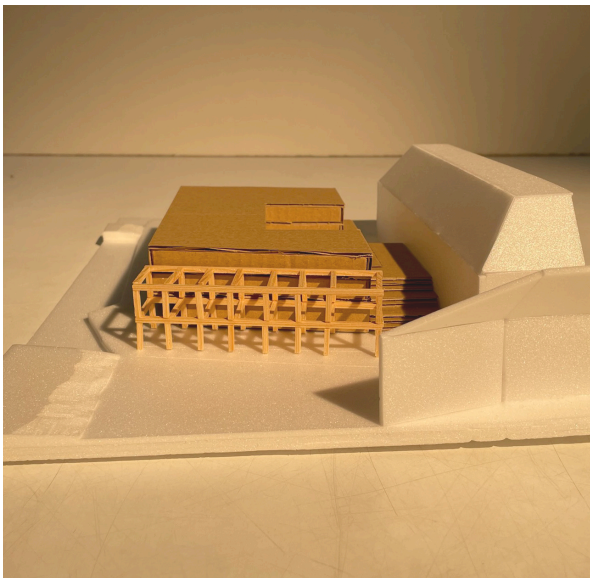


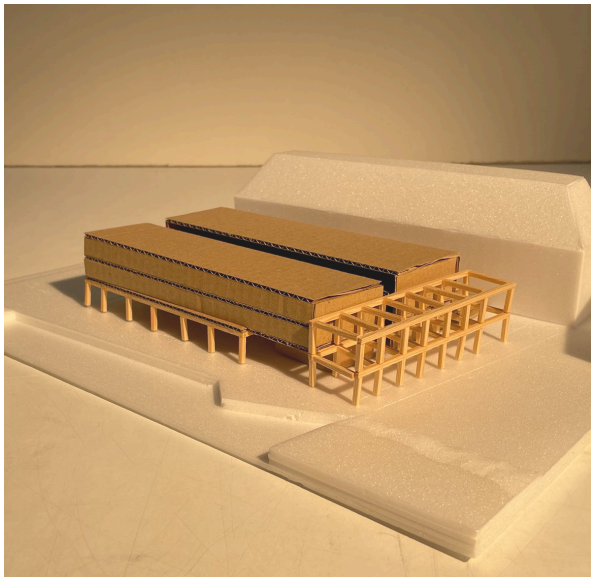


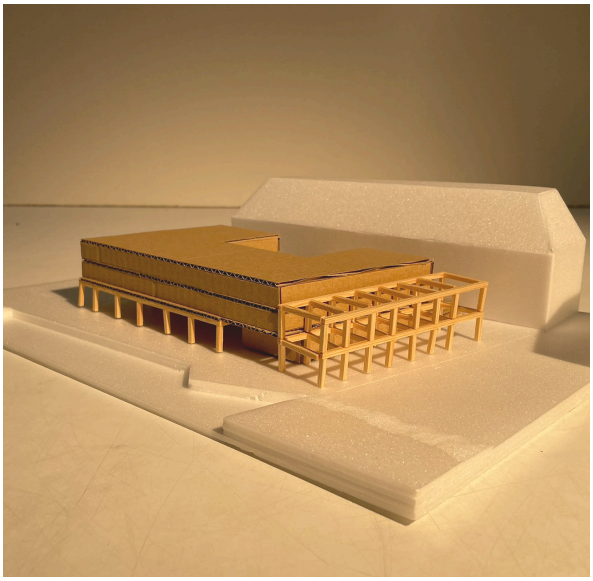
Volume study 1 Verkeerspolitie

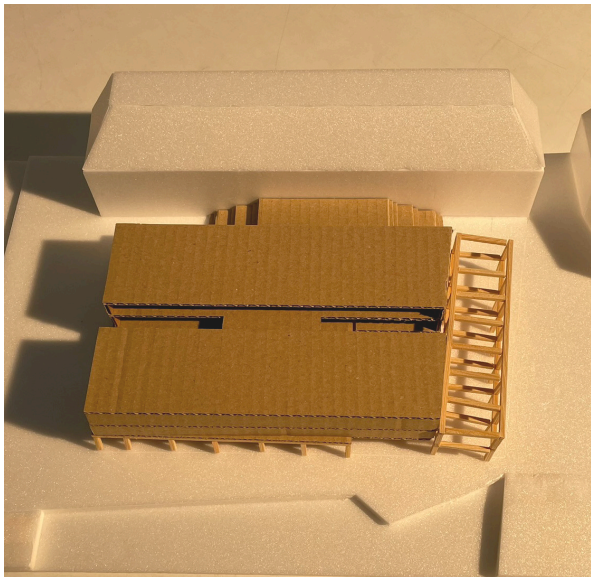
Volume study 2 Verkeerspolitie

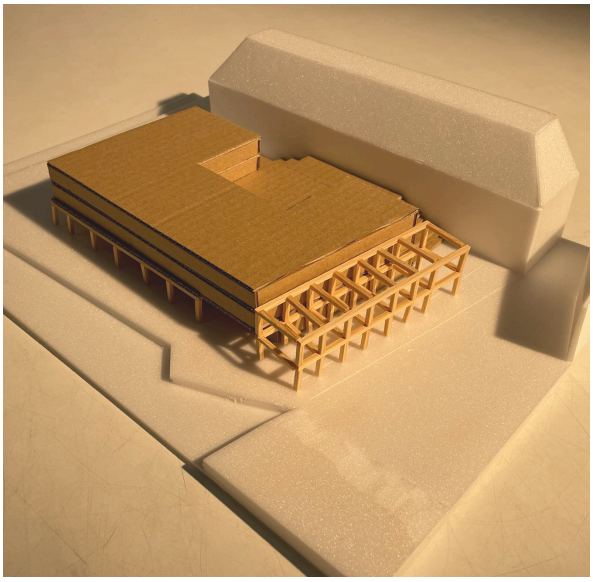






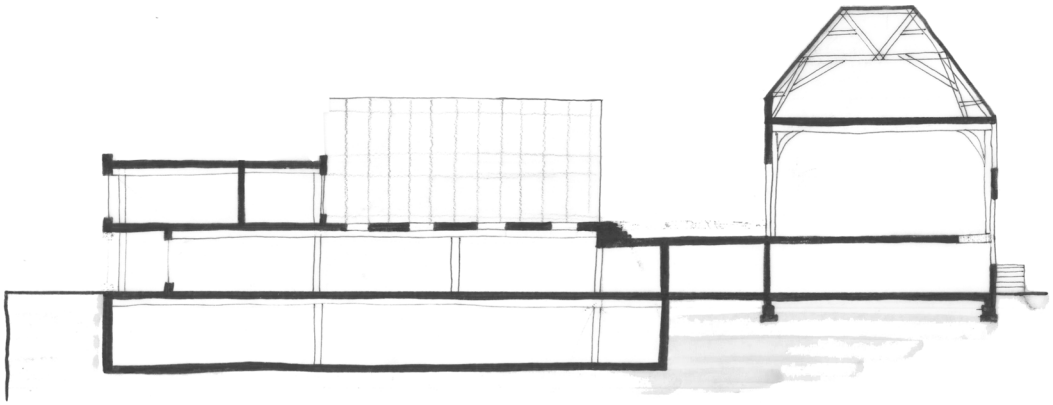


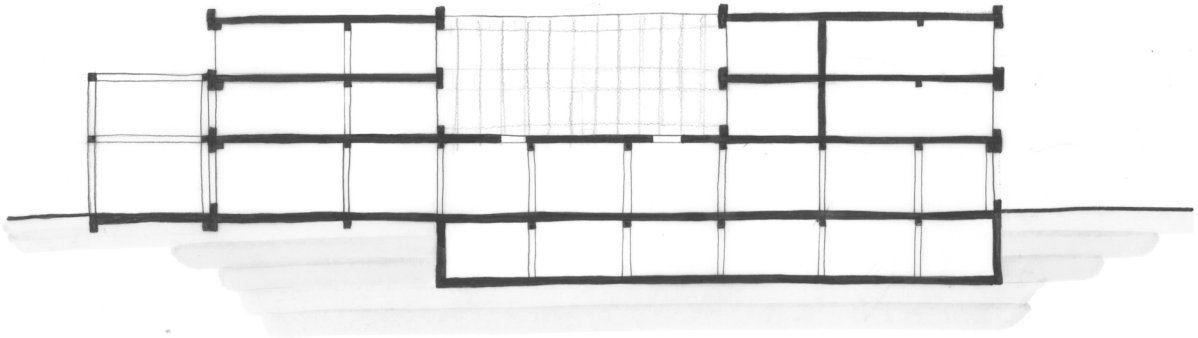


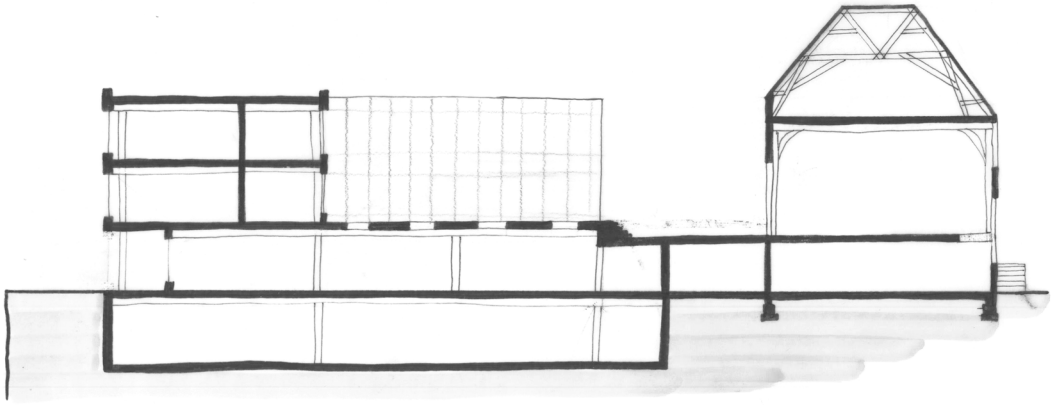


Volume study 3 Verkeerspolitie

Volume study 4 Verkeerspolitie







Research into adding extra volume on the Verkeerspolitie.

Research into adding extra volume on the Verkeerspolitie.

FINAL DESIGN PROPOSAL

4.2 Building Technology

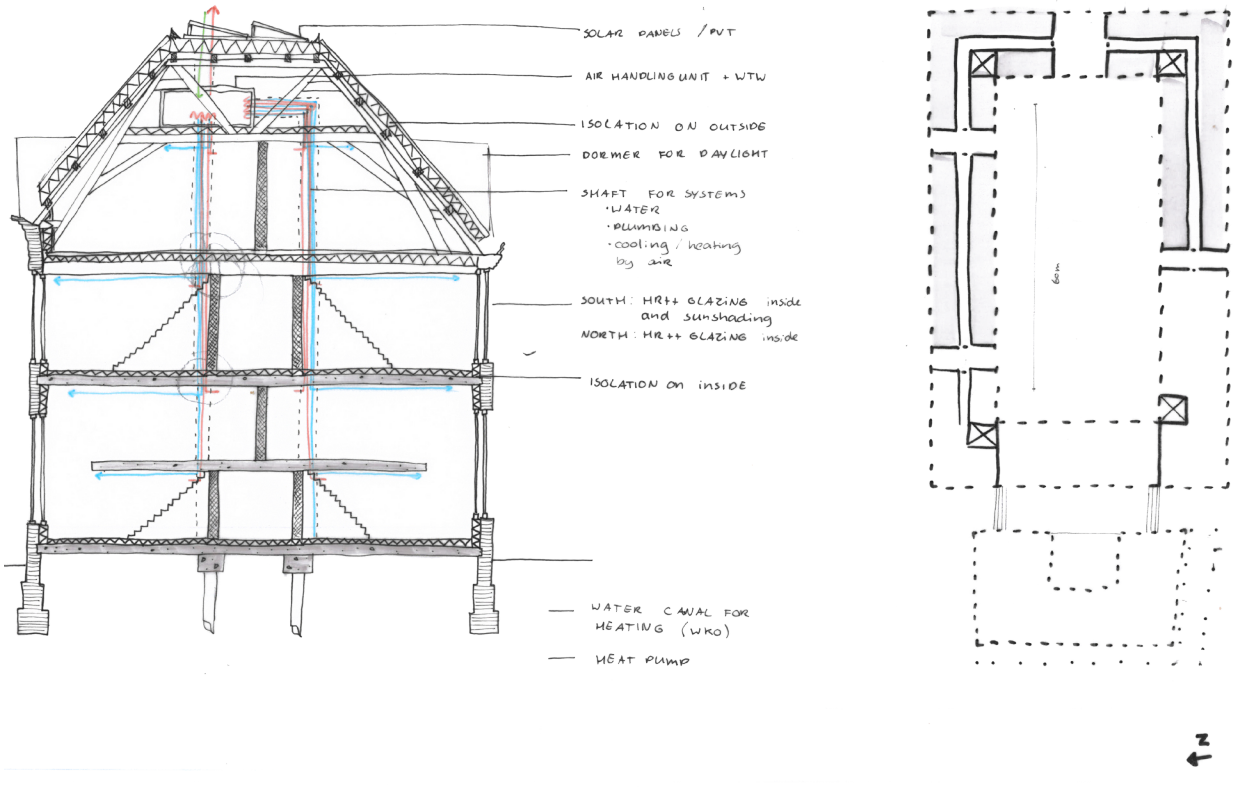
4.2 BUILDING TECHNOLOGY

4.2.1 REDESIGN KOUDENHORN

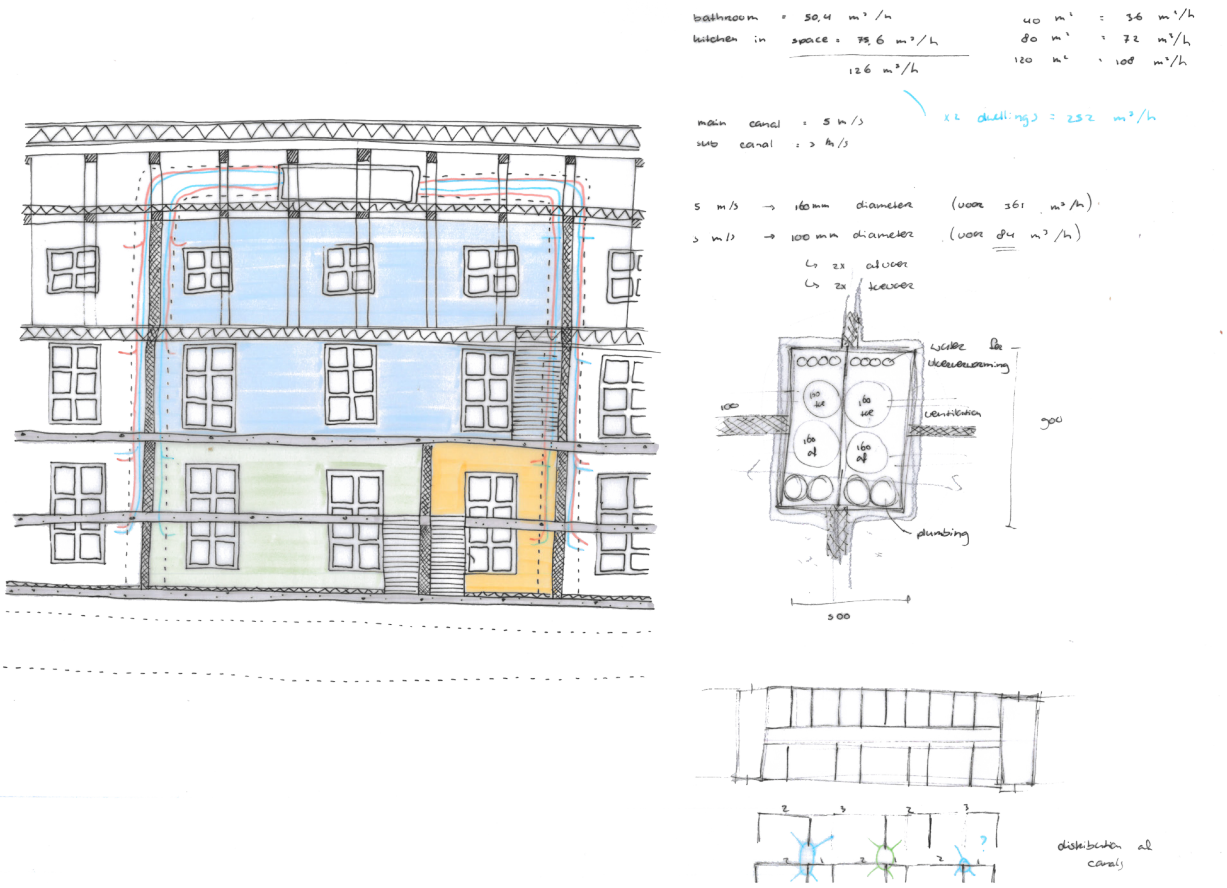
Since this graduation project is based on research by design, all elements of the design project are linked to each other. For the Koudenhorn to be able to use in an adaptable way in the future, the location of permanent elements like systems, shafts and circulation elements is important. Because of this hallways are created to divide the building with dwellings on both sides. Next to the hallways, the shafts are located in such a way that the 1-bay, 2-bay and 3-bay dwellings can be connected to this shaft. Therefore, different dwelling typologies can be found throughout the whole building. Besides, the whole building is isolated on the interior and all new materials are either biobased or recycled and are placed without any wet connections. Therefore materials can be easily replaced once broken and interior elements can be changed for future use when needed.

4.2.2 REDESIGN VERKEERSPOLITIE

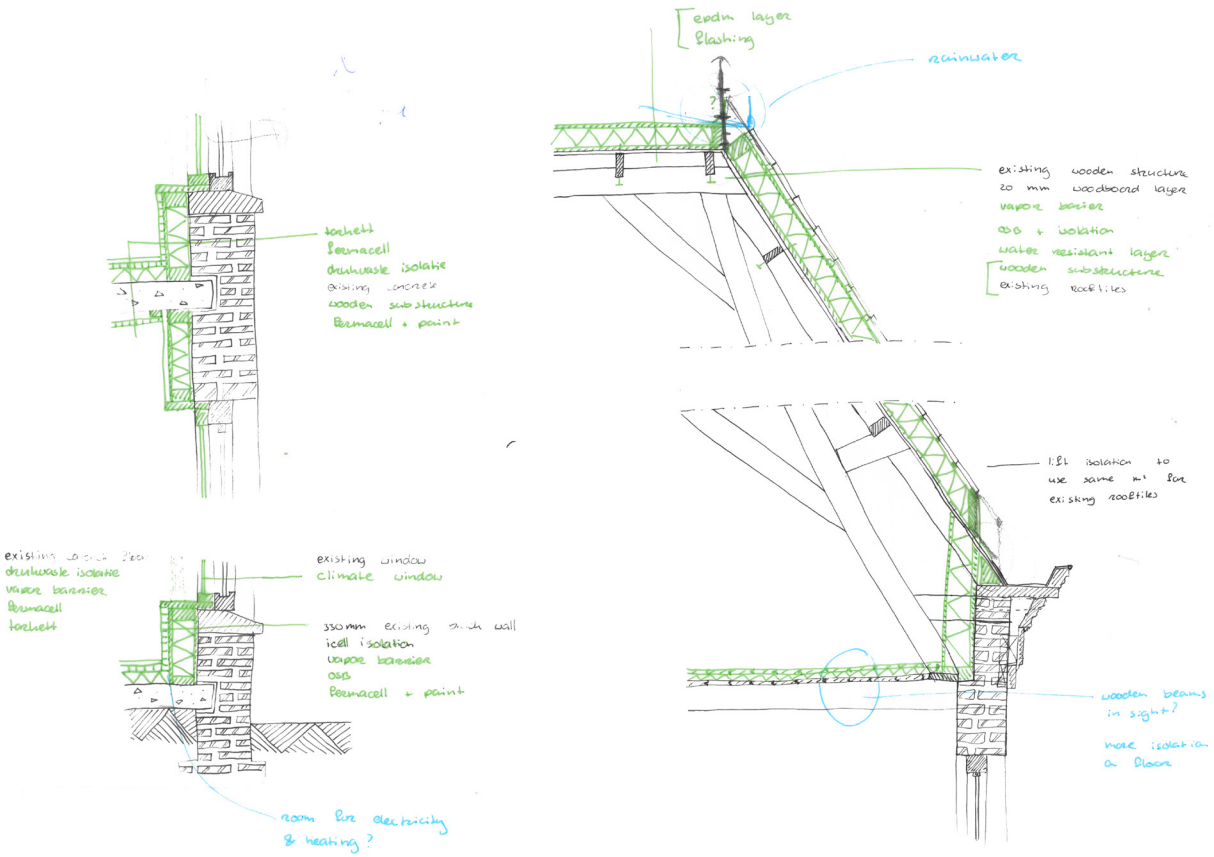
For the redesign of the Verkeerspolite, a spectrum was created on the one side keeping the building as it is and making sure the user needs to be adaptable to the building versus the other side that focuses on redesigning the building in such a way that it is most future-proof and therefore adaptable in the future. Eventually, it was most important to keep as much of the existing structure as possible and add where there is an opportunity. In the drawings on the next pages can be seen that new volume is added only where it was needed and possible.



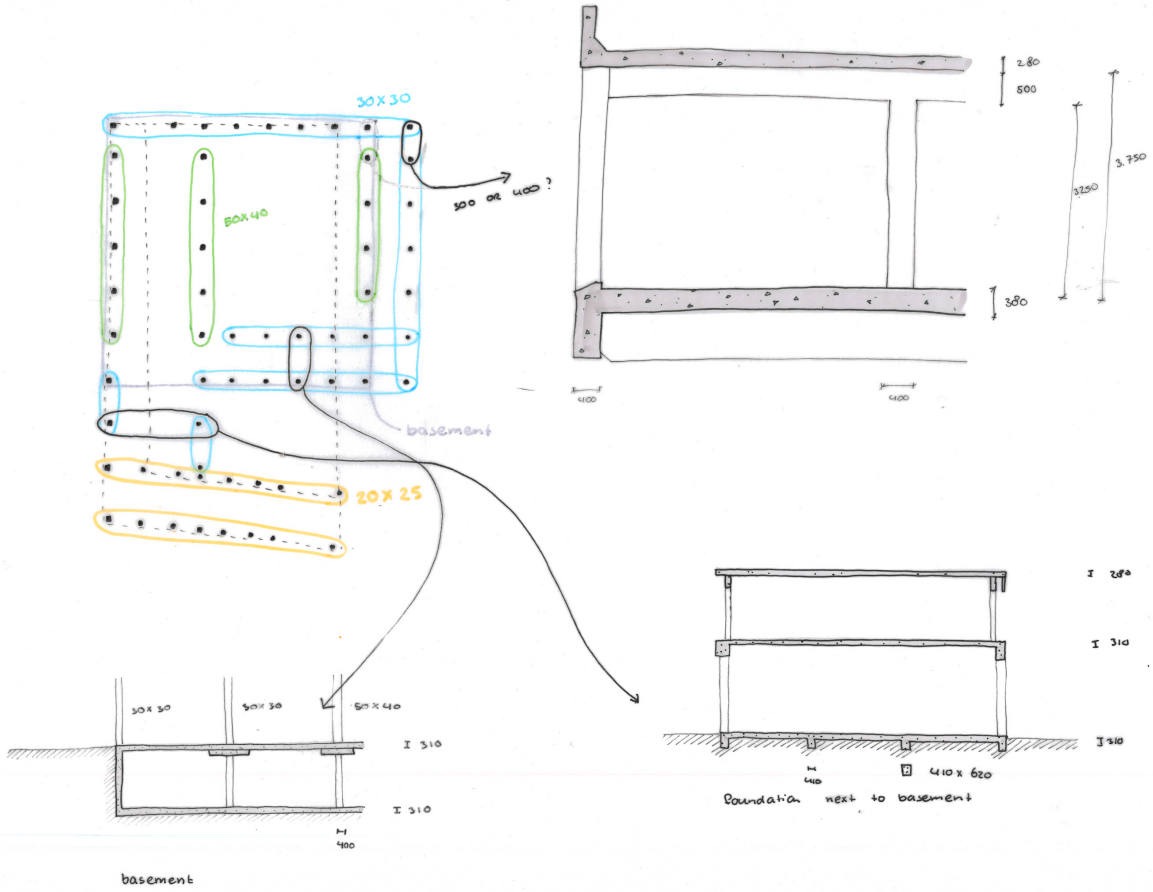
Building technology, location of systems and circulation.



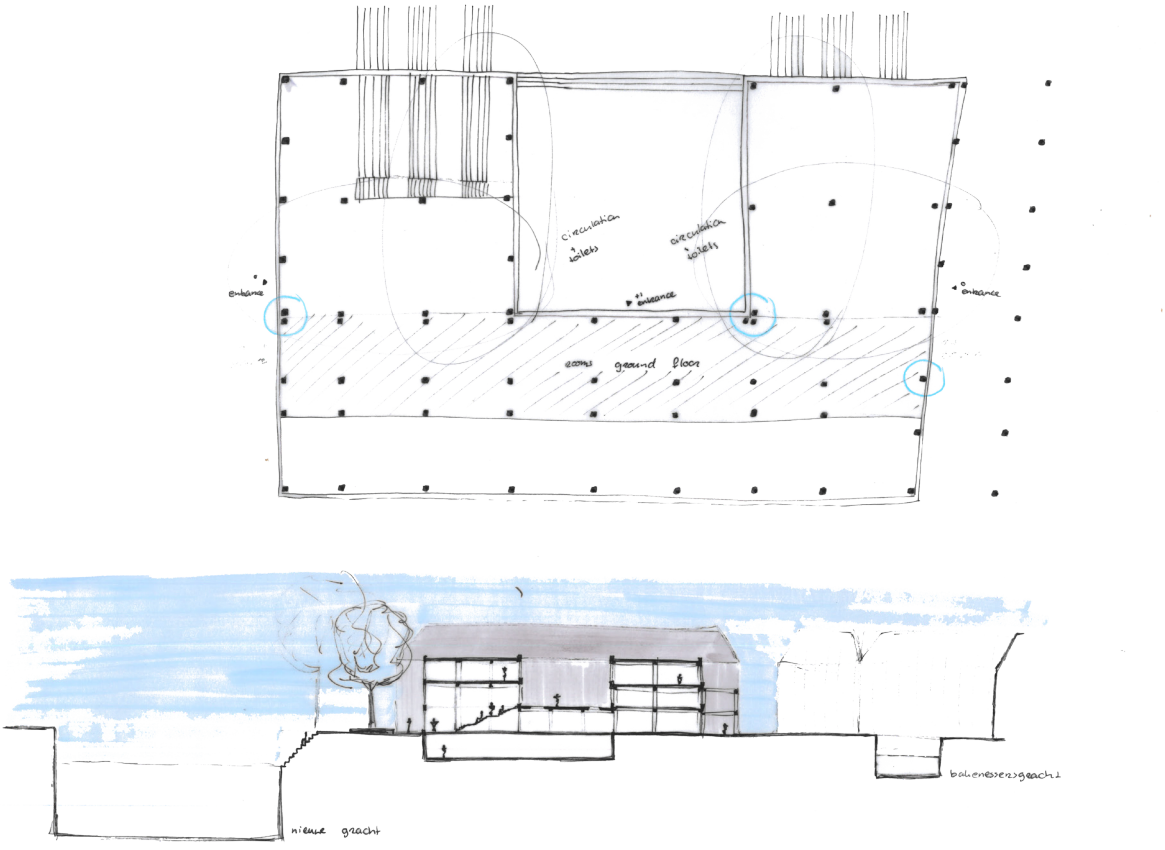
Location of shafts and relation between different dwelling typologies.



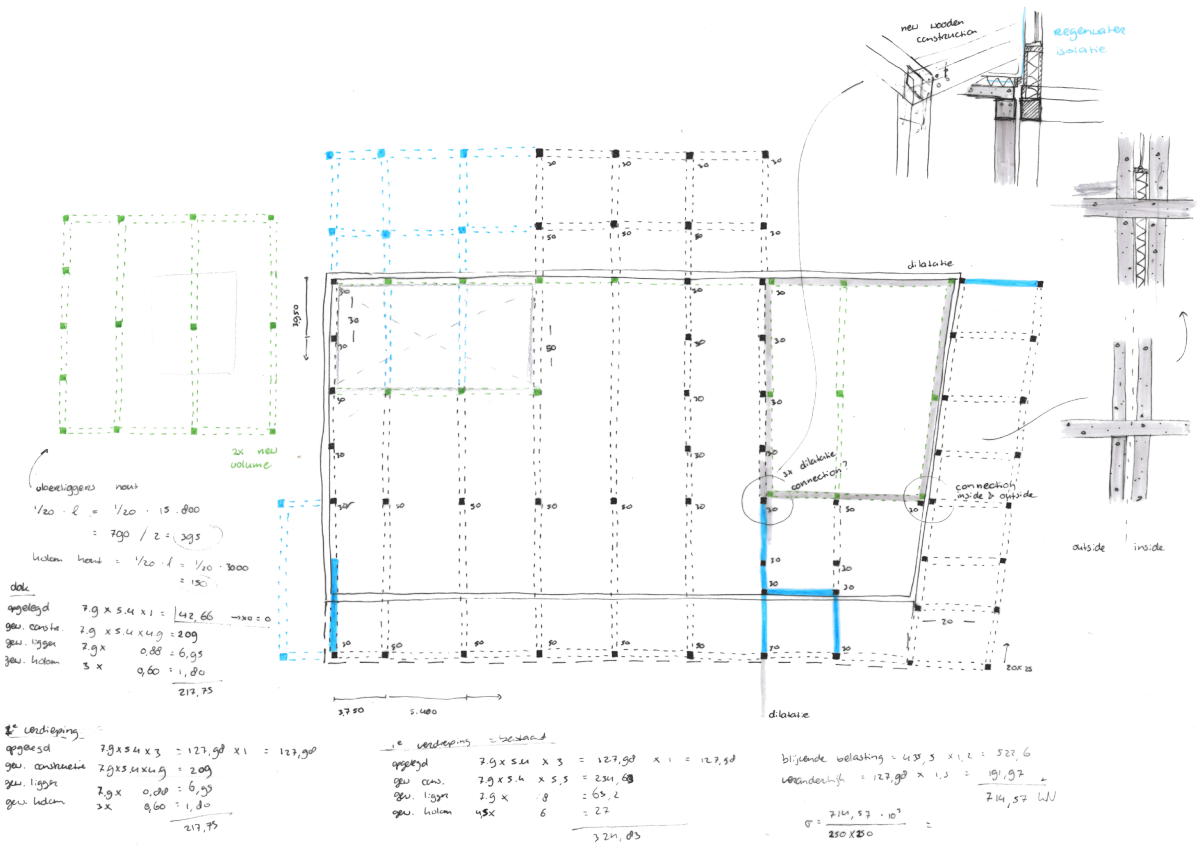
Details existing Koudenhorn.



Difference in structure of the Verkeerspolitie.



Location new circulation Verkeerspolitie.

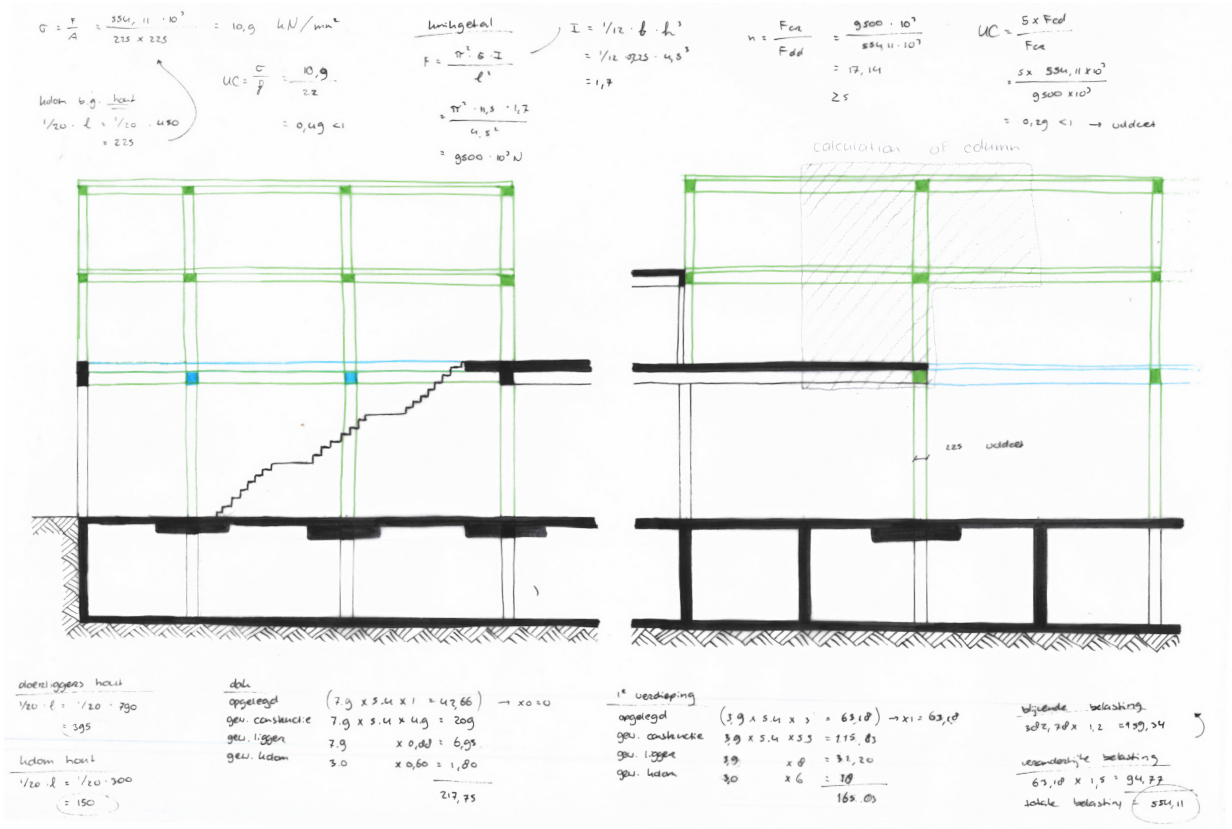


Existing Structure

Demolish

New Structure

New volume in / on Verkeerspolitie.



New volume in / on Verkeerspolitie.

Existing Structure

Demolish

New Structure

FINAL DESIGN PROPOSAL

4.3 P4 Presentation and Reflection

4.3 P4 PRESENTATION AND REFLECTION

4.3.1 ARCHITECTURAL DESIGN

During the design process, it became clear that there are two ways of interpreting the research conducted for this graduation studio. On the one side keeping the building as it is and making sure the user needs to be adaptable to the building, keeping as much of the existing structure and materials. On the other side creating a building that is future-proof and therefore easier adaptable in the future. Instead of choosing one approach, both ways are visible in the redesign proposal. For the final graduation project, it is important to have a clear vision for the whole design, explaining what are the current limitations of the existing structure and the spatial sense in relation to what is going to be demolished and what is going to be added. Besides, it needs to be more clear where and how the user needs to adapt to the spaces.

Next to implementing the research in the design, it is also important to think about the architectural quality itself. Therefore more focus needs to be laid on the design for the context, like the relation to the courtyard, the waterside and the city itself. Also of importance is the design fOr the interior, the colour and materiality of the dwellings, the public spaces and the cultural centre.

4.3.2 BUILDING TECHNOLOGY

In the redesign for the Koudenhorn building, new partitioning walls will be placed that can be easily replaced or moved if needed. However, for this to happen the current partitioning walls need to be removed. Up until now, it has not been researched yet how and if the materials of these existing partitioning walls can be reused within the building or recycled in any other way. This is something that needs to be taken into account, just as all other materials that will be removed from the building.

With the logical placement of shafts and circulation spaces, new permanent structures are added to the buildings. The question is if, with this, a generic space is created for future uses or whether it is important to find an adaptable function in the future. With the last option, it is the question of whether the building offers adaptable spaces or if the new function needs to be adaptable.

4.3.3 RESEARCH

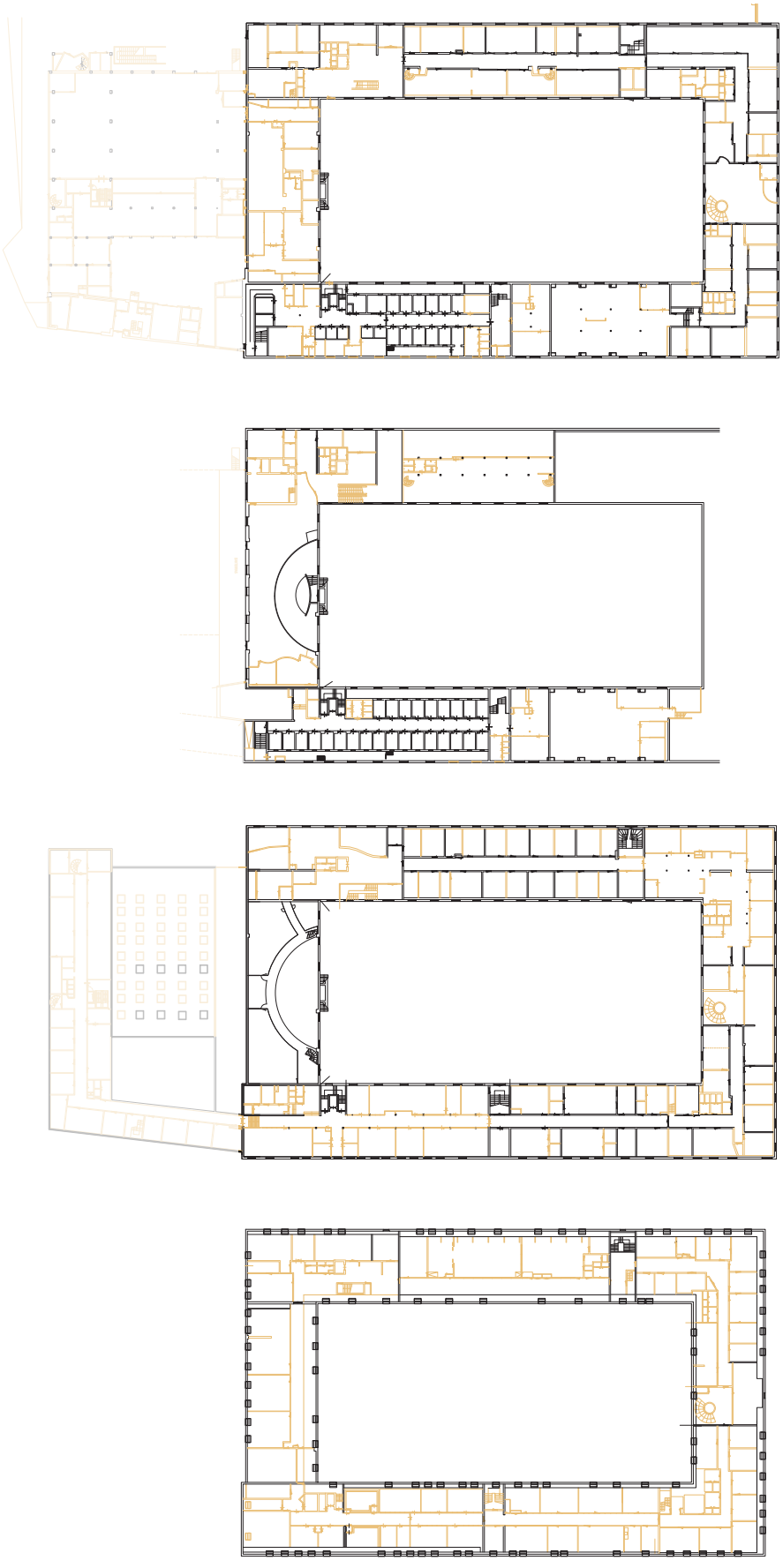
Based on the conclusions of the research that there are 3 different ways of redesigning within the permanent, it also became clear during the design process that these 3 different ways do not necessarily have the same outcome when creating a redesign for 2 types of buildings. It was a challenge to relate the outcomes of the research to the Koudenhorn building. A building that has been redesigned on the interior many times with a load-bearing structure mainly based on load-bearing walls. This results in different approaches of a redesign for future use throughout the whole building. On the contrary, the building of the Verkeerspolitie has a structural capacity that offers a lot of opportunities. Especially the open building principles can be applied to the redesign of this building.

CHAPTER 5
GRADUATION PROJECT

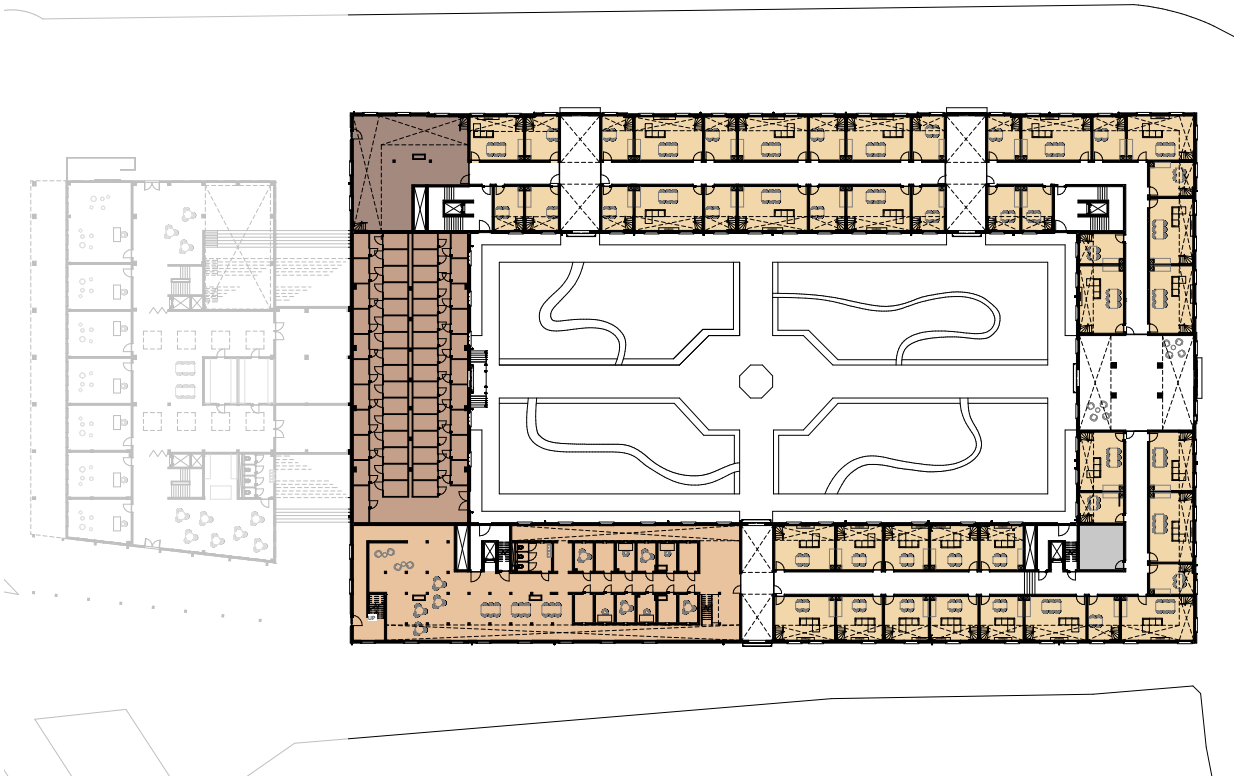
GRADUATION PROJECT

5.1 Final Redesign of the Koudenhorn

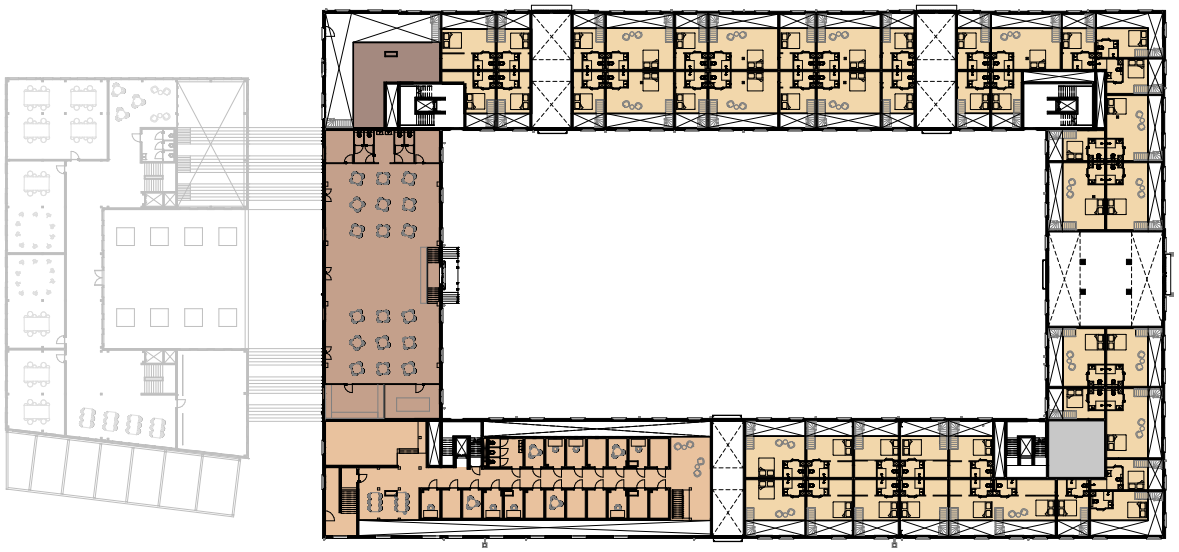
5.1 FINAL REDESIGN OF THE KOUDENHORN



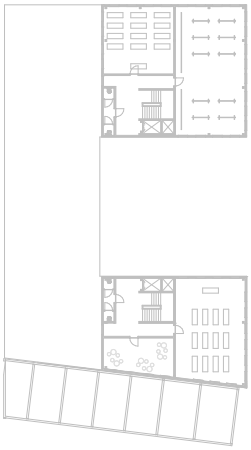
Demolition plans from top to bottom: ground floor, entresol, first floor, attic.



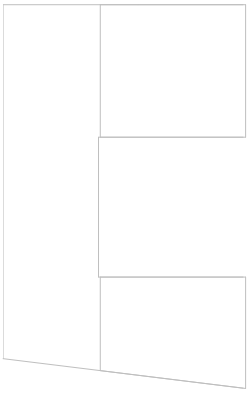
Ground Floor

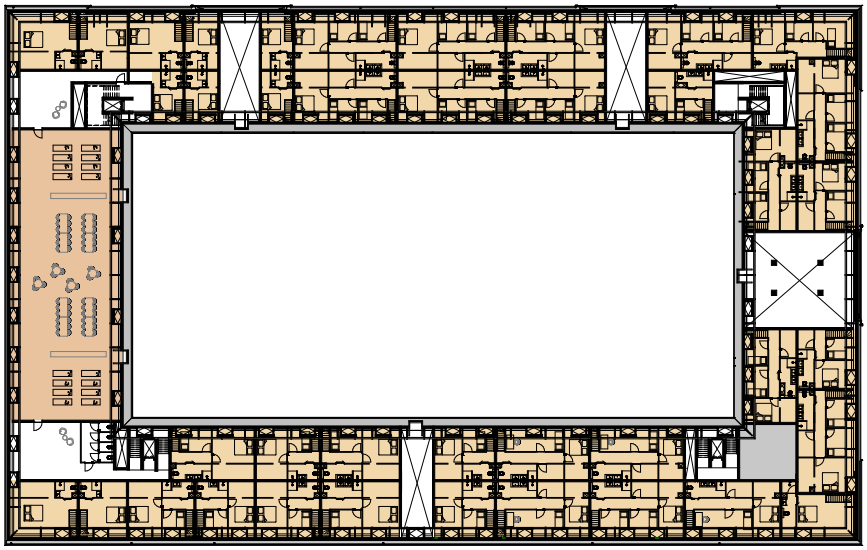


Entresol



First Floor

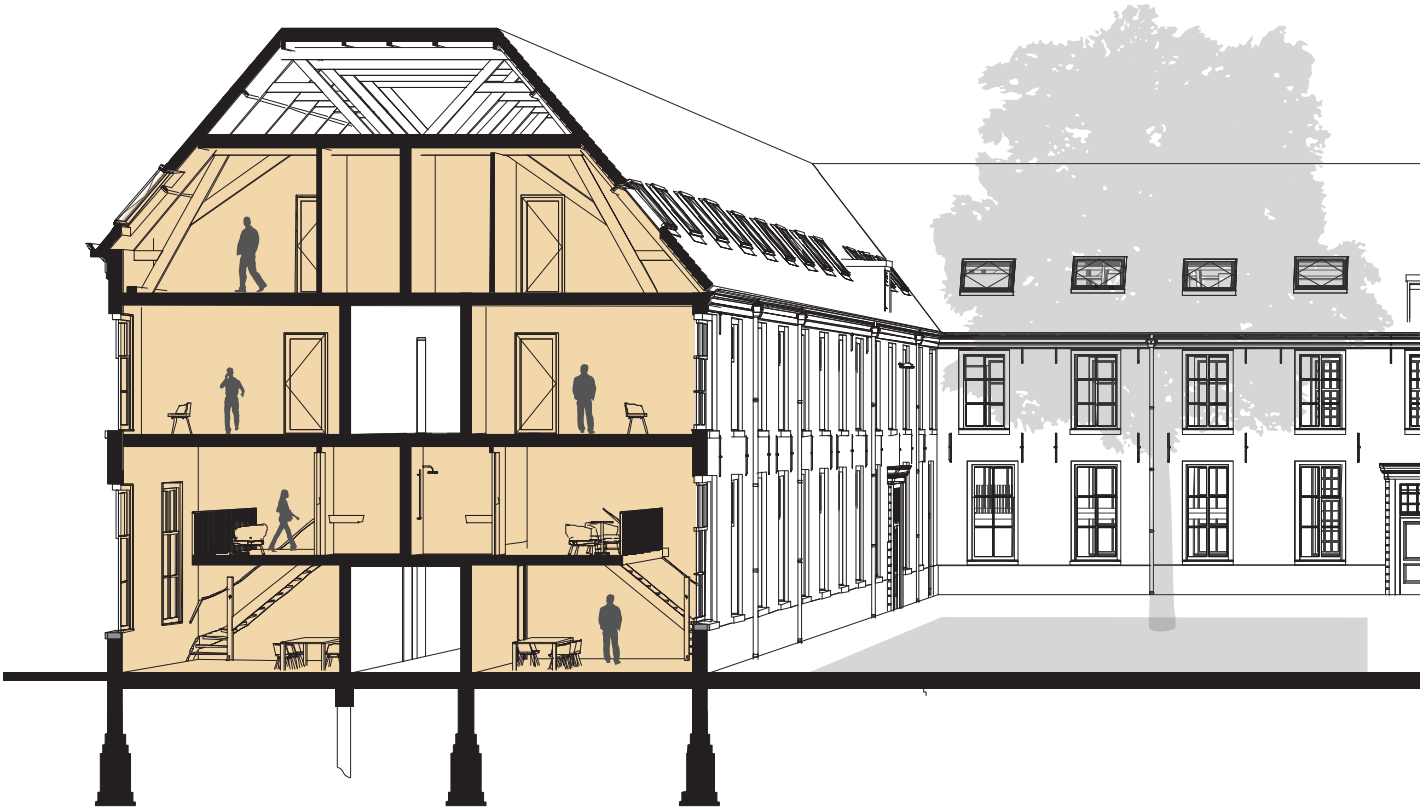




Second Floor

- Laundry Room
- Storeage
- Makerspace / Communal Space
- Dwellings
- Technical Space

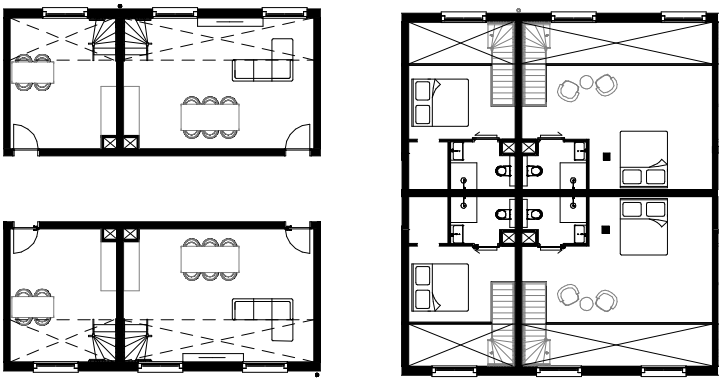
0 20M

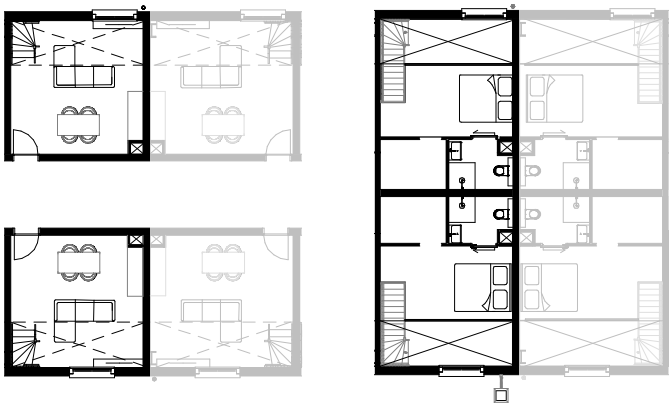


Sections over dwellings and makerspace

20 dwellings of 35 m²
BG (3.6 x 5)
Entresol (3.6 x 4.8)
(3.6 is the average between 3.4 and 3.8)

18 dwellings of 70 m²
BG (7.1 x 5)
Entresol (7.1 x 4.8)
(7.1 is the average between 6.0 and 8.2)





8 dwellings of 52 m²
BG (5.2 x 5)
Entresol (5.2 x 4.8)

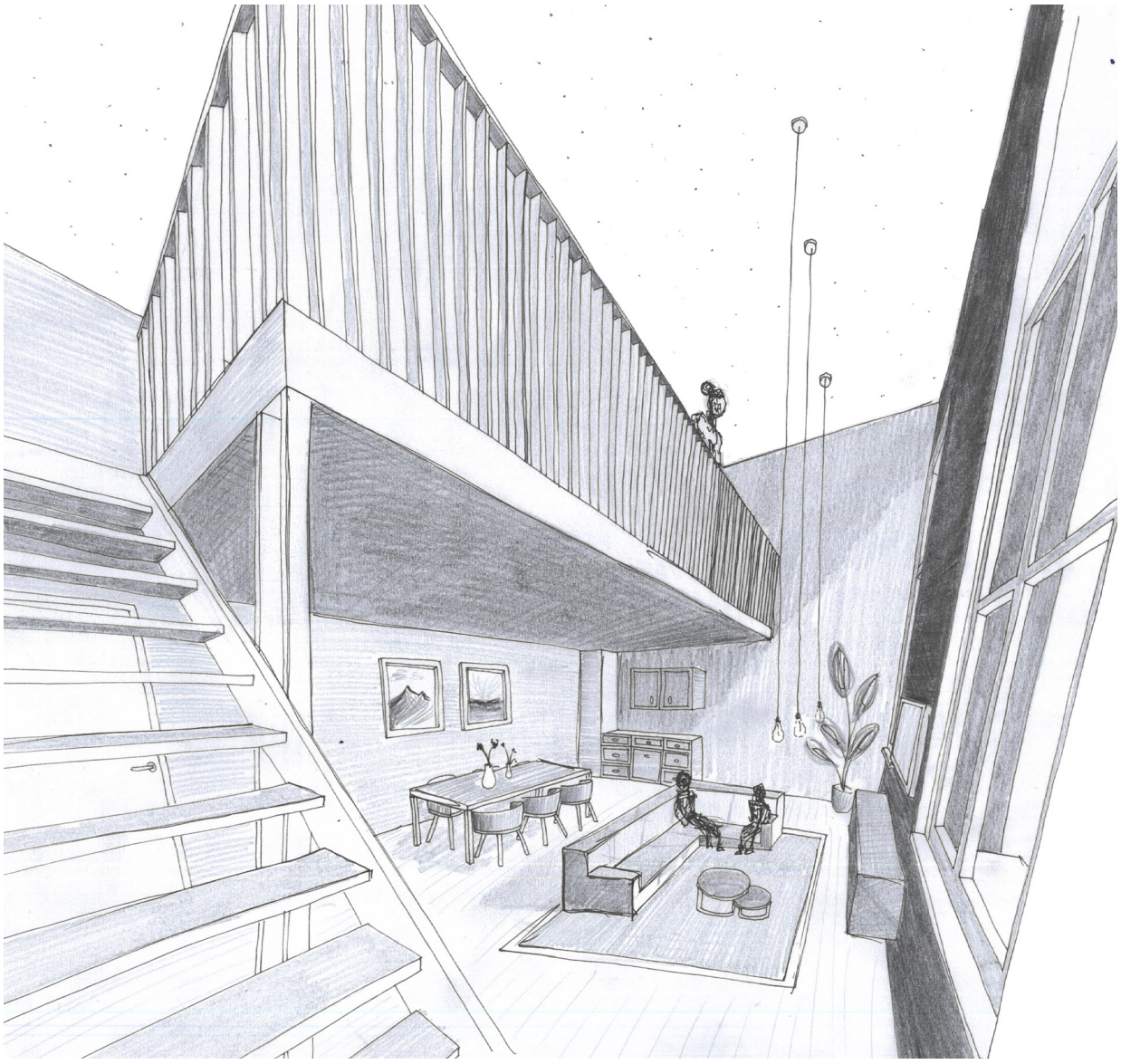
Dwelling typologies ground floor and entresol

5 dwellings of 40 m²
1st Floor (3.6 x 6)
2nd Floor (3.6 x 6)
(3.6 is the average between 3.4 and 3.8)

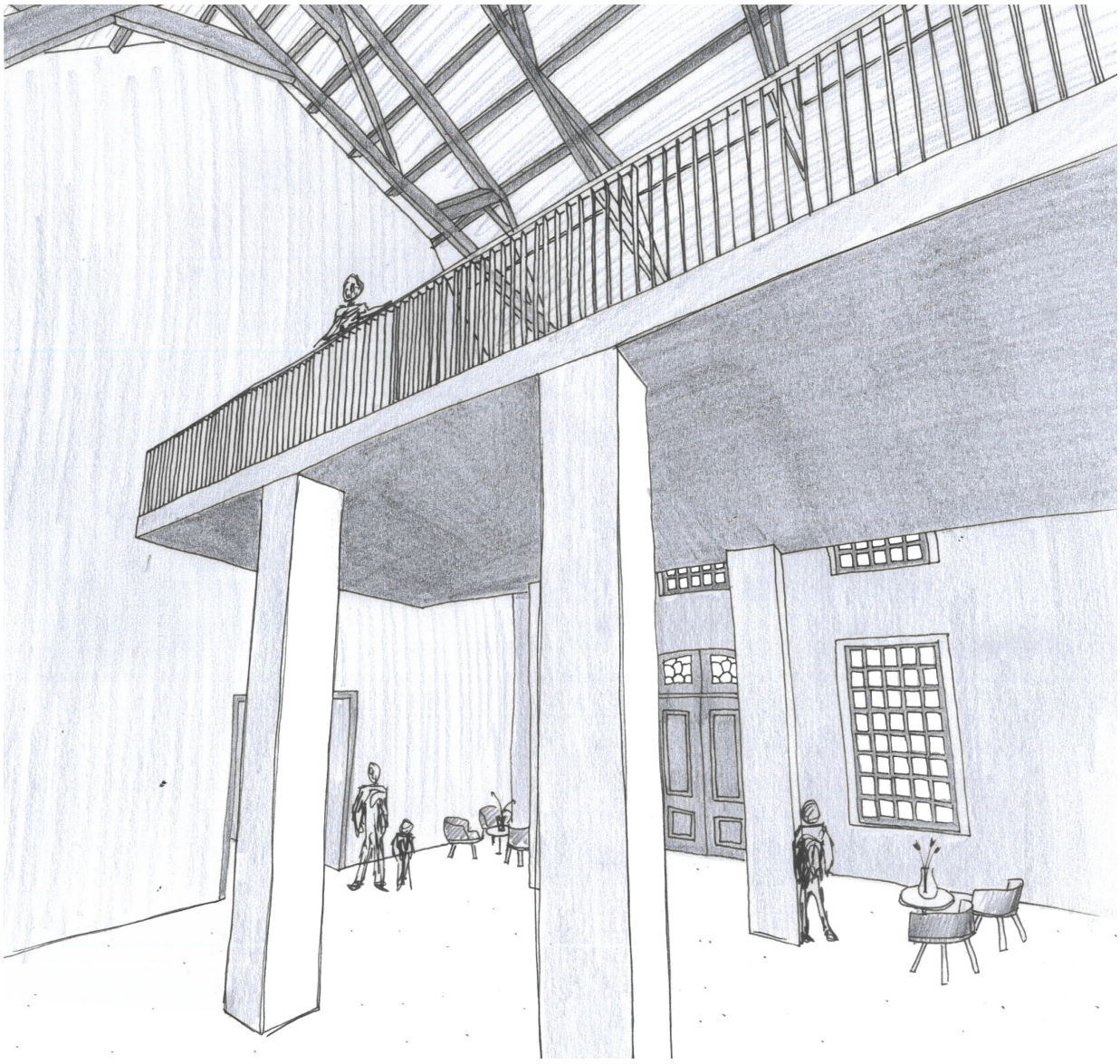
18 dwellings of 80 m²
1st Floor (7.2 x 6)
2nd Floor (7.2 x 6)
(7.2 is the average between 6.0 and 8.4)

17 dwellings of 125 m²
1st Floor (11.6 x 6)
2nd Floor (11.6x 6)

Dwelling typologies 1st and 2nd floor

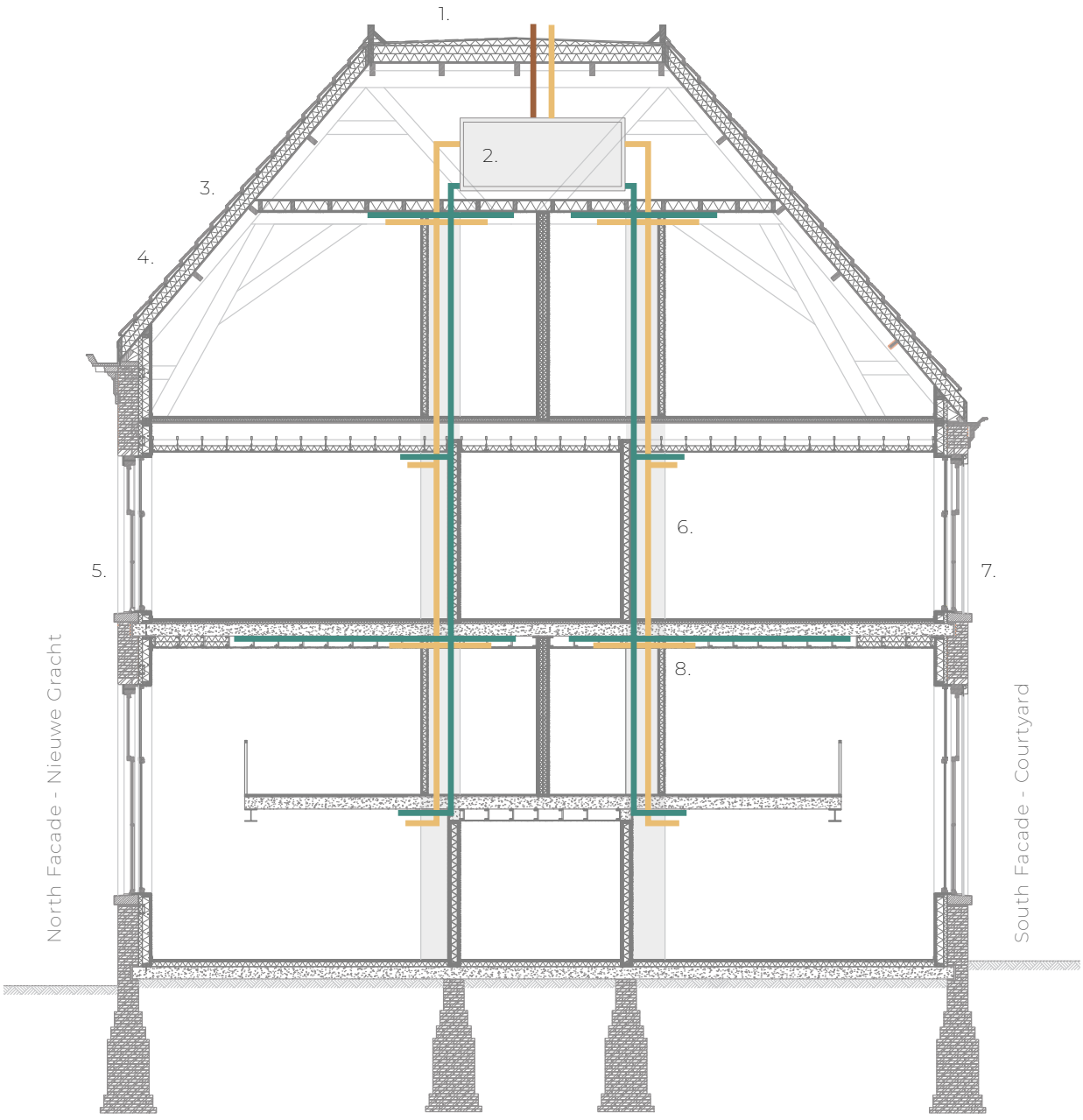


Impression of a dwelling on the ground floor

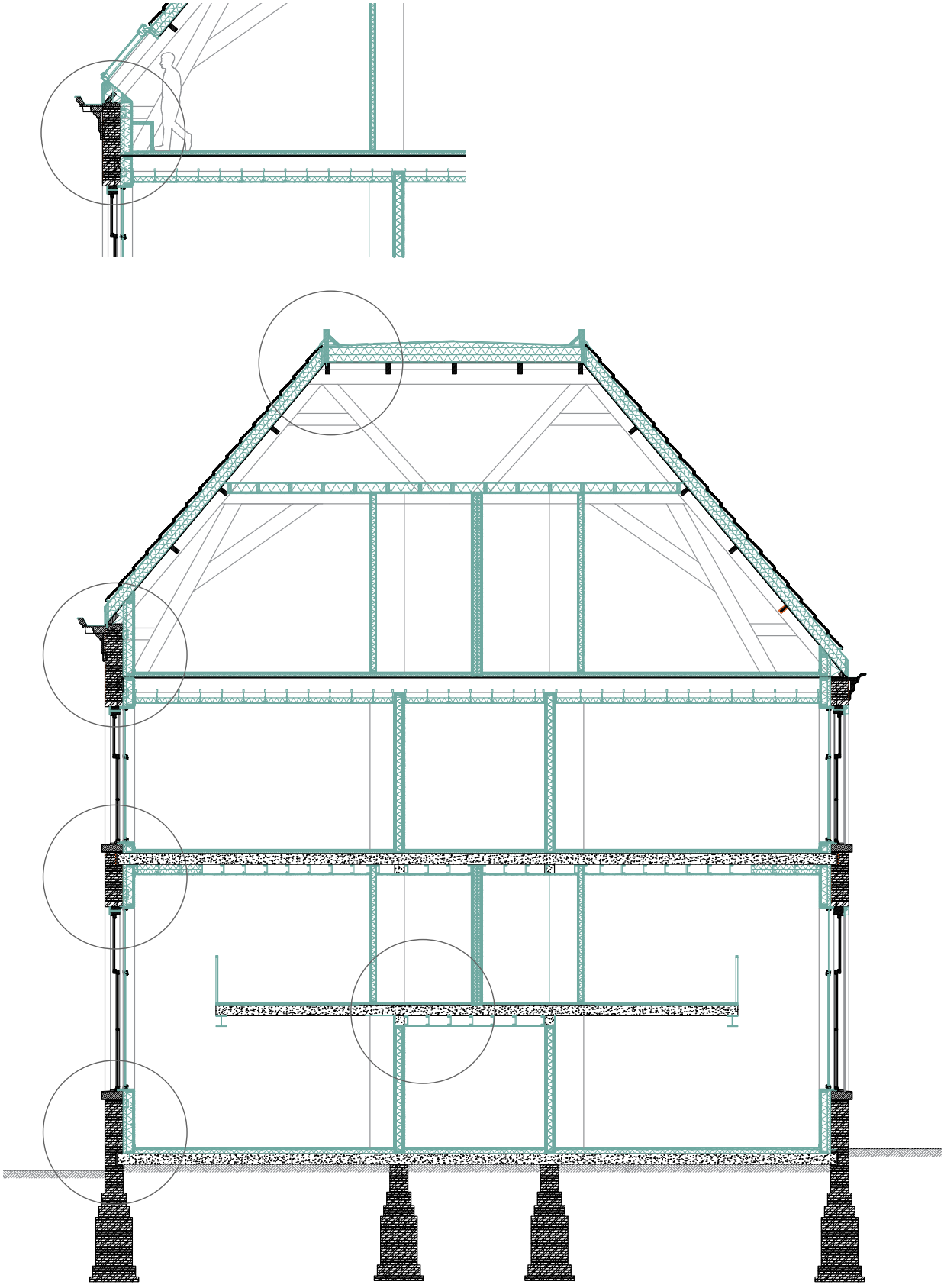


Impression of an entrance hall

1. Solar panels on flat part of the roof
2. Air handling unit + Heat Recovery System (WTW)
3. Thermal insulated roof on the outside
4. Dormer and roofwindows for daylight
5. North: Secondary openable HR++ windows on the inside
6. Shaft for systems (water, plumbing, ventilation)
7. South: Secondary openable HR++ windows on the inside and sunshading on the outside
8. Hybrid Mechanical Ventilation
9. Heat Pump located in Verkeerspolitie
10. Extracting heat from water canal for heating (WKO)



Building Technology - Section Koudenhorn

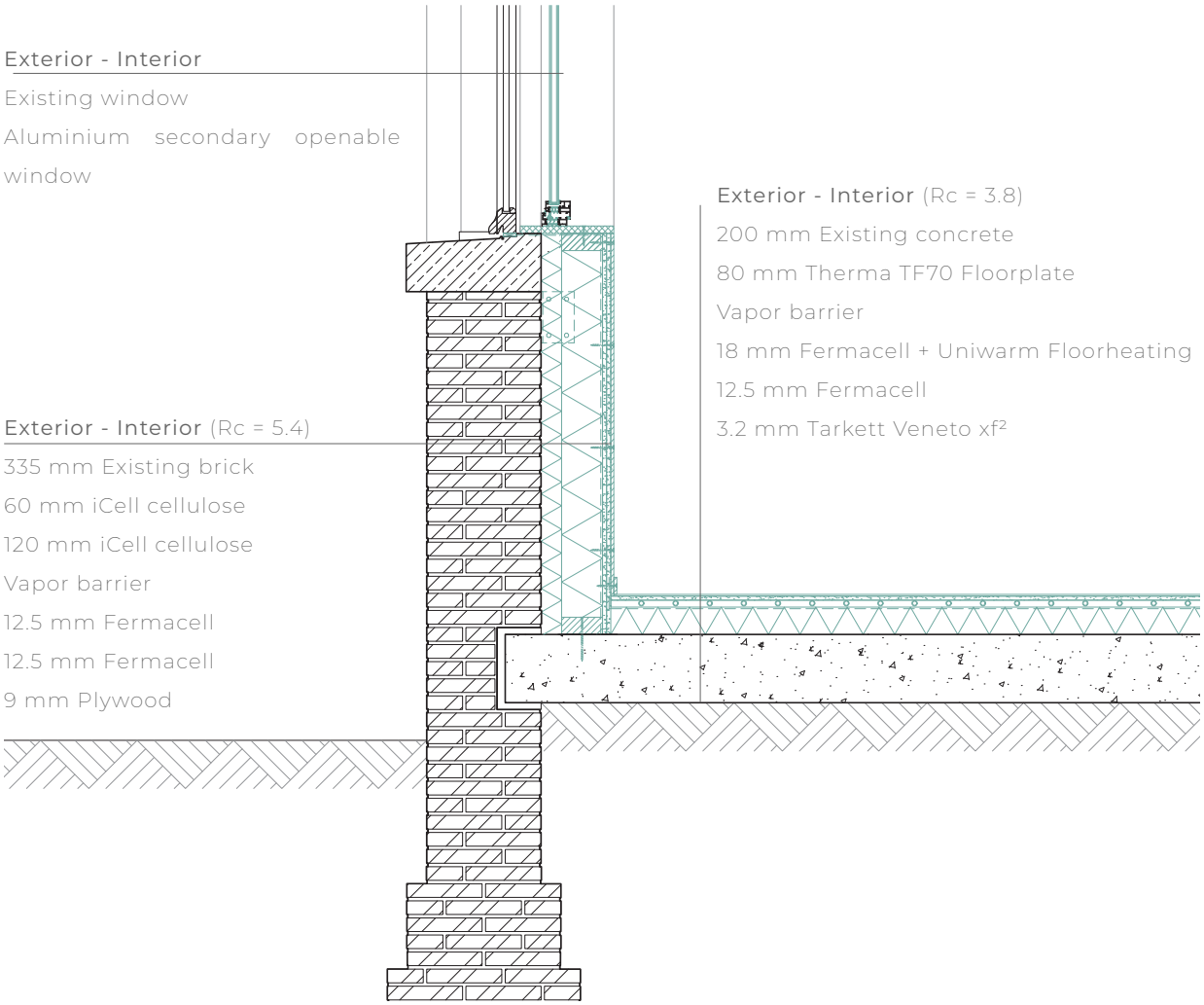


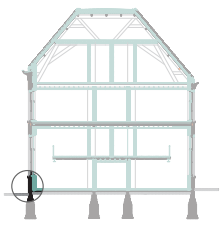
Building Technology - Section Koudenhorn

Existing building

Newly added

0 2M





Existing building

Newly added

0 500mm

Building Technology - Detail Ground Floor

Exterior - Interior

Existing window

Aluminium secondary openable window

Exterior - Interior (Rc = 5.4)

335 mm Existing brick

60 mm iCell cellulose

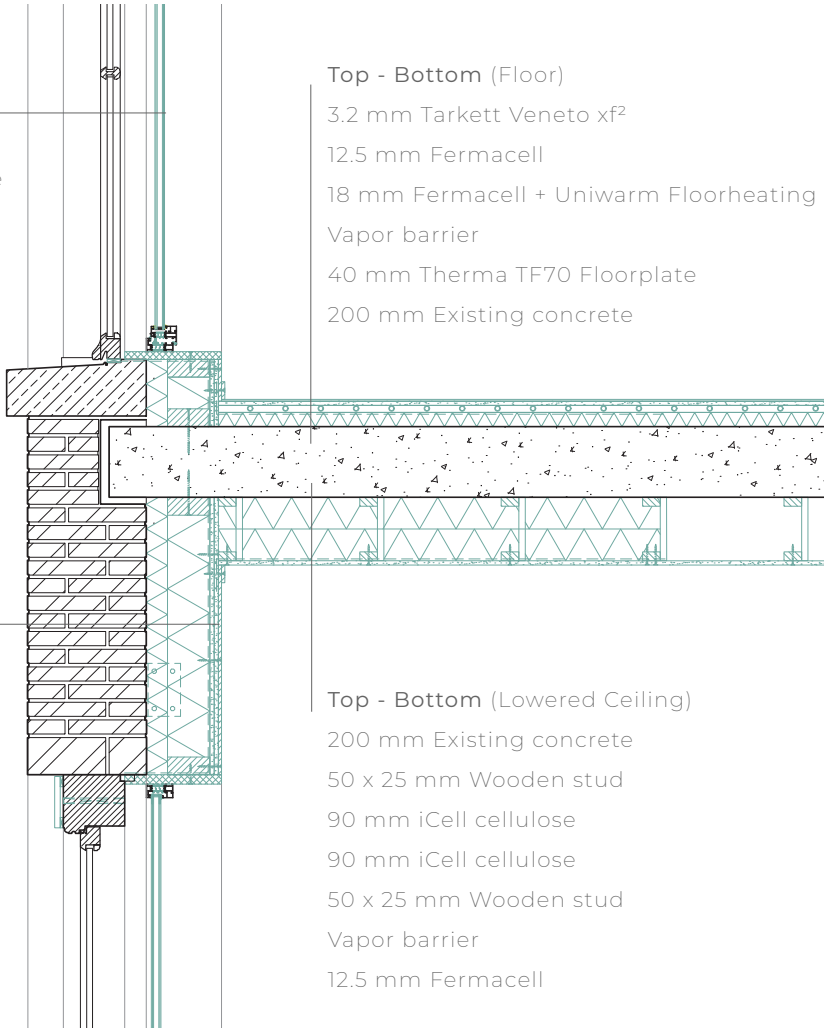
120 mm iCell cellulose

Vapor barrier

12.5 mm Fermacell

12.5 mm Fermacell

9 mm Plywood



Top - Bottom (Floor)

3.2 mm Tarkett Veneto xf²

12.5 mm Fermacell

18 mm Fermacell + Uniwarm Floorheating

Vapor barrier

40 mm Therma TF70 Floorplate

200 mm Existing concrete

Top - Bottom (Lowered Ceiling)

200 mm Existing concrete

50 x 25 mm Wooden stud

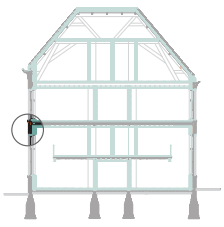
90 mm iCell cellulose

90 mm iCell cellulose

50 x 25 mm Wooden stud

Vapor barrier

12.5 mm Fermacell

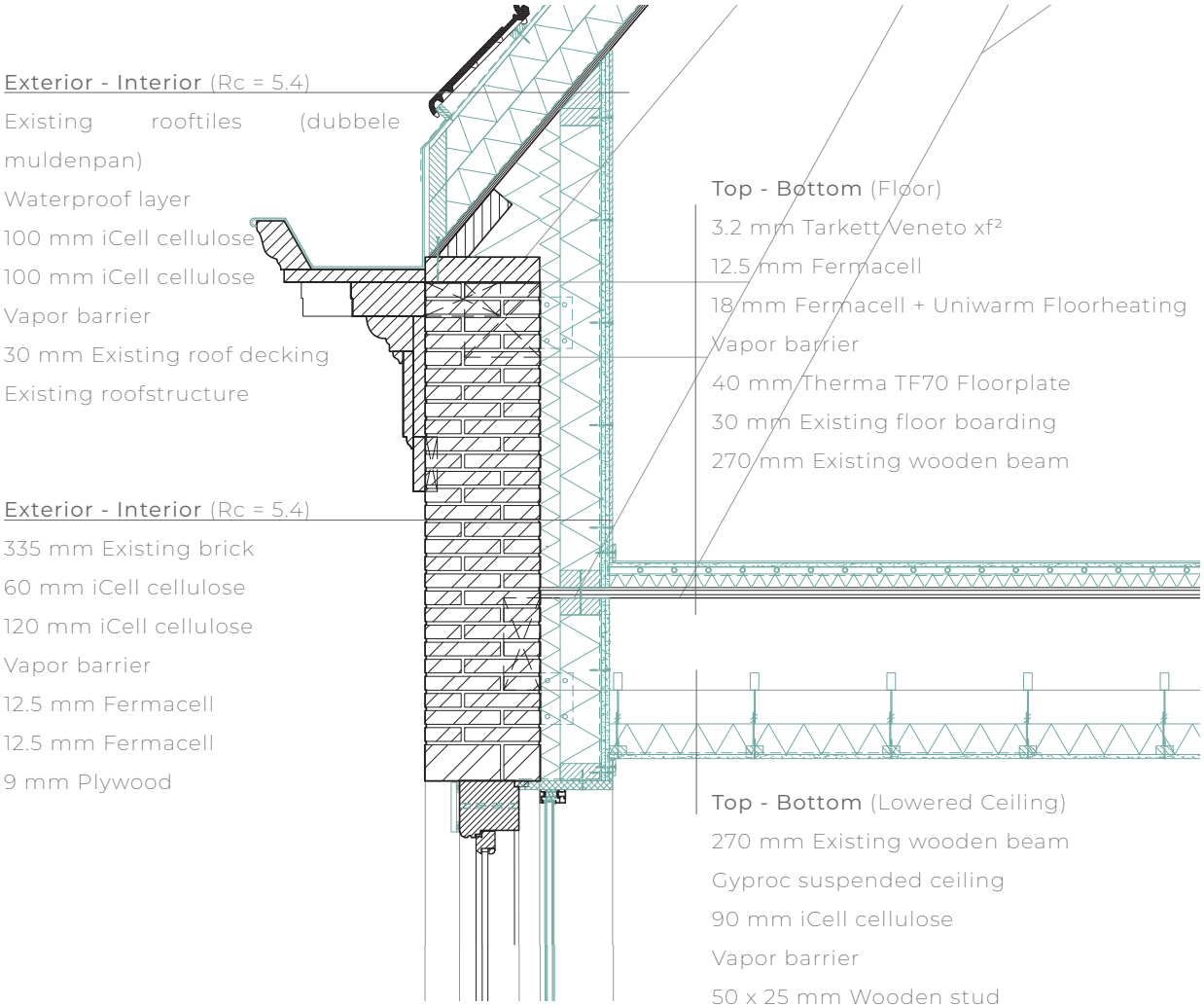


Building Technology - Detail Floor

Existing building

Newly added

0 500mm

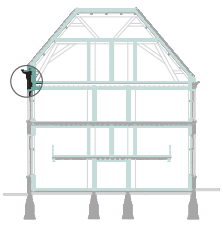


Exterior - Interior (Rc = 5.4)
Existing rooftiles (dubbele muldenpan)
Waterproof layer
100 mm iCell cellulose
100 mm iCell cellulose
Vapor barrier
30 mm Existing roof decking
Existing roofstructure

Exterior - Interior (Rc = 5.4)
335 mm Existing brick
60 mm iCell cellulose
120 mm iCell cellulose
Vapor barrier
12.5 mm Fermacell
12.5 mm Fermacell
9 mm Plywood

Top - Bottom (Floor)
3.2 mm Tarkett Veneto xf²
12.5 mm Fermacell
18 mm Fermacell + Uniwarm Floorheating
Vapor barrier
40 mm Therma TF70 Floorplate
30 mm Existing floor boarding
270 mm Existing wooden beam

Top - Bottom (Lowered Ceiling)
270 mm Existing wooden beam
Gyproc suspended ceiling
90 mm iCell cellulose
Vapor barrier
50 x 25 mm Wooden stud
12.5 mm Fermacell



Existing building
Newly added

0 500mm

Building Technology - Detail Gutter

Exterior - Interior (Rc = 5.4)

Existing rooftiles (dubbele muldenpan)

Waterproof layer

100 mm iCell cellulose

100 mm iCell cellulose

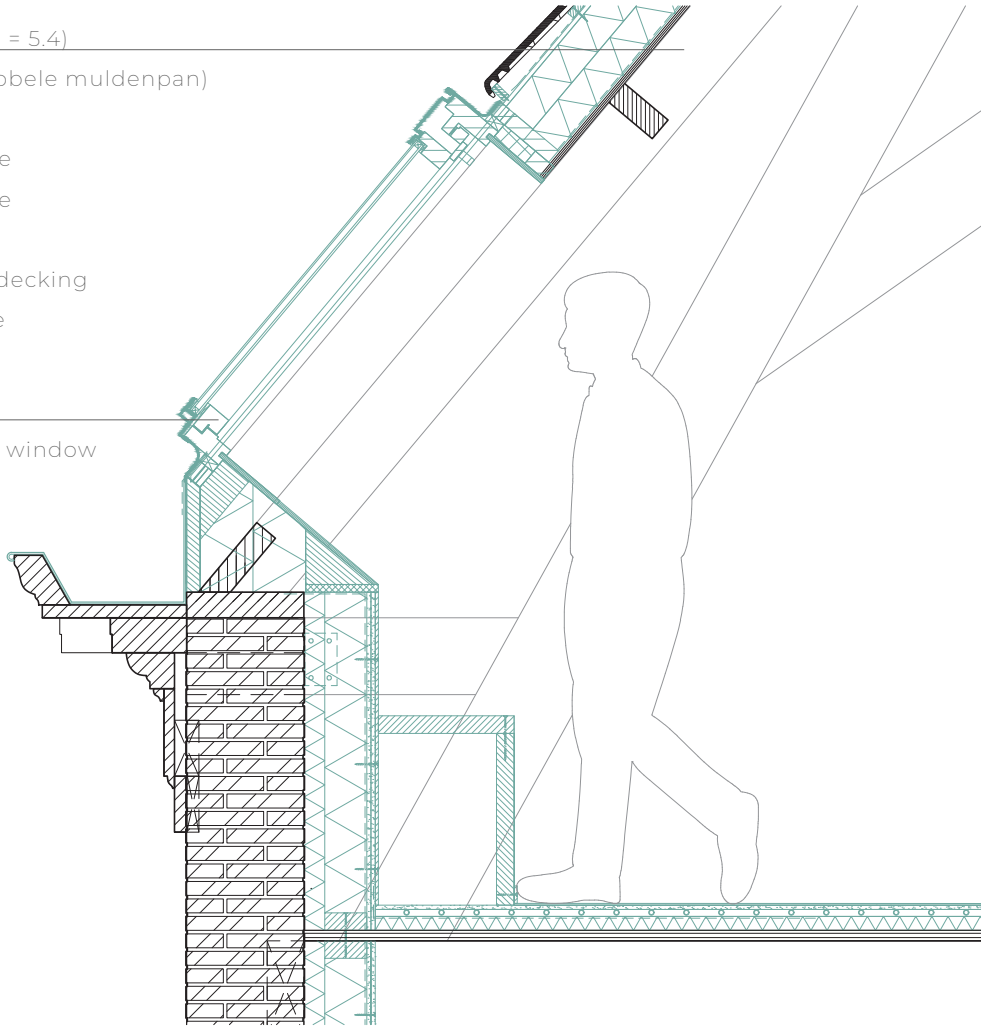
Vapor barrier

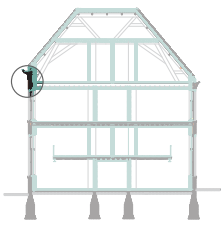
30 mm Existing roof decking

Existing roofstructure

Exterior - Interior

Aluminium openable window





Building Technology - Roofwindow

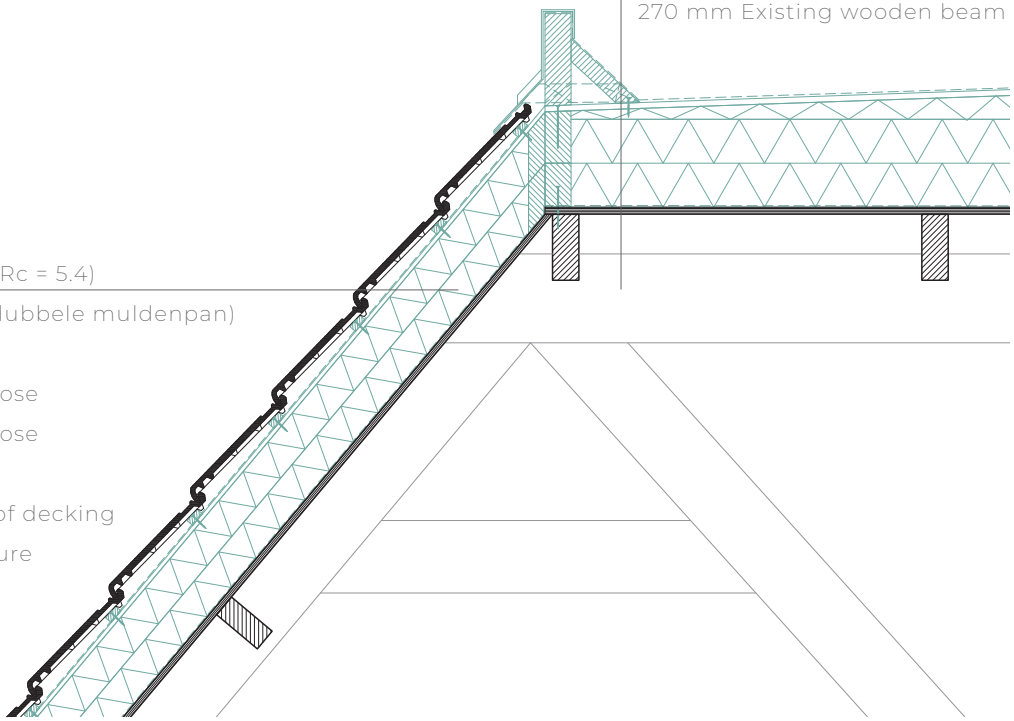
Existing building

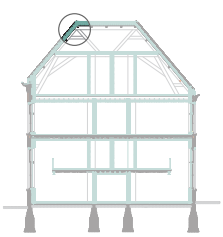
Newly added

0 500mm

Exterior - Interior (Rc = 7.0)
Waterproof layer
18 mm OSB
130 mm iCell cellulose
130 mm iCell cellulose
Vapor barrier
30 mm Existing roof decking
270 mm Existing wooden beam

Exterior - Interior (Rc = 5.4)
Existing rooftiles (dubbele muldenpan)
Waterproof layer
100 mm iCell cellulose
100 mm iCell cellulose
Vapor barrier
30 mm Existing roof decking
Existing roofstructure

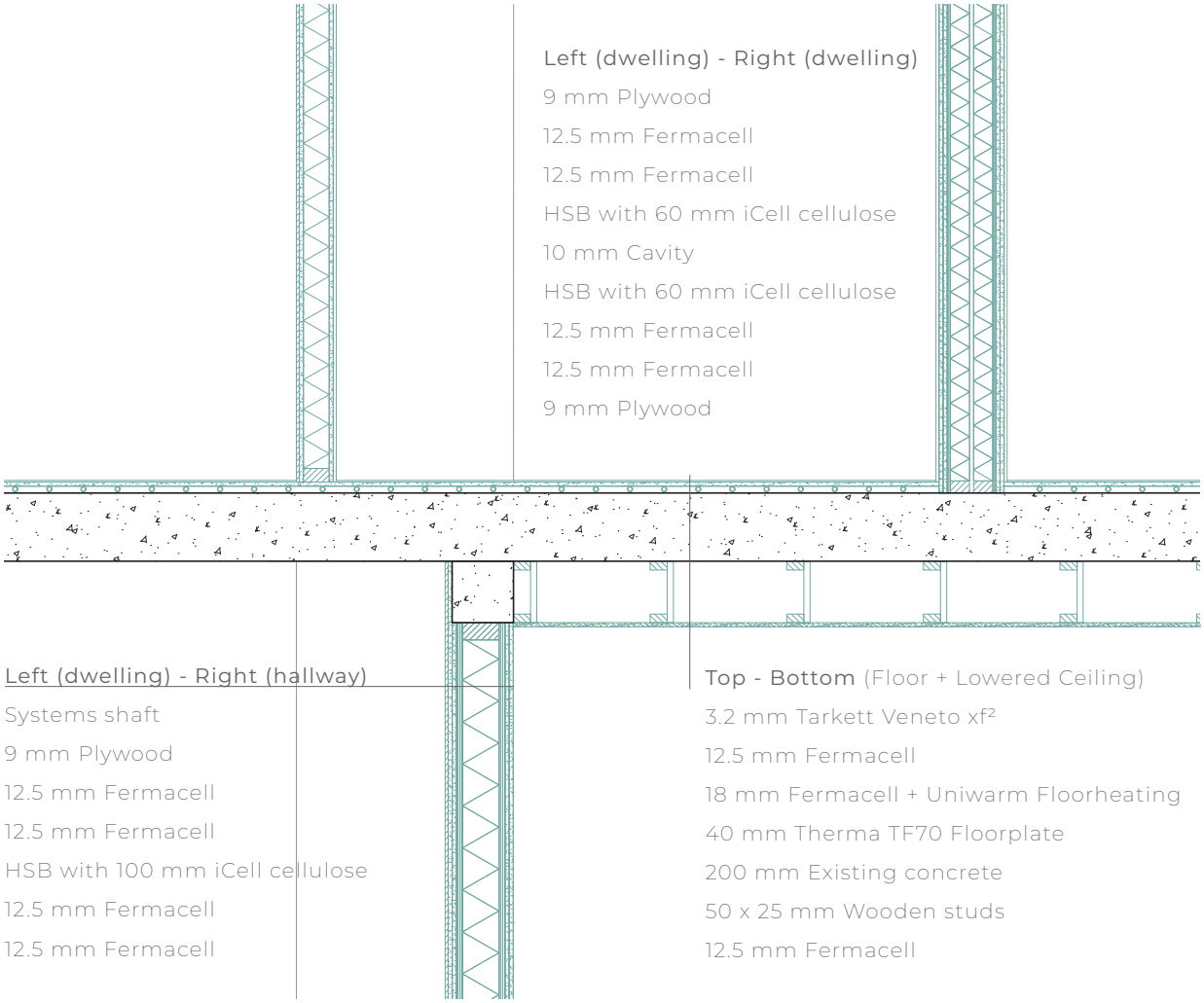




Existing building
Newly added

0 500mm

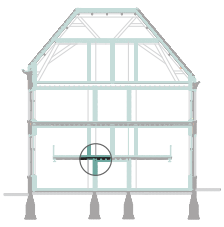
Building Technology - Roofedge



Left (dwelling) - Right (dwelling)
9 mm Plywood
12.5 mm Fermacell
12.5 mm Fermacell
HSB with 60 mm iCell cellulose
10 mm Cavity
HSB with 60 mm iCell cellulose
12.5 mm Fermacell
12.5 mm Fermacell
9 mm Plywood

Left (dwelling) - Right (hallway)
Systems shaft
9 mm Plywood
12.5 mm Fermacell
12.5 mm Fermacell
HSB with 100 mm iCell cellulose
12.5 mm Fermacell
12.5 mm Fermacell

Top - Bottom (Floor + Lowered Ceiling)
3.2 mm Tarkett Veneto xf²
12.5 mm Fermacell
18 mm Fermacell + Uniwarm Floorheating
40 mm Therma TF70 Floorplate
200 mm Existing concrete
50 x 25 mm Wooden studs
12.5 mm Fermacell



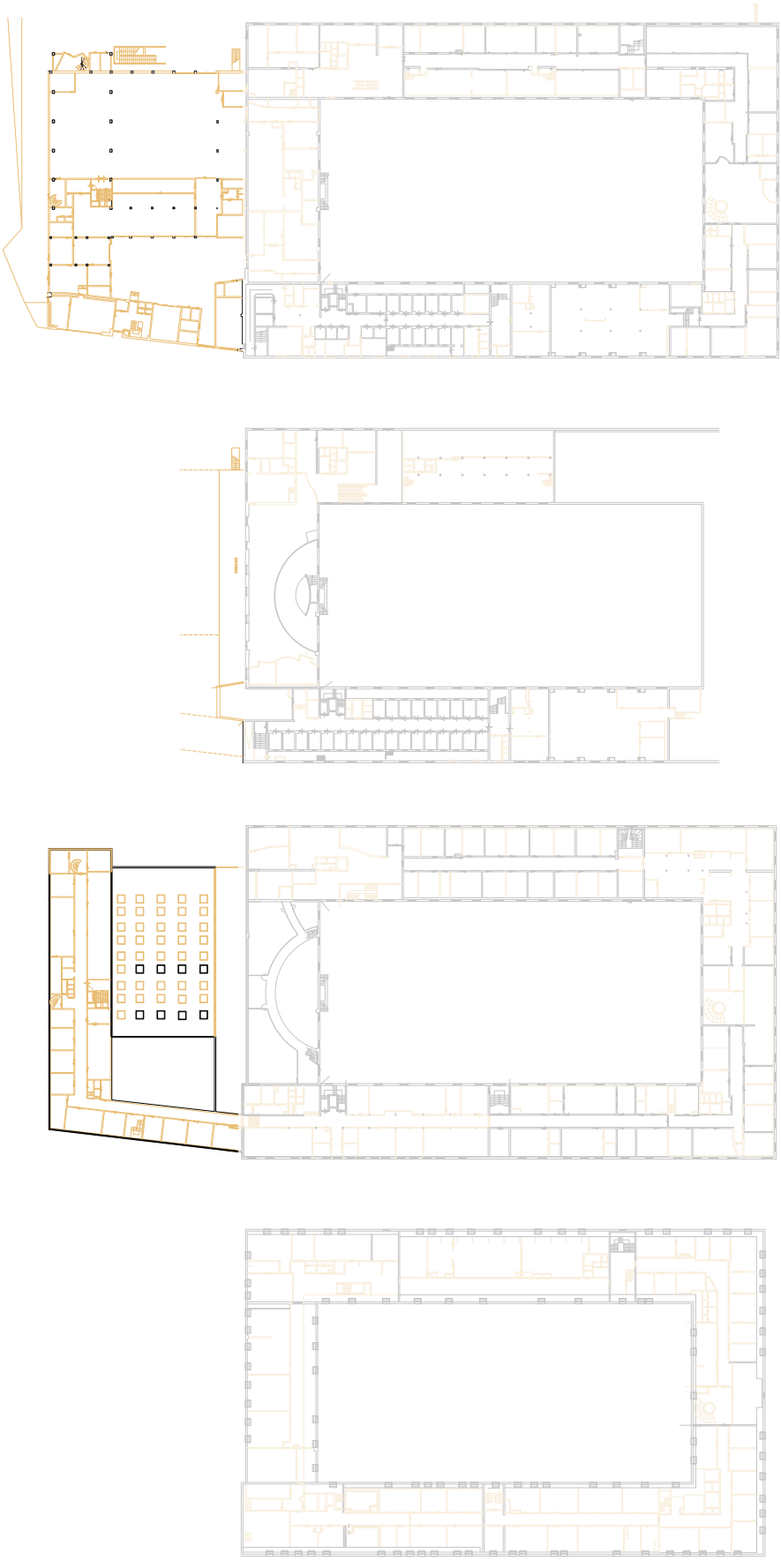
Existing building
Newly added

0 500mm

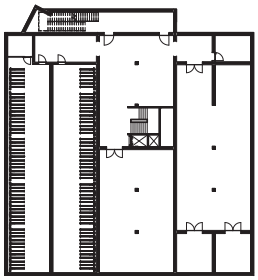
GRADUATION PROJECT

5.2 Final Redesign of the Verkeerspolitie

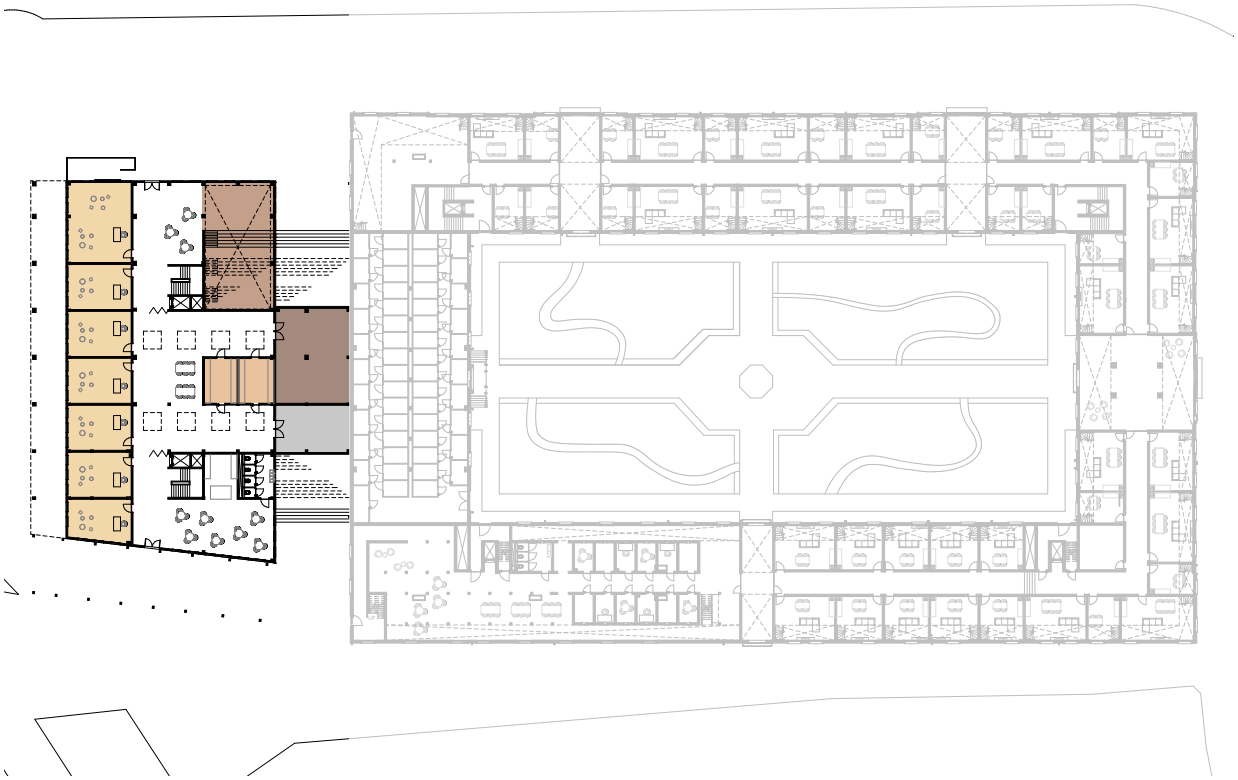
5.2 FINAL REDESIGN OF THE VERKEERSPOLITIE



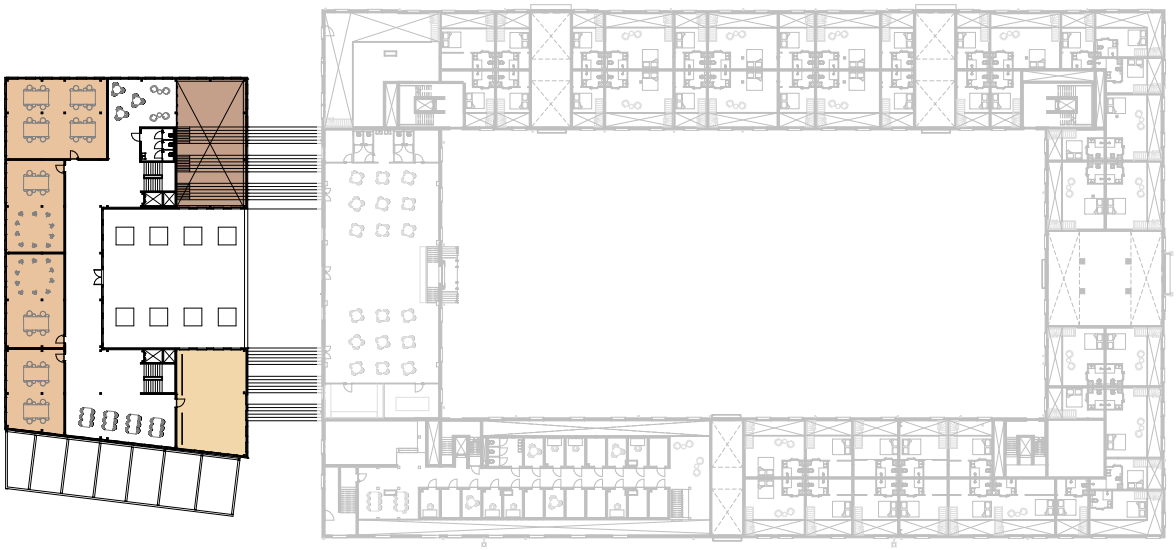
Demolition plans from top to bottom: ground floor, entresol, first floor, attic



Basement



Ground Floor

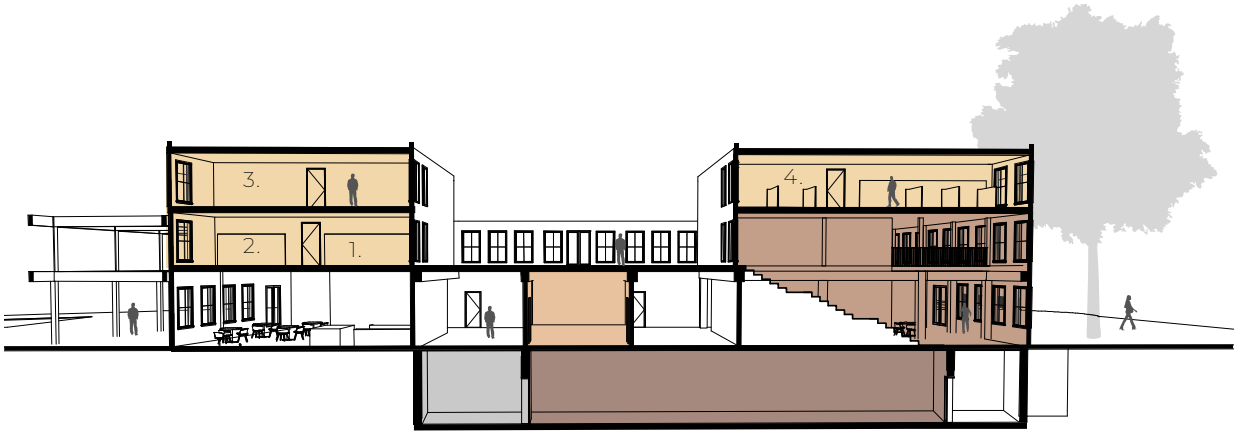


Entresol

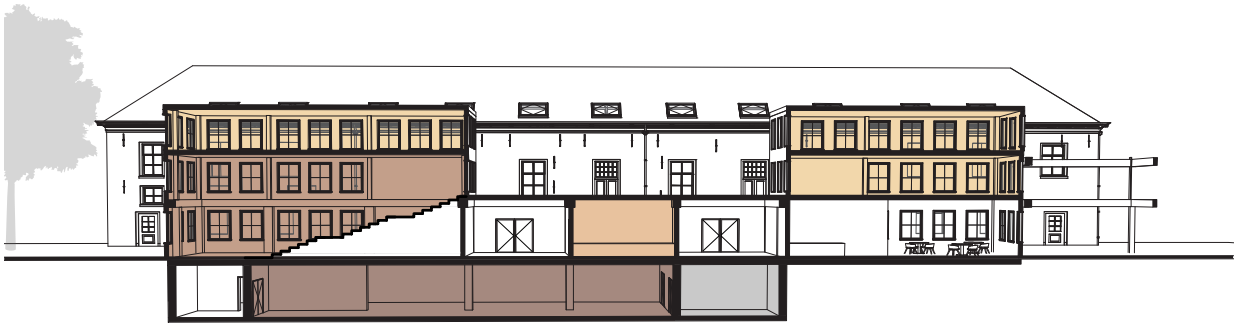
First Floor

Storeage
Theatre
Creative Rooms
Music / Dance / Mindfullness
Technical Space

0 20M



Section verkeerspolitie

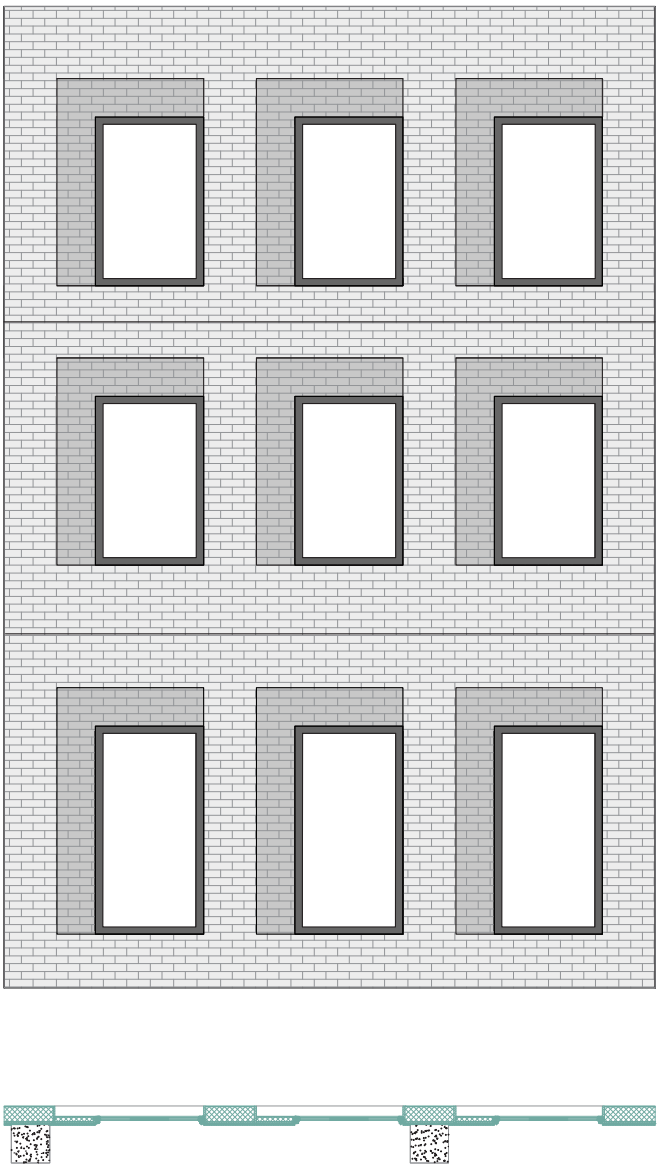


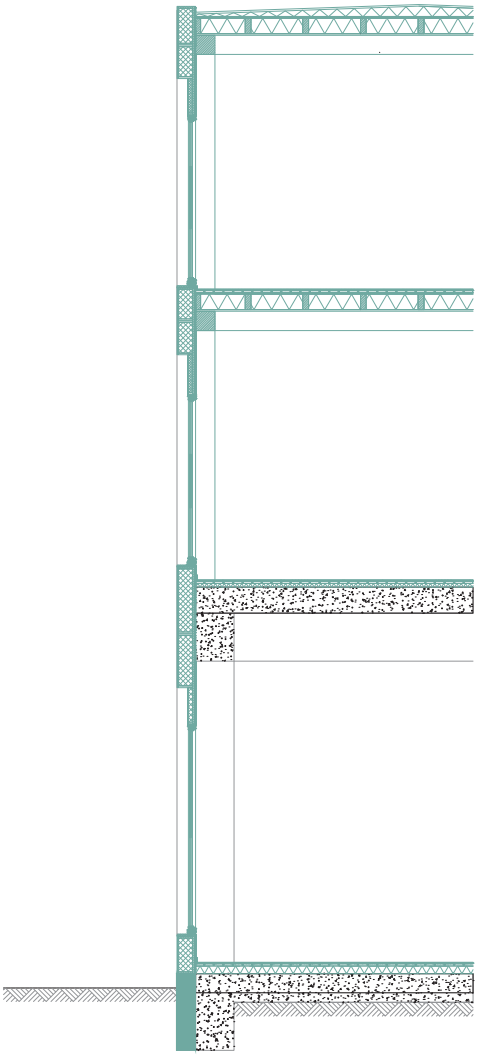
Section verkeerspolitie

1. Bar / Cafe
2. Theatre / Dance
3. Pilates
4. Ballet

Storeage
Theatre
Dressing Rooms
Cultural Spaces
Technical Space

Impression of the theatre

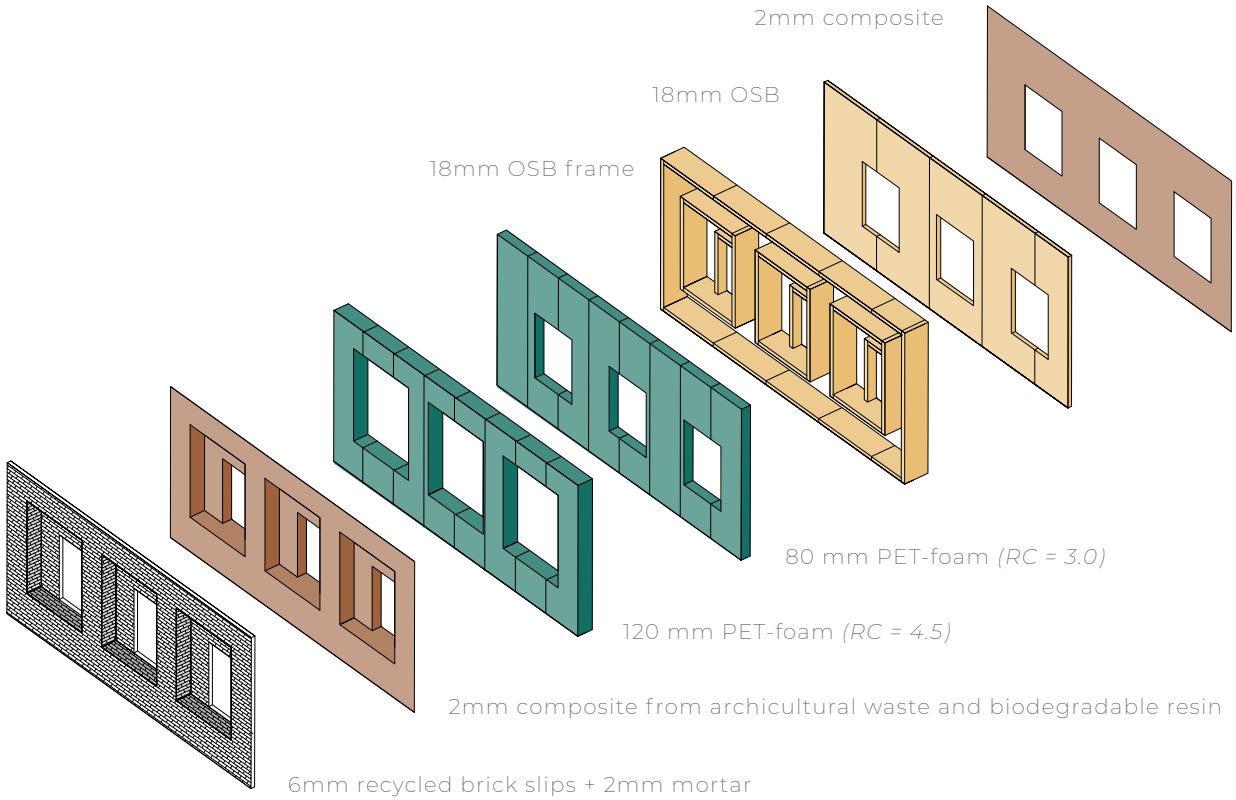




Existing building

Newly added

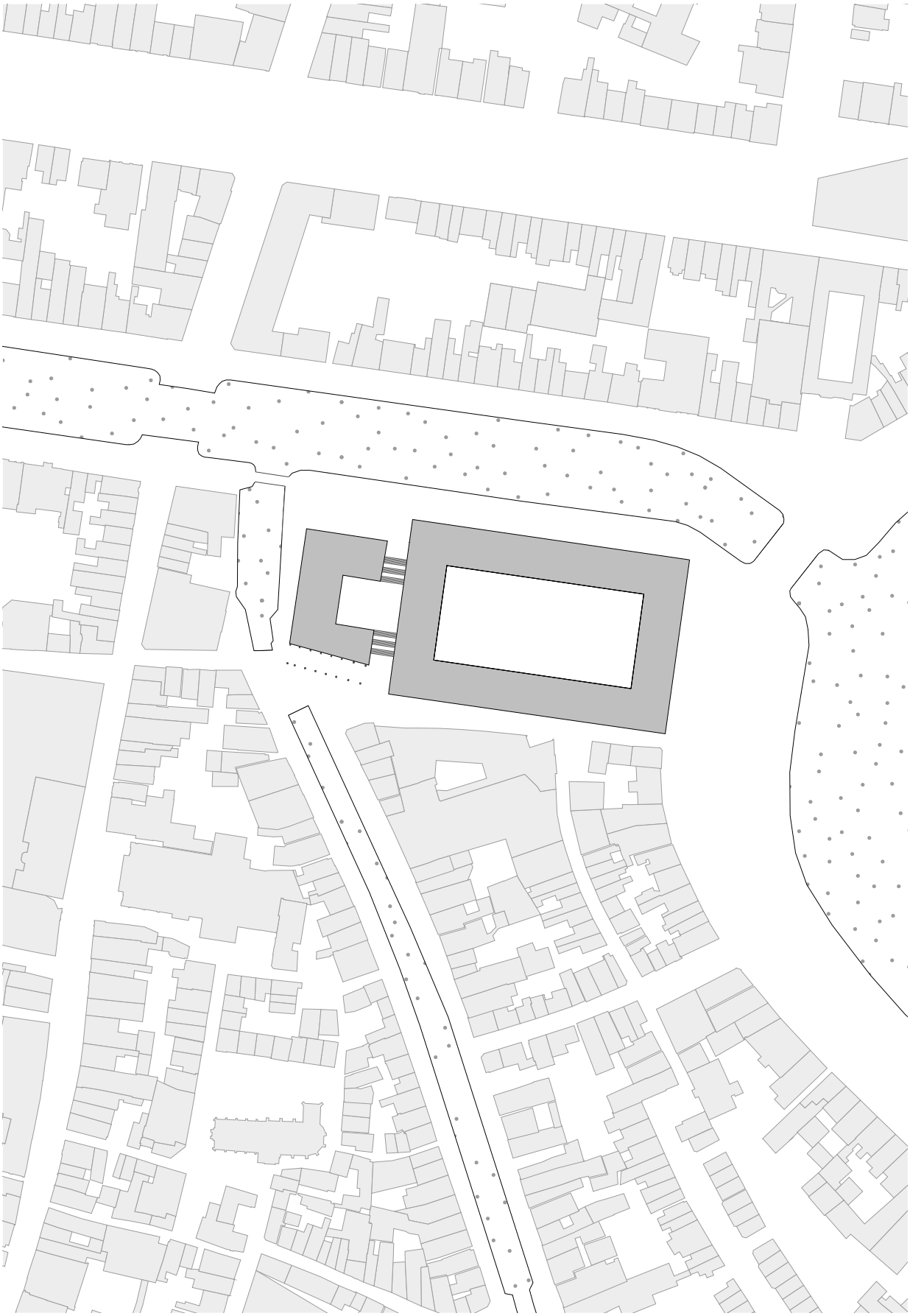
0 2m


2mm composite
18mm OSB
18mm OSB frame
80 mm PET-foam *(RC = 3.0)*
120 mm PET-foam *(RC = 4.5)*
2mm composite from archicultural waste and biodegradable resin
6mm recycled brick slips + 2mm mortar

GRADUATION PROJECT

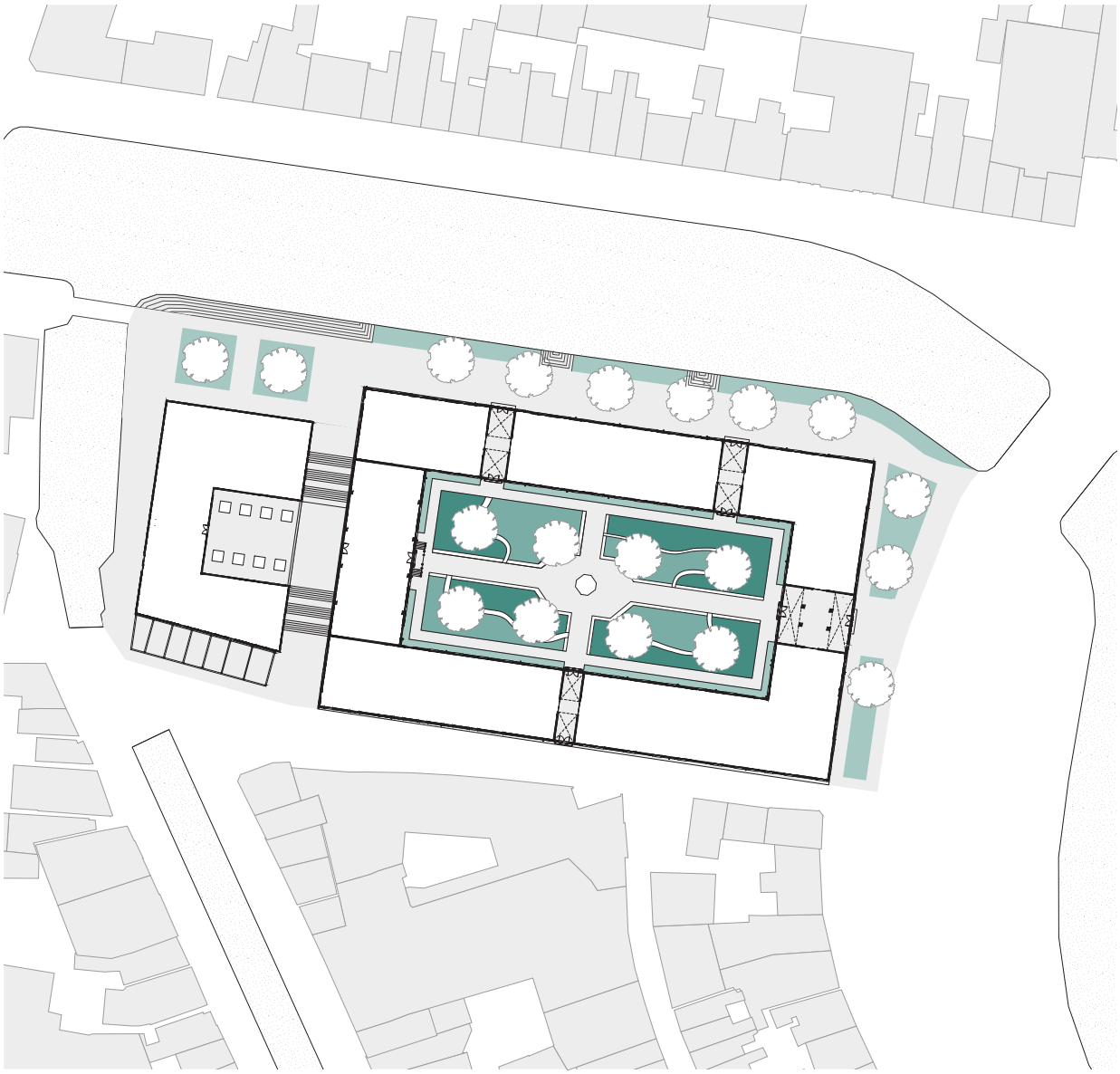
5.3 Final Design Proposal

5.3 FINAL DESIGN PROPOSAL



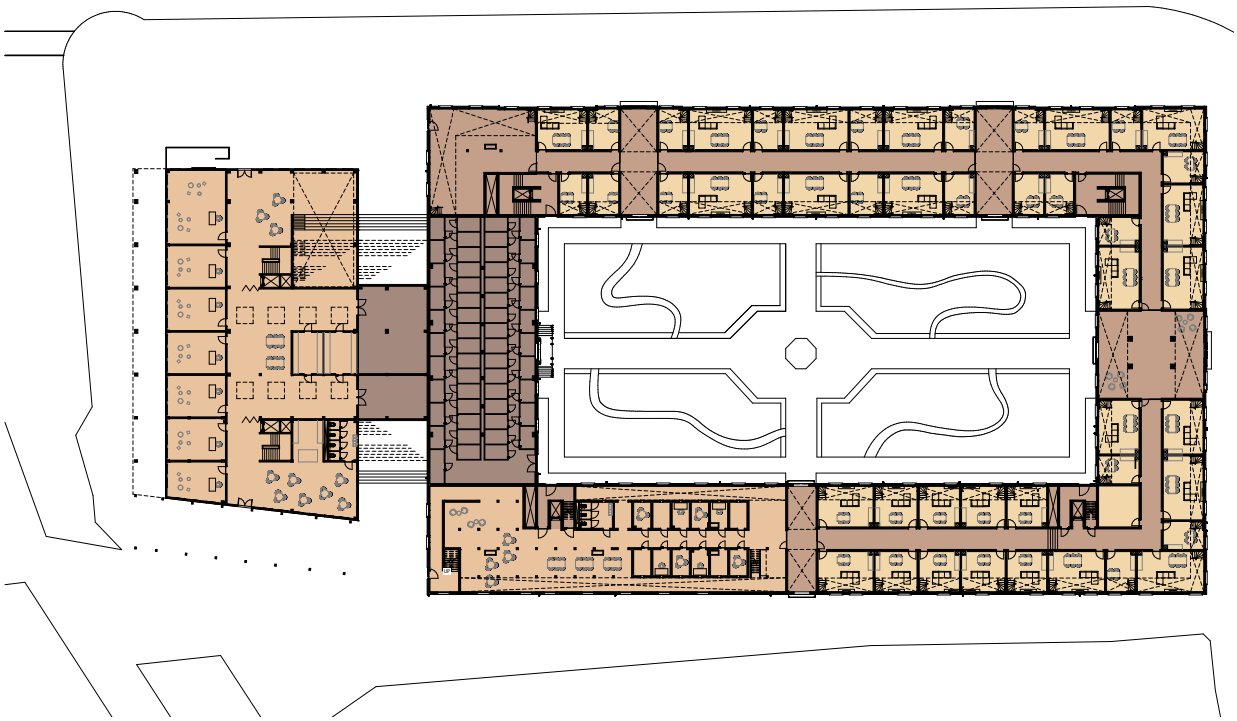
Urban Surroundings

0 50M



Urban Surroundings

0 30M

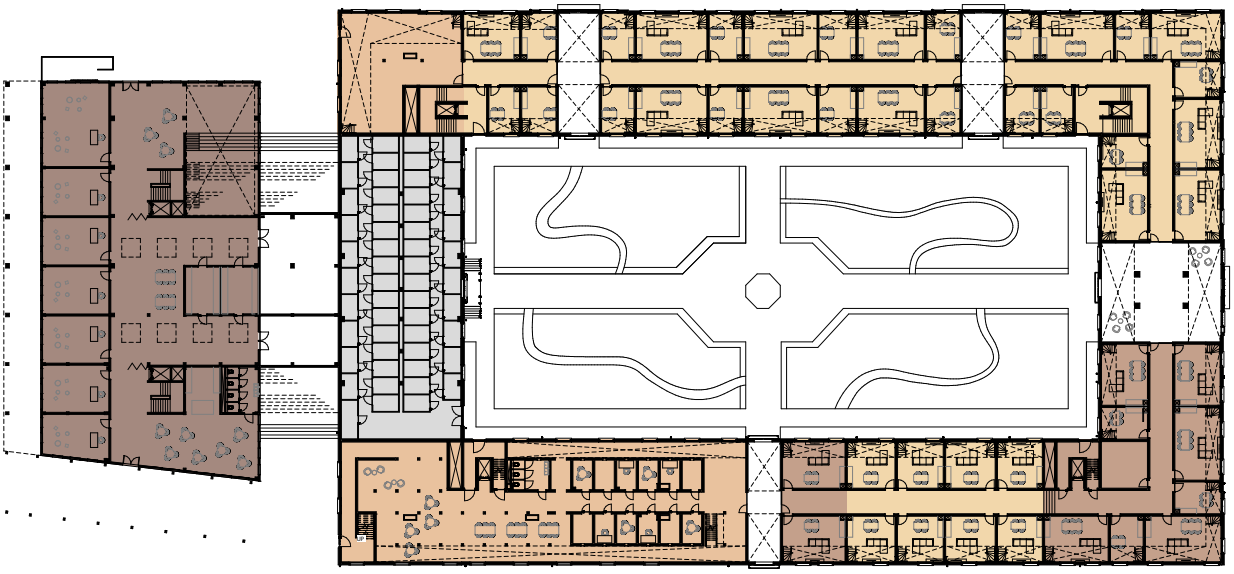


Storeage
Dressing Rooms
Communal Spaces
Cultural Center
Circulation Space

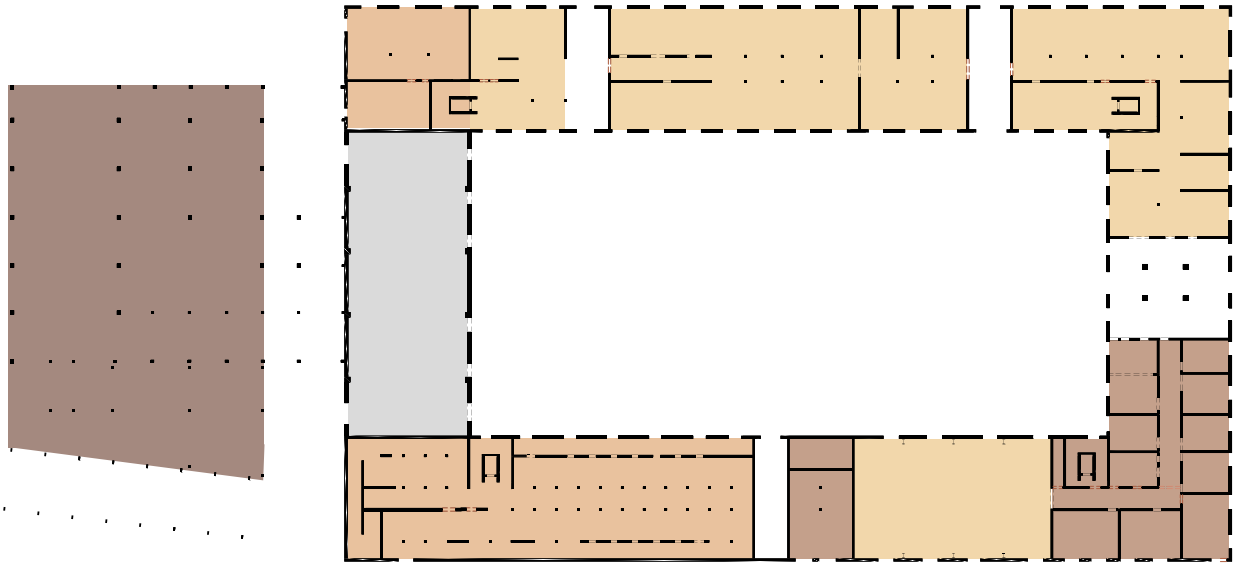
Exterior Climate
Heated by residual heat
Climatized depending on function
Heating/Cooling when necessary

Top drawing: elevation and section

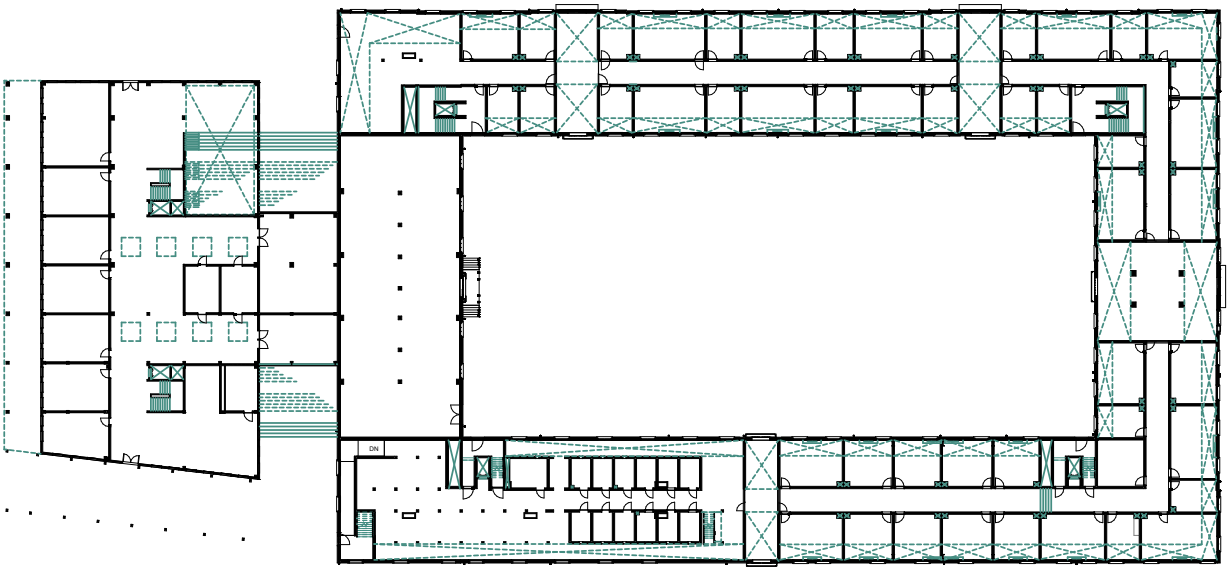
Bottom drawing: building technology



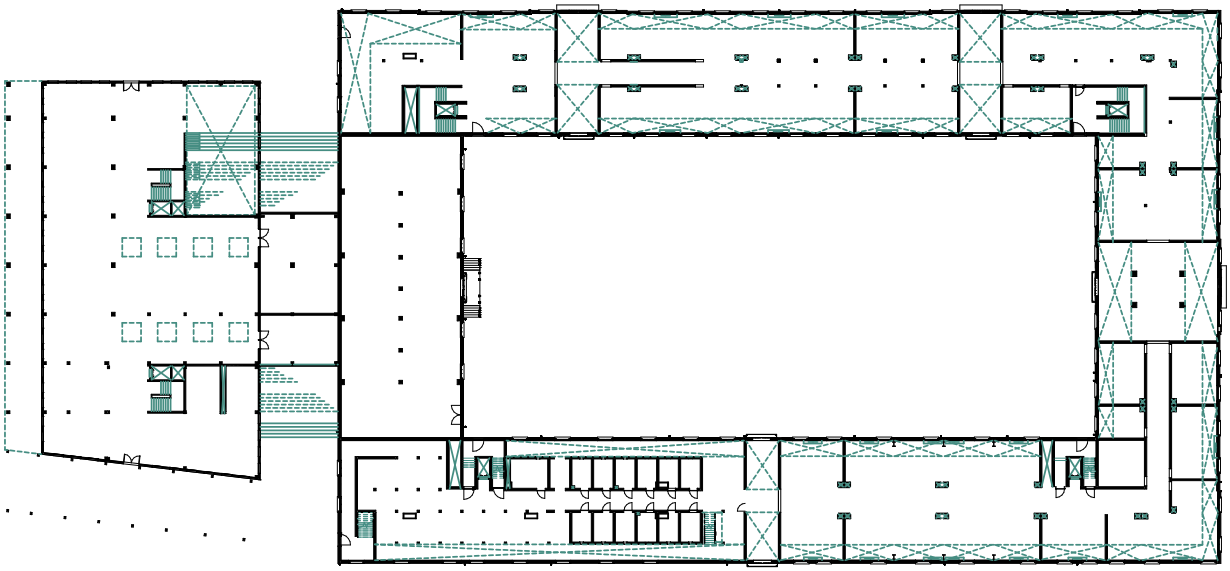
Proposal floorplan ground floor



Existing and new construction



Proposal floorplan ground floor



Existing and new construction

CHAPTER 6
REFLECTION ON THE RESEARCH AND DESIGN PROCESS

REFLECTION ON THE RESEARCH AND DESIGN PROCESS

6.1 Reflection

6.1 REFLECTION

6.1.1 POSITIONING GRADUATION PROJECT WITHIN MASTER PROGRAM

The design challenge of the graduation studio focuses on vacant police estates in the Netherlands. Because of the formation of the National Dutch Police in 2013 and the digitalization of their work, a lot of the police buildings become obsolete or do not fit within the requirements needed. That is why approximately 700.000 square meters of real estate will be divested (Politie Bouwmeester, 2021). For this graduations studio specifically, a redesign proposal for the police office Koudenhorn in Haarlem was made. The Koudenhorn building, originally designed as a Diaconiehuis in 1771, was by far the largest building project in Haarlem at the time and changed in use over time. From 1810 onwards the building was used by the French as barracks until the Napoleonic empire began to collapse. Afterwards, the Koudenhorn retained this function until 1960 by the police of Haarlem. Two centuries after it was build, a new volume was added on the side in 1971 when the whole ensemble was used by the police (Noord Hollands Archief, 2020) and the police headquarters was established in the old barracks. The total gross floor area of these two building volumes is 16.500 m2. Currently the buildings are part of the protected city scape of Haarlem and the Koudenhorn building itself is a national monument.

To make these two different buildings more sustainable for the future, it would be interesting to design an architecture that is resilient in accommodating change in use over time to create adaptable spaces. Designing from the permanent, in which the

The Koudenhorn building in Haarlem.

people that are using the building need to be more adaptable instead of designing a flexible building was the starting point for this graduation project. The graduation project itself is part of the Heritage & Architecture studio of Vacant Heritage in which the focus lies on the importance of adaptive re-use projects. Because there is a high vacancy rate of buildings, new uses need to be found to keep these buildings alive. We live in an environment where it is normality to buy or make something new once it is broken and we forgot how to give a new purpose to things. That is why we need to adjust to the time we are living in and focus on the existing building stock. With my individual focus on redesigning a space plan in such a way that it can accommodate changes in use over time, the durability of the building will be questioned and the sustainability point of transforming vacant heritage will be central.

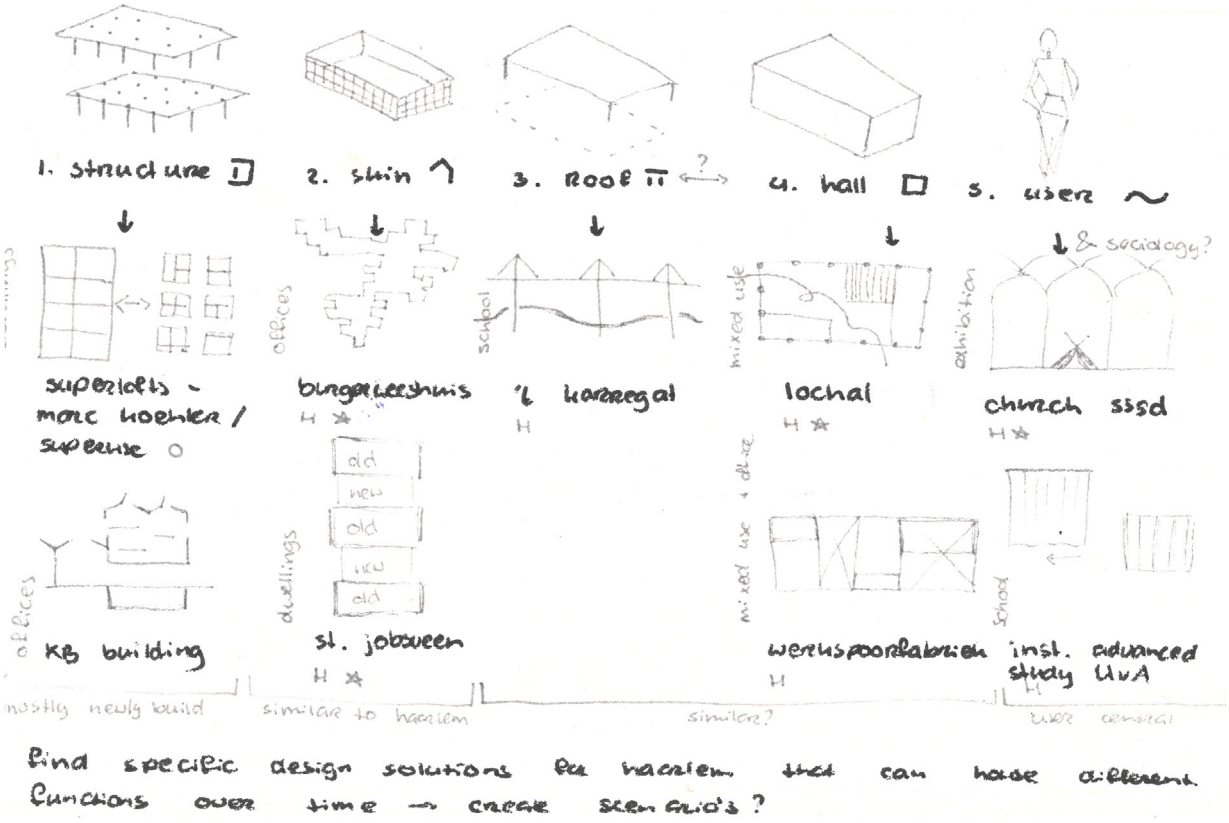
In a greater context the redesign for this building will be related to the sustainable development goals (Sustainable Development, z.d.) to build in a resilient (9) and sustainable (11) way and to be responsible with the consumption and production of materials (12). This also relates to the goals of the Delft University of Technology in general.

6.1.2 RESEARCH METHOD

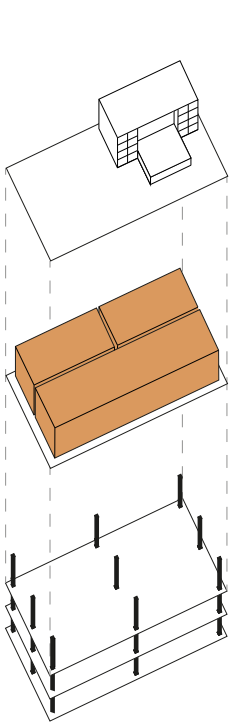
To redesign a building in such a way that it can be variously used and interpreted over time, was the starting point for this research. A redesign within the permanent in which the users need to become more adaptable, since the use of a building is never definitive and will always be organic and changeable. Therefore the following research question has been formulated: How could the space plan of a monument like the Koudenhorn be redesigned to accommodate changes in use over time?

To be able to formulate this research question, the main challenge at the start of this graduation project was to scale the research direction down. Starting on this project, the idea was to find a generic solution to be able to transform all vacant heritage, but soon I realized this was a very ambitious goal. Because at the same time, the values of every building differ and each building needs to have another approach during a redesign process. Therefore it was important to figure out what the main interest in redesigning vacant heritage was and how the research question could be change to an achievable and realistic research that could be implemented in the design.

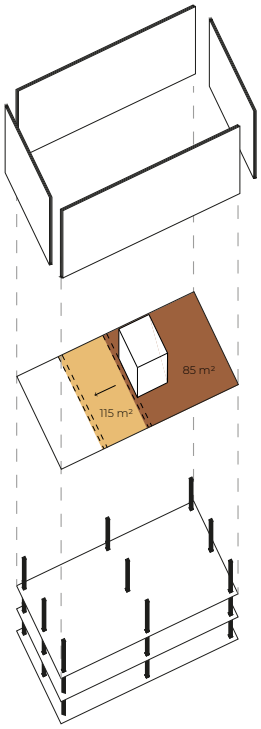
As for finding an answer to the formulated research question, it was important to come up with a good methodology. Starting off with investigating into the Spatial Building Typology aspects of different police estates to get a clear understanding of the buildings. Besides by doing literature research, the initial idea was to investigate case studies to be able to figure out how certain principles were adapted in designing floorplans. However, these case studies did not help for this part of the research, it did gave an insight in distinguishing four different frameworks in which change can take place (figure 2). After having conducted literature research, case study research and interviews initial conclusions could be formulated. To be able to redesign a space plan taking the changeable into account, three different design approaches can be used within the four frameworks (figure 3). Having these initial conclusions, it soon became clear that the combined research was a good basis to focus on research by design. Because answers to the research question could only be formulated by implementing the initial conclusions from the research into the design process.



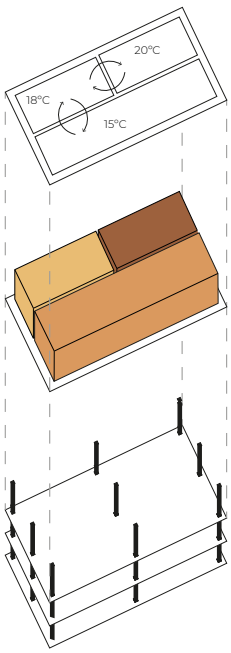
Different frameworks in which change can take place.



1. Redesign with an adaptable infill.



2. Redesign the space plan by creating a generic space.



3. Redesign with a focus on energy demands.

Three design approaches for the different frameworks.

6.1.3 RESEARCH AND DESIGN

Since the methodology for this graduation project shifted to research by design, all challenges and limitations for redesigning the space plan of the Koudenhorn to accommodate changes in use over time were investigated up upon until P4. Starting with figuring out which framework and which design approach was best suitable for the Koudenhorn building. The research of adapting the user and not the subject was specifically challenging for the Koudenhorn, since the space plan of the building already has been changed many times over the years. While at the same time I had a personal interest in investigating the 2nd framework; redesign the space plan by creating a generic space focusing on the open building principles, because this has not been yet investigated in vacant heritage. At the same time it was also important to have an understanding of the loadbearing structure for this research and because this was hard to figure out the design process stagnated quite often. At the same time, questions arose whether the space plan should be able to be used in such a way that every function should be possible, or that the change could take place between functions that are similar or do have similar sizes.

Throughout the research and design process it was hard to formulate one clear answer to the research question. Starting with this research, it was the intention to formulate conclusions on how a building could be redesigned, creating permanent spaces that can be variously used over time. This because all buildings nowadays are built to serve a specific purpose, and if the requirements alter, new typologies emerge (Kuipers & Jonge, 2017). Which results in an architecture in which the function was defining the form of the building. However, working on the redesign it soon became clear that there are so many specific requirements for certain functions that it is nearly impossible to use the frameworks as a strict basis for redesign. Besides, different functions need different requirements, which means that all these requirements have to be taken into account to when redesigning a space that needs to be able to change in the future. Also the frameworks generated are closely related to the open building principles, which are currently only used on new constructed buildings using a structure with columns which already is more adaptable than a building consisting out of load bearing walls. At the same time the adaptability of the user is also a central aspect in this research, which is something that has not been looked into, but could have helped formulating a clearer answer to the research question.

The research by design approach has ensured that both aspects are deeply intertwined within the graduation project, however it was often quite challenging to be able to use the initial conclusions for the research within the design. It often looked like the research outcome was quite contra dictionary with the design process, and looking back on the graduation project this research might be better applicable to other vacant police estates.

6.1.4 ETHICAL ISSUES AND DILEMAS

When designing a building for the future means giving definitive form to something for an unpredictable amount of time. While at the same time the task given to architects is to design buildings that are constantly subject to change. With this design proposal there is a focus on redesign in which the user needs to be adaptable and not the subject (Den Heijer, 2021). This is challenging for the Koudenhorn building, since the building has been changed many times already over the years. Why would this redesign proposal be

better and more suitable for future changes in comparison to what is already there. Besides, how can users be influenced to use a building in an adaptable way and until what point can an architect control the outcome of their design intentions.

Furthermore, a lot of ethical questions arose for how the change of use can be regulated within a building like the Koudenhorn. The redesign proposal currently mainly consists out of dwellings, taken into account that these spaces can be transformed to offices for example. However, a clear businessplan, maintenance plan and rental plan should be written for a project like this. How to deal with the spaces if they are for rent or sale, who is in charge of the communal spaces if the project only consists out of offices and how do the dwellings relate to the offices if the functions are spread out over the whole building.

Applying the redesign proposal in real life will need some further investigation to be able to become a successful project.

6.1.5 TRANSFERABILITY OF THE RESULTS

Transforming vacant heritage because of a sustainability point of view is the reason why I have chosen this graduation studio. Specifically focussing on designing an architecture that is resilient in accommodating change in use over time, redesigning a building in which the user needs to become more adaptable. On the scale of the vacant heritage graduation studio the Koudenhorn in Haarlem, which consists of two buildings from different eras, was redesigned with the principles from the outcome of this research.

A way of designing buildings in which architectural interventions are not needed when a new use is required, is not a new concept. Research and designs have been made in this field, however it has never been used intentionally when redesigning vacant heritage, therefore researching into these principles and figuring out how they can be used when redesigning space plan is relevant.

The answers from this research could provide new insights into the principles architects are using when transforming vacant heritage. The three defined frameworks can be used as a starting point for a redesign project. Looking back, these frameworks will probably work best for buildings that have a loadbearing structure consisting out of columns and beams, or buildings that have an open façade. These two elements were lacking in the Koudenhorn building, which made it difficult in the end to implement all frameworks.

CHAPTER 7
BIBLIOGRAPHY

BIBLIOGRAPHY

7.1 Literature

7.1 LITERATURE

Asselbergs, M.F. (2021, 12 Okt.). *Open Bouwen*. [Powerpoint-slides]. The Faculty of Architecture and the Built Environment, Delft University of Technology.

ArchDaily. (2019). *LocHal Library*. Retrieved 28 Oct. 2021, from https://www.archdaily.com/909540/lochal-library-mecanoo-plus-civic-architects-plus-braaksma-and-roos-architectenbureau

ArchDaily. (2020a). *Utrecht Central Library*. Retrieved 28 Oct. 2021, from https://www.archdaily.com/943774/utrecht-central-library-and-post-office-zecc-architecten-plus-rijnboutt

ArchDaily. (2020b). *City Library Het Predikheren*. Retrieved 28 Oct. 2021, from https://www.archdaily.com/944248/city-library-het-predikheren-korteknie-stuhlmacher-architecten-plus-callebaut-architecten-plus-bureau-bouwtechniek

Brand, S. (1995). *How Buildings Learn: What Happens After They're Built*. New York: Viking.

CBS OV. (2014). *Modal split van verplaatsingen binnen 22 stedelijke gebieden*. [Dataset]. Retrieved 10 Nov. 2021, from https://www.ovmagazine.nl/wp-content/uploads/2014/10/mobiliteitsbeeld-2014-kennisinstituut-voor-mobiliteitsbeeld.pdf

Ching, F. D. K. (1979). *Architecture, form, space & order*. New York: Van Nostrand Reinhold.

College van Rijksadviseurs, & Rijksdienst voor Cultureel Erfgoed. (2021). *Sublieme Schoonheid, Sublieme Duurzaamheid*. Retrieved 10 Dec. 2021, from https://www.cultureelerfgoed.nl/onderwerpen/duurzaamheid/laboratorium-duurzaamheid/sublieme-schoonheid-sublieme-duurzaamheid

Cultureel Erfgoed. (2021). *De Erfgoedmonitor*. Retrieved 9 Oct. 2021, from https://erfgoedmonitor.cultureelerfgoed.nl/mosaic/dashboard/monumenten/

De Jonge, W. (2021, 16 Nov.). *Research by design*. [Powerpoint-slides]. The Faculty of Architecture and the Built Environment, Delft University of Technology.

Den Heijer, A.C. (2021, 31 Sept.). *Managing Police Buildings and other Real Estate*. [Powerpoint-slides]. The Faculty of Architecture and the Built Environment, Delft University of Technology.

Earl, J. (2003). *Building conservation philosophy* (3rd ed.). Shaftesbury: Donhead.

Gemeente Haarlem. (2021b). *Omgevingsvisie Haarlem 2045*. Retrieved 10 dec. 2021, from https://www.haarlem.nl/bestandsopslag/bestanden/Campagne/Omgevingswet/OGV_loRes_19_mei_2021.pdf

Gemeente Haarlem. (z.d.). *Geschiedenis van Haarlem*. Visit Haarlem. Retrieved 18 Nov, 2021 from https://www.visithaarlem.com/nl/cultuur/geschiedenis

Global Footprint Network. (2021). *Earth Overshoot Day*. Overshootday. Retrieved 26 Oct. 2021, from http://www.overshootday.org/

Habraken, N. J. (2003). Open building as a condition for industrial construction. In *20th International Symposium on Automation and Robotics in Construction, Eindhoven, the Netherlands* (pp. 37-42).

Henket, H. (1998). Icon and the Ordinary. In Cunningham, A (Ed.), *Modern movement heritage* (pp. 13-17). London: E & FN Spon.

Heritage & Design TU Delft. (2021). *Heritage & Architecture – Studio: Vacant Heritage*. Retrieved 28 Nov. 2021, from https://brightspace.tudelft.nl/d2l/le/content/398787/Home

Het Nieuwe Instituut. (2009). Bollebakker, Willem. *Het Nieuwe Instituut*. Retrieved 25 Nov. 2021, from https://zoeken.hetnieuweinstituut.nl/nl/personen/detail/1aba1689-ff70-52d6-bad3-d7da94f2aad0

Jallon, B., & Napolitano, U. (2017). *Haussmann. Paris*. Zürich: Park Books.

Kuipers, M., & Jonge, D. W. (2017). *Designing from Heritage: Strategies for Conservation and Conversion*. TU Delft.

Kurt, G.H. (z.d.). *Armenzorg in Haarlem in Vroegere Tijden*. Municipal Archive, Haarlem.

Lacaton, A., Vassal, J. P., & Druot, F. (2007). *Plus. La vivienda colectiva. Territorio de excepción*. Barcelona, Gustavo Gili.

Leupen, B. (2006). *Frame and generic space*. Rotterdam: 010 Publishers.

Lynch, K. (2009). *What time is this place?*. Cambridge, Mass: MIT Press. Original work published 1972.

Medema, G. (2004). *Door nood gedrukt, verarmd en droef te moe*. Kunstlicht, 25(4), (pp. 34-39). Amsterdam: Vrije Universiteit Amsterdam.

Pereira Roders, A., & Pottgiesser, U. (2020). *100% heritage for a more sustainable future*. Retrieved 17 Sept. 2021, from https://www.tudelft.nl/en/2020/bk/100-heritage-for-a-more-sustainable-future

Pereyra, I., & Repponen, A. (z.d.). *One Shared House*. One Shared House. Retrieved 12 Dec. 2021, from http://onesharedhouse.com/surveyresults/

Prins, A. (2021). *Rotterdam is divers, nu de woningen nog*. Vers Beton. Retrieved 18 May. 2021, from https://www.versbeton.nl/2021/05/rotterdam-is-divers-nu-de-woningen-nog/

Noord Hollands Archief. (2020). *Het diaconiehuis aan de Koudenhorn*. Retrieved 11 Oct. 2021, from https://noord-hollandsarchief.nl/bronnen/archieven?mivast=236&mizig=210&miadt=236&miaet=1&micode=1340&minr=1189241&miview=inv2&milang=nl

Politie Bouwmeester (2021). *Dutch National Police*. [Powerpoint slides]. Retrieved 10 Oct. 2021, from https://brightspace.tudelft.nl/d2l/home/398787.

Rijksmonumenten. (2020). *Voormalige Diaconiehuis in Haarlem*. Retrieved 11 Oct. 2021, from https://rijksmonumenten.nl/monument/19499/voormalige-diaconiehuis/haarlem/

Sebregts, L. (2021). *Meer slagkracht dankzij de Politiebouwmeester*. De Architect. Retrieved 29 Nov. 2021, from https://www.dearchitect.nl/architectuur/artikel/2021/10/meer-slagkracht-dankzij-de-politiebouwmeester-101267141?utm_source=Vakmedianet_red&utm_medium=email&utm_campaign=20211029-dearchitect-std&tid=TIDP5473711X74FB999650C14270AE90091612A83246YI4&utm_content=

Sustainable Development. (z.d.). *The 17 goals*. Retrieved 4 Oct. 2022, from https://sdgs.un.org/goals

Uittenhout, J.B. (1997). Monumentenzorg Haerlem. In Schuyt & Co b.v. (Red.), *Jaarboek Haerlem* (pp. 173-201). Haarlem: Historische Vereniging.

Urhahn, stedenbouw & strategie, Goudappel Coffeng, & APPM Management consultants. (2020). *Integrale visie stationsgebied Haarlem 2020–2040*. Gemeente Haarlem. Retrieved 10 dec. 2021, from https://www.haarlem.nl/bestandsopslag/bestanden/Participatie/Stationsgebied/Integrale-visie-Stationsgebied-Haarlem-2020-2040_100dpi_spreads.pdf

Van Duin, L. (1998). *Architecture, Building and Planning*. Utrecht: Vereniging van Universiteiten.

Van Duin, L., & Claessens, F. (2008). OverHolland. *Vol. 7. Architectural studies for the Dutch city*. Nijmegen: Vantilt.

BIBLIOGRAPHY

7.2 Images

7.2 IMAGES

Aldershoff, R. (2015). *Burgerweeshuis by WDJ Architecten* [Photograph]. Retrieved 9 Dec. 2021, from https://arcam.nl/architectuur-gids/burgerweeshuis/

AlleCijfers. (2021). *Informatie gemeente Haarlem* [Own Drawing]. AlleCijfers. Retrieved 10 Nov. 2021, from https://allecijfers.nl/gemeente/haarlem/

Bollaert, S. (2019). *LocHal Library by Braaksma & Roos* [Photograph]. Retrieved 28 Oct. 2021, from https://www.archdaily.com/909540/lochal-library-mecanoo-plus-civic-architects-plus-braaksma-and-roos-architectenbureau

Brand, S. (1995). *How Buildings Learn: What Happens After They're Built*. New York: Viking.

De Boer, C. (1969). *Nieuwbouw op de hoek van de Zakstraat en de Bakenessergracht i.v.m. bouw 1969 en verbouw van de voormalige Koudenhorn kazerne tot hoofdbureau van politie.* Retrieved 28 Sept. 2021, from https://hdl.handle.net/21.12102/15D66E45B5C3D27B7D73BC0CE613406E

College van Rijksadviseurs, & Rijksdienst voor Cultureel Erfgoed. (2021). *Sublieme Schoonheid, Sublieme Duurzaamheid* [Rendering]. Retrieved 10 Dec. 2021, from https://www.cultureelerfgoed.nl/onderwerpen/duurzaamheid/laboratorium-duurzaamheid/sublieme-schoonheid-sublieme-duurzaamheid

Finotti, L. (n.d.). *SESC Pompéia Factory by Bo Bardi* [Photograph]. Retrieved 10 Jan. 2022, from https://arquitecturaviva.com/works/sesc-fabrica-pompeia-9

Global Footprint Network. (2021). *Earth Overshoot Day across the EU and the world* [Image]. Overshootday. Retrieved 26 Oct. 2021, from http://www.overshootday.org/

Godliman, D. (2013). *The Tate Modern by Herzog & de Meuron* [Photograph]. Retrieved 9 Dec. 2021, https://www.archdaily.com/429700/ad-classics-the-tate-modern-herzog-and-de-meuron?ad_source=search&ad_medium=projects_tab

Hannema, K. (2017). *Superlofts by Mark Koehler* [Photograph]. Retrieved 10 Jan. 2022, from https://www.architectuur.nl/project-in-context/superlofts-van-marc-koehler/

Hummel, K. (2020). *Utrecht Central Library by Zecc Architecten* . Retrieved 28 Oct. 2021, from https://www.archdaily.com/943774/utrecht-central-library-and-post-office-zecc-architecten-plus-rijnboutt

Keun, H. (1771). *'t Nieuwe Diaconie Huijs te Haarlem* [Drawing]. Retrieved 28 Sept. 2021, from https://hdl.handle.net/21.12102/E6227232FB8E11DF9E4D523BC2E286E2

KLM Aerocarto Schiphol (1960). *Burgerweeshuis by WDJ Architecten* [Photograph]. Retrieved 10 Jan. 2022, from https://nl.wikipedia.org/wiki/Burgerweeshuis_(IJsbaanpad_Amsterdam)#/media/Bestand:Orphanage-1a.Aldo_van_Eyck.jpg

Koninklijke Luchtmacht. (1959). *Luchtfoto van de Koudenhornkazerne te Haarlem. Sinds 1972 is in dit gebouw het hoofdbureau van de gemeentelijke politie gevestigd* [Photograph]. Retrieved 28 Sept. 2021, from https://nimh-beeldbank.defensie.nl/foto-s/detail/e1c9588f-a059-c061-ce84-

1ddc7b359917/media/b279e190-060a-658f-ca7b-43a95c1c49a6

Kramer, L. (2020). *Het Predikheren by Korteknie Stuhlmacher Architecten*. Retrieved 28 Oct. 2021, from https://www.archdaily.com/944248/city-library-het-predikheren-korteknie-stuhlmacher-architecten-plus-callebaut-architecten-plus-bureau-bouwtechniek

Musch, J. (n.d.). *St. Jobsveem by WDJ Architecten* [Photograph]. Retrieved 10 Jan. 2022, from https://www.wdjarchitecten.nl/projecten/st-jobsveem/

Noord-Hollands archief. (1920). *Agenten bij het politiebureau aan de Koudenhorn* [Photograph]. Re-trieved 28 Sept. 2021, from https://hdl.handle.net/21.12102/AA5E56AAD732BD228937E7D030131E77

Noord-Hollands Archief. (1930). *Koudenhorn 2, achterzijde, gezien vanaf de Nieuwe Gracht* [Photo-graph]. Retrieved 28 Sept. 2021, from https://hdl.handle.net/21.12102/F1B1E52EFB8E11DF9E4D523BC2E286E2

Noord-Hollands Archief. (1966). *Binnenplaats Infanteriekazerne Koudenhorn* [Photograph]. Retrieved 28 Sept. 2021, from https://hdl.handle.net/21.12102/536E54F7CF654D48A8F6C7C12FA1DDC6

Noord-Hollands Archief. (1973). *Koudenhornkazerne; brand in toekomstig politiebureau* [Photograph]. Retrieved 28 Sept. 2021, from https://hdl.handle.net/21.12102/D648FA3A717146EABEF33F5C3E706223

Noord-Hollands Archief. (1975). *Zakstraat. Nieuwbouw cellenblok en garage politiebureau* [Photograph]. Retrieved 28 Sept. 2021, from https://hdl.handle.net/21.12102/D3FB0F1C08384DC7A70E8230C44F9938

Noord-Hollands archief. (1979). *Panorama stadsgedeelte. Midden op de foto het politiebureau aan de Koudenhorn* [Photograph]. Retrieved 28 Sept. 2021, from https://hdl.handle.net/21.12102/35D1941A48AA4AEBB88F4A96CF04B686

Oberti, M.E. (2019). *The Orange Complex by MVRDV* [Photograph]. Retrieved 9 Dec. 2021, from https://www.azuremagazine.com/article/why-factory-at-tu-delft-dares-to-ask-why-not/

Pop-Jansen, M.L. (1997). *Veilig aan het Spaarne* [Photograph]. Beverwijk: Drukkerij Haarmans.

Smit, J. (1768a). *Plattegrond gelijkvloers* [Drawing]. Municipal Archive, Haarlem.

Smit, J. (1768b). *Plattegrond eerste verdieping* [Drawing]. Municipal Archive, Haarlem.

Smit, J. (1768c). *Gevel aan de Nieuwe Gracht* [Drawing]. Municipal Archive, Haarlem.

Spatial Building Typology collective research. (2021). *Ground Floor Plan Koudenhorn Haarlem*. [Drawing]. Municipal Archive, Haarlem.

TU Delft. (z.d.). *3D BAG Viewer*. 3D BAG Viewer. Retrieved 11 nov. 2021, from https://3dbag.nl/en/viewer

Van Den Hurk, A.P., Jansen, W.A.F. & Post, H. (1971). *Politie* [Photograph]. Haarlem: Unknown.

Van der Vinne, V. J. (1778). *Vergadering des Oeconomischen Taks; eerst gehouden van 15 septb 1778 in de zaal van het Diaconiehuijs te Haarlem* [Watercolor drawing]. Retrieved 28 Sept. 2021, from https://hdl.handle.net/21.12102/3A2E387AFB8F11DF9E4D523BC2E286E2

Van Roon, M. (2020). *KB Building by HofmanDujardin + Schipper Bosch* [Photograph]. Retrieved 10 Jan. 2022, from https://www.archdaily.com/958549/kb-building-hofmandujardin-plus-schipper-bosch

Versnel, J. (2003). *'T Karregat by van Klingeren* [Photograph]. Retrieved 10 Jan. 2022, from https://www.archined.nl/2003/12/ontklonteringeren-van-van-klingeren/

QGIS. (z.d.). *QGIS*. Retrieved 10 Oct. 2021, from https://qgis.org/en/site/

Colofon
All images and drawings in this project journal are created by the author, unless stated otherwise.

Graduation Project
Permanent Space // Changeable Use
Project Journal

Author
Annemiek Willemijn Maria Braunius
annemiekbraunius@gmail.com
4597613

Graduation Supervisors
Architectural Design I Lidy Meijers
Building Technology I Ir. Frank Koopman
Research I Dr.ir. Hielkje Zijlstra
Delegate I Prof.dr.ir. Machiel van Dorst

Delft University of Technology
Faculty of the Built Environment
Chair of Heritage & Architecture
AR3AH105 I Vacant Heritage

17-01-2023

Redesigning from the permanent, in which the people using the building need to be more adaptable instead of designing a flexible building was the starting point for this graduation project. Therefore the following research question has been formulated: *How could the space plan of a monument like the Koudenhorn be redesigned to accommodate changes in use over time?*

Designing a building for the future means giving a definitive form to something for an unpredictable amount of time. One could say that the task given to architects is to design buildings that are constantly subject to change. Taking this into account, adaptability is one of the keywords coming to mind when facing the unpredictable. Therefore it was the aim to conduct research into redesigning a space plan in such a way that it can accommodate changes in use over time.

This project is part of the graduation studio Vacant Heritage of the Faculty of Architecture and the Built Environment at the Delft University of Technology. The ongoing research and design processes of this graduation project are documented in this project journal.