FACADES

MORE THAN A WALL

Investigating how to reach Architectural Qualities
using different Facade Design Principles

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ABSTRACT

The residential façade, defined as *the building enveloping shell*, impacts the interior environment, while simultaneously acts as the backdrop of the exterior space. The duality of the façade makes the topic span over several architectural quests in one. While addressing the delicate question of integrity for the residence the design of the façade is also a subject of interest to the public view, with a large impact on the atmosphere of the urban environment in our cities.

The thesis investigates the performance of the individual façade as a crucial contributing part of the coherent city and its' simultaneous importance for the home environment. The focus is the interface, the transition where the private home and the public space meets.

The thesis aims to define architectural qualities connected to the private home and the connecting public space, set in a Swedish city environment. Further, to develop design tools aiming to reach these qualities through features in the façade design.

The purpose is not to propose the ideal façade, but rather to contribute to a more conscious approach to designing façades in general and inspire fellow architects by providing suggestions to design qualitative living environments.

Through theoretical research of subjects like *Enriched Environments* connected to the human perception of the home, and influences from classical city planning theorists, conclusions are made leading to the outcome of a number of design principles possible to use as tools when analysing a façade and in the design process of a façade. The principles are showcased in a re-design of a façade of an existing building in Gothenburg. An analysis of the result regarding reached qualities and consequences of the design choices in the project are presented to conclude the project.

Keywords: residential façade design, design principles, duality, interface, coherent city, privacy.

Entrance.
Wooden door, stone detailing.

Contents

01.

INTRODUCTION

From personal experience casually talking about architecture with non-architects, the conversation does not usually begin with discussing qualities of a floor plan. The most common topic, and what seems to spark most interest (or concern) is what we first notice experiencing any building – the façade.

Discourse

Historically, the way of designing façades has been based on the current style ideal and construction possibilities. Repeatedly met with counter reactions followed by revivals – a cyclic pattern over the centuries, evolving along with new demands and technical advances (Björk & Reppen, 2000).

The current discourse includes debate and reactions as well. A loud voice in the Nordic context that cannot be overlooked while writing about this subject, is *Arkitekturupproret* (own translation: *the Architectural Uprising*). Since starting in 2014 as a Facebook group the uprising has gathered many followers (Arkitekturupproret, n.d). Expressing a strong critique towards the style of contemporary architecture and a general distrust in the architects of Sweden. Spreading a clear message against modernism, advocating classicism and traditional style. The discussion is usually not very constructive and simply put – rather flat. Tending to get stuck in a question of style preference.

From my experience architects are usually able to carry fruitful discussions about façades, with a deeper understanding of what the architecture does, rather than looks like. However, this topic is not studied extensively during the education, which has left me wanting to learn more. I am also curious what lays behind the uprising's shouts for a certain style. Picking this subject for my thesis with the aim to investigate what actual qualities can be defined and reached through façade design.

Relevance

The loved building is the most sustainable building, someone once said. A living environment appreciated and cared for by its residents will last longer. Sustainability covers a span of various aspects and is undoubtedly one - if not the most - essential aim

in architecture. Whether it is about the Earth's resources and the production chain, social equality or economic sustainability.

Façades define the urban space in between them and affect the public environment. They embody the interface, the shift from public to private, and regulates the resident's integrity and interaction with the outside. Façade design is a key element in architecture and a delicate question.

Approach

Recent studies of the concept *enriched environments* indicates that the design of our living environment has a direct impact on our well-being (Morichetto, 2019). Suggesting that there might be scientific explanations of why we prefer certain design features over others. This area together with the aspect of so called *unmeasurable values* in the residence (Nylander, 1998) are two main references in my initial approach to the theoretical research for this thesis.

Since the aim is to span over the dual perspective of the façade, as both a private residential matter and a public matter, texts by well established architectural theorists like Gehl (2010) and Jacobs (1962) are important references for the theoretical research from the street life perspective.

Historical theory is covered briefly as well to grasp the extensive background of the subject and to set the current discourse in a context related to previous time periods.

Contribution

The ultimate aim of this thesis is to find (define) qualities and give tools to achieve them. The contributions to the field of architectures are perhaps not new inventions, but rather a summary and collection of research and theories, translated into practical tools. Supporting what many architects might already know *intuitively* from years of experience in the field.

The thesis can hopefully be of use to other architecture students or anyone wanting to get a deeper understanding of façade design and its impact. A tool in discussion, in the design process, or in analysing; façades.

Delimitations

The thesis focus is a Nordic context. The findings are applicable in a contemporary Swedish setting. Nordic theorists and case studies are used as main references.

The design project covers the design of the residential façade and has no ambition to complete a full building proposal.

The *façade* as "the buildings enveloping shell" a definition used by Morichetto (2019), will be considered from both an interior and exterior perspective. The proposals will include design of: the exterior wall, connecting balconies and roof.

Design Project

The chosen site for the façade design is in Gothenburg, in an urban context. The design is a *redesign* of an existing building façade. Building program, plans and number of floors will be kept and left unchanged. Only the façade will be designed, to put focus on the façade design. The economic aspect and detailed development plan is not considered in depth, since the purpose of the design proposal is to show a practical example of the thesis findings, not to cover all aspects in a building project.

The requirements set up in search for a building were:
1. A multi-family residential building in a Swedish urban context. Preferably in Gothenburg, easy accessible site visits.
2. At least one façade facing an already – or possible future development into – an active lively urban street.
3. In the building program there should be a place for a public functions/business on the first floor.

Not all façades (sides) of the building will be completed in the design proposal due to limited time resources. The focus lays on the façade facing the street. Earlier sketches and theories regarding the courtyard side is however included within the scope of the thesis.

While colouring of façades is an important aspect in this subject, the area deserves an investigation too extensive for the time span of this thesis and will therefore be left outside the main focus. A possible topic in a further development of this thesis subject.

Purpose & Aim

The thesis aims to develop knowledge and tools for reaching qualities through the design of the residential façade. It aims to contribute to a more conscious approach to designing façades and inspire fellow architects by providing design principles to design qualitative living environments. Show what impact the façade design has on the experience of the interior residence and the public space outside.

Method

Theoretical research

Studying scientific reports and literature about the subject. Summarising findings based on these references in the theory part of this thesis. Defining principles possible to use in practical design answering the research question.

Case Studies

A study of built references will also be included, mainly using analysis methods either found in research or using the defined design principles.

Research by Design

Sketching using the defined design principles in the design project, carried out both by hand and using digital modelling and drawing tools. Illustrations, diagrams and images are made by hand, digitally or photographed.

Research question

What kind of architectural qualities can be reached through the design of the façade, with regard to the private residence and the connecting public space, using different design principles and tools?

Outcome

1. A number of design principles, possible to use as tools in designing a residential façade to reach qualities in the residence and the connecting urban environments, based on the theoretical research in the thesis.

2. A re-design of a residential façade using the defined principles. Aiming to showcase the principles and analyse the consequences of them using a practical example. Including parts of the sketching process to analyse the method using the principles.

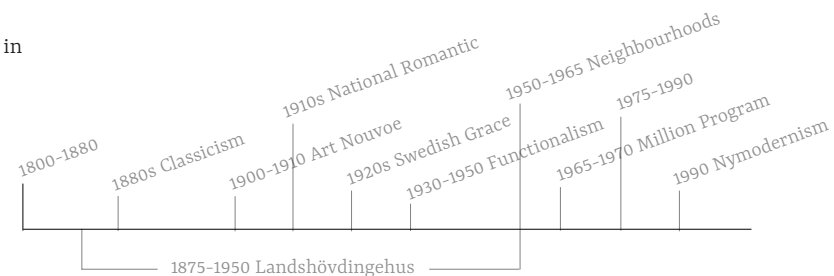## Reading Instructions

The thesis starts with an introduction and is followed by a theory part presenting background and research on the subject. This is summarized and presented in a list of design principles based on the research findings. The following part presents the design project where the design principles are implemented. Lastly, a discussion including a conclusion sums up the thesis.

02.
BACKGROUND

Historical Overview

A brief historical overview of façade style ideals in Sweden, between the 1800s and 1990s.

1800-1880 1880s Classicism 1910s National Romantic 1900-1910 Art Nouvoe 1920s Swedish Grace 1950-1965 Neighbourhoods 1930-1950 Functionalism 1965-1970 Million Program 1975-1990 1990 Nymodernism

1875-1950 Landshövdingehus

1800's

For most of the 1800s, Sweden suffered from a bad economy due to previous wars. Architecture styles evolved on an international level and influenced the Swedish towns, while the old local building tradition was carried out in the countryside. During this period materials close to the site were used. This was about to change as industrialization emerged and with it extended transportation possibilities by train (Björk & Reppen, 2000).

Industrialization had a breakthrough in Sweden between 1840-1880. Since it started in Great Britain, some British-style ideals were adapted in Swedish towns. The new technique of casting iron made it possible to for example construct Gothic tower decorations on ordinary common houses (Björk & Reppen, 2000).

Landshövdingehus

A building type is typical for Gothenburg. In 1874 the building regulations were updated regarding cellar-residents to improve living standards. Dwellings had to begin at lest 30 cm above street level. Simultaneously, due to fire safety, only two floors high wooden buildings were allowed and the maximum building height was set to 10 meters - a height normal for a three-story building. The following year, taking matters in own hands to contribute to solving the residential crisis, the local cooperation "*Arbetarnas Byggnadsförening*" collected own finances and using the new regulations to their advantage, applied for building permission for a new residential block. The site was Annedal, at this time a working class area in Gothenburg. The proposal suggested a lifted cellar floor with two wooden levels on top, in practice creating a three levels high building, still only two in wood and approved "cellar" / bottom floor to live in. The first *Landshövdingehus* was born (Larsson & Lönnroth, 1972).

At least four building applications got declined by "*Byggnadsnämnden*" during the 1870s. *Arbetarnas*

Byggnadsförening consequently appealed against the decline at *Länsstyrelsen* who approved every application! The name probably emerged from *Länstyrelsen's* clear position in the question but with a mix-up of the titles of person at the post and the office (Larsson & Lönnroth, 1972).
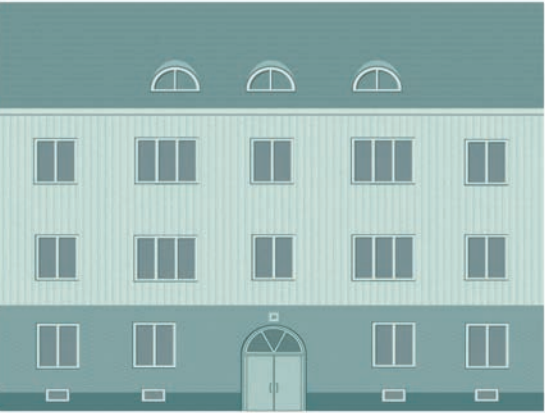
[1875-1950]

1880 Classicism

Many residential houses were built during this period. Facades facing the street were designed by architects taking inspiration from the renaissance and antiques. Ornaments of pilasters and pediments were carefully composed. The façades not facing the street inside on the enclosed courtyards were not designed, left completely plain without any decoration (Björk & Reppen, 2000).

[1880's]

Art Nouveau

As Sweden entered the 1900s a style known as Art Nouveau "the new style" in Europe also entered Swedish architecture. In Swedish, this style got the name Jugend, the German word for it. Art Nouveau emerged as a reaction to the classical ideal, previously dominating. And true to its name, a completely new way of designing was created. This style was going against most classical rules and instead based its design on organic shapes and expressions found in nature (Björk & Reppen, 2000).

[1900-1910]

National Romantic

Following the short period of Art Nouveau, the National Romantic style evolved in Europe as the nationalistic spirits gathered leading up to the first World war. The Swedish architecture style was inspired by old national building traditions but also other Nordic ones, especially from Denmark. German and English styles were also role models. The façades got a heavier and more closed character, usually in brick or plaster (Björk & Reppen, 2000).

[1910's]

Swedish Grace

The National Romantic period resulted in gained knowledge of the old Swedish styles and a revived interest in classicism. This time taking a more simple expression almost completely without decorations, a strong characteristic of the previous classicism period. The style that emerged was special for Sweden and called Swedish Grace internationally. Simultaneously a new way of urban planning resulted in larger blocks, with spacious courtyards allowing more light into the buildings. The façades were commonly long and coherent with open porticos that lead into the courtyards from where the entrances were reached (Björk & Reppen, 2000).
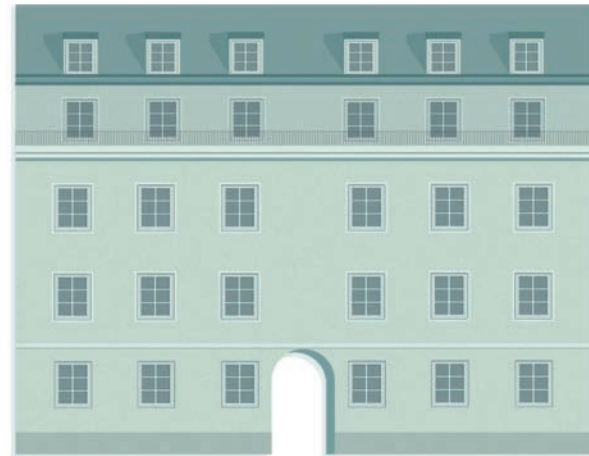
[1920's]

Functionalism

Functionalism had its breakthrough in the Stockholm Exhibition 1930. The basic principle of functionalism is that the function of the design should give the design its form: "*form follows function*". The new ideals in urban planning were also a large part of this ground breaking theory, including an important social aspect intending to improve standards and equality. The façades were simple without any ornaments since they were not considered to have any function, the material was commonly plaster in lighter shades or bricks in a plain pattern (Björk & Reppen, 2000).

[1930–1950]

1950-1965 Neighborhoods

After the second World war, as the new optimism grew, building construction started up again. The style was still strongly linked to functionalistic ideals but the war brought back a more traditional style once again allowing some decorative details. Commonly, façades had rougher textured plaster in darker shades. Windows were usually slightly set back in the façade and asymmetrically parted, one smaller and one larger frame. Bathroom windows, balconies and sometimes large panorama windows.

The production was about to evolve from a small scale more adjustable construction to the introduction of prefabrication and non-site specific large-scale production of building parts (Björk & Reppen, 2000).

[1950–1965]

The Million Program

The years between 1965 and 1975 are characterized by fast and large-scale production of residential houses. This is due to the Million Program (Swedish: Miljonprogrammet) that was introduced by the Swedish government to solve the great housing shortage in the 1960s. The goal was to build a million new residences in ten years, financed by government grants. To achieve this a standardized and rational approach was necessary, the multifamily buildings are typically 7-12 floors high and made out of prefabricated concrete façade elements (Björk & Reppen, 2000).
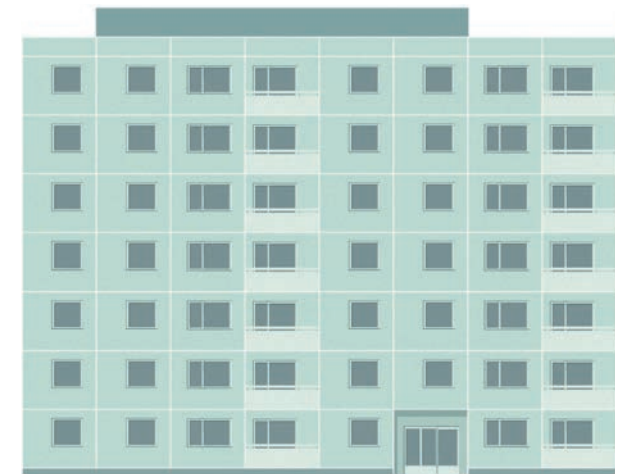
[1965–1975]

1975-1990

The production rate and scale of residential houses went down again and although post-modernism did not yet breakthrough fully in Sweden, the façades were given another character, commonly plastered and with bay windows. It did, however, influence the urban planning theory more significantly and the design returned to the traditional block structure with enclosed gardens.

New energy regulations were established and buildings with three or more floors could not be built without an elevator. These regulations had a visible impact on the building façades, windows were made smaller and it was possible to get money from the government to add extra insulation on the façades. The production of three-story buildings practically ended (Björk & Reppen, 2000).

[1975–1990]

Nymodernism

During the 1990s, the production of new residents decreased due to a financial crisis. When the demand for new residents increased around the mid 90s a residential crisis emerged. The economical situation lead to production of more exclusive and profitable residential projects.

New regulations meant that the state was less involved in controlling the building production and unconventional ways of building became more common. Trending was duble hight rooms in parts of the apartment impacting the look of the façades. Large glassed ceiling to floor windows, balconies and terraces. New-modernism (own translation) brought back an interest for functionalistic design features, large glass surfaces, light plastered façades, sometimes with an added accent colour (Björk & Reppen, 2000).

[1990's]

Basic Performance Attributes

We expect the façade to perform in a range of practical ways, with the initial function of working as a climate separating shell. Façade design has evolved throughout history along with the technical development. Some main performance attributes generally expected from it today are: *structural integrity, sustainability, durability, cost-efficiency, and human comfort* (Moghtadernejad et al., 2019). Explained further in the following sections.

Structural Integrity

These demands are important and some are regulated by Swedish law (Boverket, 2019). Fire safety, mechanical and environmental loads. Keeping kids in and potential burglars out.

Sustainability

Considering the severeness of the current environmental crisis, the demand for sustainability is highly relevant also in the façade design (Moghtadernejad et al., 2019). To achieve a sustainable façade adopting a life cycle perspective is necessary since all steps in the building production process from producing the material, during the life of the building, to the day of demolition have an impact. Resilience and flexibility in the design is also an aspect to consider here. If the building function is change, can the façade design still work well for another type of function?

Durability

To ensure the durability of a façade one must be able to overlook the expected life span of the façade and its possible failure modes. Durability has been an important aspect since the first buildings and due to previous experience with surveillance of façade performance over time, there is knowledge about how to achieve a durable façade (Moghtadernejad et al., 2019). To prevent failures in façade design one should first evaluate what could go wrong.

Cost Efficiency

In the 1960s while producing residences, rather a "quantity over quality" approach was conducted (Björk & Reppen, 2000). Bad quality window frames. The life span expectancy to about 100 years was not true, after about 40 most façades needed a total renovation (Moghtadernejad et al., 2019). From a life span perspective the costs of the initial production is not the only costs to be taken into account, in the example from the 60s the renovation costs should be included. What this teaches us is that economy should be considered from a life cycle perspective. Long-term costs rather than investment costs (Moghtadernejad et al., 2019).

Energy consumption is often a significant cost during the life of a building, that is why it can be well worth it to already in the design process adopt design strategies to reduce energy consumption during the life of the building. These could be external shading, high-performance glazing, or aiming to find the optimal window-to-wall ratio (WWR) (Moghtadernejad et al., 2019). Another important factor in the economic aspect is the expected maintenance requirements of the façade. How often it needs to be repainted, washed, replaced parts, etc?

Human Comfort

Facades make up an envelope creating an indoor climate possible to regulate temperature, comfortable for the residents. It provides shelter and helps keep residents protected from not only the weather but also unwanted visitors. The social aspect is a significant factor in the function of the façade. Human comfort is not only physical but also physiological. Façades not only provides actual safety but also a feeling of it and the possibility to regulate social interactions. The design of the façade regulate the level of privacy and control for the resident, through outlooks and insight (Morichetto, 2019).

Snow covered roofs in Møllenberg, Trondheim.

The Roof - part of the enveloping shell

The ultimate function of the roof is, as well as the exterior wall, protection. The traditional way of designing the shift from façade to roof is to clearly mark it, demonstrating the existence of the roof. A *balustrade* is another way of marking the end of the façade, giving a more mysterious message: there could be a roof or a terrace behind it (Wulz, 1991).

The eaves mark the shift. Without it, the emphasis is put on the façade, denying the existence of a roof. The effect is a continuous wall that abruptly ends in a sharp edge with no intention to lift the importance of the roof.

Functionalism
According to Le Corbusier the roof should give back the space occupied by the building on the ground, resulting in a terrace. In other words, taking away the roof. Leaving no reason for the existence of an eaves (Wulz, 1991).

[Personal Reflection]
Concluding, the roof has a significant meaning in this subject of the facade, it is part of the enveloping shell and can sometimes be difficult to separate from the facade, if the transition is not significant enough.

Further Qualities

In the beginning of the 1800's Durand wrote that architecture both counts to the field of science and art. A well-established truth of his time (*Durand*, 2000).

Today, whether architecture would be counted as art or not will be left uncommented. However, there seems to be a wider purpose of architecture than covering certain practical needs (Wulz, 1991, p. 9). Values brought through architecture difficult to measure in practicality. A belief is shared by others as well. Ola Nylander writes about the "unmeasurable values" in his thesis (Nylander, 1998).

Reaching the basic demands will make for a highly functioning façade, and building. However, architecture is more complex than reaching the bare minimum functional qualities of a building (Wulz, 1991).

A lookout could fulfil its minimum practical purpose of letting light in and providing a view out, however further qualities as providing feelings of control or added spaciousness to the room is dependent of a further consciousness in the design. The design could also, done wrongly, instead interfere with privacy or safety (Morichetto, 2019).

03.
RESEARCH

The following chapters will go deeper in describing further qualities related to the façade design. Sectioned in: the urban environment - *the Town*, the private residence - *the Home*, and the meeting between them - *the Interface*.

Town

The façades of the buildings are the walls that define the urban room in-between them. Their expression contributes to creating the identity of the area. The façades interact with the public space and each other, whether they were planned to do so or not. Hence, the design of the façade becomes a public matter. One could further argue, that it therefore also has a responsibility to contribute by not only existing as a "wall" but by providing further values to the city as well.

Living cities

The design of a façade fronting a public street has an impact on the concentration of activities in that connecting public space (Gehl, 2010, p.93). Narrow units and many entrances seem to be the recipe for more street life. On the contrary, long façades with few doors means less activity. Naturally, the activity taking place inside the building is also impacted, for instance, a function like a bank or an office tends to create less activity in the connecting street, while shops or for instance create more activity.

This also applies in residential areas (Gehl, 2010), town-houses (narrow units, many doors) create more active public spaces than a multifamily building with a long façade and few entrances. This is also supported by Jacobs (1962) who claims that buildings must not "turn their backs" to a street to ensure safety for residents as well as the by-passers. An active street is a safe street, and a safe street is more prone to become an active street. A street with many eyes on it: residents with the possibility to overlook the public space, is also prone to become a safer street and therefore more active.
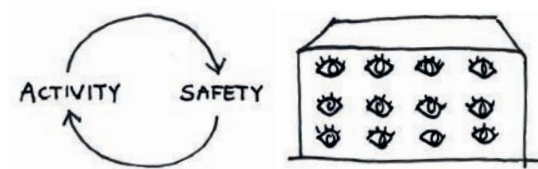
Furthermore, to achieve a street equipped to handle strangers safely in an urban environment, there should be a clear

"Just as walls, columns and so on, are the elements of which buildings are composed, buildings are elements of which cities are composed"

(Durand, 2000, p.143)
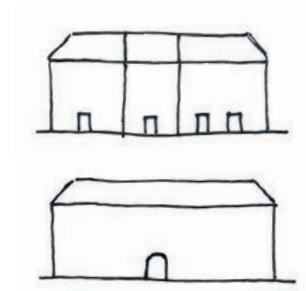
Many entrances has an impact on the concentration of activity in the connecting public space.

A safe street is prone to become an active street.
And the other way around.

"Crawling up a tree always has been a good way of hiding"

(Gehl, 2010, p.97)

We basically just perceive the first floor walking down a street.

distinction between what is public and what is private space (Jacobs, 1962). Not only does the first-floor layout of the façade affect the street life, but interactions between height levels are also an aspect to take into account. On the same level, interactions can happen even from a far distance. Within the range of 20-100 meters, humans can experience activities happening and engage with them. From about 100 meters it is possible to detect a human as another individual, called *The social field of vision* (Gehl, 2010, p.65). As the distance decreases it is possible to pick up more and more information about the other person. At about 20 meters we can perceive facial features and moods, now the level of interaction becomes relevant in a social context.

However, an activity occurring just 3 meters above is difficult to engage in or notice. This has to do with how our senses function, the human visual field spans considerably wider horizontally than vertically. Practically, what you perceive walking down a street is the façades of just the first-floor level. Otherwise, your focus lays on the pavement you step on and activities going on in the public space (Gehl, 2010, p.63).

Building Layering

A building consists of levels stacked on one another. These levels all have different conditions due to their position. Naturally, the first floor has completely different opportunities compared to a middle floor or the top floor. Light, sound, view or communication possibilities varies. Some functions may work better at a certain level compared to another.

In this context the theory of *Stacking* and *Layering* (Sim, 2019) can be introduced. Placing floors of the same type and function on top of each other is *stacking*. Not an uncommon approach, it has the advantage of being perhaps more economical, energy and time efficient, but might unfortunately deny possible qualities achieved by the other approach: layering.

Layering is when each level is designed containing functions adjusted to suit the individual opportunities of that level. Adding qualities unique for the specific level. This approach help creating a city using more of its potential qualities (Sim, 2019).

Edge effect.
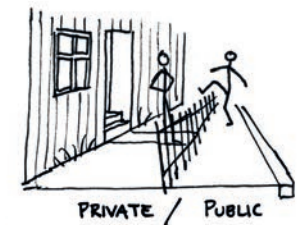
A clear distinction between private and public.

Stacking   Layering

The Social field of vision

The Edge Effect. Sunday in April, early afternoon. "Plaskis" Kungsladugård, Gothenburg.

The Edge Effect

It is possible to trace some behavioural patterns of people in public spaces. *Walking, passing by* and the *flows of movement* are some aspects. But perhaps more relevant in connection to the façade design from a social aspect, are the *standing, sitting* and *staying* activities.

If a person stops briefly on the street it usually depends on a functional and necessary reason. Like, tying shoelaces or stopping for a red light. This could occur suddenly and anywhere. The same applies when meeting an acquaintance and starting talking - you simply stop right where you met. However, when stopping somewhere for a long while in a public space - staying somewhere - there are certain preferred conditions to be noted (Gehl, 2010).

People tend to want to stay close to transition zones, like a façade or the edge of a forest. Humans avoid open spaces unless the edge zones are fully occupied, this is called *the Edge effect* (Gehl, 2010). An edge zone is beneficial since it leaves you less exposed but often with the possibility to get a good view over your surroundings. You are not in the way of flows and can easier control the social distance from others.

Naturally, the edge effect commonly occurs in the spaces close connecting to residential buildings (Gehl, 2010). Residents are often seen sitting right outside their entrance or leaning against the façade. Lingering on for a little longer talking to a neighbour, having the close-at-hand-option to retreat inside the privacy of the home at any time.

"If the edge works, so does the space"

(Gehl, 2010, p.150)

Home

An important aspect of a home is to feel safe and in control within your residence, simultaneously, there is a need for feeling connected and a sense of belonging to the outside world (Morichetto, 2019).

Living in a city comes with a certain lifestyle. Privacy and safety are important basic needs, however, people choosing to live in cities perhaps also seek the closeness to, and interaction with others?

What does the shape, transparency and construction details of the exterior wall mean to the experience of the interior space - the home?

Shift in Facade and *Corner Window*. Kungsholmen, Stockholm

Enriched Environments

The concept of enriched environments is shortly explained about how the physical environment impacts human mental health. It has mainly been used as a model to study how the brain structure and function can be affected positively through stimulation by the surrounding physical environment (Morichetto, 2019).

The report about the subject by Morichetto (2019) is used as a main reference with the purpose to find and define different features in the home that seem to contribute to positive effects on human well-being or human positive perception of the home in general. Creating further values in the home environment. A method to define qualities achieved through architecture. Ultimately aiming to answer the design question that aims to define different qualities achieves by the design of the residential facade.

The report by Morichetto (2019) addresses enriched environments connected to residential architecture resulting in three main concepts; S*patial extension, Movement and Material and detailing.* Where Spatial extension and Material and Detailing are most relevant and applicable regarding facade design.

Spaciousness

The experience of spaciousness is an important quality especially in smaller residents, but also generally. This is regulated in big part through the design of the transition from interior to exterior, how the façade allows for connection to the outside. How we perceive space and spaciousness is relative, we experience space in comparison to larger or smaller space (Morichetto, 2019).

Spaciousness
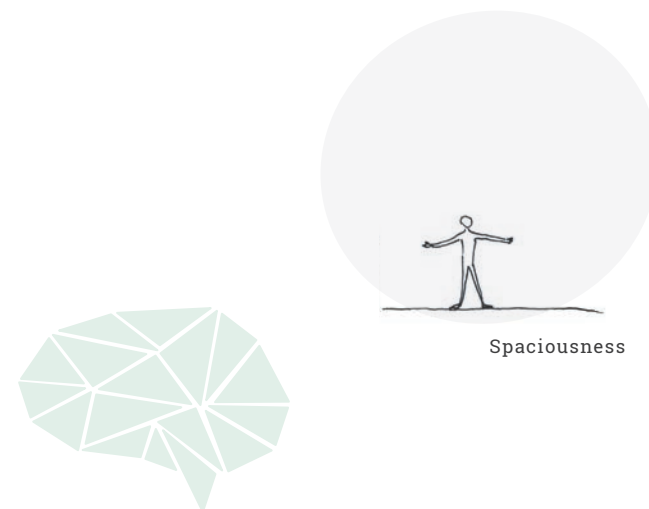
Brain structure can be affected positively through stimulation by the surounding environment in different ways.

Views & Windows

Openings in the façade provide possibilities to look out as well as let light inside, affecting the experience of the interior space. Working consciously with outlooks can bring qualities for the residents in their living environment. The possibilities and effect of the outlooks depend on the surrounding environment, however, some principles can be concluded to give certain effects generally.

The design of the exterior wall and its openings can give the residents a sense of control and safety. Windows and the view can evoke fascination and stimulation. A possibility to extend the sight-line by placing a window giving a view outside helps give a sense of space, affecting also the feeling of spaciousness of the interior room (Morichetto, 2019)


Bay-windows. Kungsladugård, Gothenburg

Diverging & Converging Views

The possibility to from one point in the residence have outlooks in different directions, viewing different scenes is called a *Diverging view*. The opposite principle is when it is possible to view the same scene or point of view from different spots in the residence. This is called a *Converging view* (Morichetto, 2019).

These concepts involve an aspect of movement which in turn adds value since it provides variation and complexity to the architecture (Morichetto, 2019).

Horizontality & Verticality in Views

Views can also be designed to reach sideways, not only right-angled from the façade. This also adds to the feeling of spaciousness in the residence. A bay window allows views in other directions than straightforward. A shift in the façade is another way to allow a view to the side possible. The added angle gives a possibility to get a view in a new direction, and the angled window further adds a quality in allowing the resident to be in a new position relative to the main façade. The experience of being partly outside the façade adds a new dimension and spaciousness to the interior (Morichetto, 2019).

Outside ⬤

Inside ⬤

Converging View

Divirging View

Bay-window

Shift in façade
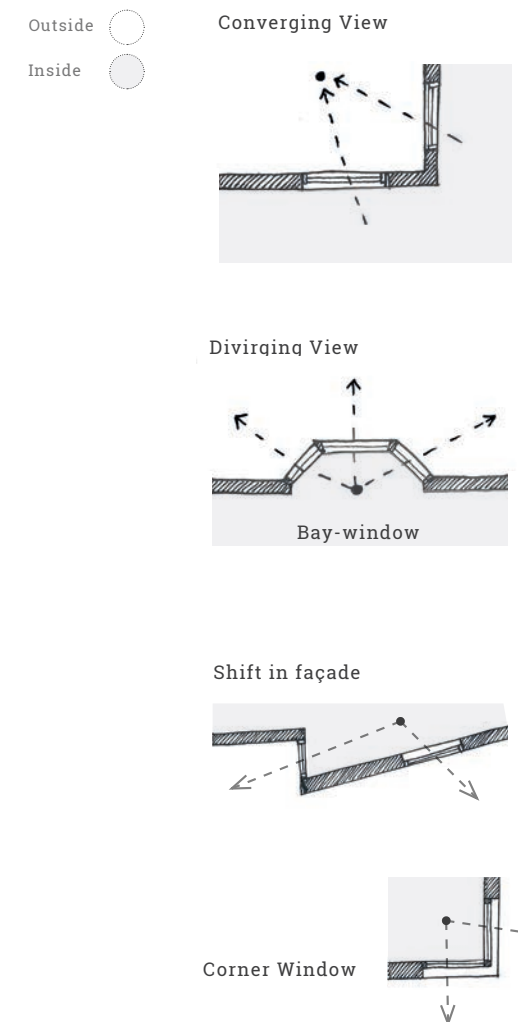
Corner Window

Residents have described how they appreciate a room that has windows in two directions, especially when they meet in a corner: the corner window. Why this is considered a quality can be explained through that it provides physical orientation, creating a "sense of place" for the residents (Morichetto, 2019).

The combination of how we move through the interior of the residence along the façade (horizontally) and the shape of the windows seem to work together, in the sense that wider windows (horizontally) seem to enhance the feeling of spaciousness in the residence (Morichetto, 2019).

However, the vertical direction also impacts the residence in different ways. A window reaching down to the floor might signal that you could walk out, like the floor could continue to the exterior, and adds to the spaciousness. A French balcony would even make it possible to open the window slightly. Extending the window over the regular doorway height leads the direction of sight upwards towards the sky or high trees outside (Morichetto, 2019).

Sheltered View

An apartment with a large panorama window might give an amazing view, but also reduce the feeling of safety. Giving the resident pieces of a closed wall helps in providing the feeling of being protected (Morichetto, 2019). The principle of letting the façade be open and closed (glassed and solid wall) in variation can also have a value regarding providing variation and hence, stimulation. The practicality of closed wall space in placing furniture is also a factor.

Having a good overview and visual control but at the same time protection have been crucial during evolution and humans have preferred spots that attains this combination of features. Finding a balance between these concepts is therefore something to strive for in creating a good quality living environment.

A bay window is a solution to achieve this in a good way with a possibility of 180 degrees field of sight. Another quality of this type of window is that it lets light in from several directions (Morichetto, 2019).

Material & Detail

Material and detail in architecture are of great importance. Morichetto (2019) examines principles connected to the material and detailing and how they affect the home environment. One central concept defined is *care*.

Care

The importance of *care* in the execution of architecture is confirmed by Nylander (1998), he further describes how it is connected to the residents' identification of themselves through their homes. The well-executed detail signals signs of care, and contributes to making the residents feel "cared for". It even works as a confirmation of their social worth and dignity. Being proud of where you live is a quality for the resident (Nylander, 1998). Architect *Peter Hulting* follows the same track, interviewed by Morichetto (2019, p. 180) he describes the care and well-executed detail from an architect's perspective as *an act of respect* for the user, a quality independent of any certain style or shape.

Some factors can be defined in why we interpret care in a detail: *authenticity* and *association,* as well as both *physical* and *abstract* perceptions of them, explained in more depth as follows.

Authenticity & Association

Materials carry associations and symbolic worth. *Authenticity* is an aspect of importance in the interpretation of care in architectural detail and material choice (Nylander, 1998). Some important factors to perceive a material as authentic are: *The knowledge of the material origin, the understanding of the processing of the material,* and *the usage from a historical perspective* (Nylander, 1998).

One example is a wooden floor compared to a plastic floor. It is easy for most of us to imagine the complete life cycle of the wooden floor. The material carries a symbolic and cultural value and is part of our collective memory, especially in a Nordic country with our historic relationship to the forest (Nylander, 1998). We are familiar with how it grows, how it is treated to become its floorboard shape and the procedure of the floor construction on-site. The fabrication of a plastic carpet is not as intuitive, does not carry the same historical

Meeting of wood, stone & glass. Kungsholmen, Stockholm

Nature or things mimicking it seems to spark positive associations. Humans are drawn to nature.

depth and could be considered less authentic. Furthermore, materials, shapes and environments that have associative connections to nature seems to spark positive associations generally.

Tactility and Touch

Materials are interpreted both through stimulating our senses *physically* through touching and vision, but also in abstract ways through *associations* and *symbolism*. The same parts of the brain that activates when we are being touched are also activated when we see *someone else* being touched. In the same way, humans are affected not only by the physical sensation of touching a material but also by the visual image of materials meeting (touching each other) (Morichetto, 2019). This indicates the importance of care in how the joining of materials and details are carried out.

"Det är omsorgen som är det primära, inte en viss estetik"

"The sense of care is most important, not a certain type of aesthetics"
(Own translation)

(Morichetto, 2019, p.183)

Brief analysis of two facades in Gothenburg:

Kungsgatan, Kungshöjd. Gothenburg

Kabelgatan, Gråberget. Gothenburg

Similarities:
Plain façades, about the same scale, about the same window height, facing a calmer street.

The left facade have some added colour on window sills, small French balconies and stone plinth adding to the sense of care and authenticity. It is simple but still manages to avoid dullness due to added colour and details, adding to complexity.

The right facade that has a large scale sense to the building components, lacking in sense of care due to non site manufactured building parts. It is simple in a way that it lacks in complexity and could hence be perceived as dull.

[Personal Reflection]

How people experience their surrounding environment seem to be affected by many subtle details. Why we intuitively like or dislike something can to each person be very clear and instant feelings. However, recent research connecting this to neuroscience and brain activity makes it possible to explained this from a scientific perspective.

What seem to be the most crucial aspect in giving value to the resident by the design is: Care. And that care can be expressed in many ways. One of the most Interesting things to me is that people's homes are linked to their perception of themselves and connected to their feeling of self worth.

Re-connecting with nature is a growing trend in general in society today, from my experience. To me it makes sense to explain human behaviour through an evolutionary perspective, reaching back to survival instincts. Why we prefer certain views or places in the city for instance. It gives an indication of why we might appreciate certain design features.

Interface

The physical transition between the interior and the exterior space might be easy to define. While the transition from what we experience as a private zone to the one of a public character might not be as distinct.

Nylander (1998) describes the concept of the *boarder space*, an interior room that borders the exterior space. One could be in this room and be noticed from the outside through a window, indicating that the transition from *private* to *public* starts already somewhere here. Of what extent depending on the design of the architecture between the two spaces.

Possibility to Choose

The possibility, or lack of, to choose the level of privacy is related to stress. This indicates that the physical environment can contribute to increasing or reducing stress, and the importance of creating the transition zones connected to the residence with care. Aiming for situations where the resident can control the contact to the public space. Creating spaces of different characters, both more private and intimate rooms but also ones offering possible social interactions with the city or neighbours (Morichetto, 2019, p. 166).

Entrances

How the residents enter their building can be done in numerous ways. A shared entrance with a common stair up to the different apartments will create a situation where spontaneous social interactions between neighbours could occur. While separate private entrances can activate the courtyard through *the edging effect* (Gehl, 2010), and give the residents a feeling of ownership of their own little spot right outside their entrance.

An entrance facing the street might create activity and contribute to a more lively street life from an urban perspective (Gehl, 2010). While entrances in the private courtyard side might instead create meetings between neighbours and activate the courtyard. Having the entrance connected to the courtyard could further be a reason for a family with small children to stay in the apartment in the city and not move to a house with a garden.

Another solution (than moving to a house) is the one described from a residential project by the architect Peter Hulting (Morichetto, 2019, p.167). In this project, private "terrace-entrances" were created through providing all apartments with their own terrace connected to a spiral staircase directly down to the courtyard. Giving the residents the same type of qualities as a ground-level building with a private entrance.

Scandinavian Climate

Sweden has a dark and cold climate in large parts of the year. This has given us a special relationship with the sun. Many Scandinavians will recognize the strong urge to feel the sunshine on one's skin after a long winter, even if it is for just a few minutes (Gehl, 2010).

The cold, windy, and snowy climate makes us spend a lot of time inside our homes. An optimal façade should let daylight in (which is of even more importance when the hours are scarce), while still be energy-efficient enough to keep the cold out.

An important quality would be to create opportunities to stay outside and enjoy the direct sunlight, by providing sunny but weather-protected spaces.

"Northern Europeans automatically choose a place in the sun." (Gehl, 2010, p.179)

Several connections between the inside and outside give a sense of freedom (Morichetto, 2019).


Students outside *Kårhuset* during lunch time, 9th March, + 1°C. Chalmers University, Gothenburg.

Incentives for *Staying*

Factors for creating good conditions for staying activities. Encouraging people to spend time in places, not just pass by. Contributing to a living city part (Gehl, 2010):

1. Easy access in and out of residence.
2. Good staying areas directly in front of the house (not crossing in the "street flow")
3. Something to do, to work with, directly in front of the house.

4. *Weather protection. Opportunity for direct sunlight (Personal addition).*
5. *A place to sit (Personal addition).*

BAYWINDOW
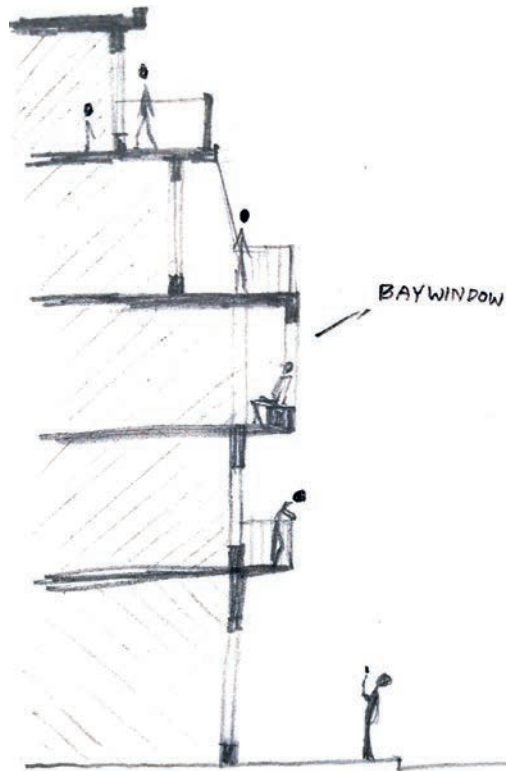
Added (rounded) steel balconies on to residential building.
Bakklandet, Trondheim.

Balconies

A balcony works as an extra space or room outside the residence and is truly a perfect example on a space where the interior meets the exterior space. A balcony can both be experienced as *exposed* or *safe* depending on the design of it. A protecting wall or angle in the façade can provide shelter, while at the same time taking away parts of the view. As mentioned in the section about "Views and windows" humans need the balance between the exposure and possibility to overlook to feel optimally comfortable using the space (Morichetto, 2019). A balcony needs to be designed according to these needs depending on the specific situation where building is positioned.

The design of the connection between the balcony and the interior can have an affect on the experience of spaciousness inside the residence. For instance, a balcony with walls on the side of it can give the experience of an extended interior room compared to a "free" balcony with a 180-degree outlook (Morichetto, 2019, p.162).

Since the balcony walls define the balcony space, looking out from the interior; the gaze will travel via the "balcony wall" before reaching the "open view" and this may lead to the appearance that the room continues outside, adding to the spaciousness. This effect is not as strong if the balcony is without solid walls. A large glassed surface can when reaching down to the floor or the edge of an interior wall, also enhance the appearance of the interior space continuing outside (Morichetto, 2019).

Strangers & Neighbours

"Cities are, by definition, full of strangers. /.../ Even residents who live near each other are strangers, and must be, because of the sheer number of people..."

(Jacobs, 1962, p.30)

According to Jacobs (1962) the clear distinction between what is public and private is necessary to give the users of both spaces the best opportunity to want to use them without feeling like an intruder and more likely not use it. The same would go between private and private, in other words: invading ones neighbours private space with yours. The clear separation between neighbours territories.

[Personal Reflection]

Co-living, creating spontaneous meeting spots through architecture and other means can be beneficial in decreasing loneliness and creating a sense of community in the neighbourhood, further contributing to provide safety.

However, one does not pick ones neighbours, and the opportunity to choose ones privacy is still an important quality. With that said, the opportunity to choose to socialize can at the same time also be a quality of significance. Giving the residents the individual power to choose, protects their integrity but give them freedom to expand outside of an otherwise possible isolation in the home.

Furthermore, while privacy is important and safety perhaps even more crucial, who are we to say what people want? Someone might love to live "exposed" to the street, valuing the interaction with the city life by their doorstep. Letting go of the strong prioritazion of complete privacy, might open up for other qualities.

Composition

When talking about façades the word composition is commonly involved. This theme has in this thesis been given its own chapter, but is a wide concept and will be impossible to cover in any extensive depth. Composition also gives reason to connect to an historical aspect of façade design. Presented is a brief definition of composition connected to façade design.

Composition in Architecture

The definition or ultimate goal of composition varies (Tayyebi & Demir, 2019). Depending on what aspect is considered the emphasis could either lay on the syntax of the parts arranged to form a unity or the semantic meaning of the formed unity. The former requires a syntactical approach, to the arrangement and order of the physical elements. The latter is more about the perception and symbolism of the composition.

Well-used concepts of composition like proportion, geometry, and symmetry can be traced back to the time of the Roman architect Vitruvius and his multiple-volume work De Architectura Libri Decem (Mårtelius, 2011). Based on evaluating the proportions of the human body and shapes in nature, the belief that the universe is construed by number ratios and mathematics is shared among various theorists of the time. Vitruvius meant that architecture should follow the same symmetries.

Vitruvius writes about the concepts of Order and Symmetry. Symmetry ratio between the parts and unity of the parts. Order in the meaning that a dimension that is repeated or divided. Eurythmics is a third concept, interesting concerning order and symmetry since it is rather about the perception of the two. Eurythmics is the experience of good architecture, described by Vitruvius as a value of quality (Mårtelius, 2011).

Historically, architects have followed a variety of composition principles with rules and methods of how to compose the building elements the right way. What has been desirable has varied over time and depended on the current architectural

ideology of the time. In more recent decades, however, the importance of composition principles has started to be questioned, a freer approach has evolved. Rather than a ruling style ideal, individuality can be sensed where the architects develop personal principles and prominent features can be identified connected to the style of the individual architect. For example, the proportion for Le Corbusier, minimalism in Zunthor, and smoothness in Zaha Hadid (Tayyebi & Demir, 2019).

Tayyebi & Demir (2019) have in their work developed a method for describing contemporary architectural compositions, that focuses on the syntactic aspect. The arrangement of the physical elements. In a façade, these are windows, doors, eaves, ornaments, frames, and so on.

Yin and Yang

Harmony

Reaching harmony is commonly mentioned as a central aim in architectural composing methods (Mårtelius, 2011). The concept can be described as the unity of opposites that creates an equilibrium, a balance. The word origins from Greek mythology: Harmonia was the daughter of Aphrodite the goddess of love and Ares the god of war (Wulz, 1991).

This principle is also illustrated through the Yin-Yan symbol within Taoism. In the same way, a harmonic composition in architecture is the unity of different architectural elements put together in a way that creates a balance. When formed into a unity, it might appear like if one element is removed the harmony would be ruined (Wulz, 1991).

Mathematics

Seemingly perfect regularity in nature phenomenons has given humans reason to believe that the universe is arranged according to certain numbers. Number symbolism is still today apparent and certain numbers are culturally connected to luck or magic. The origin reaches back to numbers associated with the understanding of the relation between heaven and earth. 3 was a symbol for the divine and 4 associated with the earthly. 3x4 is 12, and that is a number with various further cosmological associations (Wulz, 1991). There are many more numbers and connected values and magical meanings, however, to summarize: both the symbolic and the mathematic values of the numbers have had a significant impact on the development of theories in proportioning architectural compositions.

The Greek philosopher Protagoras stated, "of all things man is the measure". This has later been referred to during the renaissance with its human-centered Worldview, and then again as functionalism emerged in the 1900s. However, the new interpretations of the statement were more about the human proportions as a module for the world, than its original meaning about the interpretation of the world through human perception.

The Golden Ratio or Divine Section

The golden ratio is known to have been used by architects throughout history to achieve harmonic and aesthetically pleasing compositions (Lucan, 2012). It has also been found repeatedly in various nature patterns and is mathematically explained as the number 1.168 (Carlson, n.d). In architecture commonly used as design tool, where it is the base for placement of parts in a composition.
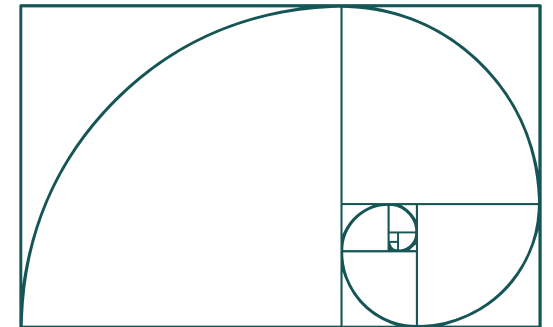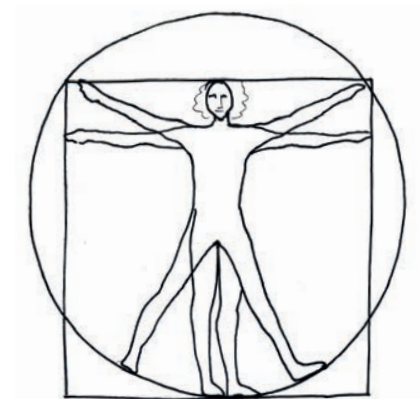

The Golden ratio/ Divine section
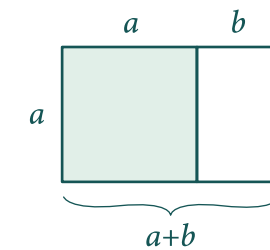
$$\frac{1+\sqrt{5}}{2} \approx 1.168$$

$a+b$ is to a as a is to b.

The Vitruvian Man

Anonymity / Identity

Anonymity is a consequence of living in a city. It can be seen as an inhumane and antisocial circumstance, but also, on the contrary, freedom for the individual, independence from social demands, and protection of integrity. Anonymity is also a phenomenon in architecture. Anonymity through mono functional areas, as residential housing blocks with the same building design "copied" over and over again. This does not promote a variety in activities, since it is not a mix of functions (Wulz, 1991).

What further speaks against the building anonymity, if the concept refers to a residential area where all buildings look basically the same, is the report by Ghomeishi and Ilbeigi (2017) who investigated the preferences in façade expression among architects compared to non-architects. The findings indicate that both groups appreciate the features: simplicity and *uniqueness* in a façade above all others.

Complexity

Another conclusion made from the assessment (Ghomeishi & Ilbeigi, 2017) was that a *medium level* of *complexity* gives the most satisfaction according to both groups. The middle level was a clear winner compared to *low* and *high*, however, low complexity was preferred over high complexity. Complexity and simplicity are not contradictions in this case, the absence of complexity would not reach simplicity but rather dullness (Ghomeishi & Ilbeigi, 2017).

Complexity is according to this investigation achieved by a set of factors that varies between the two groups.

According to non-architects, what influences the complexity in a façade depended most on the factors:

1. Number of colours

2. Decoration

3. Repetition

4. Number of windows

(in this order)

According to the architects the most important factors were:

1. Number of Materials

2. Decoration

3. Repetition

4. Number of colours

5. Number of elements

6. Lighting

7. Number of windows.

This assessment might give a general indication of which features are most desirable in façade aesthetics, however, the group of participants was about 120 in total, of which about half were architects and half non-architects, a relatively small and local group connected to the Tehran University. The preferences could vary depending on social or cultural background and therefore differ in another area or asking a wider spread of people.

However, complexity is also mentioned by Morichetto (2019) as one factor connected to *stimulation*. Stimulation as a wide concept is crucial in achieving an enriched environment. Enriched environments have the character of being both restorative and stimulating, ultimately contributing to health and well-being. A fundamental feature is that it is dynamic and does not stop varying. A certain degree of complexity is necessary (Morichetto, 2019).

The investigation by Ghomeishi and Ilbeigi (2017) gives suggestions of what might be interpreted among both architects and non-architects as contributing to the experience of complexity in a façade.

Lower Complexity   Higher Complexity
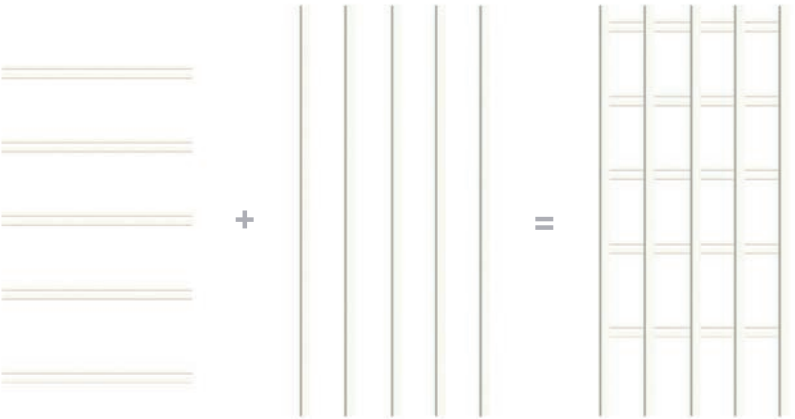
Horizontal and Vertical lines are features contribuiting to the perception of complexity in a building façade (Ghomeishi & Ilbeigi, 2017)

04.
DESIGN PRINCIPLES

Concluding the Research

From the research it is possible to define some principles that is shown to give qualities and values for the the residents and the urban environment applicable to the design of the façade.

They are categorized into four groups to make it easier to overview. All groups contain sub-categories. *Spatial Extension* and *Material & Details* are mainly based on findings from the Home-chapter. Interface from the Interface-chapter and Urban Environment from the Town-chapter.

The composition and façade design methods and theories might be useful as an attained knowledge base in the process of creating façade designs. While the formulated principles might be useful both as an analysis tool and in the sketching process. Aiming to fulfil the principles to reach qualities in different aspects.

The meaning of the principles is not that it is necessary to reach all of them to create a good façade, but to use them as suggestions of how to add further qualities. Some might be desirable in one situation while not in another, depending on the individual project.

Spatial Extension

• Spaciousness

• Converging/Diverging Views

• Horizontal/Vertical Views

• Connection/Interaction
  with the outside
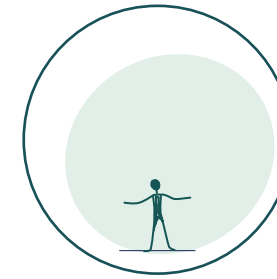
How the experience of the interior space is affected by the design of openings in the façade, and about the connection to the outside.
(Shares subjects with nr.3: *Interface*)

Material & Details

• Care

• Joints (Abstract touch)

• Tactility (Physical touch)

• Authenticity

• Positive Associations

• Adjusted level of detail

Care is a central feature, and the other concepts are all in ways connected to it. Material and details can give qualities in both physical and associative ways.

Interface

• Safety / Clear distinction

• Integrity / Social Control

• Connection/Interaction
  with the outside

• Place for Staying
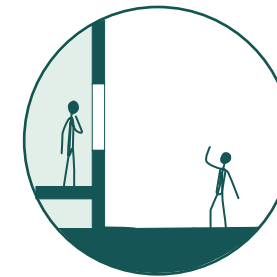
The interface is where the home meets the town. Private meets public. The transition zone needs careful design to achieve desired qualities.
(Shares subjects with nr.1: *Spatial Extension*)

Urban Atmosphere
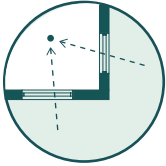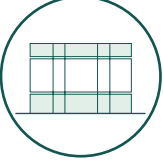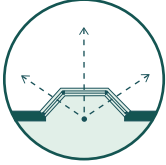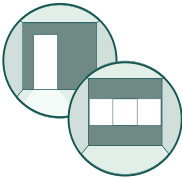
• Culture & Associations

• Composition

• Active/ Safe Streets

• Layering

• Sunny spots

Features giving values to the public environment. Many factors have a part in the complex total experience creating the urban atmosphere.

Principles
With Graphic Symbols

Spatial Extension	Material & Details	Interface	Urban Atmosphere

Spatial Extension

• Spaciousness

• Converging Views

• Diverging Views

• Horizontal/Vertical Views

• Connection/Interaction
  with the outside

Material & Details

• Care
  - Material Selection
  - Construction Execution

• Joints (Abstract touch)

• Tactility (physical touch)

• Authenticity

• Positive Associations

• Adjusted level of detail

Interface

• Safety / Clear distinction
  - A clear distinction between
    public and private

• Integrity / Social
  Control

• Connection/Interaction
  with the outside

• Place for Staying
  - Sunshine! Weather protection
  - Seating close to entrance
  - Easy access in and out
  - Things to do

Urban Atmosphere

• Culture & Associations
  - Identity, Uniqueness
  - History

• Composition
  • Stimulation:
  - Variation, Rhythm
  - Complexity

• Active Streets
  - Places to stay
  - Variety of functions
  - Many Entrances
  - Well designed Interface

• Safe Streets
  - Many eyes on street
  - Well designed Interface
    (Design Principle nr.3)

• Layering
  - Stacking VS Layering
  - Unique level opportunities

• Sunny Spots
  - Quick way to make a space
    attractive is providing sunshine.
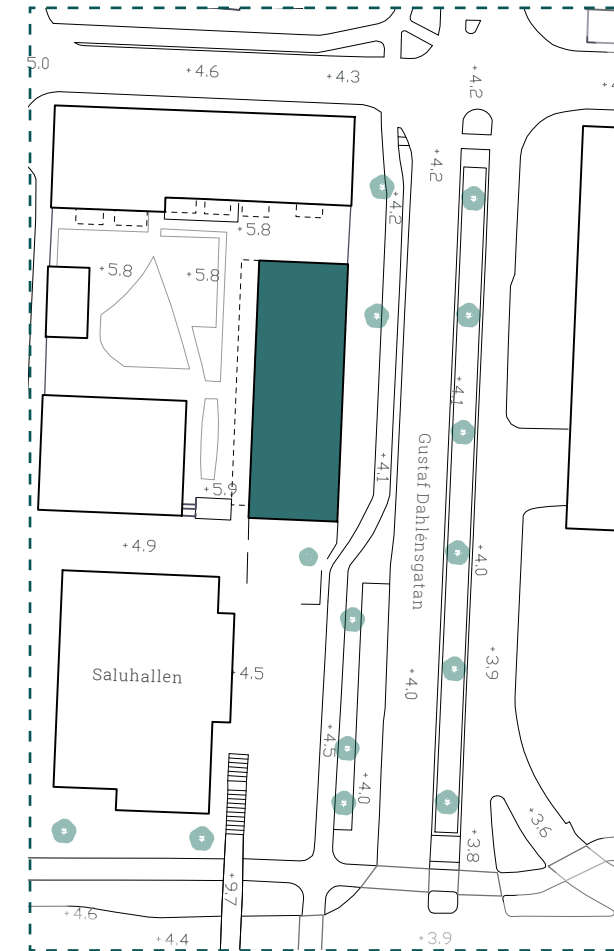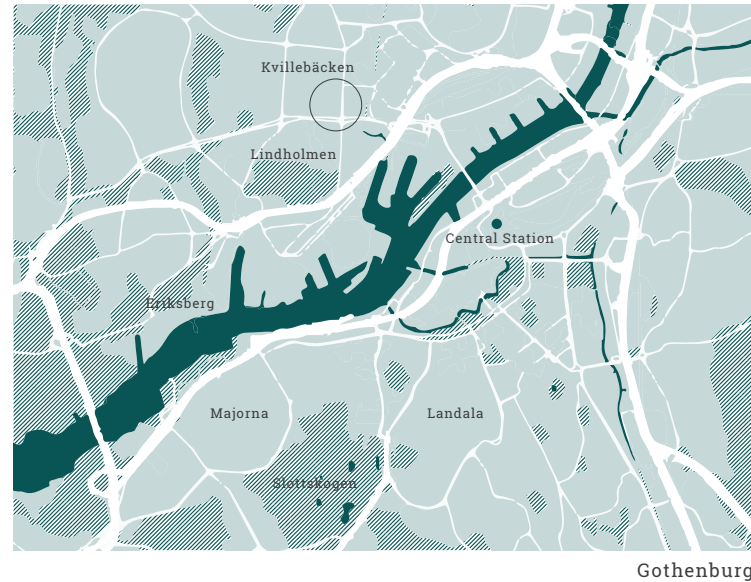
05.
DESIGN PROJECT

Site

Kvillebäcken, Gothenburg.
Gustaf Dahlénsgatan 6, next to Kville Saluhall.

Building
Residential building. By KUB Arkitekter, 2015.

The site is chosen because it is a residential building in a city context. The design is carried out with the presumption that this area will develop into an area of a "city centre-character" meaning an active and lively urban street life, as the city centre of Gothenburg expands.

Gothenburg

Tram station: Vågmästareplatsen

Building: Gustaf Dahlénsgatan 6

Kvillebäcken Area. Scale 1:5000

Site plan. Scale 1:1000

Method / Approach

Redesign

The redesign of the façade is not made as a critique of the existing façade. The façade is analysed using the design principles with the purpose of demonstrating them.

Process

The aim is to use the principles to analyse the site and existing facade in the initial phase. In the following step use the design principles as part of the method in the design process.

Design Principles

Building analysis

Urban Atmosphere

• Composition
• Culture & Associations
• Active / Safe Streets
• Layering

• Composition

The façade composition have a structured, monolithic, and symmetric expression. The cladding is a veneer brick wall construction made up with the same type of bricks on the entire façade, contributing to the monolithic character, although, the first two floors are marked by a different brick pattern. The majority of the façade is covered by a horizontal brick pattern, while the first two floors, together with decorative strips lining the windows horizontally, consists of a vertical brick pattern. Adding to the complexity of the façade, but it could overall still be considered quite flat in this sense, tending more towards lower than higher complexity.
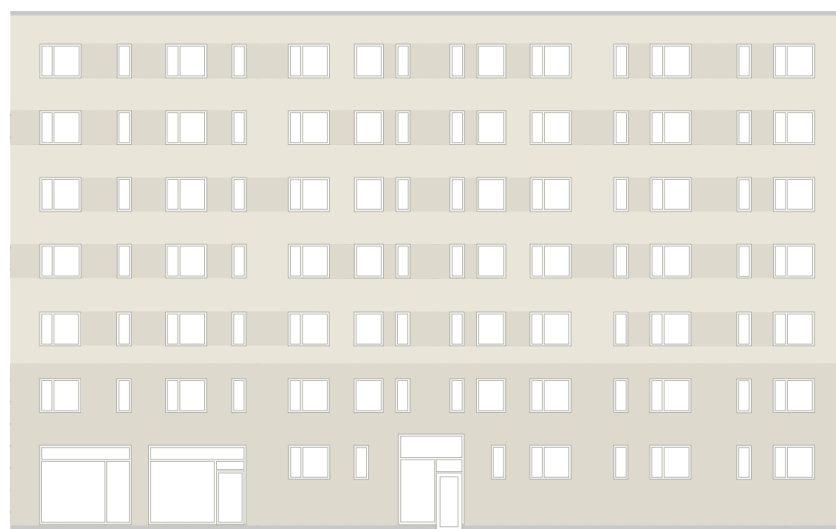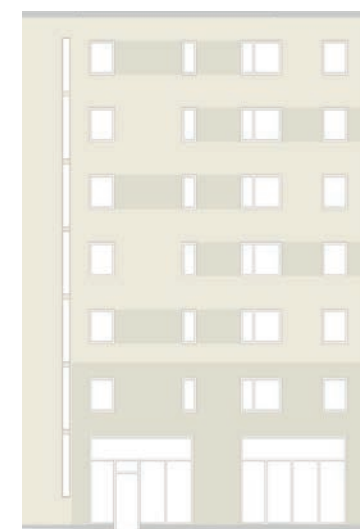
• Culture & Associations

The façade expression can be associated to a functionalistic style with its pale colour and monopolistic character. While at the same time follows a symmetrical order and distinguished first floors, a more classicalist approach. The bricks and closed wall character can also be connected to the style of the National Romantic period.
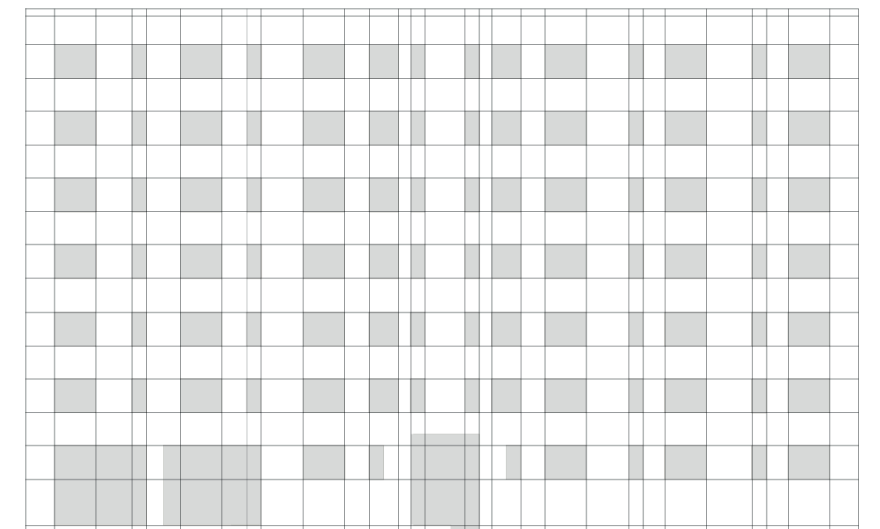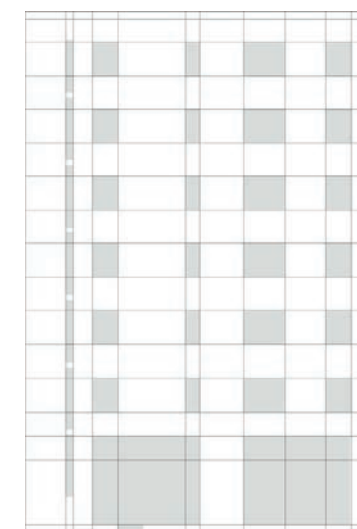
The entrance is glassed and gives a feeling of openness, with associations to open porticos leading into a courtyard commonly used in the new classicism/Swedish style grace period.

The selected cladding material is common in Gothenburg, the characteristic yellow brick can be seen in various central buildings. This brick has a slightly more cold and neutral colour.

• Layering

This buildings a clear example of stacking. Except for the slightly different first floor layout, only in the south-facing quarter of the plan tough.

• Active Streets / Safe Streets

The façade provides eyes on the street through the windows and function (restaurant) in the bottom floor with large glassed openings reaching around the corner. The glassed entrance also provides a feeling of connection to the inside, further more giving residents on their way out a chance to get a glimpse of the street well before stepping out.

Besides the restaurant on the short side of the building and the entrance in the centre of the long side, the façade is completely closed for communication, not giving any possibilities to move or stay outside of the façade, through a shift in the exterior wall or balcony for instance.

The apartment windows on the first floor are set at a higher level to minimize insight and provide privacy. The presence of them still give a sense of being observed when in the street space. However, the façade generally still does not give any good possibilities for the resident to get a sense of entering the street space. Or a stronger street connection besides letting in air and sound through opening a window, at higher levels.

Conceptual Facade Elevations – Brick Pattern

Conceptual Facade Elevations – Overall Composition

Interface

• Safety / Clear distinction
• Integrity / Social Control
• Connection/Interaction
  with the outside
• Place for Staying
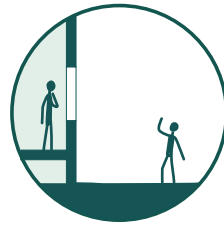
• Safety / Clear distinction + Integrity / Social Control

There is a clear distinction of public & private. The façade starts directly connected to the walking path creating a hard edge between public and private. Distinguished by the exterior wall. The transition is instant. The glassed entrance helps making the transition softer for the residents, although the fact that they still step directly into the potentially busy public zone is there, making the physical transition occur in the instant one steps over the threshold.

• Place for Staying

The pavement meets the façade plinth directly. Since the façade is overall of a flat character no indents or out standing bay windows, and connects to the walking path directly, no alternative street rooms are created in connection to the façade that are outside of the street flow, where one could step put of the "communication route" and stay still for a while not being in the way - edging.

No benches or seating opportunities in direct connection to the interface are created. However, the restaurant on the short side (in almost a perfect right angle to the south) have good seating / staying opportunities. These are however private or semi private, for the restaurants customers.

• Connection/Interaction with the outside

As mentioned previously about Active/Safe Streets, the flat façade without balconies or extensively large windows limit the interaction with the outside. The extent of it is opening a window for sound or temperature regulation and of course views. They will be investigated further in the subject of Spaciousness on the following spread.

The restaurant with large windows have a better connection with the street, the large windows invites bypassers to glimpse inside getting a sense of the activity, sending signals of a public restaurant and not a private residence, we can read this distinction without problems due to cultural reasons.

Material & Details

• Care
• Joints (Abstract touch)
• Tactility (Physical touch)
• Authenticity
• Positive Associations
• Adjusted level of detail

• Adjusted level of detail

The same level of detail in the brick pattern and the overall façade expression covers the entire façade. This might give a sense of lacks of care in the design, since the architect does not actively demonstrate the recognition of the difference in how we are perceiving the different floors. The first and second floor are what one is able to experience from up close, while the rest are mostly possible to get a clear look at from a distance. The façade is actually treated differently in the brick pattern, a shift in technique is made after the second floor, however this change is so subtle it is almost not noticeable from the street perspective. The façade seems to continue up until the eaves of the roof, giving it a massive expression where the scale is not beaked down in respect to the small human on the street. A tall flat wall is created.

The monolithic, flatness, minimalistic style approach of the façade plasticity also contributes to the general approach of treating all floor levels the same, which might take away from the sense of understanding for the scale and position of each level.

• Authenticity + Positive Associations

The bricks contribute to the sense of care by the materials' authenticity. The history of using bricks reaches way back, and the material the consist of is natural, clay found in nature. These are associations many can understand without knowing much of brick-making. Part of our collective cultural memory and understanding of general basic human construction and creation. Since nature generally gives positive associations this adds to the overall positive perceiving of the material.

The brick façade is honest, the construction principle is possible to read from looking at the façade. Although this is nor honest in the sense that it is not a load bearing wall but simply a veneer brick wall. But the function of them is still real as weather protection. And the material has a strongly grounded familiarity due to its long historical use.

The bricks make up the smallest building block, stacked up on one another, hold together by mortar, together creating the massive wall. The brick is from most peoples understanding, possible to hold in your hand and brick by brick one could imagine building this wall by hand, although this might not be how this particular wall was constructed. The relatable scale of the brick breaks down the massiveness of the façade and construction-wise make it readable, giving a sense of authenticity, which has proven to give positive associations and is a quality.

• Joints (Abstract touch) + Tactility (Physical touch)

Steel window and door frames meet the brick wall directly. The lowest façade part meeting the stone pavement consists of a slightly set back concrete plinth. The rain gutter train pipes are attached by simple metal plates screwed plainly on top of the bricks. The windows are slightly set back approximately one brick length in. Steel is commonly not the most authentic material and a good heat end cold conductor making it uncomfortably cold in the winter or hot to the touch by the sun in the summer. Compared to wood for example.
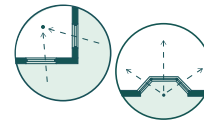
The vertical placed brick pattern, covering the bottom levels is not what most people would recognize as traditional and could therefore give a feeling of care since the designer seems to have made an active style choice.

Spatial Extension

• Spaciousness
• Converging/Diverging Views
• Horizontal/Vertical Views
• Connection/Interaction
  with the outside

Floor Plans

The floor plan drawings are created based on scannes retrieved from *Stadsbyggnadskontoret*. Bygglovshandlingar: Brämaregården 62_1.
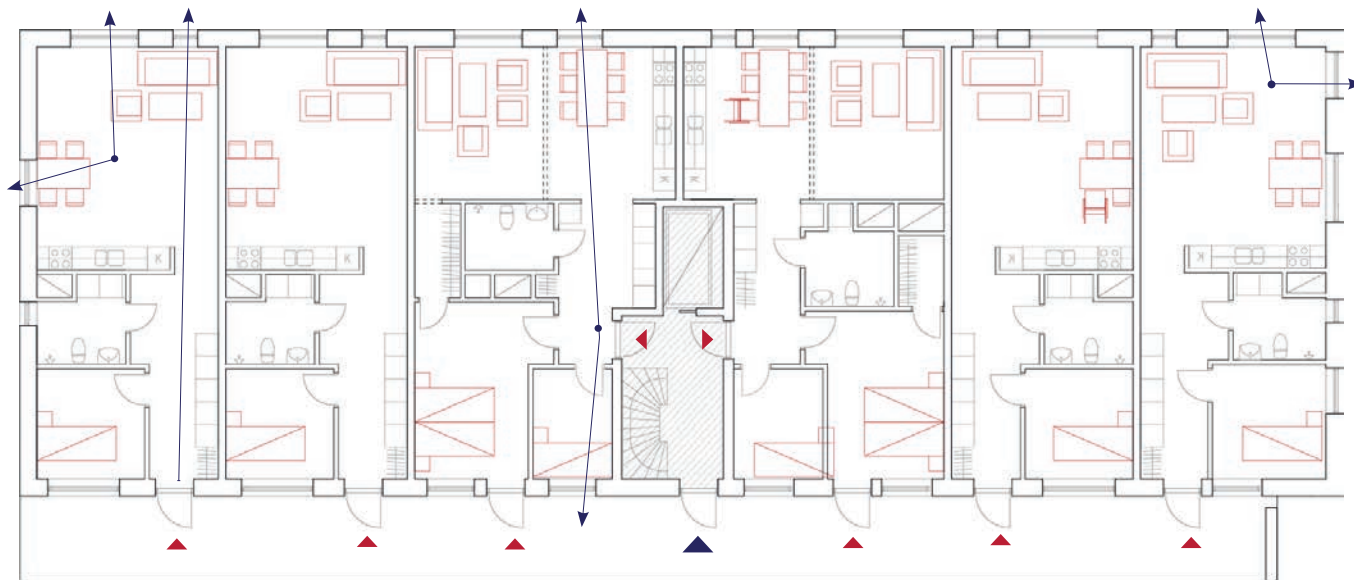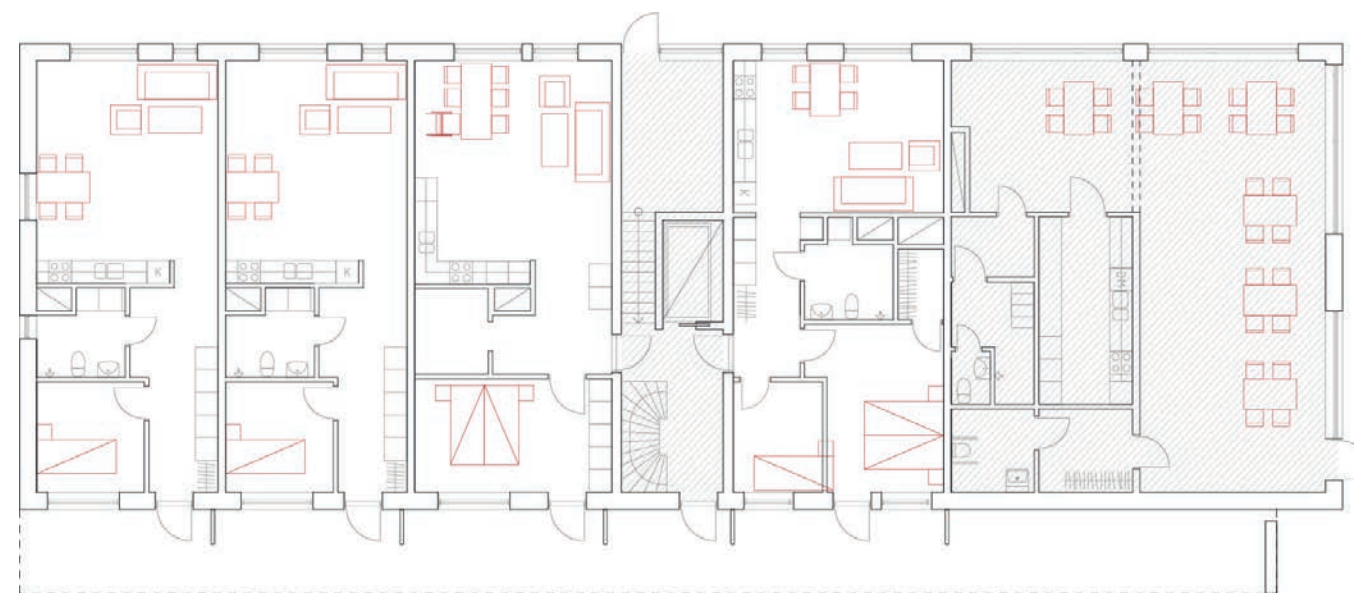
• Converging / Diverging Views

The one place with a clear diverging view is the corner apartment to the south (furthest to the right at this page). Since it has two windows in close connection with views in different directions possible to view from the same spot in the apartment. Another one is in the north corner apartment (left). This one is less clear but it is possible to from the same spot have views in two different directions. However, this does not look like a conscious design approach with the aim of achieving diverging views. No shifts in the façade or bay-windows. No converging views.

Floor 2-7. 1:200 (A4)

Ground Floor. 1:200 (A4)

+26 m

+4,4 m

Section 1:200 (A4)

• Connection outside + Spaciousness

All apartments have their own entrance from an exterior balcony, reached through the central elevator/stair room, with entrances from both the street side and courtyard in the bottom floor. The two larger apartments in the middle have two entrances.

Traffic noise is a problem on the site. That is probably the reason for placing all bedrooms on the courtyard-side. A situation is created concerning privacy for the bedrooms regarding by-passing neighbours and visitors on the balcony. This should be considered in the design of the wall openings.

As one enters the smaller apartments there is an uninterrupted sight-line from the entrance out through a small window on the opposite side, giving a connection to the street-side, an instant sense of direction helping orientation and increasing the feeling of spaciousness. The same quality is reached after taking one step inside the larger apartments where a view out towards both the street-side and the courtyard-side (through a bedroom) is visible.
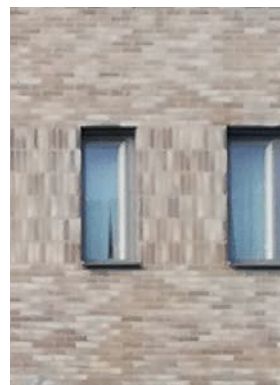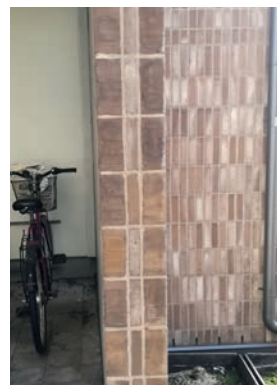
Phenomenology, Analysis
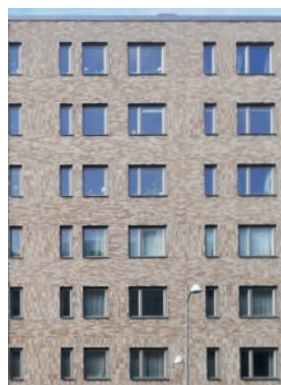

Palette

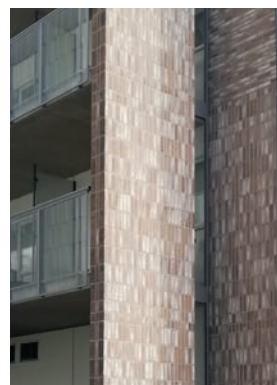Materiality

Frame

Foot

Pattern

Shift

Rhythm

Edge

Plasticity
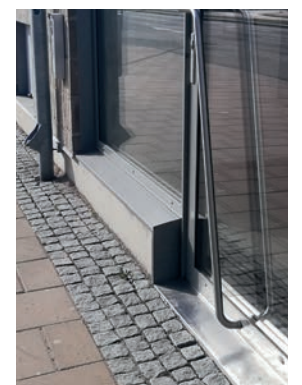
Landscape

Still Life
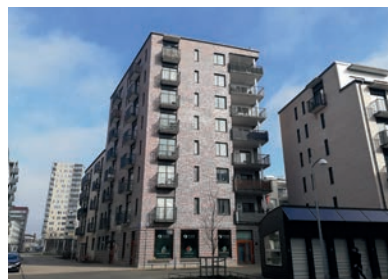

Portrait

Surrounding Area

West side

Gustaf Dahlénsgatan
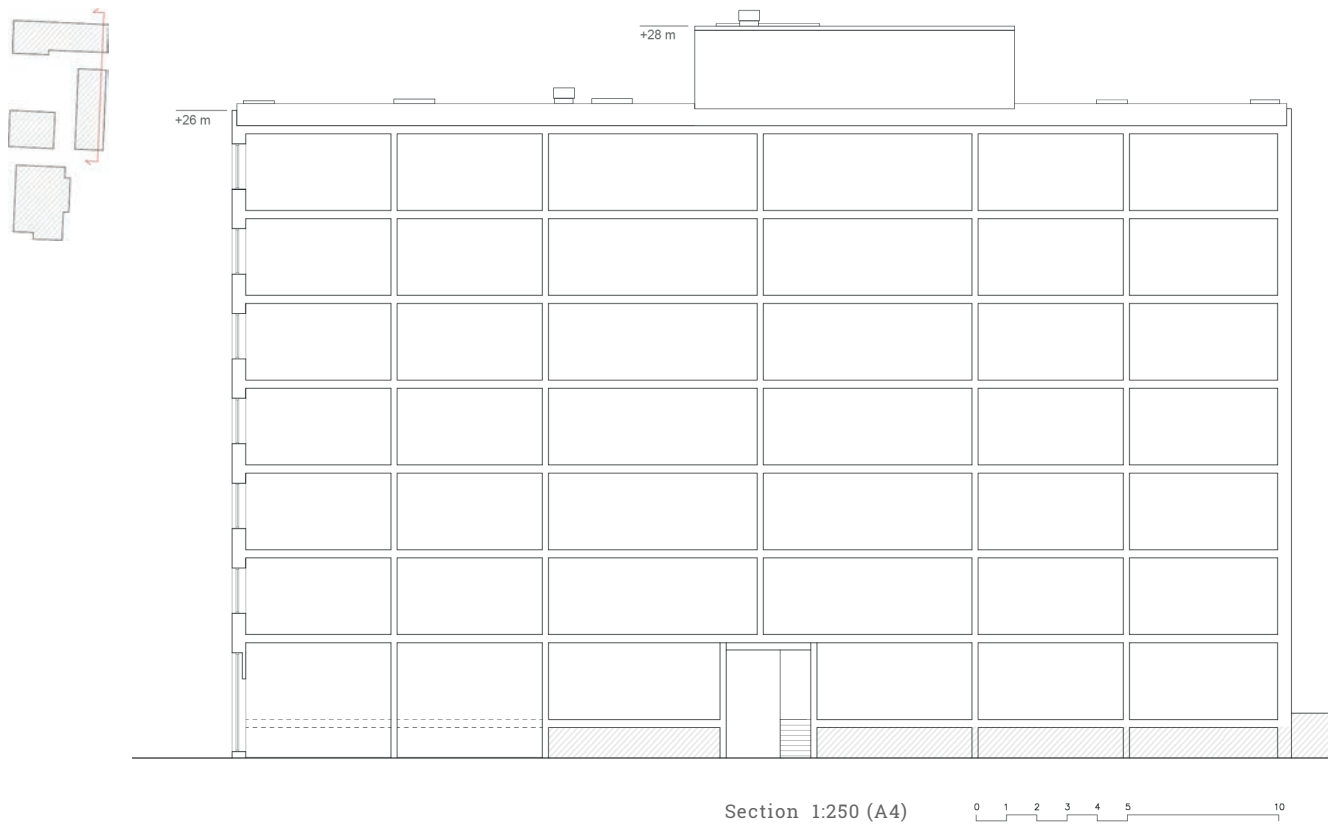

Gustaf Dahlénsgatan

East side

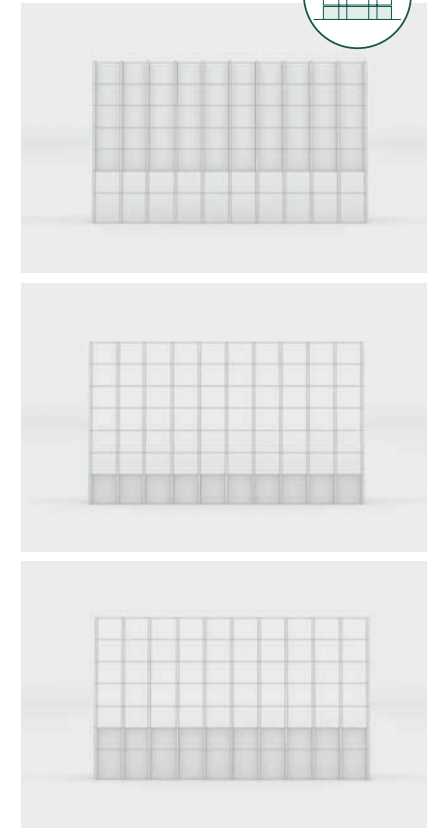East side

Design process

Sketching Method

The section of the existing building was used as a base for the re-design. Testing different conceptual window types and compositions on top of it. Reaching different design principles, in different combinations.

Sketching Tools

Both digital 2D and 3D tools where used, as well as sketching by hand. The sketching *prototypes* of different conceptual facade openings and compositions made in a digital 3D modeling program are shown as screenshots. A fast way to "mix-and-match" different features during scetching.

Section 1:250 (A4)

Prototypes
Wooden Structure

Prototypes Roof

Set back top floor (terrace)

Balconies (cut out)

Skylights

Dormer windows

Balustrade (hidden flat roof)
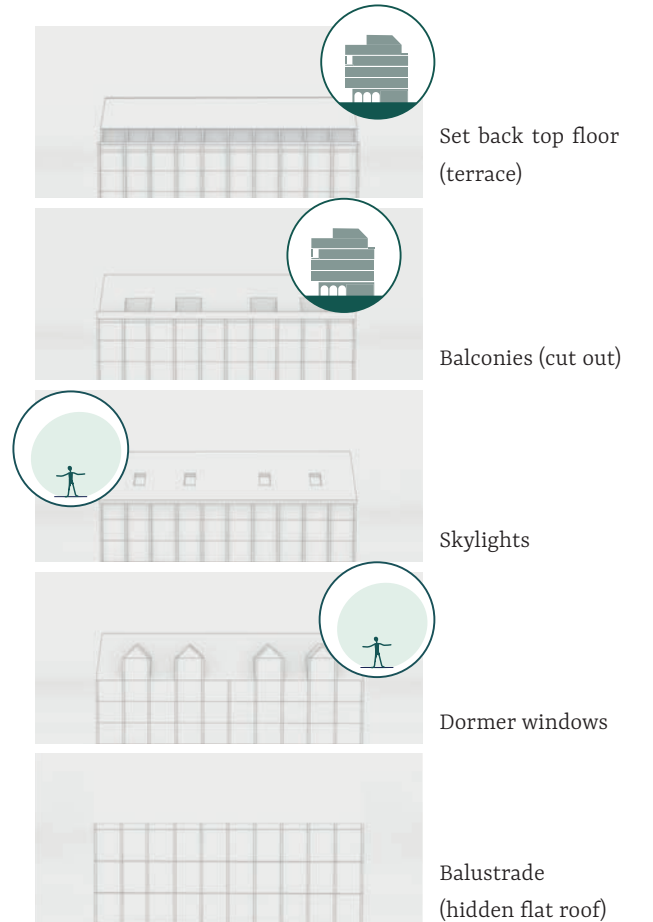
Prototypes Windows
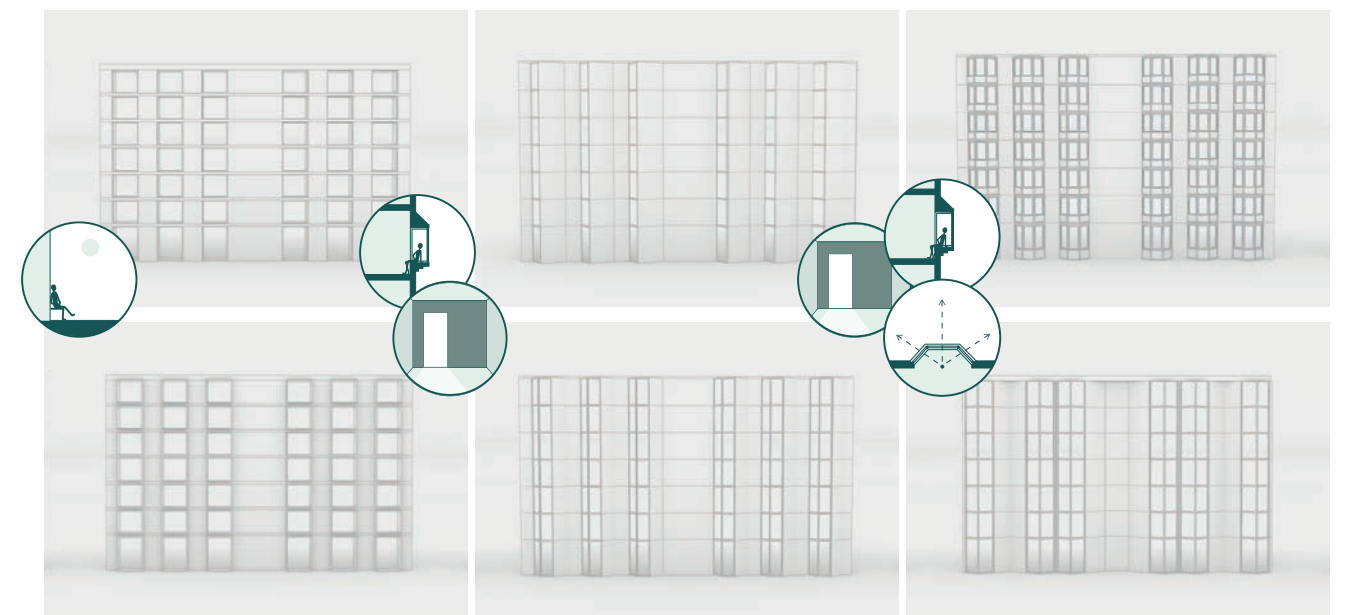
Focus: Creating Rooms, Spaces

Focus: Outlooks / Views

Focus: Outlooks / Views

## Horizontal Division

Horizontal structuring to break down the large scale and create a setting to easier adjust level of detail to situation.

Level 1 and 2 interacts most with the street and the design of them has a meaningful impact on the urban atmosphere and usage of the public space.

The middle floors interact less with the street life due to the hight difference, providing a possibly calmer climate with different opportunities.

The top floor has limitless possibilities extending upwards, in theory. In reality not limitless due to regulations, however there is a significant difference between the sixth and seventh floor, with new opportunities to take advantage of.
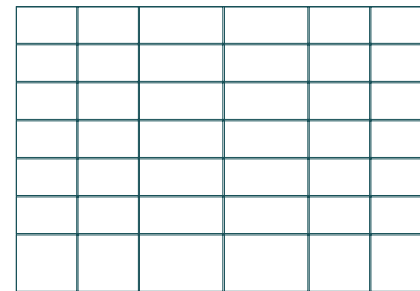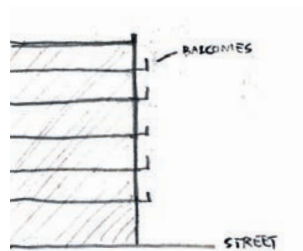

Length Section, appartment division.

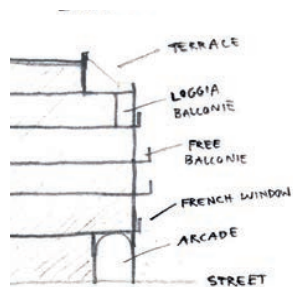Length Section, floor division.

Stacking

Stacking principle. The floors are the same, stacked upon each other. In section creating an L-shape meeting the street.
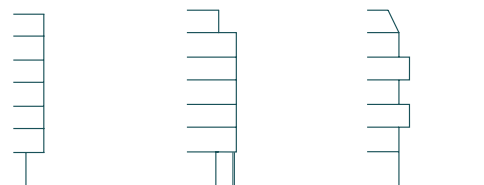
Flat

Layering

Layering principle: treating floors differently depending on their position and opportunities.

Overhanging
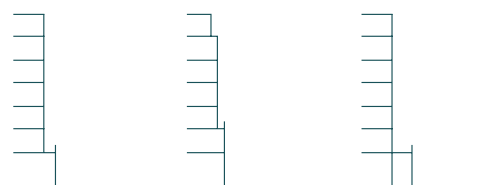
Leaned back

Methods for Breaking Down Scale
Stacked Facade

Color shift   Material / Pattern mix   Markers   Pattern shift

With the aim to achieve a façade that interacts with the street, and avoid creating a massive wall not meeting the relatively small human scale, a tool is to break down the façade. To "break down" is in other words, structuring the façade in smaller parts or components. This creates new smaller scaled frames possible to structure the composition around.

Marking a division in the structure, signals a that the floors are treated differently. Or at least difference between the floors. Indicating that there is a thought and understanding , a sense of care that the architect acknowledges the difference between the levels.

Sketching Process

Prototype A

Creating divirging outlooks

Sketch of lighter wooden structure

Sketch of a "dubble facade". Balconies
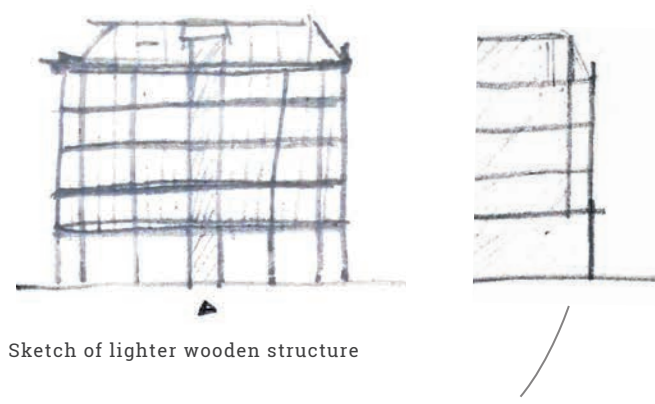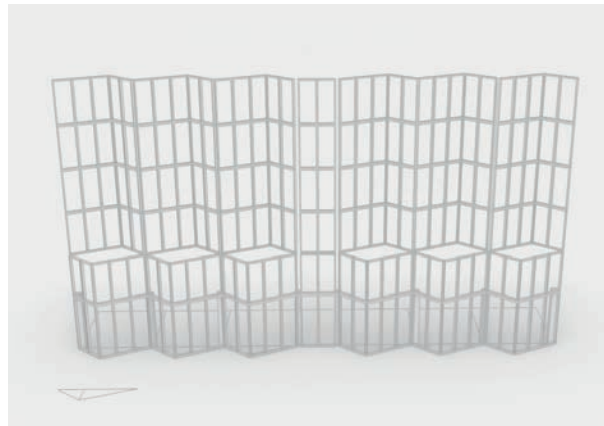creating a room between resident and street.

Overhanging

Prototype B

Creating street connecting spaces
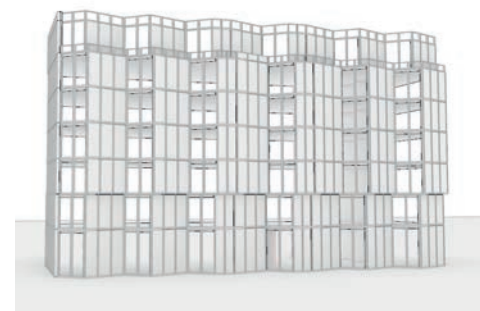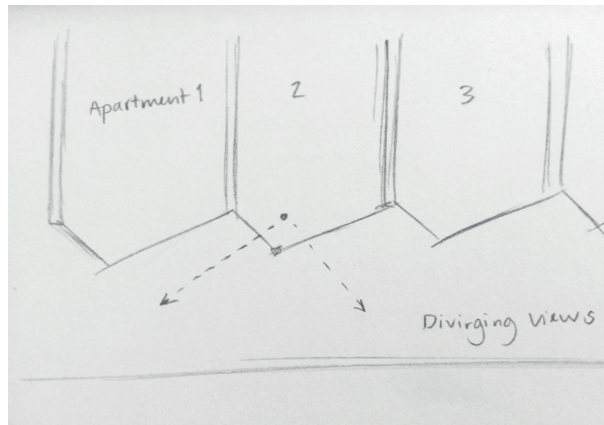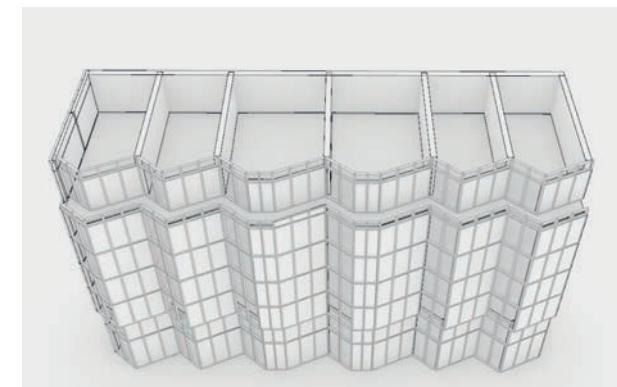
What I most like in prototype A that B is missing, are the view-qualities. Prototype A is reaching a shift in the façade giving the residents a new view angle, with a view reaching all the way to Vågmästareplatsen (tram stop towards the south).

The angles in the façade creates diverging outlooks down the street. A set back top floor marks the ending of the building and makes good use of the opportunity for a roof terrace.

Prototype B is more massive than A and the conceptual focus is creating a good meeting with the street, in making spaces for staying in connected to the street.
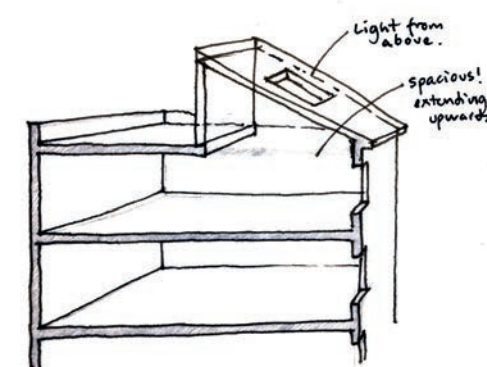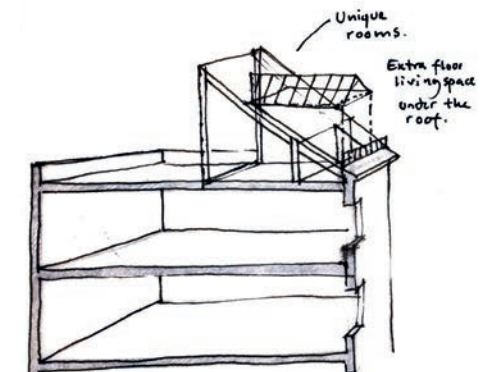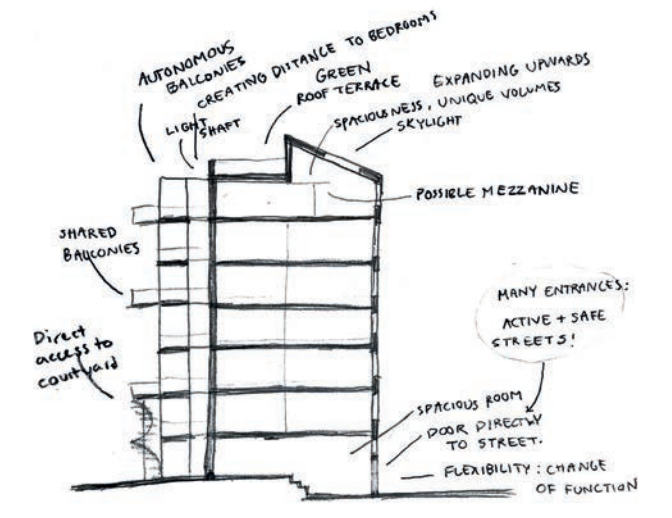
The top floor is extended upwards, creating extra spacious apartments – the layering principle.

Result

South. 1:150

East. 1:150

Prototype B

Facade Elevation 1:150

0   1   2   3   4   5   10

Spatial Extension

• Spaciousness

The large windows adds to the feeling of spaciousness, making the apartments feel larger and more connected to the outside. The possibility to open and take a step out on the French balconies is another contributing feature.

The top floor and the bottom floor are given extra height in the ceiling making the apartments more spacious.

• Vertical Views

The large windows going all the way to the floor creates an extension of the space, giving a sense of freedom an illusion that you can continue walking out through the glass.

• Connection/Interaction
  with the outside

The main street-interaction happens in the lower floors. Above the first floor is a long balcony at a level where it is still possible to interact with people on the street from a partly protected (set back) spot.

The bottom floor naturally have the closest interaction with the street. The large windows and entrance on the same level as the street makes it easy to slip in and out. The indents in the façade creates places to sit (enabling the edge effect) comfortably partly protected from neighbours and just next to of the street flow. Contributing to a living street life.

Material & Details

• Care

Care can be noticed on different levels in this façade proposal. Described best through the following principles:

• Joints (Abstract touch)

Care in the construction of details brings qualities through satisfaction in our perception of the material meeting (joint). This principle is not completed until the end when the detail is actually constructed (with care and skill). However, it starts with a design with care of the material joint. On the following page displaying a zoomed in elevation this aspect is analysed in a deeper sense.

• Positive Associations
• Authenticity

The brick cladding and wooden window frames is a material selection contributing to authenticity. We know them as traditional building materials reaching way back in history and connects them with nature. Nature is shown to give positive associations.

• Tactility (physical touch)
• Adjusted level of detail

This façade has a quite consistent level of detail regarding the different levels of the façade, due to the chosen cladding material that covers the entire surface. However, the shape and function is adjusted to specific situation. For example, the main entrance is set back and vertical brick profiles are angled in this spot creating a wider view and softer transition. They are also angled by the individual apartment entrances to let the sun through better. Wood material (frames, benches) are chosen where the residents pass through openings and make contact with the building. A smoother and warmer (tactility) material than the rougher surfaces of the bricks.

Analysis

Using Design Principles

Crown

Middle

Foundation

A - A

Leaned Back

Facade Drawing (East) 1:150

0   1   2   3   4   5   10

A
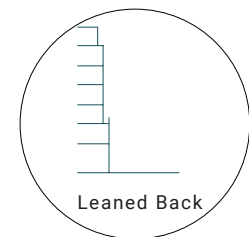
Interface

• Safety / Clear distinction

This question becomes crucial mainly in the bottom floor in this proposal. Deep wall profiles creates a partly protected space just outside each apartment, distinguishing this spot as belonging to the residence. Further, the stone cladding on the ground helps in making the limit clearer.

• Integrity / Social Control

This proposal lacks in reaching complete privacy in the bottom floor, due to low windows. If the resident prefer, controlling privacy is possible through flexible solutions like curtains or similar since the architecture does not provide full privacy on its own. This is a conscious choice where the advantages of this design are seen to be more important than reaching permanent privacy. The balcony on top of the first floor reaches a good balance between interaction and privacy. Windows on the first floor are set higher to provide less insight from the street.

• Place for Staying

Creating good places for staying connected to the street has been a priority in the façade proposal. Creating places to stay next to the façade, just outside the residences, contributing to a livelier street environment. Easy access in and out creates good opportunities for activities in connection to the property. Perhaps most importantly, the design provides a partly protected spot to enjoy the sun in!

• Active Streets
• Safe Streets

The building connects well to the street in the lower levels, with places to stay and many eyes on the street. Due to the French balconies on the higher levels they also provide better connection, compared to just a window. Active streets, creates safer streets – and the other way around.

Urban Atmosphere

• Composition
• Culture & Associations

The façade has a brick cladding and gives a solid expression. Thick columns make the wall look deep and the "leaned back" shape adds to the heavy and set expression. Compared to prototype A from the sketching phase, giving a much lighter, less dense expression.

The layout of the façade with a distinguished foundation, a middle part and a crown is a traditional type of composition. Associated with classical architecture reaching back historically, giving a cultural connection and making the type recognizable. The structure of the façade composition consists of combined vertical and horizontal profiles adding to complexity, placed in a balanced rhythm.

The structure is however not completely symmetrical, but adjusted to the site situation. A balcony reaches around the corner towards the square in the south. A softer flow between Gustav Dahlénsgatan and the square is created through the cut off in corner the bottom part. Giving the restaurant a new entrance connecting more to the east side which activates it better compared to where it is placed in the existing façade on the site today.

• Layering

A slight shift of the foundation breaks down the scale and in addition makes a balcony possible on top. The ground floor has entrances on ground level and high ceilings making the building flexible. The apartment volumes are suitable to hosting other functions in the future, if the area changes and is in need of a change of function. A resilient future perspective is important from the sustainability aspect. The design also allows for the residents to make use of the ground position, claiming the close connecting street space - extending outwards on the street. While the top floor extends upwards creating spacious attic-like apartments. These solutions make use of the different levels unique conditions, according to the layering principle.

The Ground Floor

Ground Floor Plan 1:200
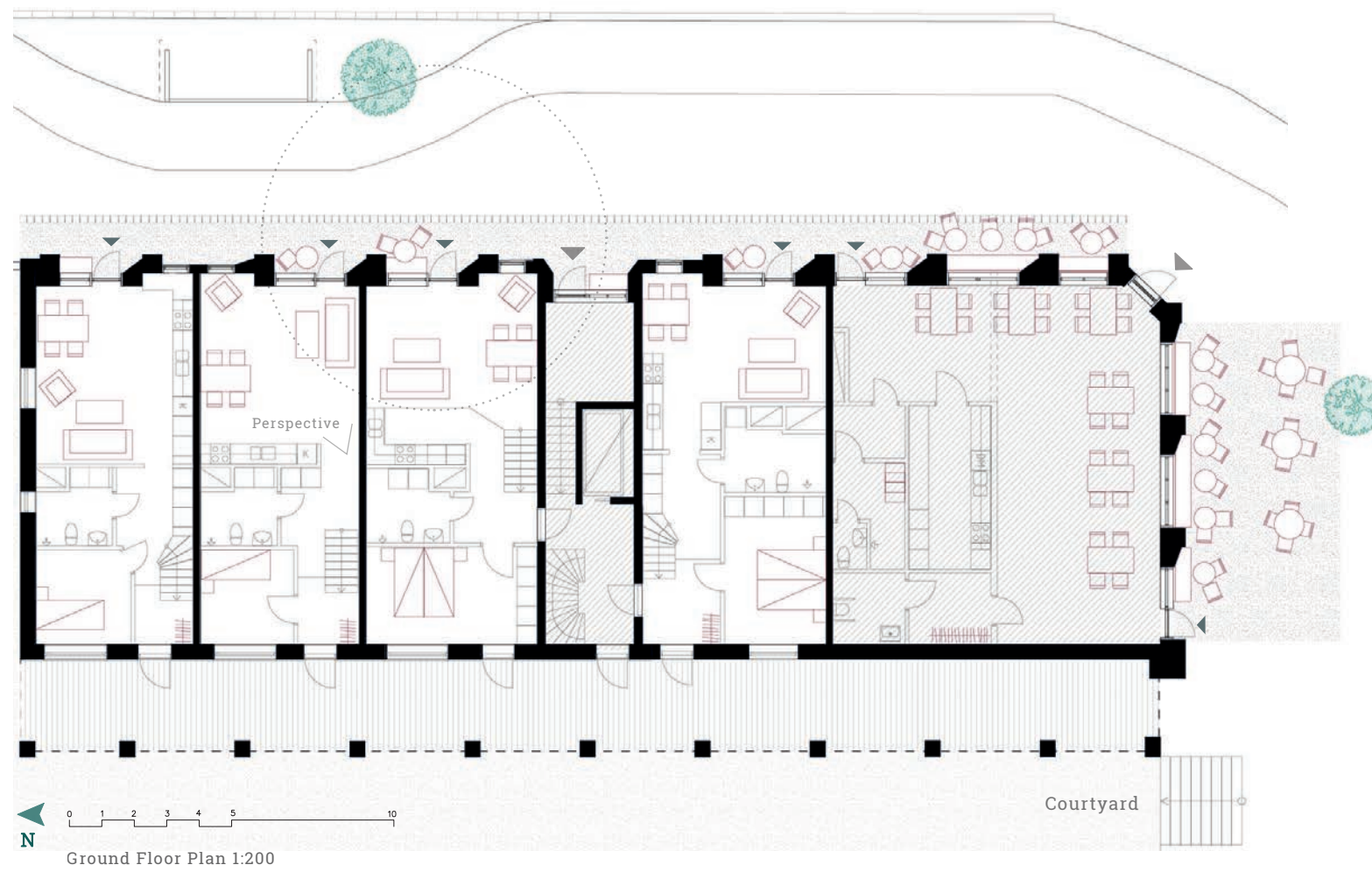
Perspective Ground floor apartment. 3,8 m cieling height.
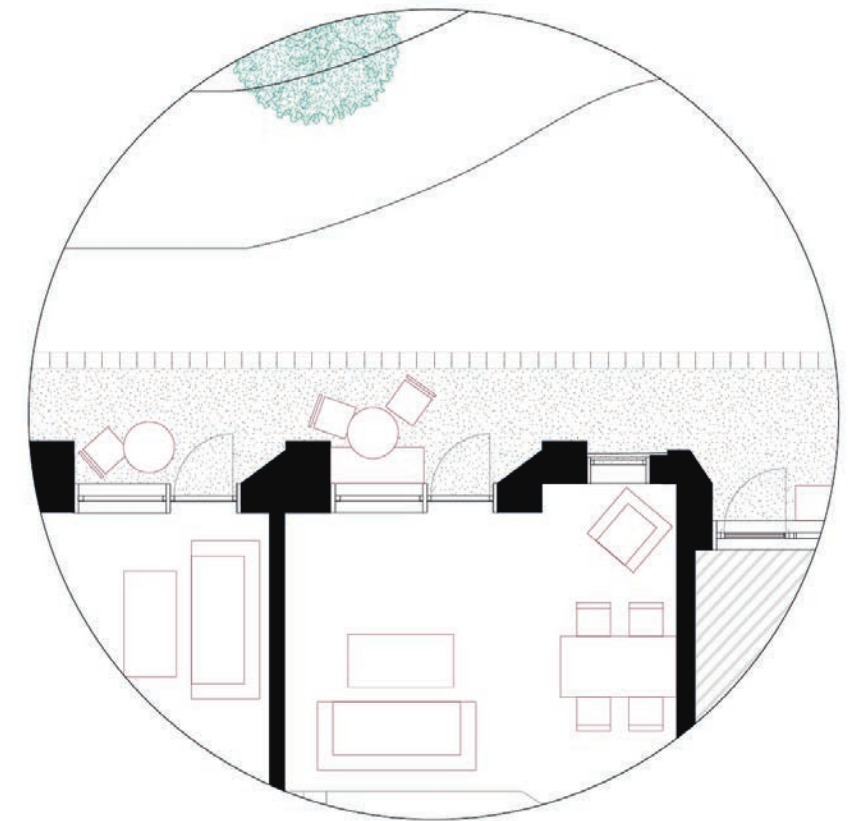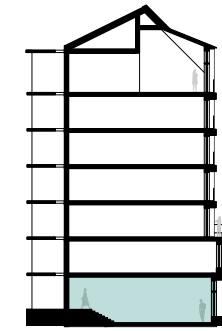
Cut Out Floor Plan. 1:100 (A4)

Ground Floor Design

Residences on ground floor are lowered to level with the street. Creating high ceiling apartments and an easy access out.

A clear distinction between what is public and private is still reached, directly in front of the windows a zone is distinguished through deep wall columns, creating a subtle marking of where the street space ends. Allowing an area for the resident to claim. Contributing to a living urban environment. Adding a different type of ground cladding makes the distinction even more clear.

However, the open insight can feel like an intrusion of privacy and perhaps even safety. This is the possible downside and compared to the qualities this solution brings, it comes down to a question of what cities we would like to create in the end. What is the price for privacy? And does everyone even want it? What is clear is that you win some you loose some. The architects job is to offer options. This one brings qualities like flexibility in possible future change of functions, interaction with street life, safety in creating eyes on street, and spacious apartments. At night or if suddenly needed, curtains can be closed.
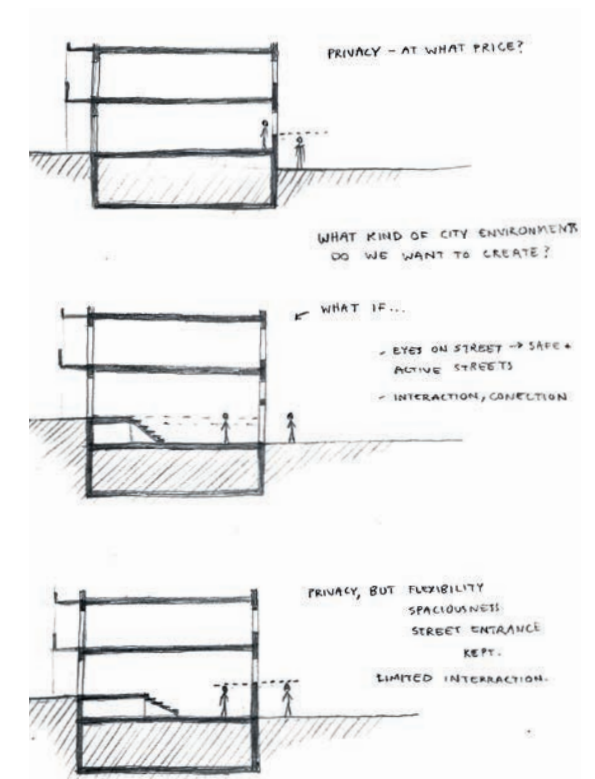
Elevation Bottom floor
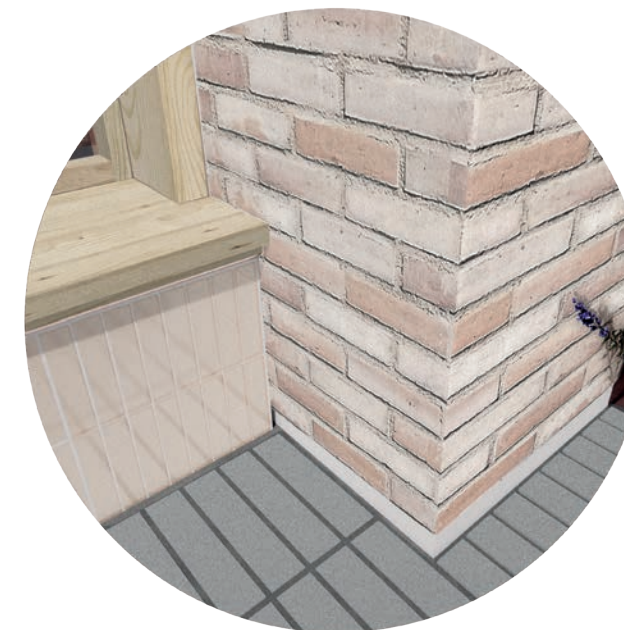
Care. Material selection, detail construction execution.

Claiming the Street

The design of the facade invites the residents to claim the street. A nice place for staying, protected through the shift in facade created by the indents.

Care in detail execution is shown through material selection (authenticity: wood, brick, stone, tiles) and the level adjusted ground cladding emphasizing where the walking path is and the "staying" area is.

The brick profile that is angled shows care in detail through letting the sun (from the south direction) through better creating good conditions for a sunny and wind protected spot.

The Middle Floors

Perspective

Floor Plan ∧

Floor Plans ∨
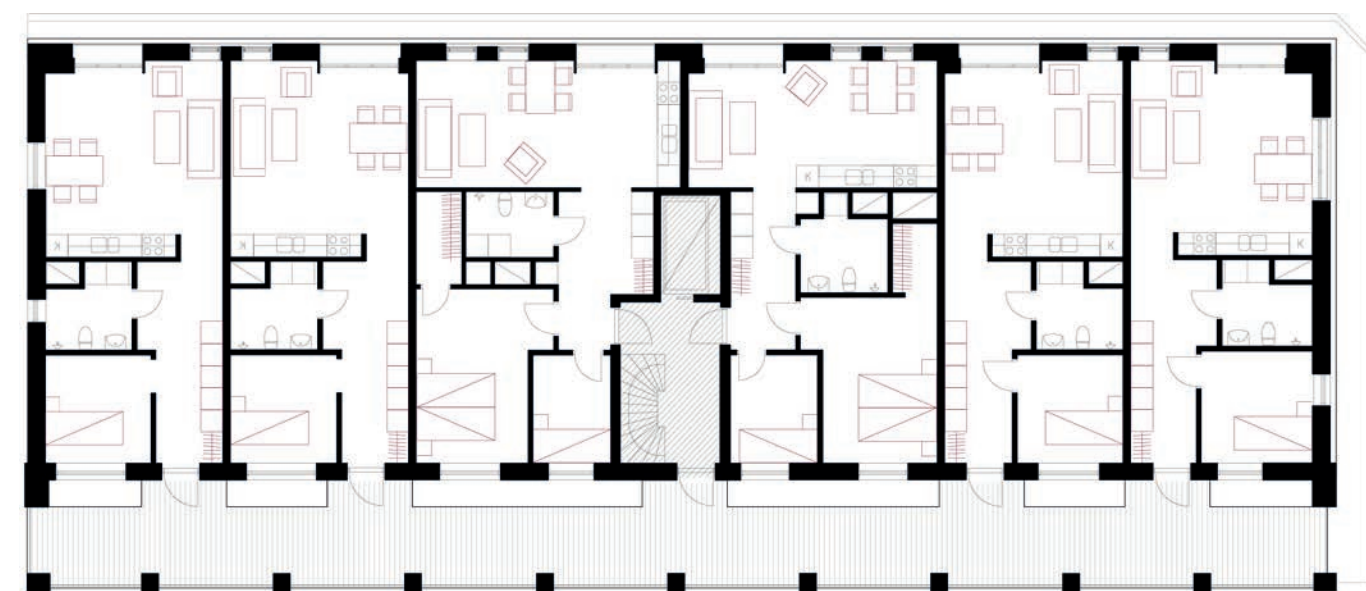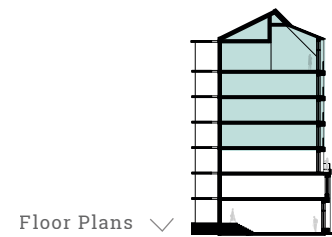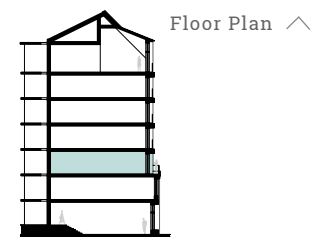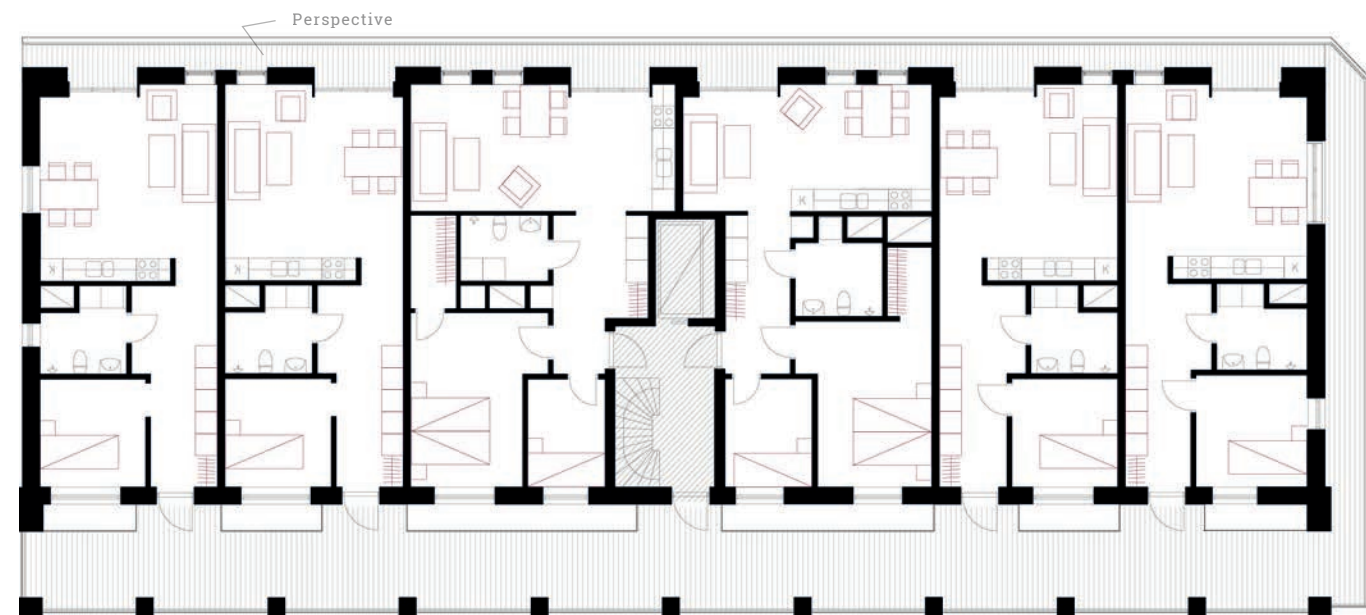
N   Plan 1:200 (A4)

Balcony along the facade towards the street.

Balconies

All floors above the two first have access to french balconies. The ones above the shift in the facade have a larger balcony running along the whole facade. The balcony towards the south facing the square is for all residents to share.

The courtyard side has a balcony along the facade where the individual apartment entrances are accessed. This is made larger and is provided with cut outs to let light in along the facade surface.

Illustration Facade Elevation top floor.

Perspective top floor apartment. Kitchen + Livingroom

The Crown

The top floor is given a different design of an attic character, underneath a large angled roof. The apartments are spacious with high ceilings and both higher and lower windows leading the gaze to the sky and far view, and down to the street below.

The middle floors have large windows possible to open to a French balcony. They have access to balconies on the calmer less noisy courtyard side. The possibility to open up and get a wider view of the urban space from a position further out in relation to the façade, adds something compared to a regular window. Another type of interaction with the street space. Large windows to the floor gives a feeling of spaciousness to the interior compared to a higher set window.

Existing building, KUB Architects.

Re-design Proposal. Future Perspective, developing into boulevard.

2,5 m

3,8 m

Section. 1:200 (A4)

Sustainability

Ultimately this thesis aims to contribute to creating architecture that makes qualitative living environments. This is one of the fundamental tasks architects have, and from a sustainability aspect, building homes and cities that people enjoy using is crucial. Loved architecture is lasting architecture.

A long term perspective is necessary. The final façade design proposal in this thesis is prepared to interact with the street of a more inner city character. As the city of Gothenburg grows and expands, it is possible that this part of town (today, mainly a residential area with a busy street due to traffic passing through) will become a small city-centre with a development towards slower traffic and higher prioritized pedestrians. A boulevard with more people than cars and shops and cafés on the ground floors.

The apartments on ground level are levelled with the street, this gives advantages such as spacious apartments but also makes them more flexible. If needed they can be transformed into shops or cafés well connected to the street.

06.
DISCUSSION

Reflection on Method & Process

Approach
My initial approach to the thesis was investigative and the exact focus areas only became clear at a later stage in the research phase. My reasons for choosing this subject were that I experienced it to be a personal gap in knowledge and that the questions lifted in the contemporary discourse was intriguing to me, I saw a possible opportunity to contribute to the discussion in a constructive way.

"Façades" is a wide area to begin research about. There is an extensive history of methods and theories available connected to the subject, while the contemporary approach to facade design might not be as straight forward and simple to conclude, from my experience.

Early Stages
My method in the start was mainly theoretical research. Both scientific reports collected from data bases, and books I got recommended from teachers. The books were mainly about background and historical theories. I found it important to cover a rather wide background to gain confidence in writing and an understanding of relevance to formulate delimitations in the continued research.

Guiding Question
The research question acted as an important guide. Concluding the question, it meant for me practically in my work to: define qualities connected to the residence and the urban space, and summarise how to reach them through façade design features.

Hence, other than studying background, I started searching for scientific research defining *qualities* connected to architecture and the residence. The aim was to find support for how certain design choices could lead to a more qualitative living environment. A way to define qualities was through the human *perception* of the living environment. *Enriched environments* is about how the living environment affects people in positive or negative ways. I chose to study this aspect to cover mainly the interior aspect of the home. At this point I set the delimitation of the façade definition as "the building enveloping shell" including both the *exterior* and *interior* aspect of it.

To cover the exterior I figured a need for going into urban planning theories. Finding qualities through investigating features creating a qualitative urban space. Gehl and Jacobs, known established voices in the field, became the obvious starting point. I quickly was able to start defining several urban design features that seemed to lead to qualities in the living environments.

Concluding the Theory
The design principles was formulated as a practical summary of the research findings. At mid-term a first draft of them was finished and my next step was to develop a way to display them through a design project. A clear justification for the thesis was however still missing, a crucial comment from the examiner. I immediately after mid-term formulated an introduction for the thesis, setting the reasons for the subject and introducing it. It would have been nice to formulate this at an earlier stage for me personally, however the investigative approach might have made it difficult to come to this sooner.

Another good outcome from the mid-term opposition was realizing I could display the principles through a re-design of an existing project. My original idea was to create some type of theoretical scenario, not related to a site to showcase the principals in a theoretical way. This was to abstract and the re-design approach helped understanding my own findings better. Letting the design principles relate to an actual existing floor plan and site. I did not need to spend time creating a building program and designing floor plans.

Design Project
The practical design process was still quick but ran rather smoothly. Using the principles in analysis and as a tool was quite straight forward to my opinion.

During the design phase I often wished I had a team of workers by my side, trying out several design proposals in parallel, displaying the principles in different ways. I had to, due to lack of time, limit my self to finish only one proposal.
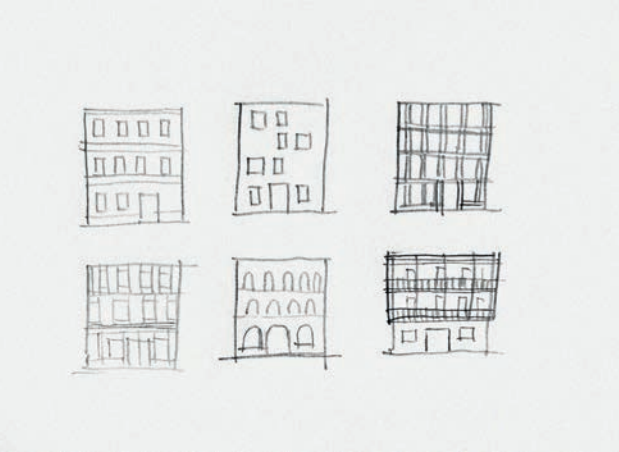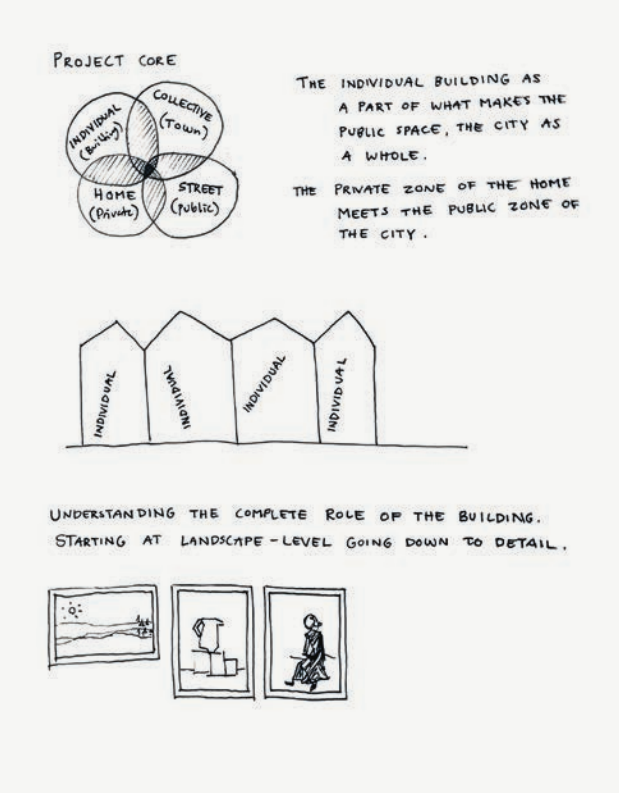
Sketches from early in the process

Research question

What kind of architectural qualities can be reached through the design of the façade, with regard to the private residence and the connecting public space, using different design principles and tools?

0 1 2 3 4 5   10

Facade Elevation 1:300

Summarizing

The research part suggests and defines different types of qualities possible to reach connected to the design of the building enveloping shell - the façade. The qualities are defined in regards to both the experience of the private residence and the connecting urban space.

What kind of different qualities can be reached? Is answered in the theory part, and summarized as the *design principles*. The principles can be considered as a type of checklist containing defined qualities and used as a tool to, in a conscious way, reach the different types of qualities.

Evaluating the Result

Theoretical Research

The theory resulted in a number of design principles, they are a display of different qualities connected to the residence and urban environment.

Using them in the design process the principles work as an analysing tool of the design choices during sketching, and as inspiration displaying suggestions of how to reach different qualities. Combining different features connected to the principles in different ways, they become a method of working in the sketching phase.

They further work as a tool for only analysis, defining qualities in finished designs. I realized this as I started analysing the building on my selected site.

Practical Design Project

What I found interesting with the result of the design project is that the style is rather classical/traditional. However, it is not possible to draw conclusions based on this fact since the sketching process shown tendencies of other results as well. There were two prototypes, A and B, developed alongside each other during the (relatively short) sketching phase, which both had the aim to reach a selection of the design principles but became different from each other regarding the building style.

My initial idea was to keep both and finish them completely but due to lack of time I ended up choosing only one. Compared to prototype B, the style of Prototype A is not at all as classical, although A - just as B - follows many of the design principles. This makes an interesting point, and that is why I felt that it was important to present Prototype A, rather extensively, as part of the process in the report.

My goal with the project result was not to create the ideal façade but one façade reaching a selection of the defined principles. Reaching all principles in one design is not the purpose. The result of this final façade design is just one example.

I think the design principles would have been given a more fair display from a few different design proposals though, making a point out of that there is not one right way to design for more qualities, but several!

Concluding

I have gained a much deeper understanding of façade design and its impact personally. I further believe that this thesis could be of use to others, giving a summary of theories and tools to achieve a more conscious façade design method.

My hopes are in addition that these concluded principles, supported by research and well established theories, could contribute to a more constructive and positive discussion about façade design and the style of buildings. Focusing on what qualities architecture can add, and letting that lead the design choices, rather than being lead by certain style rules or possibly imagined expectations of what contemporary architecture should look like.

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