GRADUATION REPORT - why large needs small

Influential facade elements defining the architectural scale,
- a comparison of the canal house archetype and the buildings of the Binnengasthuis complex -
Graduation Report

Faculty of Architecture and the Built Environment
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Master Heritage & Architecture
Project theme - Heritage & housing

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As part of the Graduation Studio Heritage and Architecture the theme of Heritage and Housing immediately caught my attention as it perfectly suited my personal interest in both topics.

At first historical buildings are fascinating me because of their story they have gone through and their expression of this aging process. They are illustrating the past and can teach us many things for the future. Heritage reflects important historical values on architecture, culture and techniques and can be of added value in our present society.

Besides, I think re-use of existing buildings is a sustainable solution for architecture and is becoming an urgent profession in nowadays situation with a lot of vacancy. It has great potential to develop even further in the future in which I want to be part of too.

Secondly, my personal interest in housing is related to the fact that I prefer small scale projects in which you can really dig into detail. Besides I think designing housing can have a very personal touch as it is the place where one spends most of his/her individual time, it is the place where one can be him or herself and express his or her personal values.

This housing purpose can add a new additional layer to the existing story of the historical building. However I think it should be designed in a proper way without affecting its values and this is where I want to operate. The current values should be maintained and can function as additional quality for a new function as housing.
Figure 1: Map of Amsterdam with Unesco canal district and project location of Binnengasthuis area in historic city centre.

Within the studio Heritage & Housing the assignment contains a re-use design for housing in the historical building complex of the Binnengasthuis area in the city center of Amsterdam, which is located within the dotted circle in Figure 1.

Unesco Area

The heritage site of the Binnengasthuis area is located in the ‘buffer zone’ of the UNESCO canal district, (which is colored in orange) and this means other rules are applied to this area. The Unesco-protected area requires more careful attention to rules than the buffer zone around it.

The Amsterdam Canal district has obtained this UNESCO status because it illustrates exemplary hydraulic and urban planning on a large scale through the creation of a large-scale port city. The gabled facades are characteristic of the middle-class environment and represent the city’s enrichment through maritime trade and the development of a humanist and tolerant culture.

In the 17th and 18th centuries, Amsterdam was seen as the realization of the ideal city that was used as a reference urban model for numerous projects for new cities around the world. The network of canals form the basis of the urban layout, along with the radial waterways and streets and served as a reference throughout the world until the 19th century 1). Nowadays Unesco has changed its approach by dealing with the consequences of time:

‘Cities are dynamic organisms. There is not a single ‘historic’ city in the world that has retained its ‘original’ character; the concept is a moving target, destined to change with society itself.’

Unesco sees the historic city as something that has to change to be able to fit our modern society and at the same time something to preserve because of its values for the next generation.

Framework research and design

Within this report I will discuss these changing conditions within the framework of façade design of the traditional canal house in the historic city center of Amsterdam and compare this to the project location of the Binnengasthuis area.

Their overlapping topic will be that of the individual elements and their architectural scale. This derived from their large difference in scale which was immediately remarkable and quite a conflict for transforming such a building into housing. The main focus point in both the research as the design is this aspect of scale.

The initial idea for this topic derived from the studio’s theme of housing. In my point of view the canal house is the typical archetype for housing in the city centre of Amsterdam, which is underlined by the Welstand of Amsterdam (Aesthetics Committee) as well. As the Binnengasthuis area is also located within this area, this is relevant to investigate.

Binnengasthuis through time

In history, the Binnengasthuis area has been functioning as a monastery (16th century), became an academic hospital (1867) and since 1981 most of the buildings are owned by the University of Amsterdam. From then on some major interventions have changed the character of the area. This will pursue in the future as the university campus will become even denser.

Characteristic for the urban typology of the Binnengasthuis area are the clearly defined boundaries creating an enclave in the heart of the city centre of Amsterdam. The buildings within these boundaries surrounding the inner courtyards have been housing since the beginning of the area. Through the years these have been trans-

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2) Unesco, ‘New Life for historic cities’
formed into institutional buildings. Inside the area lots of new institutional buildings arised as well. Most of these institutional buildings have a very monumental appearance as they were meant to express the aspirations of the institution in it.

New purpose of housing
Introducing housing into the previously mentioned defining borders, the 'the outer ring', relates to the surrounding fabric of housing and preserves the enclave character of the Binnengasthuis area, which is an important value of the site.

Creating new housing possibilities in the city center of Amsterdam is very much in need as the city center is getting denser through the years. Besides, as the largest target group looking for accommodation is that of single professionals, the design is focussed on creating comfortable apartments which are suitable for them.

The aim of transforming the most monumental building into appropriate and comfortable apartments relates back to the research topic of scale differentiation. This was initiated through the theme of canal houses compared to the buildings of the Binnengasthuis area in which this became immediately obvious. It is also related to my personal ideas on housing, in which I think human scale and proportions are really important in creating an appropriate space to live in. The design therefore focusses on finding the right balance between monumental and human scale, which elements are most influential for this perception of scale and what is most appropriate for the right function.

All of these conclusions and lessons to be learned on how to deal with scale, on how to enlarge or reduce a certain element or volume are explained and illustrated in the last chapter of reflection.

This report summarizes one year of graduation project, from the initial phase of research up to the final phase of design and reflection. The area of the Binnengasthuis offered lots of opportunities for interventions and was really interesting to work with.
Human scale

A building is in human scale when it is designed so that the human figure and other objects with recognizable size look normal in it and against it’ (Architectural scale, Licklider)

necessary for readable and comfortable living

Monumental

‘Dignified in manner static in form, geometric in shape, grandiose in scale and should evoke feelings that are in sympathy with its purpose’ (Monuments and monumentality, Elliot)

quality of architectural appearance Binnengasthuis
As mentioned in the introduction the research part within this report discusses the topic of façade composition of the traditional canal house, as I see this as the archetype for housing in the city center of Amsterdam, and the façade design of the buildings in the Binnengasthuis area.

The structure of this research starts with a theoretical part explaining the change of façade design of the canal house from the 17th century until now and continues with a second part consisting of a site specific analysis on the building of the Binnengasthuis area. Consequently this is followed by a program of possibilities, which is the result of both the theoretical and site specific research and illustrated in a diagram in Figure 2.

Individual decomposition
To be able to understand how the façades are composed, the method of deconstruction is applied in order to read the elements individually. All façades are therefore decomposed in the same way and the elements, which are most characteristic in the composition, are discussed separately as it is relevant to zoom in on their individual meaning and purpose.

The elements decomposed are: the plinth/doorstep, the surface of the wall, the windows and the gable, which is also illustrated in Figure 2. This method is applied analy on both the theoretical research as on the site specific analysis of the building in the Binnengasthuis area.

In the case of the theoretical research on the canal house façade, this topic is discussed in the period from the 17th century onwards and is related to the idea of changing conditions as mentioned in the introduction. It starts from the 17th century as Amsterdam grew exponentially in this period of the Golden Age. The typical archetype of the canal house was therefore a great success since the 17th century.

Architectural scale as linking element
Additionally a brief chapter on architectural scale is discussed as this initiates tools/strategies on how to work with scale. For me the aspect of scale is very important as it considers housing and I think this should be designed with human scale, which means one can relate to it. This idea of human scale is present in the composition of the canal house but is, in my opinion, lacking in the buildings of the Binnengasthuis area.

Therefore the idea of scale links my theoretical research to the site specific analysis. What I want to know through research is:

How did the façade elements in the archetype of the Amsterdam canal house change from the 17th century until now and how can these lessons, together with the aspect of scale, help to transform façade compositions of the Binnengasthuis area into housing purposes?

The site specific analysis highlights the most representative elements of each building, its relation with other buildings and the context. Important in the buildings of the Binnengasthuis area is their scale which is very big in comparison to the archetype of the canal house. Therefore the idea of housing seemed in conflict with this scale.

Through research on similar approaches of small scale elements in large-size architecture, as the buildings of the Binnengasthuis have a very large size, I was first initiated with these tools/strategies. This was the start of my search into these methods to apply on large scale buildings.

Appreciation element and relevance
The results of the theoretical research give an idea on how the architectural elements have changed through time and what is their relevance for housing today. Stressing the aspect of scale, their individual perception is also a crucial aspect in the appreciation of the element and its scale.

For the site specific analysis, the results give an overview on the important architectural and historical values of the buildings and what measurements/elements/divisions are defining the entire composition.

The program of possibilities offers opportunities for transforming certain parts or elements within the façade composition and discusses the entire ensemble values and potentials, which is also illustrated in Figure 2. This is pursued with my personal design solution which continues on the results of the research, which is consequently followed by a reflection in broader sense.
Figure 2. Diagram of structure and method in research report.

**PERSONAL FASCINATION**
- housing
- human scale
- heritage

**FAÇADE COMPOSITION**
- archetype of canal house
  - * literature
- human scale in large-sized architecture
  - * literature & examples

**METHOD - DECOMPOSITION**
- in time
  - 17th - 2014
  - what changed and why?
  - what is relevant today?
- different meanings/functions
  - plinth
  - wall
  - window
  - gable
  - housing anno 2014
  - what is the building’s scale and what are possibilities

**POSSIBILITIES**
- 3. PROGRAM OF POSSIBILITIES

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1. THEORETICAL RESEARCH
- Binnengasthuis buildings
  - values and characteristics
  - * drawings and monumental values

2. SITE SPECIFIC ANALYSIS

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Figure 2. Diagram of structure and method in research report.
THEORETICAL RESEARCH

Research on the characteristic elements in the traditional canal house composition, their appreciation and their individual perception and relevance.
**FAÇADE ELEMENTS**

**CANAL HOUSE**

*from the 17th century until now*

**Introduction**

This chapter within the theoretical research focuses on the characteristic façade elements of the archetype of the canal house. These elements within the composition of the canal house are also mentioned in the Welstand Amsterdam 2013. This is the Aesthetics Committee of the Netherlands which controls the architectural appearance of buildings. They describe the traditional canal house as an entity through the composition in plinth, façade surface and a termination in the form of a cornice, i.e. gable 3).

In my point of view the window design also plays an important role in the appearance of the façade and therefore I also integrated this as a characteristic element of the façade composition. My own interpretation of the characteristic façade elements therefore contains four elements, as is represented in Figure 3.

Important in this composition of the façade of the canal house is its scale, as is already discussed in the previous chapter. The proportions are of big influence as it consists housing in this case and this requires a human scale. In the composition of the canal house this can be noticed in the doorstep for example.

**Within this theoretical research the façade designs are evaluated through time in order to learn from the past and why this has changed. The current situation of façade design in 2014 reflects our requirements and needs for today’s housing and these lessons can help for the design assignment in the Binnengasthuis area.**

As mentioned in the chapter explaining the structure of this report, the elements are decomposed individually and discussed through time. All elements are of equal importance for the entire composition of the traditional canal house and they all have a different function and/or meaning.

**The individual elements**

The doorstep and the plinth, which I consider to be a different layer in the façade composition containing a different material and or front door are important aspects of the composition because of their relation with the street. The plinth is a separate element in the façade composition as it intentionally differs from the rest of the surface.

In the typology of the canal house the doorsteps are part of this plinth. They are crucial elements in the street image of Amsterdam as they create a lively environment in the street rhythm and they provide an interaction between the public and dense street and the private house inside. The design of the doorstep and the plinth is very much related to its use and is also interrelated with the surface design of the entire façade.

In continuation of the plinth is the wall surface, which defines the main structural composition of the façade through the open and closed parts in the façade. Such a defining composition is for example a vertical division into bays through the addition of pilasters or just by vertically accentuating of the window openings. The design of the wall is also interrelated to the design of the windows as they are positioned into the composition of the wall.

The windows themselves are very important in terms of the rod division. This division creates a rhythm in the façade and influences the perception of scale. Besides, the windows as openings in the wall are important for the interaction with the outside as well. They also provide the inside with daylight and fresh air this is also crucial for a comfortable living function inside.

At last remains the upper part of the façade which is the gable. These gables are very characteristic for the overall composition of the canal house. They were initially designed to cover the roof structure behind it and developed into an important element within the composition.

As mentioned before this chapter will discuss these elements individually and evaluate their change through time, which will be from the 17th century until now and their relevance in the architecture of the canal house today. This chapter will end with an introduction on the human scale in architecture, which I think is present in the façade composition of the canal house but is lacking in the monumental institutional buildings on the Binnengasthuis area.

The issue with these large-size buildings is that we can’t recognize its measurements as everything is large and therefore it is hard to relate to it. However this was also the intention of the institutional buildings, to impress its spectators.

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3) Welstand Schoonheid van Amsterdam, 2013 p. 104
Figure 3: Decomposition of façade elements in canal house typology
At first, let me clarify the term ‘plinth’ as it means several things in my opinion. The plinth defines the relationship with the street, which can be open or closed but either way it has the most direct relation with the street and it usually differs in composition from the rest of the façade. It can also be just a difference in material because of its practical reasons of other material properties.

Introduction

Important in defining the relation between in-and outside in the typical canal house is the doorstep, which is called ‘stoep’ in Dutch. It traditionally indicated the paved stroke in front of the house which was usually lifted a little from the street surface, and if needed added with a few steps. The doorstep functioned as an extension of the house and often contained a bench for the inhabitants or visitors to sit on. Sometimes it was used to sell merchandise as well. Usually the steps were enclosed with a wooden railing and later on with iron to clearly define this ‘personal’ space. The stairs were of great influence for the street profiles and important in defining this relation of the house to the street, which will be discussed in this chapter. What started as a few wooden steps in front of the door in the 16th century, developed into stone stairs which became an important architectural element of the façades of the Amsterdam canal houses.

As a common feature of the Amsterdam canal house in the mid 16th century already, the doorstep had to meet requirements given by the city authorities, which was the maximum height of 4 ½ foot (125 cm). This shows that the doorstep had evolved from a few steps into a solid stone stair and that it had become a common and ‘normal’ feature within the canal house typology 4).

The stairs derived from the need to preferably place the basements above water level in order to prevent the storage from weathering 5), as in Figure 4. Another reason for this was that it wanted to make the space in the basement, which was previously used as storage, more useful. Maybe this was also related with the fact that the inhabitants were living prosperous years then and that they had to house more servants.

In the 17th century two types of stairs were common, namely the frontal doorstep and the longitudinal step, which are both shown in Figure 5.

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An example of this trend, where the stairs became higher and higher, is on the Herengracht. In the early 17th century this street was full of messy timber and later on this transformed into a row of monumental stairs.

4) (Boeken, 1950, p. 9-11)
5) (Slothouwer, 1928, p. 7)
6) (Boeken, 1950, p. 20)
These monumental stairs became so high, often 1.80m above street level, in order to give the main floor an impressive majesty. However, the relation with the street completely disappeared in this as there was no direct contact or view with the outside and its size was clearly inconvenient; it was not human anymore.

Later on, the lower floor became so useful for the regular inhabitant of Amsterdam, which wanted to have this previously close relation with the street, in Dutch called the 'laag-bij-de-grondse-nuchterheid', that this caused the stairs to disappear in the typology of the canal house. In this case, the front door of the house resulted on street level and lost its initial transition 7).

18th century

Generally, the 18th century is regarded as a period of time which is characterized by its rich ornamentations. The style which was common then is the well-known Louis XIV, which derived from France. This Louis XIV style is recognizable in a lot of architectural artifacts as well as artworks of that time. The decorations applied in this Louis XIV style are also present in the other architectural elements of the traditional canal house façade. The doorsteps were one of these elements decorated with ornaments. The ornamentations covered the doorsteps with a harp piece, which is a surface with curved forms in front of the steps, whose form was completely independent from the steps behind it, as in Figure 6. This richly decorated forms adorned the stairs and were incorporated with the door frame into one assemblage 8).

An important feature in this decorated stairs were the railings as well which were made of wrought iron and accentuated the curved lines of the harp piece. They were adding delicateness and movement in the design of the stairs.

Two tendencies were occurring at the same time, namely that of the vanishing stairs and that of the stairs being decorated with Louis XIV ornamentations.

19th century

After the richly ornamented period of the 18th century, Amsterdam's building process paused in the first half of the 19th century. The city wasn't recovered from the huge economic and societal downturn yet, which the French had brought here. These bad economical conditions had a great impact on the architectural appearance of a lot of buildings. The decorated Louis XIV style of the 18th century disappeared and made place for an architecture that was characterized by its soberness. The new architectural style was continuously the Louis XVI which is stricter and simpler than the previous styles 9).

As well as in the 18th century, the 19th century also knows two simultaneous tendencies. In fact, they are a continuation of the tendencies which occurred in the 18th century already.

The first tendency which led to the disappearance of the stairs resulted in a very small plinth which was just a remnant of the plinth in a different material. This material was often natural stone as it had a lower porosity than brick and therefore reduces the moisture which was absorbed from the ground water. The typology without the stairs, and plinth, had a great influence on the street image of Amsterdam and its rhythm of façades 10). In fact, this wasn't even bad as this created a lively and differentiated image within the canals and this had been going on for centuries already. As long as they didn't disappear all of them, because their function was very valuable.

The other tendency was the one continuing on the decorated doorway of the 18th century. As mentioned before, the 19th century was characterized by its soberness and was expressed in stricter designs. The curved harp pieces in front of the doorsteps made place for the straight lines of the Louis XVI which is shown in Figure 7 and its composition consisted of rectangles and straight lines. In most of the cases this resulted in the 'infill' of the space underneath the steps by showing the actual steps as well as in Figure 7.

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7) (Boeken, 1950, p. 115)
8) (Boeken, 1950, p. 36)
9) (Boeken, 1950, p. 36)
10) (Boeken, 1950, p. 15)

Figure 6. Harp piece in Louis XIV style (source: Boeken, 1950, p. 51)

Figure 7. Louis XVI stairs with straight lines and steps being visible again (source: own photographs at site location visit, oktober 2014)
In the 20th and 21st century a lot of different things were happening as a prevailing style or fashion, as was the 18th century, is lacking in this period of time. However, it is characterized by another kind of richness, which means rich in the sense of a lot of different typologies.

The historic city center of Amsterdam doesn’t have a lot of newly built canal houses, they occur just incidentally on the Keizersgracht and the Prinsengracht. Most of the newly built canal houses are present in the western part of Amsterdam, for example in the Egelantiersstraat and the Anjeliersstraat, and in newly developed areas as Java island on the Ij-river.

In all of these locations a lot of variations are being constructed, as shown in Figure 8. Apparently the stairs are still important in defining the transition from the house to the street. An obvious reason for leaving out the stairs is because of practical issues as there was much space needed for traffic in the streets and the stairs were seen as an inconvenient obstacle. A solution to this problem is shown in Figure 11 by incorporating the stairs into the façade.

In the mid 20th century a new tendency of revaluation was initiated by the Bureau Monumentenzorg, which was in control of the national heritage in the Netherlands. In 1953 when they started to be active in Amsterdam, stairs were being reconstructed in order to restore the historic street image with its lively rhythm of doortops.

The latest trend in plinth design is reflecting today’s society in which the overall architecture gets more and more transparent. The plinth is completely made of glass and has a very open and direct relation with the street, as everything is made visible as shown in Figure 9 for example. Often this is combined with a working function in this part of the house, which refers to the historical ‘front house’. In the 17th century this was designed as a space for receiving important guests and therefore it had an appealing appearance, for those times, on the outside façade. The modern version of this appealing façade is made in glass as it reflects our open society in which everything is shared.

During years a lot has changed in the typology of the canal house and this created lots of variations in the street image of Amsterdam, which was previously quite monotone in its appearance as everything was designed by a few architects. This differentiation is a characteristic feature of Amsterdams canals and I think this is very valuable.

Remarkable is the disappearance of the stairs when they became too high, as this expresses the importance of ‘human’ measurements which are required in order to perform well. The size of 1.80m was way too high, it’s even more than the height of an average person, and therefore it didn’t work as an architectural element which was daily used.

In my point of view the stairs are crucial in terms of defining the transition from the public street to the private house. Even if its use has changed through time, it is still seen as the ‘private space’ in front of the house. This can be compared to the usual ‘front garden’ in traditional Dutch houses. People really appreciate this outside space and it is important in the gradation from public to private, which is often missing in modernist constructions.

The scheme on the right, Figure 10, illustrates the information in the previous paragraphs and shows how the element of the doortop has changed through time and how the two tendencies, which started in the 18th century, continued to exist simultaneously until present day. The process of reconstruction is also illustrated as a sideway to the newly built constructions. In the end the stairs changed due to practical reasons, fashion ideals and independent from its period in time, it reflects society’s aspirations.
Figure 10: Change of doorstep and plinth from 17th century until now

17th Golden Age

18th French Era - economic downturn

19th

20th

21st

why change:
- introduction of basement
- alteration in floor plan
- status & more space needed
- style/fashion
- reflection of society,
  openness

1,25m
1,80m

difference in material
(often natural stone)
glass
Element
Wall Surface
from the 17th century until now

Introduction

In continuation of the plinth, is the directly connected ‘wall surface’ which I named like this as it considers the closed part of the façade, i.e. the solid material part. The façade is usually made of a very thin layer of brick, just 30 to 40 cm thick. In the traditional archetype of the canal house, the surface of the façade is usually vertically divided into two or three bays coupled with vertical windows 13). The division of the surface into plinth and ‘wall surface’ is deliberately chosen because of the difference in material and composition. Both have a very different function as well as the plinth stands for the direct relation with the street. The surface of the façade above the plinth usually consists of several stacked floors which decrease in height. The main floor, which is called the bel étage, is traditionally higher than the upper floors, as mentioned in the previous chapter.

The thickness, actually ‘thinness’ of the wall and its obliquity in Dutch ‘op de vlucht’ is influenced by the construction of the former wooden house, as shown in Figure 11. The wall was made this thin because of the weak soil which made it hard to create proper foundations. Another reason for the walls being very thin is the material cost of stone 14).

17th century

The traditional vertical division into two or three bays has been the usual for façade design of the single house since they were made of brick and usually the middle bay was wider than the side bays. This division of bays derived from the maximum possible width for creating openings in the wall, which were dependent on the material properties of both the glass and the brick.

In the early 17th century the canal house was lower than the canal house we know in present day. This type of house consisted of a plinth, a main floor and an attic only and later on this evolved into a housing type with additional floors in which the main floor was traditionally higher than the upper floors. This was related to its initial function which was a space for merchandise or offices and therefore had to be of significant appearance, as mentioned in the previous chapter. Most of the canal houses we see now have three or four floors.

Another change in the façade composition was the vanishing symmetry as the front door moved from the middle bay to the side due to internal changes in the floor plans 15). From then on this would be the usual place for the front door which was connected to a corridor inside.

Very characteristic for the surface composition of the 17th century are the pilasters, which provide this division into bays and which create a rhythm, as in Figure 12. These pilasters, which derived from examples of the classical antiquities, accentuate the direction of the façade and are applied on each floor individually to show the building of several floors.

According to Slothouwer they define the width of the bays and the position of the windows in between 16). They seem to indeed, but this is purely visual. I think. As mentioned before, the material properties of both the glass and the brick were defining this width. The pilasters were placed in between the openings in order to distract the observer from the relatively large closed brick parts.
With this differentiation the brick parts look smaller as the eye is distracted from the entire surface. The pilaster order as in Figure 12, was a very common architectural development in entire Europe in the 17th century. The order of pilasters applied the classical orders as Doric, Ionic and Corinthian as we all know them.

However a flaw in the 17th century façade composition is its complete mismatch with the interior. The façade design didn’t pay any attention to the relation with the interior which often led to unfavorable combination of walls and window openings. This was due to the fact that a harmonious façade composition was superior than respecting the interior. This would know further improvements in the 18th century.

Remarkable is that the egalitarian society in civic Amsterdam was really represented in the façade design of the 17th century. There was no room for giant palaces in the city centre, so rich families had large apartments, which were not only for living but also for trading purposes.

As each house belonged to an individual family, an own front door was very much appreciated, but most valued were usefulness and affordability which still is an important factor in housing. At that time, people demanded a useful house with a façade which was in fashion and functioned as a representation of the inhabitants. However the representation of the individuality of each inhabitant of Amsterdam was also very much appreciated; this is why façade designs have changed a lot during the years.

This idea of the house as a representation of its inhabitants is still present; however society has changed today and therefore our housing design as well but the idea is the same.

18th century

As mentioned in the previous chapter the 18th century was characterized by its rich ornamentation in the Louis XIV style. The previous pilaster order came to an end and made place for the free interpretation of the curved lines. The Louis XIV style, which was developing in whole Western Europe, was also being followed in the Netherlands; nonetheless in our own manner which had their own character. The plain simplicity of the classical 17th century façade vanished with the introduction of the Louis XIV and its excessive ornamentation.

An improvement in the 18th century was that more attention was paid to the coincidence of a proper façade composition and a comfortable interior. The position of the windows was designed carefully to achieve a valuable interior space. In order to achieve this right balance, the 18th century façade is characterized by its flat surface in Dutch ‘vlakken gevel’ and makes it possible to have openings which are as large as possible and which are positioned in a regular way to coincide with the interior as shown in Figure 13 and 14. The façade is designed as simple and flat as possible. This flat surface is the result of leaving out the classical pilasters, but nevertheless the division in vertical bays remained, however equally divided and expressed by the windows. This was also influenced by technical improvements which could create larger openings in the wall so more ‘open’ glass and less ‘closed’ wall.

The ornaments were added onto this surface and were initially quite clumsy, which still represented the 17th century ornaments based on nature aspects. Later on the ornaments developed into very delicate elements in which curls, volutes and other kinds of round curvy forms are very important.

17) (Slothouwer, 1928, p. 49)
18) (Vlaardingerbroek, 2013, p. 25-27)
19) (Slothouwer, 1928, p. 54)
20) (Slothouwer, 1928, p. 57-58)
In continuation of the previous era, the 19th century façade is also characterized by a 'flat surface' as the 19th century was caught in bad economical conditions which led to a sober architecture in all kinds of buildings. The character of the façade is mainly achieved with the proportions of the windows and the wall in between. In the 19th century the windows became slightly slimmer and the openings slightly bigger in comparison to the closed parts of the wall. So it's obvious that due to techniques the windows are getting bigger and bigger.

However, techniques were not the only reason for the windows gaining in size, as people's requirements in having a nice view were increasing. Due to this need and the fashion trend of plasticity within the façade design, new elements as balconies and oriels were integrated in the composition, which is shown in Figure 15 as well. The balconies and oriels, varying in materials from wood to glass and metallics, created a new dimension on the previously flat surface.

Probably these oriels were created to gain just a little more space inside the house and to have a nice view to the outside. It also enabled the façade to have a better daylight penetration in the interior.

The elements of the balconies are not very much applied on canal houses in the historic city center of Amsterdam, at least on the front façade because I'm quite sure the back façade does have some balconies. In all other newly built canal houses outside the historic city center, balconies are integrated within the design as having an outside space was an important requirement for the inhabitants. This is very logical as Amsterdam doesn't have a lot of ground-bound houses with a private garden, there is not enough space for it so therefore the balcony is the perfect solution.

The aspect of plasticity continues in the 20th and 21st century and this plasticity is even upgraded to the next level by the new trend of the loggia, which is an outside space inside the façade 'boundaries' as the right image in Figure 15 shows.

As just mentioned before, the outside space is very important in the requirements for housing in the city center of Amsterdam. Besides, what is also really obvious in contemporary façade design, which is expressed in the right image of Figure 15 as well, is that the overall composition is more accentuated in the horizontal direction in stead of the traditional vertical.

Conclusion

Remarkable in the changes of the façade design is that in the 17th century the possibilities were defined by the material properties and their capabilities, as for example the defining size of the maximum width of an opening in the wall. Later on, when techniques develop, the 'closed' brick parts become smaller and smaller as people want as much daylight and view as possible and the techniques were up-to-date to enable this. And indeed, I think that daylight, view and outside space are the most important drivers in creating a comfortable house. This is also noticeable in the latest façade designs as oriels, balconies and loggias have been implemented in almost every new housing design. Besides, this outside space in the form of a balcony or loggia is very valuable in a dense city as Amsterdam as there are not a lot of possibilities for a private outside space. The scheme on the right, Figure 16, shows how the façade design has evolved through time and reflects its most important changes and characteristics.

21) (Slothouwer, 1928, p. 68)
22) (Welstand Schoonheid van Amsterdam, 2013, p. 104)
Figure 16. Change of wall surface from 17th century until now

- 17th: Golden Age
- 18th: French Era - economic downturn
- 19th:
- 20th
- 21st

Why change:
- Additional floors
- Sizes: dependent on materials
- Changes in floorplan
- Styles/fashion
- Need for view/outside space
- As much view as possible

Loggia’s (inside façade surface)
ELEMENT WINDOW
from the 17th century until now

Introduction

The history of the window, as an opening in the wall, started way before the 17th century but this chapter will start with the cross window, which was the most common window type in the 16th and 17th century.

In the 16th century window openings were not dimensionally stable because they used glass in the form of lozenges, as in Figure 17 and because of the timber frames which could be made in all different sizes. These lozenges were made out of a circular glass plate which was cut into these forms because they had the least material waste. In Dutch this form is called the ‘ruit’, whose name is still used as a synonym for window. Later on the table glass was introduced in which rectangular glasses were cut and this, together with the possibilities of stained glass, led to a stable dimension of the cross window in the 17th century 23), see Figure 17.

17th century

The cross window consisted of two glass panes on top and two shutters on bottom and was initially made in stained glass, which could have a maximum width of 60 cm (two feet), as in Figure 18. The maximum width of the cross window in Amsterdam was therefore four feet and three jambs, which is 156.5 cm (five feet and 6 thumbs) 24). The historic measurement size is explained in feet, which derived from human scale measurement which have always been applied in common aspects of our daily life.

In order to achieve the best light penetration, the elongated window originated, which also meant a small horizontal opening and therefore less forces on the bricks, in which stained glass was placed in the upper parts in order to get daylight and the lower parts were provided with rotatable shutters who could provide fresh air and a nice view when opened. The lower part of the historic cross window initially only consisted of shutters, there was no glass in it. In winter this caused serious problems when opening the shutters and therefore inner glass windows, which could be opened to the inside, were inserted later on 25). This resulted in a lower part of the window which was a little set back from the upper part.

When façades were made of wood, the timber frames were defining the rectangular panes for the windows and they were traditionally placed in front of the façade. Even though the wooden façades have been replaced by brick, the principle and measurements have remained the same. Of course a type always has some exceptions, as for example on the bel-etage and on the mezzanine, which is the lower part just underneath the roof. The mezzanine which was too low for an appropriate cross window, contained only half of it. Such a ‘half’ cross window is called a bulb or reel frame. Within this half cross window usually one compartment was closed with a shutter and the other one with stained glass.

Later on, the stained glass disappeared from the cross window as the 17th century interior demanded more and another type of daylight than the stained glass could offer. It was replaced by bigger glass which was placed in wooden rods. In the last quarter of the 17th century the cross window was not being built anymore and the division of glass panes in rods was becoming larger. This development wasn’t

23) (Zantkuyl, 1994, p. 198)
24) (Zantkuyl, 1994, p. 205)
25) (Zantkuyl, 1994, p. 204)
due to the fact that they could make bigger glass panes, because they were already capable of doing that, but due to the possibility to position the glass panes in this manner.

18th century

Very important in the 18th century architecture of the window is that the interior demanded a different kind of daylight. This new interior, influenced by the Louis XIV style, consisted of beautiful and delicate decorations in stucco on ceilings and walls. The rough appearance of the cross window with its plumb was not fitting with this fine decoration of the interior. In the 18th century the window had to be the ‘fourth wall’ of the interior, so the outside scenery was an important aspect in the experience of the space.

For this reason a large glass surface was required. However, the need for a space defining element was still necessary and therefore the sash window with its wooden rods was the right solution.

The sash window, which derived from France, was applied in the façade only when the interior was changed to the 18th century fashion with stucco decorations. The principle of the sash window is a fixed upper part and a movable lower part, as in Figure 19.

After 1700 this would be the common type of window and in general we assume that the sash windows with the smallest glass panes are the oldest ones, but this is not always true. The sash window with a division of 5 glass panes is the most common until the last quarter of the 18th century, then it enlarged to a division of 3. This division was based on the 3:4:5 proportion in which the height was 1.4 times the width. This proportion was very important in the composition, as the role of the window was more important than that of the brick as its surface was larger.

Another ‘new’ type of window was the French turning window, which was introduced around 1780. This type, which could be opened inwards, was very popular in the design of living rooms, palaces and public buildings in France. However, this inward opening window caused a lot of problems in practice. In our Dutch climate a small opening was more favorable, which was only possible with the sash window. The interior with its curtains and inside shutters was neither fitting these inward opening windows. Therefore the sash window remained the common window type in the 18th century. This will become clear in the next paragraph and is also illustrated in Figure 20.

19th century

As presented in the scheme by Zantkuyl, Figure 20, the 19th century window design can be described as a mix of combinations related to fast developments in techniques and materials. Therefore it is helpful to explain this according to the image on the left. If, for example, you combine the 18th century sash window and the French inward turning window, the result is the Empire window. The first row in the scheme shows these types of windows, consequently sash window, French turning window and the Empire window, in which the tendency of less division already initiates.

The second row shows three different kinds of sash windows, the first two with a vertical division in two and the last in which the division has completely disappeared. The last row shows some examples with an undivided upper part and a center rod which accentuates the vertical aspect. The last type has a completely undivided bottom part in order to have a view as broad as possible. The division in the upper part caters for the fact that the feeling of enclosure still had to be there in order to define the ‘wall’.


27) (Zantkuyl, 1994, p. ?)

28) (Zantkuyl, 1994, p. 215)
The T-window, which is in the last row in the middle, was commonly used after 1870 in the city center of Amsterdam, as well as outside the center. This type of window design was very favorable because it provided for a lot of daylight and it remained the desired distinction between the inside and outside because of the vertical rod in the middle. In the usual decrease of the windows in height, this type of vertical division could be easily compensated. In some other examples the lower division completely vanished. This was due to the fact that the lower part of the window had to be as open as possible to have a better view. However the upper part of the window was preferably divided into several parts to still preserve the feeling of enclosure.

It is obvious that in the 19th century most of the windows lost their division. The proportions of the 18th century, in which the height was 1.4 times higher than the width, became slightly larger into a proportion of 1.6, which nearly touches the Golden Section.

The change of this window division also had a great impact on the entire composition of the façade, as it changed the entire pattern. However I think the vertical division suits the canal house composition very well as it accentuates its length and makes it look even longer.

20th century - 21st century

In the last centuries, a lot of different materials and techniques are applied in the window composition. It is obvious that the canal houses in the historic 17th century city center of Amsterdam remain in the same pattern of window design to fit in the texture of the other adjacent façades, so either repeating the sash window or the T-window as mentioned before. Outside this historic city center the newly built canal houses have a totally different window design as the main direction has changed from vertical into horizontal. Besides, they are applied as turn and tilt windows in order to be able to open the window in different ways depending on the climate, as in Figure 21. I think it’s aptly that these types are the ones being most applied now, as they are not coherent to the vertical composition of the canal house and the materials aren’t matching either. However they provide for a large view and they are very comfortable and that’s why they are such a great success today.

Another example of this type is on the project location of the Binnengasthuis area in which the façades of the 80’s block contain colored plastic window frames in green and orange, as in Figure 22.

Conclusion

Remarkable factors in the design of windows are the technological innovations which made it possible to design all kinds of window types, forms and materials. Its use and comfort however were the determining factors which made several types, as the sash window in the 18th century, into a great success.

At first the window design was based on the possibilities of stained glass, which were relatively small, and the goal was to reduce the forces which stressed the adjacent bricks by creating a relatively narrow opening in the wall. In today’s situation in which the horizontal direction is prevailing, we have found solutions to deal with these forces created by the opening, as for example hidden lintels underneath the brick. Everything is possible today as techniques in glass, window frames and lintels have improved and we could design every window we could think of. It’s up to the designer itself to consider that view, comfort and use are the most important factors for success.

In Figure 23 an overview is given of the content in this chapter. It illustrates the changes through time.
Figure 23. Change of window design from 17th century until now

- **Golden Age (17th century)**: Why change: new delicate interior fashion, window is ‘fourth’ wall.
- **French Era (18th century)**: Why change: fashion in France, previous type was unpractical.
- **Economic downturn (19th century)**: Why change: more view is wanted, new materials/techniques.
- **20th century**: Why change: more view and comfort.
- **21st century**: Why change: revaluation of patterns and divisions.
ELEMENT

GABLE
from the 17th century until now

Introduction

As last element in the façade composition is the termination i.e. the gable. In Amsterdam, as well as in the rest of the Netherlands, where this typology of the canal houses also exists, the single houses have a perpendicular roof to the façade, which is related to the elongated floor plan which was created through plot division. In order to hide this roof, the façade was lifted in front of it and followed the outlines, creating a triangular shaped gable.

The most common type in the first canal houses was the step gable, which was already present when façades were made out of wood. It is hard to date certain gable types, as most of them occur during ages and simultaneous to others. The step gable however is certainly the oldest one, which would evolve into a lot of different types.

17th century

The 17th century step gable is commonly known as typical Dutch, as it is applied in a lot of cities in the Netherlands, not only in Amsterdam. The Amsterdam variation to this common Dutch type is the most simplistic one. A characteristic feature of the step gable is its fixed slope in which the steps are the same height as the width, as in Figure 24. The steps are each covered with natural stone in order to prevent the brick to completely saturate in the rain, as natural stone has a lower porosity than brick. These natural stone elements also create a tension in the composition between the horizontal and vertical elements, as the steps are accentuating the horizontal within the vertical composition of the façade. These cover strips were sometimes extended into cordons, which are horizontal differentiations in the façade and mostly applied in natural stone. This is shown in Figure 24 as well. Characteristic for the step gable is its simplicity in design, which offers a lot of possibilities. An even more simplified version of the step gable is the spout façade which was usually applied in warehouses and not in residential buildings. But mostly they were applied as back façades, as the back was less important than the front, which had to be a reflection of the inhabitant’s status.

In the early 17th century house the roof structure already started above the first floor as the house contained two floors only. Later on, the houses became higher up to three or four floors, and the façades were adapted to this.

Due to style influences the step gable evolved into another type which was more harmonious to the Louis XIV style, which contained curved lines and ornamentations. This was the neck gable, as illustrated in Figure 25. This image also shows why the straight corners of ninety degrees, which are typical for this type of gable, were filled with claw pieces. These are the decorations on both sides of the neck, as the roof behind it still needed to be hidden and usually they were made of sandstone. Often the decorations contained fruit or flower motives which were also decorated with garlands, which are festoons.

A recurrent element in the 17th century architecture is the classical fronton, which is applied on top of the gable, as in Figure 25, and in the façade, as for example above the front doors as well. This type was only built in a short period of time and was in fact an intermediate between the step gable...
and the clock gable, which would be most popular in the 18th century because of fashion preferences, which was the well-known Louis XIV then.

18th century

Because of this Louis XIV fashion, the neck gable from the 17th century lost its steps and straight corners filled with claw pieces and made room for a gable which didn't contain any straight lines at all, namely the clock gable, as in Figure 26. The clock gable is quite similar to the neck gable in outline forms, but doesn't contain a straight middle part with 90 degree corners and claw pieces. Its form is in fact a continuation of the brick façade.33)

As illustrated in Figure 26, the clock gables are also decorated with the same elements, however even more delicate. All these types of gables, from step gable, neck gable to clock gable, serve to hide the roof of structure behind it.

A completely new type is that of the decorated attic, as in Figure 27, which no longer follows the form of the roof behind it as this had also changed. The composition of the attic consists of a mezzanine, which is the part with the low windows just underneath the cornice, and a richly decorated baluster. Probably this new type is also related to internal changes, as the spaces underneath the attic needed more space for other functions. The new roof structures, other than the traditional perpendicular one, offered more space.

Besides, every change in the design of the gables was influenced by the current style of that time. It purely served as a representation of the inhabitant's wealth and knowledge of the arts and styles of that time, as the gable had no specific further purpose, it was just a beautiful piece of art.

19th century

The delicate and rich decorations of attics and balusters as in the 18th century slowly vanished and made place for a type that could be described as a sober straight cornice. Again, this was related to the bad economical conditions of the 19th century which led to sobriety in all architectural features.34)

Most characteristic for the 19th century are these straight cornices which are simply used as the termination of the roof surface in order to drain the rainwater. This is related to practical and most importantly financial reasons and not to its aesthetics. The beautiful art pieces of the 18th century were just too expensive and demanded too much maintenance, which made them disappear in the 19th century.

As mentioned before, the change of gable type was also related to the change of the roof structure. This was probably due to the fact that the function in the attic changed from storage or spaces for staff into actual living spaces, and therefore needed more space.

The traditional perpendicular roof made place for a parallel one, probably only in the front part of the house. This resulted in a roof surface, which was usually hidden, that was in full sight and was part of the façade composition now, which totally changed its character. This roof surface was then also added with dormers in order to gain more space and daylight, as illustrated in Figure 28 (left). The dormers created a little bit more liveliness in the straight and sober appearance of the 19th century cornices.

The richly decorated art pieces of the previous centuries vanished as they were not in fashion anymore and they had no other particular function than being beautiful. Financial reasons and maintenance were more important than art.

33) (Killiam, 1978, p. 22)
34) (Killiam, 1978, p. 23)
The sober architecture of the 19th century gable, which is in fact not a gable anymore, continues to pursue in the 20th and 21st century and the only typology remained is that of the cornice, as this can no longer be called a gable. As mentioned before the introduction of the straight cornices is related to the different roof structures and the need to have more space underneath the roof, as this is used as ‘normal’ living space nowadays. Within this new type of cornice, the roof structure is flat and therefore not visible in the façade surface. The front façade of newly built constructions no longer contains a gable, or roof of surface as in the 19th century as in Figure 28 (left), but just a tiny cornice, as in Figure 28 (right) to protect the material from the rain.

The complete disappearance of the gable and of the 19th century roof of surface, means that the traditional division of the façade into plinth, façade surface and gable has also changed. The traditional division is no longer present in newly built canal houses and maybe this isn’t even relevant anymore. The gable, as it has been used in previous centuries served to hide the roof of structure behind it and served as a representation of one’s wealth and status. The small cornice, as purely functional to protect the façade a little from the rain, is a reflection of our society today.

In the composition of the newly built canal houses the surface of the façade extends until the flat roof and is being covered by a small strip of different material, as shown in Figure 28 (right). As the cornice is not directly linked to human actions and needs, the appearance of the cornice is less important than the plinth and the window design for example.

Conclusion

The history of the gable started as a practical element, as a solution in order to hide the roof structure behind it and later on this developed into an element of style. During the years it was constantly influenced by fashion and it purely served as this representation of style, because it had no further practical purpose. As it had and has, no actual function, we don’t really need because it doesn’t match our current ideas on fashion anymore.

Most important today in the ‘roof of design’ is that its space underneath is practical and has daylight, if it serves for living functions. Roofs are applied as flat surfaces so that we have as much space as possible and therefore the newly built constructions don’t contain a gable anymore.

I don’t see this as something bad, because the gables have always been a representation of its society of that time and I think the cornices nowadays are also a representation of today’s environment. The previously richly decorated types are not in fashion anymore and therefore they are not being built today.

The fact remains that the historical gables are very beautiful and a representation of the style preferences of that time and therefore they are very valuable. However maintenance is laborious and expensive, but because of their value I hope they won’t completely disappear from the canal house typology because that would be a pity.

Figure 29 on the right illustrates the changes of the gable through time and shortly summarizes their reasons of change.
Figure 29. Change of gable typologies from 17th century until now

- **17th Century (Golden Age)**: Additional floors
- **18th Century**: Style influences
- **19th Century (French Era - economic downturn)**: More space needed in attic, financial reasons
- **20th Century**: More space & daylight
- **21st Century**: More space & less costs/maintenance

Why different: Back façade less important

Why change:
- Additional floors
- Style influences
- More space needed in attic, financial reasons
- More space & daylight
- More space & less costs/maintenance

Figure 29. Change of gable typologies from 17th century until now
ELEMENTS
CONCLUSION
from the 17th century until now

How is the element related to the spectator’s experience?

| *because of its direct relation it is reachable to user |
| low |
| significant |
| *only related to it when using it, than it is very much appreciated |
| medium |
| *has great influence on spectator’s view and comfort, it can adjust to needs (open/close) |
| strong |
| *not at all related to human actions, it only served as a beautiful art piece to look at - not reachable at all |

17th CENTURY 2014

Gable as old-fashioned element
- the historical gable, as it was in previous centuries, is not in fashion anymore and has therefore disappeared from the façade composition
- reasons for this are also expensive costs, maintenance and its lack of function, as it was only meant as a piece of art

View and comfort as drivers
- as techniques have improved so far that we could make anything we can think of, windows are now as wide as possible in order to have a panoramic view
- standards in our daily life have improved and therefore our needs of comfort to a, in which possibilities of opening the window is crucial

Outside space most valued
- need for a small outside space as balcony or loggia, as apartments can’t have an own garden each, only the ground bound houses
- maybe these are not always applied in front façade but definitely in the back ones as these were always very different from the front

Relation to street very important
- transparency of today’s plinth reflects our open society and our need to have this interaction from the inside house to the outside street
- the glass part is often combined with working space behind it and is also a way to sell ones work

Figure 30. Façade elements of 17th century compared to situation today
After discussing all the elements in the previous chapters, I can conclude that the composition of the traditional canal house archetype has changed quite a lot since the 17th century, as illustrated in Figure 30. However, some important characteristics have still remained.

During years, this change has created lots of variations in the street image of Amsterdam, which was previously quite monotone. As mentioned before, I think this differentiation is very characteristic for Amsterdam’s canal streets and I think it is very valuable.

The diagram on the left illustrates the comparison between the 17th century typology and that of today’s situation. It is obvious that nothing has remained the same, which is quite logical since our daily life and society has made crucial changes for four centuries now. As the house is an architectural object directly related to us, as human beings, it consequently changes together with our needs and aspirations, as they are occurring in the environment we are living in then.

Figure 30 illustrates the individual elements in the typical composition from the 17th century façade and from newly built constructions today as they are shown in Figure 31 as well. These façades are a clear example of the combination of all the elements, as they have been discussed in previous chapters, and represent today’s characteristic composition.

What is immediately remarkable at first sight, is that the overall composition has changed from vertical to horizontal, which is related to technical improvements and our needs to have a view as wide as possible. Furthermore, a second crucial change in the composition is that of the plinth, which has become completely transparent nowadays.

This constant change of the plinth, which is illustrated in Figure 10 as well, was of great importance for the relation to the street and was a reflection of the living environment at that time. In my opinion, this element is the most important one in the entire composition of the façade as it has the strongest influence on the spectators’ experience. This is related to the fact that this part of the façade is positioned at eye level, and therefore, we, as passersby, will have the strongest relation to it.

In the past, it occurred that the stairs, as part of the plinth, became so high that they were completely ignoring the human experience of it. They were designed like this in order to show one’s status, which was seen as superior to others and therefore that high above the street. Eventually, this didn’t work out, as it was very unpractical and not related to human activities; it was too distant from the street, which the inhabitants didn’t appreciate. So this direct relation has always been very important.

Nowadays, this relation is defined in a different way. It is not necessarily defined with stairs, but in lots of newly built constructions through a completely open plinth in glass. This is a new way of defining this very direct relation as everything is now visible on the outside.

The other elements in the façade composition, as balconies, loggias, and windows, are important aspects to consider in terms of use, comfort, and view. These factors, when applied in the right way, will make a composition into a great success, seen from the inhabitants’ perspective. In the end, this is what it’s all about, if the people living in it feel comfortable.

Finally, to sum up all that’s been explained in the previous chapters, the direct relation to the street is most important in the spectators’ experience, so its appearance from the outside and its effect on the passerby. Seen from the inside of the house, comfort, use, and view are most valuable in creating a comfortable house.
HUMAN SCALE IN ARCHITECTURE

human proportions in large-size architecture

Perception of scale

To pursue on the conclusions about the canal house composition, some elements were strongly related to the spectators experience, and others weren't. This is influenced by scale and size and how this information is given to us. In the conception of the ‘human scale’, as mentioned in the introduction before, these aspects as size and the relationships of sizes are very important.

Applied to architectural scale, this subjectivity of personal impressions means that the apparent size of a division, or of a shape in a building is affected by the other divisions and size relationships in the same view. So our impression and understanding of this impression is affected by its direct context, which forms a reference to what we see.

In order to understand what we see, we need to relate it to shapes or forms we are familiar with. Shapes with recognizable sizes can serve as a measure to compare the other shapes seen with them. The spectator must be able to recognize this standard size for a clear perception. A common mean for this standard recognizable size is the module of the human figure, which can be a measuring rod at any time. The human figure is a unique module in architecture, it is the common measure of the ensemble.

Applying the human scale to a building means that size and the relationship of sizes are related to the human body. According to Licklider:

“A building is in human scale when it is designed so that the human figure and other objects with recognizable size look normal in it and against it”.

Within my theme of façade composition, I was intrigued by the idea of scale as the archetype of the canal house contains this human scale proportions in the façade design. These can be recognized in the forms of door steps and small size windows, which are related to the relative floor height of the houses. In my point of view, this idea of human scale is quite missing in most of the buildings on the Binnengasthuis area, as they were designed as institutional buildings and therefore quite monumental. As mentioned before, I think housing should contain this human scale as mentioned by Licklider and possibilities should be found to do so.

The problem with large-size monumental buildings is that measuring is hard as the shapes don't have recognizable sizes. As none of the measuring rods of recognizable size can be considered entirely reliable, and as the most reliable elements, which is the human size and shapes designed for human use, become increasingly ineffectual as the buildings increase in size, it is clear that they cannot be recognized easily in a large design. According to Licklider, human scale requires a consistent standard of size throughout a design and it has to be implemented effectively.

Another influencing aspect on the perception of the buildings scale is the division in façade design and scale variations. Divisions in façade elements or in materials seem to control a design’s apparent size. In the absence of other reference points, the more divisions that are used, the larger the building appears. The observer expects a building with more units to be larger and one with fewer units to be smaller.

The same effect is gained by the use of a smaller or a larger size within the whole block, as when a row of or the windows are made smaller or larger. This idea of façade division is also present in the buildings of the Binnengasthuis area and it creates divisions within the bigger unity of the façade composition. This will be illustrated in the site specific analysis.

Examples on human scale in large-size buildings

In order to understand this discussion of the human scale within the larger composition, this case for introducing a housing design in the buildings of the Binnengasthuis area, I will describe a few projects done by other architects within this topic. This paragraph will show examples of how influential scale can be in a composition and what elements trigger this influence. As mentioned before, we need recognizable standards in order to understand scale. This is for example visible in designs by Hertzberger and Bakema, Figure 32 and 33. In their designs, the human normal size has been duplicated in order to create the large scale, which makes the buildings still readable even if they are very large.

The examples in Figure 34 and 35 illustrate how influential materials, proportions and ratios can be on the perception of scale.
Material properties and ratio influencing scale

Figure 34 shows how large measurements make a building look smaller and how many divisions make it look bigger. The last image shows how the ratio of open and closed and the division of windows can also have a great influence on the idea of scale. Both material and ratio are important factors.

Hertzberger - Ministry of Social Affairs

Within this design the scale of a large-size building is reduced through lots of relief and differentiation, which are composed of smaller units in façade and floor plan. Window heights and floors are ‘normal’ and therefore we can relate to the building as we can recognize these measurements.

Bakema - Hansaviertel housing block in Berlin

The large building block is composed through the repetition of the same small housing units. Therefore its size becomes ‘absorbable’ for the spectator. The smaller housing units contain ‘normal’ human measurements and create divisions in the façade which make it easier to recognize its scale.

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Material properties and ratio influencing scale

Figure 34 shows how large measurements make a building look smaller and how many divisions make it look bigger. The last image shows how the ratio of open and closed and the division of windows can also have a great influence on the idea of scale. Both material and ratio are important factors.
SITE SPECIFIC ANALYSIS

Research on façade compositions, materiality and values of the buildings in the Binnengasthuisarea
THE SECOND PART OF THIS REPORT CONTAINS THE SITE SPECIFIC ANALYSIS OF THE BINNENGASTHUIS AREA. A SHORT INTRODUCTION TO THE HISTORY OF THIS AREA WILL CLARIFY THE MOST CHARACTERISTIC CHANGES THROUGH TIME.

CHANGING CONDITIONS IN BINNENGASTHUIS AREA

The Binnengasthuis area has erected gradually between 1868 and 1913 in a diverse catalogue of architectural styles and found its existence in 1579 on the area of the former Old Nuns monastery which housed the Sint Pietersgasthuis, later on named the ‘Binnengasthuis’ which means infirmary.

In 1867 the building complexes were assigned for an academic hospital, the newly built constructions were all commissioned by the regents of the infirmary and the building committee. Since their creation, the buildings have changed a lot internally. From 1984 onwards some radical changes have occurred, as the demolition of the former building for Anatomy by B. de Greef and a part of the administration building by J. van der Mey.

On urban level the site has changed a lot as well as the area has been redesigned with continuous cycling routes right through the area, which have created the new streets of the Vendelstraat, the Turfdraagsterpad and the Binnengasthuisstraat. These have completely changed the inner character of the area.

FAÇADES
BINNENGASTHUIS

COMPOSITION AND DESIGN OF BUILDINGS ON SITE

Introduction

The former Binnengasthuis complex is of common interest because of cultural and medical-historical value as an expression of the development of scale enlargement and modernization in hospitals at the end of the 19th century.\(^{40}\) Besides it is also of interest as one of the last big hospitals within the city centre of Amsterdam.

Within this analysis about the Binnengasthuis area, the purpose is to highlight the most representative architectural elements of each individual building, its relation with other buildings and its direct context.

Outside and inner façades

Obvious in the façade designs of the buildings is that the outside façades, facing the streets surrounding the Binnengasthuis area, are very different from the inside façades. In order to see this difference the analysis starts from the outside streets, showing how the buildings are integrated into the street pattern or how they are related to each other. After this the buildings facing the inner courtyards or streets will be presented in the same way.

Each set of analysis focusses on the urban context by showing it in maps, showing the most important architectural features in the façade designs and is decomposed in the same way as for the theoretical research on the canal house, namely in the plinth, the surface of the wall, the windows and the gable.

Large scale architecture

In order to get an impression of the building scale the most important measurements are given to the side. In both the theoretical as site specific research the façades are compared to the standard size of a human being, which functions as a reference to the composition.

Striking in the composition of the Binnengasthuis area is that the buildings have a very large size. Nonetheless the massive façades can be seen as divided into segments, some horizontally some vertically divided. This will be shown in the analysis as well and will serve to understand the façade composition and the future possibilities.

The analysis will be presented in the order as showed in Figure 36 and documented on the next page. This overview shows the buildings location, the architect, building year and monument register number.

All buildings are illustrated individually and briefly documented with a short explanation on its architectural style and main characteristics, which derived from the monumentsregister of the Rijksdienst Cultureel Erfgoed.
INNER SPACES

5. Oudemanhuispoort
- Administration building - J.M. van der Mey
  1914 - monument number: 518310
- Womens hospital - A.N. Godefroy & B. de Greef
  1877 - monument number: 518303
- Maternity hospital - A.N. Godefroy
  1870 - monument number: 518302

6. Vendelstraat
- Second surgical clinic - F.W. M. Poggenbeek
  1897 - 1900 - monument number: 518308
- Clinical hospital - H. Leguyt
  1890 - monument number: 518306

7. Vendelstraat courtyard
- Second surgical clinic - F.W. M. Poggenbeek
  1897 - 1900 - monument number: 518308
- Nurse housing - F.W. M. Poggenbeek
  1900-1914 - monument number: 518308

8. Binnengasthuisstraat
- Social housing - P. de Ley - 1985
- Nurse housing - F.W. M. Poggenbeek
  1900-1914 - monument number: 518308

OUTER RING

1. Grimburgwal
- Administration building - J.M. van der Mey
  1914 - monument number: 518310
- Womens hospital - A.N. Godefroy & B. de Greef
  1877 - monument number: 518303
- Maternity hospital - A.N. Godefroy
  1870 - monument number: 518302

2. Oude Turfmarkt
- Womens hospital - A.N. Godefroy & B. de Greef
  1877 - monument number: 518303
- Dutch Bank - W.A. Froger
  1869 - monument number: 5780

3. Nieuwe Doelenstraat
- Social housing - P. de Ley - 1985
- Nurse housing - F.W. M. Poggenbeek
  1900-1914 - monument number: 518308

4. Kloveniersburgwal
- Nurse housing - F.W. M. Poggenbeek
  1900-1914 - monument number: 518308

BINNENGASTHUIS AREA
Figure 36: Map of Binnengasthuis area indicating the buildings included in the analysis.
OUTER RING
1 GRIMBURGWAL

From left to right:

Administration building - J.M. van der Mey - 1914
Women's hospital - A.N. Godefroy & B. de Greef - 1877
Maternity hospital - A.N. Godefroy - 1870

façade in drawing
- - - load-bearing
- not bearing
entrances

inside walls
- - - load-bearing
- not bearing

changes in time
still existing
removed

façade drawing
characteristic features
in building design
Façade characteristics and values - front

The Maternity hospital, which is built according to the corridor principle, is erected in dark brown colored brick on a plinth of natural stone and consists out of three floors and a mezzanine underneath different forms of roof structures. The sober building has a long side on the Grimburgwal, a short façade on the Oude Turfmarkt and its back façade on the South-Eastern side with a five-sided oriel.

The long façade consists of a center risalit and two flanking wings with corner risalits. The risalits are vertically accentuated with protruding brick colonnades and the entire composition is horizontally articulated with profiled cordons in natural stone. The vertical division however is more dominant. The elongated front façade has a load-bearing function and is very closed as it doesn't contain any entrance at all. These entrances are positioned on the short side, which will be discussed later on.

The Women's hospital is just aside the Maternity hospital and resembles in its architecture and materiality. The same corridor system, brick color, building height and risalits has been applied on this building as well. This façade however does contain several entrances, which aren't present in the other building. The entrances and balconies are integrated into one element, which is decorated with Gothic ogival forms.

The Maternity hospital and the Women's hospital are both of general interest because of their architectural and historical value as a good and are a well preserved example of utilitarian architecture of the 1860s as well as of interest for the work of Godfroy and de Greef. Their location on the corner of the Oude Turfmarkt and the Grimburgwal represents an additional urban value and forms the Northern border of the Binnengasthuis complex 41).

41) (Rijksdienst voor het Cultureel Erfgoed, 2004 nr. 518303 and 518302)
Comparing the two sides, namely front and back, it becomes very obvious that there is a big difference between them. The front, which is shown on the previous page, is obviously monumental while the back is completely the opposite, namely extremely sober.

This is quite logical as almost all architectural objects have a front that is more significant than the back. In this case it is even enhanced because of its urban position, as the front is defining the outer boundaries of the Binnengasthuis and positioned on a prominent spot while the back is almost touching another building and nearly visible.

The entire building of the Maternity hospital is erected in the same material, namely in dark brown colored brick. Its composition is the same as well and consists of a plinth, three floors and a mezzanine. The back façade however doesn't contain cordons, which are horizontal articulations, in natural stone and it is attached with a lot of anchors, which shows it doesn't have a bearing function. The current entrance to this building is positioned in the five-sided oriel in the middle. This side of the building could get a lot of daylight as it is facing the south, however the volume of another building in front is hindering this light penetration and view.

The back façade of the Women's hospital is even more sober than the adjacent building of the Maternity hospital. Its composition consists of a plinth, which is a protruding volume of one level in front of the actual façade, two floors and a mezzanine. The central part differs in composition as the stairs are located in there. This façade has a better exposure and is positioned on a significant sight-line inside the Binnengasthuis area, facing the square in front of the Binnengasthuisstraat.
The importance of the façade compositions is very much dependent on their urban position, as the buildings seen from far are more significant than the ones who are not. This is illustrated in a drawing on the urban framework of the Binnengasthuuis area by the municipality of Amsterdam, Dienst Binnenstad Figure 37. This drawing shows that some buildings, as the Dutch Bank, the Women’s hospital, and the Nurse housing have very extended sight-lines and therefore they are marked in black. This represents their significant meaning as they can be seen from quite a large distance.

The drawing on the right illustrates the inner sight-lines which are mainly focussed on the square in the middle, as this is the center point of the area right now. It’s quite logical that there aren’t much sight-lines inside the area as its character is composed of inner courtyards mostly.

Figure 37: Significant sight-lines towards Binnengasthuuis area and inside complex itself (source: Stedenbouwkundig kader Binnengasthuisterrein, Dienst binnenstad, 1999, p. 20)
OUTER RING
2. OUDE TURFMARKT

From left to right:
Maternity hospital - A.N. Godefroy & B. de Greef - 1877
Dutch Bank - W.A. Froger - 1869

façade in drawing
- - - load-bearing
- - not bearing

entrances

inside walls
- - load-bearing
- - - not bearing

façade drawing
characteristic features
in building design
As mentioned on the previous page, the Maternity hospital by Godefroy consists of two sides: a long side on the Grimburgwal and a short side on the Oude Turfmarkt. The Northern long side forms an urban boundary and therefore the entrance is located on the short side.

This side contains the main entrance, in the centre risalit, which ends in a tower-like gable. The centre risalit is flanked by two wings and is accentuated with the same vertical elements as in the long façade, which create a division in the façade composition. The material and composition is the same for the entire building and consists of dark coloured brick and horizontal cordons in natural stone on a plinth of natural stone as well. This façade is entirely load-bearing.

The adjacent building of the Dutch Bank in classical style is one of the main and most monumental early office buildings in the Netherlands. Its monumental appearance is expressed in the use of natural stone. The horizontal composition consists of a large plinth, two storeys and a mezzanine. In vertical direction the centre risalit with fronton is flanked by two four-window wings and corner risalits.

The lower part of the façade, which is in fact a very large plinth, consists of Oberkirchern sandstone and is quite closed in its composition. The upper part is clad with Bentheimer sandstone and resembles in color with the lower part, which are both different shades of gray. In this composition both the horizontal and the vertical division are important.

The building has two entrances, which are situated in the side risalits, and form an entity with a balcony on top of it. The centre risalit also has balconies, which are in fact decorated stone parapets. The fronton on top of the centre risalit contains decorations in human forms.

42) (Rijksdienst voor het Cultureel Erfgoed, 2004, nr 5780)
OUTER RING
3. NIEUWE DOELENSTRAAT

From left to right:

Social housing - P de Ley - 1985
Nurse housing - FWM Poggenbeek 1900-1914

façade drawing
characteristic features in building design

façade in drawing
load-bearing
not bearing
entrances

inside walls
load-bearing
not bearing

changes in time
removed

N
One of the most recent changes in the Binnengasthuis area is the construction of the social housing block on the Binnengasthuisstraat with a short side on the Nieuwe Doelenstraat. The entire building is made out of concrete, varying in height from four to six floors, and the façades are finished with white plaster. The entire façade composition is composed in a repetition of the same elements. However, the façade on the Nieuwe Doelenstraat is more sober and only contains some of these elements: the round-shaped balconies and wooden colored windows, which look like plastic, in horizontal direction.

The building of the Nurse housing was extended a few times as the workload of the nurses was reduced and the amount of nurses increased. The first extension connected the building to the Second Surgical clinic, on the other side of the inner courtyard.

The dark coloured brick façade of the Nurse housing contains a plinth in natural stone and is characterized by the alternation in tops and cornices and the differences in floor heights, which create a vertical division. The dormers with crossing roofs are also very characteristic in the façade composition. In the design of the windows it is striking that the windows on the ground floor are covered with iron bars. The decorative brickwork in the upper parts of the façade is visible in the form of vertical lines underneath the cornices.

The Nurse housing has a close relation with Second Surgical clinic as they form a unity around the courtyard. They are of common value because of their typological value and the Nurse housing especially is of urban value as the North-Western ‘coulisse wall’ on the Nieuwe Doelenstraat and Kloveniersburgwal.

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43) Rijksdienst voor het Cultureel Erfgoed, 2004 nr. 518308
OUTER RING
4 KLOVENIERSBURGWAL

Nurse housing - F.W. Poggenbeek 1900-1914

façade drawing
characteristic features in building design

façade in drawing
- load-bearing
- not bearing
entrances

inside walls
- load-bearing
- not bearing
changes in time
still existing
In continuation of the previous page, the Nurse house building follows the corner of the Binnengasthuisstraat and the Kloveniersburgwal. The part on the Kloveniersburgwal is an extension of the existing nurse housing and is built in 1913-1914. Its architecture and composition is similar to that of the Nieuwe Doelenstraat as it forms one entire building. So the brick colour plinth and building height is the same as the façade on the Nieuwe Doelenstraat.

As the façade on the Nieuwe Doelenstraat functions as a load-bearing wall, the façade on the Kloveniersburgwal will be probably the same.

However this façade contains less alternations as the floor heights and cornices are all the same height. The alternation is created through the difference in tops and roofs. Another important aspect of this part of the building is that it is currently in use for housing mostly by students. There is just one small entrance on this side of the façade which means this entrance is used for the entire part of the building, as the façade on the inner courtyard doesn't contain an entrance as well.

Additionally the dormers on the rooftops have been altered during the years. Previously they were single dormers, as they are still present on the Nieuwe Doelenstraat. The dormers on the Kloveniersburgwal have been connected to each other and added with some extra space underneath the roof. This is probably due to the fact that the rooms underneath the roof required more space and daylight.

With the creation of the continuous cycling routes through the area, a new passage has been created through this façade. The cut-out in the façade is made in concrete and supported on a concrete lintel in the brickwork façade.
INNER SPACES
5. OUDEMANHUISPOORT
Oudemanhuispoort - Rendorp - 1754

façade in drawing
load-bearing entrances

façade drawing
characteristic features in building design
Façade characteristics and values

The Oudemanhuispoort, which literally means Old Men’s gate, consists of a classical design around a rectangular courtyard. The building in Louis XV style has been commissioned by mayor Rendorp in 1754 \(44\), but has changed a lot internally since then. The outer courtyard façades are the only remains of this building as the interior spaces have all blended into one conglomerate.

The horizontal composition consists of two floors and a roof surface with a very present cornice which articulates this horizontal direction. The four façades forming the courtyard are similar to each other and consist of two mirrored designs. Each side contains an entrance to the complicated internal building which has changed a lot through time.

The two main entrances, one designed with a fronton and one with an attic decorated in baroque style elements have a very prominent place in the façade composition.

The entire façade is vertically divided through difference in material as the centre and corner parts of each façade are covered with white plaster and the sections in between of dark purple/red coloured brick. Within the white plastered parts there is also a division in ground floor and first floor as the ground floor is accentuated with horizontal lines.

Characteristic in the façade composition are the sash windows with their four rod division, which is also defining the rhythm in the façade. This rhythm of windows and the variations in material with the prominent cornice, which really accentuates the horizontal direction, are most important in the overall composition.

\(44\) (Rijksdienst voor het Cultureel Erfgoed, 2004, nr. 4012)
INNER SPACES
6. VENDELSTRAAT

From left to right:
Second surgical clinic - F.W. Poggenbeek - 1897 - 1900
Clinical hospital - H. Leguyt - 1890
Façade characteristics and values

The clinical hospital, which is built according to the pavilion system, is designed in a sober Neo-Dutch Renaissance style and consists of two separate wings, one for men and one for women, which are connected with a central part. This central element contained the common facilities and a round extension which housed two stacked amphitheatre-wise lecture rooms.

In the 1980s the open courtyard in between the two wings was filled with a prismatic glass atrium to create a new mensa-function.

The horizontal accentuated composition contains a plinth, two floors and a mezzanine underneath a tiled roof. The overhanging and profiled cornice underneath the roof is supported by volute consoles. Both wings of the clinical hospital contain a central part, in which the stairs are located, which are expressed in both sides of the façade, the exterior and atrium façade. This central extruding part is composed of an entrance and gable with balusters and decorative elements.

The entire façade is made of orange coloured brick with horizontal accentuations in white natural stone. Most influential in the façade composition is the rhythm of windows, which are the highest of all buildings on the site.

45) (Rijksdienst voor het Cultureel Erfgoed, 2004, nr. 518306)
INNER SPACES
7 VENDELSTRAAT
COURTYARD

From top to bottom:

Second surgical clinic - F.W. Poggenbeek - 1897 - 1900
Nurse housing - F.W. Poggenbeek 1900-1914

façade in drawing

characteristic features in building design

load-bearing
not bearing
entrances

inside walls
load-bearing
not bearing
The courtyard in between the Nurse housing and the Second surgical clinic is well defined by the buildings and be accessed from one side mainly but also contains a hidden gate.

The Second surgical clinic contains two perpendicular wings which define the northern boundary of the courtyard. The entire building is made of dark brown coloured brick and contains decorative brickwork in the upper parts of the façade.

The courtyard façade of the Second surgical clinic is composed of a plinth and three floors. A roof surface is missing as the building contains a flat roof and the façade is lifted in order to hide this. The sober composition is mostly articulated through the vertical window composition and the continuous balconies and ends in flattened step gables decorated with iron lifting beams.\(^\text{46}\).

On the other side of the courtyard is the back façade of the nurse housing. As well as the front, this façade contains a lot of vertical divisions and alternations.

The composition resembles the front side as it also contains a small plinth, three floors and roof surface with dormers. The alternating floor heights and cornices are the same as in the front as well. The façade has a very lively appearance due to these differences in heights and this is most characteristic for the composition.

\(^{46}\) Rijksdienst voor het Cultureel Erfgoed, 2004, nr. 518308
INNER SPACES
8. BINNENGASTHUIS-STRAAT

From top to bottom:
Second surgical clinic - F.W.M. Poggenbeek - 1897 - 1900
Nurse housing - F.W.M. Poggenbeek 1900-1914

façade drawing
characteristic features in building design

façade in drawing
load-bearing
not bearing
entrances
inside walls
load-bearing
not bearing
changes in time
still existing
As mentioned in the introduction this street was introduced to create continuous cycling routes and to re-connect the area with the city centre. The new housing block by P. de Ley follows this street in an angled line pattern. The entire building is made out of concrete, varying in height from four to six floors, and the façades are finished with white plaster.

The composition consists of the same repeating elements, namely: a glass porch with a door step and little shed which is shared by neighbors, round-shaped balconies and wooden colored windows, which look like plastic and are concatenated in the horizontal direction. The window frames are green or orange colored. Obvious as well in this façade elevations is the upper floor which is partly set-back in the façade creating loggias.

The street façades of the Second Surgical Clinic are completely different from the façades on the inner courtyard. They are characterized by their irregularities and protruding elements which create a lively appearance.

The central part of the building which connects the two perpendicular wings and which contains the main entrance is facing an important intersection of cycling routes and is positioned in such a way towards the square in front of it that it accentuates the main entrance. The sober dark brown coloured façade contains decorative brick in the upper part of the façade.
MATERIALIZATION
OVERVIEW OF BUILDINGS

1) Maternity hospital
   - Urban value/importance
   - Front façade
   - Back façade
   - Material size
   - Ornament
   - Monumental

2) Women's hospital
   - Urban value/importance
   - Front façade
   - Back façade
   - Material size
   - Ornament
   - Monumental

3) Dutch Bank
   - Urban value/importance
   - Front façade
   - Back façade
   - Material size
   - Ornament
   - Monumental

4) Nurse housing (street)
   - Urban value/importance
   - Front façade
   - Back façade
   - Material size
   - Ornament
   - Monumental
**Social Housing**

- Urban value/importance
- Front façade
- Back façade
- Material size
- Ornament
- Monumental

**Second Surgical clinic (street)**

- Urban value/importance
- Front façade
- Back façade
- Material size
- Ornament
- Monumental

**Clinical hospital**

- Urban value/importance
- Front façade
- Back façade
- Material size
- Ornament
- Monumental

**Notes**

1) Dark colored brick - natural stone cordons and ornaments - wooden cornices as decorations
2) Dark colored brick - natural stone cordons and ornaments above doors/windows - wooden cornice
3) Plinth in Oberkirchner sandstone and rest of façade in Bentheimer sandstone - decorated fronton
4) Dark colored brick with black differentiations (lines) - decorative brickwork in façade and underneath cornice
5) Concrete plinth and stairs - white plaster - painted wood window frames - steel frame balconies
6) Dark colored brick damaged with graffiti - new additions in glass and concrete - turret with decorative brickwork
7) Orange/red colored brick - white/gray differentiations (lines) in brick and natural stone - decorated cornice with consoles
8) Purple colored brick and white plastered 'blocks' - classical ornamented fronton and baroque baluster with clock

9) Dark colored brick - elongated iron balconies - flatted version of step gable with iron decorations on side

10) Entrance with glazed porch - dark colored brick with black differentiations (lines) - decorative brickwork underneath cornice and dormers
Finally after analyzing all the buildings in their composition and materialization, they can be organized in terms of their articulation and compartments within the composition, as is illustrated in Figure 38. This is an overview of the results in the previous chapters in which the façades were decomposed into individual elements, namely the plinth, wall, window and roof of surface. In these drawings the compartments were indicated with dotted lines, dividing the façade into smaller segments. These results are organized in the horizontal direction of the upper scheme.

The articulation of the façades is illustrated in the vertical component of the scheme and shows that most of the buildings are articulated in both directions, horizontal as well as vertical, and in the vertical direction. The only building composed in the horizontal direction is the Clinical hospital.
As illustrated before in Figure 37, the importance of the façade compositions is very much dependent on their urban position, as the buildings seen from far are more significant than the ones who are not. This urban significance is also related to the monumental appearance of a building and, therefore, it is important to evaluate this urban position and monumentality. In my opinion, monumentality can be achieved through this urban position, through its materialization and scale. All these aspects are organized in Figure 39 (above), ranging the buildings from their urban value, material properties, and scale. The buildings which have a significant urban value are logically positioned in the outer ring of the Binnengasthuis area and they have quite long sight lines as indicated in Figure 37. The building of the Dutch Bank, however, is the most monumental in its appearance, as Illus...
trated in the lower left corner because of the application of natural stone in the entire façade surface. This is also very logical as the building was deliberately designed to impress pedestrians passing by. The least monumental on the other hand are the back sides and the ones facing the inner court-yards, as the buildings in the right upper corner. The diagram on the right represents the scale range of the individual elements as they were discussed in the previous chapters. The two extremes in this, which are the social housing block by Paul de Ley and the building of the Dutch Bank, represent both the most impressive scale and the most 'human' so small scale. This speaks for themselves as the Dutch Bank building was designed to impress and the social housing block was designed for housing. Most of the buildings, which are institutional, are 'monumental' as well.
PROGRAM OF POSSIBILITIES

Results of research leading to opportunities for future change in the Binnengasthuis area
As illustrated in Figure 40 on the left, some façades are very monumental because of their urban position or because of their prominent architectural appearance, while other buildings are hidden inside the enclave or less important because of their insignificant façades. The latter means more possibilities for change as these are seen as less valuable in terms of architecture, history or position.

In Figure 40 they are indicated in red and it becomes very obvious that most of these façades are located in the inner spaces of the area which has an inward and mixed character.

The outside appearance is very important as it can be seen from quite a large distance and therefore very significant in the context of Amsterdam. This is illustrated with all the sightlines directing towards the area. The sightlines inside the area are very short as in fact there is not much open space.

However there is one important open square which is the main square in the area right now.
After analyzing the existing values of the buildings on the Binnengasthuis area, an overview can be made on the possibilities for future change, as illustrated in Figure 40. This figure shows the most monumental façades as already concluded in Figure 39, in purple and façades which have most potential to be changed in red. The assumptions are based on their position in the direct context, so if they are situated within important sight-lines or if they are back façades or facing inner courtyards. All façades colored red are ‘non monumental’ as illustrated in Figure 39 before. This means they are less valuable within the urban context and therefore they can allow for larger adaptations in the façade design. The red striped colored façades are a little harder to adapt as they are functioning as load-bearing walls.

Immediately remarkable in this figure is that all monumental façades are institutional buildings, as their goal was to express their superior ambitions. These façades are very important for the outside appearance of the Binnengasthuis area and should maintain this monumental status, which could be even enhanced by accentuating sight-lines or by increasing monumentality in the composition. One of these monumental sight-lines is illustrated in Figure 41 in which the front façade of the Women’s hospital absorbs all attention. The other figures, 42 and 43, illustrate the back sides of the Maternity hospital and the Women’s hospital which are both monumental in the front and sober in the back. This soberness and their inferior value as back façades offer more possibilities for change. All of these pictures are compared to their previous situation and shows that the context has dramatically changed and has even deteriorated. Intervening in these back façades also means improving its direct context.

![Figure 41](source: beeldbank.amsterdam.nl, nr. 010003007345)

![Figure 42](source: beeldbank.amsterdam.nl, nr. 010122015588)

![Figure 43](source: beeldbank.amsterdam.nl, nr. 010003007369)
FACADE
CHANGES IN HOUSING

LESSONS THROUGH RESEARCH:
HOUSING 2014

Gable: old-fashioned element

View and comfort as drivers

Outside space most valued

Relation to street very important

INFLUENCE ON SPECTATORS EXPERIENCE

strong

medium

low

significant
examples how to intervene on façades which have most possibilities, as illustrated in Figure 40

FACADE POSSIBILITIES BINNENGASTHUIS

EXPLORE RELATION PLINTH

CONSIDER OUTSIDE SPACE

THINK ABOUT COMFORT AND VIEW
Vacancy of monumental buildings

The results of the research and analysis have led to several possibilities for change, as indicated in Figure 40. To frame this issue within a greater context I will discuss the issue of vacant monumental buildings which will increase in the Netherlands in the coming years.

This is related to the fact that the Government wants to repel lots of its properties onto the market. The Rijkswestgoedbedrijf, which is the Governmental real estate institution, wants to sell three million m² until 2020 on a market which is already saturated. In order to find a new destination for these buildings the RVB, Rijkswestgoedbedrijf, has invented a new strategy, the abc-scan. This quick scan gathers all the ingredients of the building, as position, size, history, features, values and re-use potential.

However this issue hasn’t been solved yet as the range of vacant buildings is growing and will increase further in the future. Besides lots of vacant office buildings, the Netherlands will also increase in vacant institutional buildings, as for example the buildings on the Binnengasthuis area. Solving this problem can be a great challenge and a good example for lots of other similar projects within the Netherlands.

The monumental institutional buildings on site are indicated in Figure 44 on the right, in which two are located on the outer border and two are ‘hidden’ inside the complex. The other issue in the city center of Amsterdam will be discussed on the next page and it seems to be a perfect solution to combine both of them in order to solve them both.

47) (Marijke Bovens, source: http://www.herbestemming.nu/editie-6/3493/nieuwe-koers-rvb)

Figure 44: Institutions leaving buildings which results in vacancy and problem of housing need in city center of Amsterdam, both problems can solve each other.
Need for housing in city center

The city center of Amsterdam has always dealt with housing problems as the ever growing capital of the Netherlands keeps attracting people. In the current environment in which we live now, the single population will become the largest population group in Amsterdam. This is related to social aspects as families are shrinking in size and couples are divorcing a lot. This target group of single person households has a very large range from young professionals (late 20s) to young seniors (60s).

According to this same report by the Stadsregio Amsterdam, which is part of the municipality, there is a lack of middle class renting apartments. The current housing market in Amsterdam mostly consists of expensive houses (buy) or social housing. This causes a problem as the previously mentioned single population can’t afford to buy a very expensive house and they, the young professionals, earn enough salary so that they can’t qualify for social housing.

So middle class apartments, which are around 650 to 1000 euros/month, are very much in need as they aren’t available in the city center of Amsterdam and because of the constant growing population of singles (and/or couples).

Transforming the institutional buildings of the Binnengasthuis area into single person apartments in the middle class renting-class could both solve the problem of the housing need in the city center of Amsterdam and could be an example for re-use of vacant institutional buildings in the rest of the Netherlands.

This is illustrated in Figure 44 in which the direction of arrows complement each other: the one leaves, the other arrives, which is symbolic for the institutions leaving and the single young professionals arriving.

As the age range of the single person household population is quite large, it is difficult to define an exact housing typology which would fit this. Therefore the apartments should be of average size for a single person (or couple) which varies form 50 to 80 m², depending on the renting price of course. A single floor apartment would best suit this target group as even young seniors, or maybe even older, can remain in the same apartment. This enables great freedom for the inhabitants.

Other important features for housing were analyzed in the previous chapter on the theoretical research and focuses on façade design. Within this research it has become clear that the relation of the house to the street is very important, which can be expressed in an individual front door or a collective entrance, and private outside space in the form of a balcony or loggia. These elements should be taken into consideration for future developments in creating housing in former institutional buildings.

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48) (De roltrap in beweging, Stadsregio Amsterdam, 2012)
49) (De roltrap in beweging, Stadsregio Amsterdam, 2012, p. 32)
CURRENT HOUSING MARKET RELEVANCE

Profile check range:
apartment in city centre - 35 to 55 m2 - max. 1500/month

Longstay (months)

Good location - furnished
1. Singel
   45 m2 - 1500
2. Raamgracht
   40 m2 - 1325

Good location - unfurnished
3. Oudezijds Achterburgwal
   55 m2 - 1250
4. Prinsengracht
   37 m2 - 1295

Less location - unfurnished
5. Nieuwe Achtergracht
   54 m2 - 1500
6. Sint Jacobsdwarsstraat
   45 m2 - 1200

Shortstay (days)

Good location - furnished
7. Zieseniskade
   45m2 - 100/night
8. Herengracht
   35 m2 - 110 - 300/night

1. Furnished
   (source: funda.nl)
2. Furnished (expat)
   (source: expatrentals.com)
3. Unfurnished
   (source: wo.onedetective.nl)
4. Unfurnished
   (source: funda.nl)
Conclusions housing market profile check

The quick scan on apartments within the city centre in the range of 35 - 55 m² up to 1500 euros/month shows that most of those are being rented as unfurnished apartments. This means they are rented for a longer period as people have to move their entire furniture content.

Looking at the apartments analyzed on the previous page, the most expensive ones are due to: a good location (1) or more square meters (5). Furthermore it becomes obvious that it doesn’t matter if the apartment is rented furnished or unfurnished, the only difference is the target group which is attracted by this. This target group consists of professionals looking for a temporary accommodation in Amsterdam or expats coming to Amsterdam, which means both are business related.

As previously mentioned in the relevance of the assignment the largest target group looking for accommodation is that of single professionals which have problems finding this. This is related to their budget range which is too tight for apartments in the city centre of Amsterdam. They should rather search in the outskirts of Amsterdam as this is less expensive and still very easy accessible.

The current apartments located within the city centre are rather luxurious because of their very attractive location and often monumental architecture. Within this current housing market it can be a good solution to create furnished apartments for short and long stay, as those are in minority. This can be very attractive for the previous mentioned target group of professionals and expats.
DESIGN

Creating luxurious serviced apartments suitable for young professionals who are looking for long or short stay accommodation in city centre of Amsterdam
Based on the research outcomes, the former “Vrouwenverband” was the best expression of the monumental architecture of the Binnengasthuis and therefore the biggest challenge to transform this building into an appropriate housing program. The design shows how the architectural tools of enlarging and reducing can be applied on different scale levels.

The new Binnengasthuis Residence contains 18 long stay apartments (months) and 10 short stay apartments (days), of which 6 are combined living-working units with an office space on the ground floor facing the canals of Amsterdam. The long stay apartments are located on the first and second floor and the short stay apartments in the attic which have the profit of having a nice roof structure.

Meant for single young professionals, the luxurious apartments are facilitated with a concierge in the main hall and small storage units for bicycles.

Essential within this design is the dilemma of preserving certain qualities of the LARGE (monumental heritage) and introduce other qualities of the SMALL (comfortable living). The first expresses the formal atmosphere of status while the latter gives the opportunity for a relaxed atmosphere in the inner spaces of the Binnengasthuis.
Program

Ground floor: combined living-working units
(1) stacked, (2) groundbound, (3) collective

First and second floor: long stay apartments
50 m² apartments: 18

Attic floor: short stay apartments
35 m²: 10

TRANSLUCENT WALLS
more daylight + luxurious item
Monumentalize

Front (north) - Formal - Status

Interventions focused on plinth: accentuating openings

negligable on level of volume

Side (west)

Interventions: introducing small divisions

makes volume look bigger
Humanize

Back (south) - Informal - Liveable
Interventions focussed on elements: doors/windows
makes volume look bigger

Side (east)
Interventions: introducing small divisions
makes volume look bigger
Figure 46. Tools to enlarge or reduce on a certain scale level: volume - element - material.

Volume

1. divide
2. stretching

Element

1. 2.
3. contouring

Reduce

Irregularities

5.
4. juxtaposition

6. new size

element

material

detailling

fierce colour
STRATEGY TOOL: VOLUME

Circulation spaces

Enlarge: stretching tool

Main entrance hall with circulating stairs

Spacious corridor
Reduce: dividing tool

Space division inside apartment
STRAEGY TOOL: ELEMENT

Facade fragments
Vertical fragment existing window with climate control
DETAIL
1:20

Horizontal façade fragment of apartment

section 1:20

from left to right:
existing window with additional window frame interior
balcony with seatings as structural support
new window
replacement of element: door with side window
connection glass wall to glass profilit in façade
Connection translucent wall to glass strokes in façade
Hidden rain water drainage inside façade

Glass blocks 190 x 190
Aluminium framework (structure glass blocks)

Isover Sonepanel
Acoustic, thermal, fire resistant
(Gypsum, insulation 50mm - C profiles, insulation 75mm)

Glass Profilit translucent

Rainwater drainage
Masonry façade 320 mm

Steel U-profiles

Steel rectangular profile
Framework seating and support balcony
New interior window in front of existing frame

Wall insulation on interior
Floor fire safety separation
Sunscreen hidden in wall
Aluminium window frame

Existing window frame

Natural stone

Ventilation grill brick format

Climarad Briza Fresh
(Ventilation, heating, cooling)

Isover Sonepanel
Acoustic, thermal, fire resistant
(Gypsum, insulation 50mm, C profiles, insulation 75mm)

Framework support balcony

Climate system with climarad radiators

Sunscreen

Existing window frame wood

Sunscreen 1:5

Climate 1:5

Scale interventions - Toolbox - how to enlarge/reduce

VOLUME ELEMENT MATERIAL

1. divide
2. stretching
3. contouring
4. juxtaposition
5. irregularities
6. new size

Fierce colour

Detail

Elevation 1:20 | Tools: (5) (6)
IMPRESSIONS
MAIN ENTRANCE

Left and right: small storage units for bicycles

Front: office of concierge which controls service in apartment building

Up: circulating stairs which offer a nice view to the existing façades and the interior space
IMPRESSIONS CIRCULATING STAIRS

Left: elevator hidden in glass profil strokes

Front: view to existing façade

Railings with steel frames in repeating size of glass blocks, colour: standgroen (deriving from colour palette in existing windows)
Similar for seatings which are integrated
IMPRESSIONS
CORRIDOR

Left: entrances to apartments

Right: view to existing façade and canals of Amsterdam

Front: Visible beam structure, lighting and similar railing as in stairs
IMPRESSIONS
INTERIOR
APARTMENT

Left: furniture stairs elements in which the inhabitants can store small objects.

Front view open kitchen/living room with mezzanine upstairs.

Railings with steel frames in repeating size of glass blocks, colour: standgroen (deriving from colour palette in existing windows).
IMPRESSIONS
TRANSLUCENT WALL

Right: new element with integrated door, side window, division and skylight

Front: Materialization of translucent wall, with glass blocks set in steel frame, with wooden furniture elements as small cabinets and bookshelves.
IMPRESSIONS
ATTIC APARTMENT

Left: glass profile strokes which hide the additional emergency stairs inside the lightwells

Front: wooden roof of structure
Translucent wall with furniture elements

Interior is designed as studio with kitchen/living and sleeping area (35 m²)
Cut out in glass profili strokes which enclose the lightwells and still allow for enough daylight penetration.

New replacing elements: integrated with door, sidewindow, divisions, skylight.

Balconies with decorative railings and seatings which function as structural element as well.
Left: mezzanine which divides spaces, integrated with same railings as in corridor and balconies

Front: stairs which function as furniture element

Right: new window frame and existing frame which is enlarged by contouring its outline and with the juxtaposition of a new small window
IMPRESSIONS
TRANSLUCENT WALL

Front: Materialization of translucent wall with glass blocks set in steel frame, with wooden furniture elements as small cabinets and bookshelves.

The translucent wall allows for more daylight penetrations and its design is slightly shifted to ensure there is no direct view to the neighbours.
REFLECTION

Impact of strategies and tools applied on monumental building and its values, the chosen program and its consequences
STUDIO - TOPIC

Relation of assignment and subject

Graduation Studio description

The central theme of the studio is housing in historic inner cities. The assignment is to design a housing project within the borders of the UvA Binnenstadscampus, which is known as the Binnengasthuis area which is located in the oldest part of the city centre of Amsterdam. The ‘Kadastrale Minuutplan’ from 1811-1832 shows, that a large part of the site was planned and used for residential purposes.

In what way can the current university property be transformed into housing again? What are the right scale, location, typology, and atmosphere? How to cope with regulations and technological challenges? What is the role of historic growth, authentic materials, former functions and old narratives?


The relationship between the theme of the graduation studio and the chosen subject

Within the framework of the studio Heritage & Housing at the Binnengasthuis area, the approach of the studio was to give each student an individual theme on a specific ‘element of housing’. These topics were related to aspects as the floor plan, the entrance and the façade composition for example. The latter became the starting point of my research and by combining this theme of façade compositions with the studio theme of housing at the Binnengasthuis area, this resulted in the topic of ‘scale differentiations in the façade compositions of the traditional canal houses and the Binnengasthuis buildings’.

In my opinion these canal houses are the symbol of housing in the city centre of Amsterdam, in which the project location of the Binnengasthuis is also located. In order to create a proper housing design within this specific site it was necessary to understand the direct surroundings, which were the traditional Amsterdam canals with their characteristics houses.

Within this theme of scale differentiations in both façade compositions, the research on canal house façades was focused on their change since the 17th century up till now to find out whether this type of façade design was still appropriate and/or still being used for housing today, which is the design assignment within this studio. This can than be applied to the buildings of the Binnengasthuis.
The relationship between research and design

The relationship between research and design is relevant to first briefly define the framework of the research. As mentioned above my research was focused on façade compositions of both the canal houses of Amsterdam as the historical buildings of the Binnengasthuis. What immediately struck me within this topic was their large difference in scale as the canal houses were rather small-scaled and the buildings of the Binnengasthuis area were the complete opposite with their monumental and large-size measurements, see image front page. This scale differentiation was very conflicting in my idea, as housing needed a certain amount of human scale in which one can relate to a building and feel comfortable in it. And it is this specific aspect which is missing in most of the façade compositions of the Binnengasthuis buildings, one can't relate to it as there is no reference and therefore its scale is unreadable. The buildings seem perfectly ‘normal’ as they are well proportioned, but it is when a recognizable reference is placed next to it, that its scale is expressed.

Therefore the aspects of scale, human or standard references and monumental appearance have a major role within my research and design and has resulted in the following research question:

**How can the monumental institutional buildings, which are representative for the Binnengasthuis area, be transformed into affordable* and human-scaled apartments without deteriorating their valuable assets?**  
* affordable in here means a rent of 650 - 1000 euros/month

This question is related to my own goal within this design assignment and is specific for this case at the Binnengasthuis area. In a broader architectural sense, the problem statement on scale differentiations leads to the following question:

**Which architectural tools can be used to enhance or reduce a certain scale?**

Continuing on the content of the research, of both the canal house as the buildings of the Binnengasthuis, I have decomposed the façade elements within the composition into individual aspects to be able to focus on their individual scale and relevance.

The research on the canal house façade composition resulted in an appreciation of the element of the plinth, which nowadays has an open and direct relation to the street; the element of the window and in particular the window divisions which grants the composition a certain scale; and at least the element of the balconies, which became an important feature in current housing designs. Furthermore, the site specific research on the buildings of the Binnengasthuis area focused on...
their monumental character and which aspects defined this monumentality. The outcomes of the research show that their monumentality is achieved through oversized measurements, materiality and significant urban positions, which are all of great value for the architectural appearance of the buildings.

Together with the value assessment on the existing buildings this led to the approach of combining both scales within one design, as they both matter. On the one hand the monumental character is specific and a valuable asset of the Binnengasthuis buildings and on the other hand the human and small scale is needed for a comfortable housing program.

Scale matters on the level of the element
Through research and design the following conclusions can be made, which elaborate on the previous question on what architectural tools to use when enlarging or reducing a certain scale. At first it is important to mention that there are several levels in which this can be applied, namely on the level of the volume, level of the element or level of the materialization. For each level of scale there are different or similar tools to work with these strategies, which is illustrated in Figure 46 on page 86.

In this specific assignment of the Binnengasthuis area, the level of the ‘element’ appeared to be the most significant. This was due to the fact that this level of scale had the best expression of this differentiation between large and small; at this scale level this was best perceptible.

On the level of the volume ‘bigness’ is most important and this can be expressed by recessing or protruding volumes. Another strategy to make a volume look bigger is to insert small elements which function as a reference point inside the large volume and enlarges the scale of the volume. Within this level of scale materials and their measurements are negligible as they aren’t observable. For the materialization level this is the complete opposite as material measurements become very significant because of the close perception.

The level of the element is intermediating between these two and shows both the entity and the detail which results in the best possible expression of scale. Therefore my interventions are focussed on this element level as it illustrates best how to work with these strategies.
Front façade exterior: impact of stretching elements is negligible on level of volume becomes obvious when approaching the building

Back façade exterior: impact of division and new sizes has enlarged the scale of the volume when observing closely the elements are small
Figure 49. Impact back façade and attached volumes and apartments.
Housing program

Through additional research on the current housing market of Amsterdam and its population it became obvious that the biggest population group were single professionals and that there is a lack of renting apartments in the middle class segment, which is 650 - 1000 euros/month. Therefore the aim was to create apartments of approximately 40 - 50 m², which would fit within this range of max. 1000 euros/month (average rent price of 20 euro/m²).

As illustrated in figure 45, the exemplary apartment consists of 50 m² (initially 36) by inserting a mezzanine which provides for additional space for a bedroom. The apartments on the first floor and second floor are quite similar except for the fact that the mezzanine isn’t a full height floor (less than 2,30m) and therefore slightly different.

Suitable for the previously mentioned target group of young professionals are furnished short and long stay apartments, which mean either for a few nights (short) or for a few months (long). As the apartments on the ground floor first and second floor are most comfortable and larger in m² they will function as these long stay apartments. Exceptions to those are the combined living-working apartments. The attic apartments are the smallest ones and therefore suitable for short stay apartments, as they are still very luxurious.

The relationship between the studio’s method and the chosen method

The methodical line of approach of the studio consist of two aspects, namely a theoretical part and a site specific part. The theoretical part of my research focused on the change of the canal house façade composition and the site specific part described all characteristics of the Binnen- gasthuis façades.

Very influential in the design process was the value assessment, which is a significant part of the assignment by understanding the existing buildings and why they are valuable. In each step within the design a reflection on the value assessment was necessary and this helped defining certain choices within the process.
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Research housing market


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