DIALOGUE ABOUT EXPRESSIVE FUNCTION

Combining Solid and Filigree Construction for a Film House in Gothenburg

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Department of Architecture and Civil Engineering

Supervisor: Mikael Ekegren
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CHALMERS
UNIVERSITY OF TECHNOLOGY

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Abstract

It could be said that we live in a societal context where non measurable values in architecture such as form and meaning, more often than the opposite, aren't being paid attention to and even architects themselves have a hard time promoting the importance of it.

It is a well known fact that we project character and in a sense – life, onto the inanimate objects we are surrounded by. We ascribe them meaning, more or less consciously, and hence give value to the things we surround ourselves with. The fact that we spend a great part of our wake time in and around buildings, underpins the importance of these qualitative values in architecture. The aim for the thesis would be to bring up the discourse of meaning and qualitative values in architecture.

The thesis takes as its starting point the pair of basic concepts – stereotomy (solid construction) and tectonics (filigree construction) and how each of them can be not only structural bearers but also bearers of meaning. Historically, the significant factor has at times been prominent in the cavities, voids and spaces encompassed by a solid construction and at times more prominent in the structure itself consisting of physical elements and convexities. This time-tested aspect of the duality of solids vs. cavities, further consolidates its role as a bearer of meaning. Therefore, the thesis question is: *How can mode of construction take part in creating expressive value in a space or a building?*

The method chosen for the study is a research by design approach conducted through iterations in drawings, physical models and visualizations. Studies of built references are used for understanding of pragmatic execution of solid and filigree constructions. As well are literature studies for understanding of theoretical concepts conducted, although prior to execution of the thesis work.

The result is a design proposal for a Film House in central Gothenburg with a program consisting of exhibition spaces, a cinema, dining and office spaces. Because of the programs diverse need for enclosure, it is directly related to the constructional principles of solid construction and filigree construction.

The conclusion of the thesis emphasizes the contrasting of expressions inherent in both the tectonic and the stereotomic principle. Maybe the answer to the research question isn't found in each of them individually but in the interaction between them. That is where the key expressive value in this project is found. Although subjectively evaluated it is believed that our collective experiences and associations make it possible to empathize with characteristics suggested by each constructive principle in the design proposal.

Contents

INTRODUCTION

Student background

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2017-2018	Chalmers University of Technology, Gothenburg M.Sc. Architecture and Urban Design Masters Thesis Preparation Matter, Space, Structure
2016-2017	Felippi Wyssen Architekten, Basel Internship
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2014-2015	Universidad de Guanajuato, Guanajuato Exchange year, 60 ECTS-credit points
2011-2014	Chalmers University of Technology, Gothenburg B.Sc. Architecture
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1991	Born in Stockholm

Thesis background

The subject of this thesis grew from a viewpoint that we as occupiers and observers of spaces and buildings project character and life onto them, we perceive their expressions and hence - ascribe them meaning and value.

Heinrich Wölfflin wrote 'Our bodily organization is the form through which we grasp all physical bodies." - saying: by having a body we understand other physical bodies. (Janson, A: Tigges, F. 2014) We are all familiar with how it feels to stand up, or lie down, to carry a load or being heavy ourselves.

This basic understanding of other physical shapes is called *empathy* and is not exclusive to the people trained within the subject of architecture. (Janson, A: Tigges, F. 2014) The buildings our society constructs, are in best case going to be present in our cities and surroundings for many years to come, we can not just discard them if they talk to us about values we don't relate to or we happen to ascribe them negative values. When built, they make a direct impact in the lives of many people. At the same time, the buildings that last over many years are usually the ones cherished, and valued by many. For buildings to last, they need maintenance and someone to make the effort of taking care of them. In order to increase the value of architecture it is important to discuss architecture itself without making it overly complicated, exclusive or a mere solution to other problems. Thanks to empathy, basic physical expressions call to all and everyone just because of its shape and composition.

This thesis discusses the subject of construction but also how it relates to expression and not only to pragmatic building. Therefore - the pair of basic concepts found in architectural theory and construction: stereotomy/solid constructions and tectonics/filigree construction are the main subject of this thesis. Structural facticities and concepts posses the same physical characteristics that everyone with a body can relate to - saying, they appeal to our collective memory and are regarded as a very basic and archetypal expression, in the thesis. (Janson, A: Tigges, F. 2014)

The concepts of *meaning*, *form* - and how it differs from symbol, *empathy*, *stereotomy* and *tectonics* will be further explained in the theoretical part.

A public building is chosen as program for the design implementation since it is found more relevant to keep this kind of conversation surrounding expression and spacial impact in this kind of building. As there are current plans for constructing a Film House in Gothenburg this is selected as program for the thesis' design proposal.

Aim

The strategy and aim for this thesis is to use both solid construction and filigree construction within one program to gain further insight into their similarities and differences and how these could work together. By working parallel with both of the principles the intention is to make this even more evident than if treated one at a time in different projects or with different programs.

Other goals are:
- To keep a discourse surrounding architectural expression and qualitative values within architecture.
- Showcase a site-specific implementation in a design project.

Research question

The main research question is:
- How can mode of construction take part in the creation of expressive value in a space or a building?

Complementary questions are:
- How can solid and filigree construction answer to varying needs of enclosure?
*- How could a Film House be designed at Pustervikspl*atsen in Gothenburg?

Delimitations

In 2017 a fore-study, (*Filmens Hus - Internationellt center för rörlig bild i Göteborg. Förstudie för Västra Götalandsregionen kulturnämnd och Älvstranden Utveckling AB*, Toll, B. 2017) seeing into the viability of a center for film in Gothenburg, was published. Although, the plans for this type of building in the city are still at an early stage. Therefore, the fore-study is used only as a loose basis for the program of the design proposal proposed in this thesis. The proposal is not to be regarded as an answer to all the needs and intentions formulated in the fore-study but rather as an interpretation of them.

Also worth mentioning are the different ways of addressing a Film House or other exhibition building. There is always a certain question surrounding this type of programs of "What is a Film House?" or "What is an exhibition?" This thesis do not has as its aim to investigate this question, and the program of a Film House is therefore not questioned but a rather conventional approach is used in order to focus the thesis towards its aimed intention.

Method

The method chosen for the study is a research by design approach conducted through iterations in drawings, physical models and visualizations.

Studies of built references are used for understanding of pragmatic execution of solid and filigree constructions. As well are literature studies for understanding of theoretical concepts conducted, although prior to the execution of the thesis work.

Early on in the thesis the site is analyzed by site visits, drawings and physical models. Also done early during the thesis is the defining of the space program which is formed by interpreting the functional needs suggested in the fore study (Toll, B. 2017) for a Film House, commissioned by the Affair of Culture in Gothenburg.

THEORETICAL CONCEPTS

Meaning

Architecture conveys meaning. (Janson, A: Tigges, F. 2014) Period. We are surrounded not only by the physical presence of walls and forms but also with what they signify or express - what they talk to us about. Hence, meaning is interpreted on an individual basis but also, and maybe more importantly, on a collective one. Due to cultural frames and social norms, much of our interpretations are the same as the person standing next to us.

In the theory of architectural meaning, meaning states itself either through signs and symbols , images, references or metaphors or they do it through the immediate expressions due to the expressive character of their form. (Janson. A: Tigges. F 2014) The first way of perceiving meaning needs to be learnt where the latter reaches out to our collective experience - we don't need to decipher them. A symbol however contains meaning outside of its form - its meaning is pre-decided and learnt. This thesis will not treat symbols.

Form

Architectural forms can rarely be described objectively. The language used to describe them often express certain qualities that objectively may not even talk about the physical state of the form. This is called the expressive character of the form. Form also has an expressive function, to highlight and create an impression of a buildings function. (Janson, A: Tigges, F. 2014)

Empathy

Heinrich Wölfflin wrote 'Our bodily organization is the form through which we grasp all physical bodies." - saying: by having a body we understand other physical bodies. (Janson, A: Tigges, F. 2014) Through this empathetic understanding that we posses as beings with bodies, we are able to animate buildings and parts of buildings. Because of their form and materials they talk to us about concepts we are familiar with: how it feels to stand up, or lie down, to carry a load or being heavy ourselves. This phenomena of empathetic expressiveness enables an unconscious projection of human emotions from us. (Frampton. K. 1995) When talking about meaning and in architecture, empathy is a key aspect and it is directly connected to form and material.

Our familiarity with architecture is facilitated when we are offered expression of permanence and substances that is attained through a tectonic conception of architecture, rather than an ephemeral (short-lived; author's note) *appearance.* (Janson, A: Tigges, F. 2014)

Tectonics and filigree construction

A filigree construction is often referred to as an open frame structure; consisting of linear structural members such as columns, beams and rods. It lends primacy to the structure - the masses, volumes and bodily parts of a space. In its pure form, this type of structure do not alone create interior spaces and does not make a separation between inside and outside. For it to work as enclosure, the gaps between structural members needs to be filled in with panels of chosen enclosure. The characteristics of a tectonic structure are lightness, openness, heterogeneity and convex (assembled) shapes. (Rasmussen, S.E. 1959) (Deplazes, A. 2005)

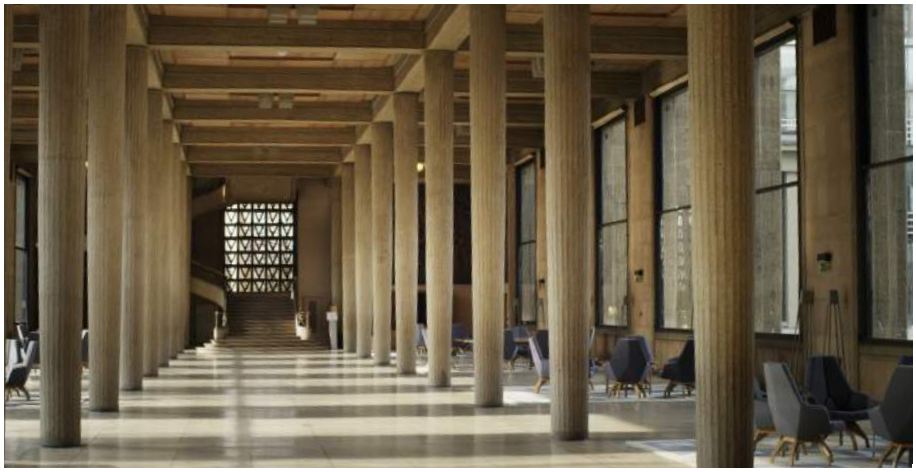


Figure 01. The hypostyle placement of the pillars, the exposure of the structural elements and the differentiation of surfaces and parts contributes to making the Musée National des Travaux Publics by Auguste Perret an apt example of the tectonic expression. (Emigholz, M. 2012)

Stereotomy and solid construction

The primary element of solid construction is the three-dimensional, loadbearing wall. It lends primacy to the enclosed voids of an architectonic space. The distinct separation of interior and exterior and the direct creation of enclosed interior space are two of the main features of this construction type. Often used principles of forming enclosed space by solid construction is by additive cells, subdividing a larger space into smaller cells or by parallel load bearing walls with open-end facades. The characteristics of solid construction are heaviness and compactness, homogeneity and concave (excavated) shapes. (Rasmussen, S.E. 1959) (Deplazes, A. 2005)

Figure 02. The complete absence of volumous elements, employed by Leon Battista Alberti, rather enhances the composition of hollows. The church San Sebastiano in Mantua is a very clear example of a stereotomic approach. (Introini, M. 2012)

Solid construction

Body
made from walls (vertical)
- solid, homogeneous

↓

- plastic, solid bodies

Primacy of the space
- directly enclosed interior space
- distinct separation between interior and exterior

↓

- plan layout concept

Principle of forming enclosed spaces
a) Cells
- additive, starting from the smallest room unit
- divisive, by subdividing a large initial volume (internal subdivision)
b) Walls
- hierarchical, parallel load bearing walls, clear directional structure (open-end facades)
- resolution of the walls: parallel rows of columns

↓

Loadbearing principle
- horizontal: arches; shells (vault, dome); form-active loadbearing structures (stressed skins)
- for long spans: additional strengthening with ribs and downstand beams
- directional systems (truss designs) or non-directional systems (waffle designs)

↓

Openings as wall perforations
- the structural disruption in the wall
- mediation between interior and exterior
- the hole: dependent on the wall-opening proportions

Filigree construction

Body
made from linear members (horizontal and vertical)
- open framework (2D, 3D) reduced to the essentials

↓

Primacy of the structure
- no direct architectural interior space creation
- no separation between interior and exterior

↓

- the construction of the framework dominates: linear members as lattice elements, infill panels

Principle of forming enclosed spaces
Gradual sequence of spaces, from “very open” to “very enclosed” depending of the degree of closure of the infill panels
c) Skeleton construction
- partial closure of horizontal and vertical panels between lattice elements: floor/roof or wall as infill structure
d) Column-and-slab construction
- solid slab as floor/roof construction in reinforced concrete

↓

- walls as infill between columns or user-defined wall developments (not load bearing)

Loadbearing principle
- horizontal beams (primary), possibly more closely spaced transverse members (secondary)
- eccentric nodes; directional hierarchy; layered; primarily timber engineering
- axial nodes; directional and non-directional; primarily structural steelwork

↓

- for long spans: increased structural depth of primary elements
- trusses, plane frames (2D), space frames (3D)

Panel as structurally inherent opening principle
- the structural opening as a variation of the panel between lattice elements
- infill panels: solid; horizontal; vertical
- non-loadbearing curtain wall, horizontal ribbon windows

Comparation of relationship between solid and filigree construction. (Deplazes. A. 2005)

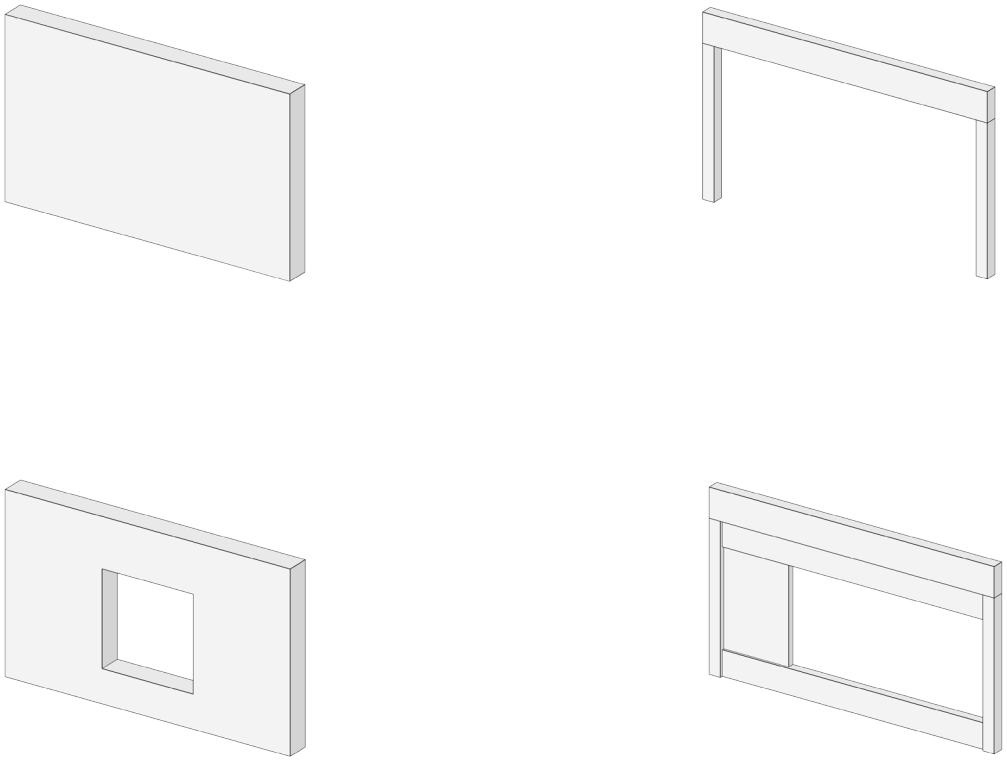


Figure 03. Concept of opening as wall perforation in the solid wall vs. the panel as the inherent opening/enclosing principle between lattices in the filigree construction.

Co-existance

Although basically all constructional systems in architecture can be derived from filigree construction and solid construction there is a difficulty today in making clear definitions. As Andrea Deplazes puts it:

"Today, the array of architectural design forms is less clearly defined than ever before. Everything is feasible, everything is available. From a technical viewpoint at least there seem to be no boundaries anymore. The often new and surprising utilization of high-tech materials and complex system components leads to an ever greater blurring of the original boundaries between construction systems. Solid and filigree construction in their true character have long since been unable to do justice to new demands and new options; composite form prevails." (Deplazes, A. 2005)

Contrasting

Regarding the expressive aspects of the solid and filigree concepts, the theoretical concepts of stereotomy and tectonics are better used to talk about them. During history the concepts have been used both isolated and together in contrast, most often for the architect to achieve a dramatic visual effect and to make a strong impression. When interested in construction only, the use of contrasting serves no purpose. (Rasmussen, S.E. 1959)

"The employment of masses and cavities together in effective contrasts leads to works which lie in one of the peripheries of architecture, close to the art of the theater and at times of sculpture. But they still belong under architecture." (Rasmussen, S.E. 1959)

Figure 04. The entrance to the Faaborg Museum serves as an apt example of the contrasting between masses and cavities. Not shown in the image is also how the volume of the entrance facade protrudes from a concave shaped facade, further enhancing the contrasting. (Wikimedia Commons, 2007)

BUILT REFERENCES

Kunstmuseum Basel

Museum extension, Christ & Gantenbein, Basel, Switzerland. 2016

For the thesis, thoughts of facade handling, plan layout and brick detailing have been extracted.

Organization of exhibition spaces
The extension of the art museum connects subterraneanly to the older building with the permanent exhibition. With the subterranean floor counted, the building offers exhibitions on all four floors, connected by a main staircase. Although the asymmetric outer boundary of the building, the exhibitions are organized in a symmetric fashion as two orthogonal blocks inside the volume. The spaces in between are used for communication and storage.

Facade
The solid brick walls of the facades are built as one homogeneous surface without accentuation of floors or other construction. Instead the gradient of the bricks together with the limitation of windows in the two bottom floors and the LED-lit fries in the top floor, allows for a visual division of the surface. The building expresses a clear stereotomic character with the choice of material, the limitation in exposure of construction and very few apertures.

Figure 05. View of facade (Li Wan Po, D. 2016)

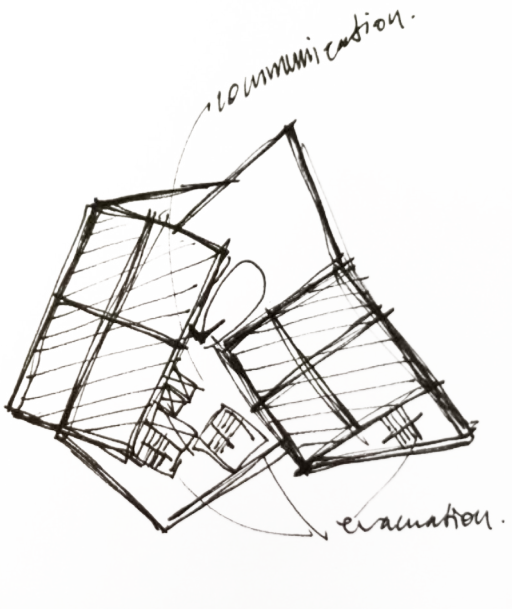


Figure 06. Diagrammatic sketch of configuration of orthogonal exhibition spaces and communications within building envelope.

Centre PasqueArt

Museum extension, Diener Diener, Biel, Switzerland. 1999

For the thesis, the project has been used as an example of combining different expressions and bringing them together in one common dialogue.

Facade

The added closed block containing the contemporary exhibitions, although a bit alien and different to the already existing neoclassical building, maintains a clear conversation with it. For example the height of the volume and the choice of material and color scheme are quite obvious and literal ones, where the height of the windows and the transparent pedestal could be considered interpretations. It is an apt example of a project that brings two different types of expressions together.

Figure 07. View from street showing entrance facade of extension together with the already existing neoclassical building. (Diener Diener. 2000)

Volta School

School building, Miller+Maranta, Basel, Switzerland. 2000

For the thesis, the constructional system with the parallel loadbearing walls and how they can be interrupted and work both in compression and tension have been of great use for basic understanding of the system.

Construction
The mixed use of the school with the large open sports hall in the bottom floor and the smaller room units of the classrooms in the upper floors requires the loads to be transferred. The use of parallel three-dimensional solid walls in combination with concrete floor slabs as the main structural system allows this, entirely without the need for downstand beams. This constitutes a monolithic construction with a characteristic open end facade. In plan it is clearly seen in the four bands of rooms that are created. The ceiling of the sports hall is thus carried from above.

The reinforced concrete walls and floors in combination can be considered as an I-section beam, allowing it to span up to 40 meters. (Deplazes, A. 2005)

Facade
Since the loads from the shear diaphragm walls (internal transversal walls) are transported to the parallel longitudinal walls enclosing the sports hall, this leaves the facade free to behave differently at the bottom floor.

Figure 08. Entrance facade (Miller+Maranta. 2001)

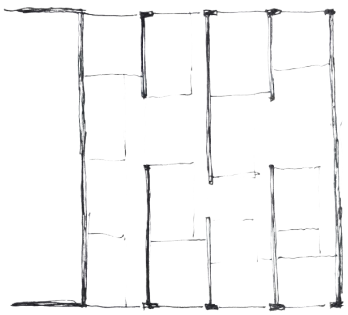


Figure 09. Diagrammatic sketch of regular floor plan showing parallel loadbearing walls.

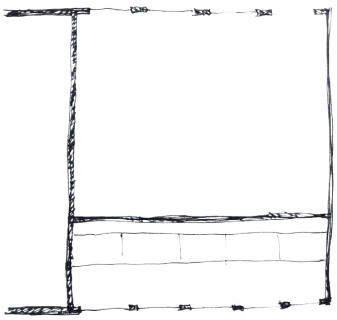


Figure 10. Entrance floor with sports hall

Im Birch
School building, Peter Märkli, Zürich, Switzerland. 2006

For the thesis, the project has been of great use for understanding basic filigree constructional concepts, dimensioning and detailing.

Facade
The load bearing system consists of concrete columns behind a lightweight non structural facade. According to the basic principles of filigree construction, the amount of enclosure depends on the infill between linear members, these alternating between concrete, brick and glass.

Figure 11. Non structural facade showcases different degrees of aperture/enclosure. (Walter. M. 2008)

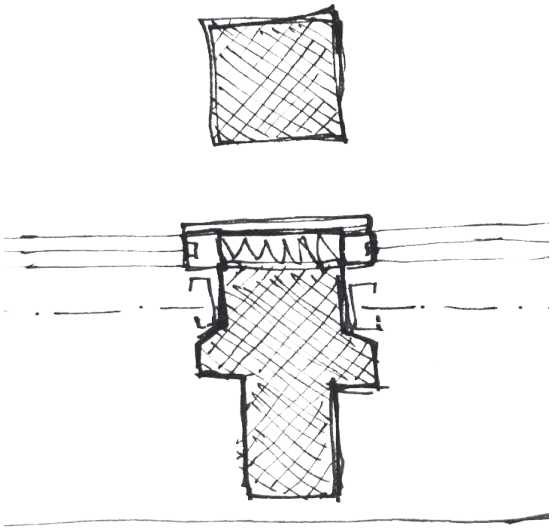


Figure 12. Sketch of detail showing relationship facade system/ loadbearing structure.

Novartis Laboratory Building

Office building, David Chipperfield Architects, Basel, Switzerland. 2010

The project has been studied due to its loadbearing facade system and tectonic appearance. As a contrast to the Im Birch reference that utilizes an internal loadbearing system and a non structural facade.

Facade system

The load bearing facade system consists of pre-casted concrete elements which leaves an open floor plan without any columns but with two concrete cores that give shear stability. By consistently employing the pre-casted facade elements and repeting them, changes can be made in height according to floor height (see top and bottom floor) as well as the change in relief on the recessed bottom floor or the integrated sun-shading.

Figure 13. Entrance facade. (David Chipperfield Architects, 2010)

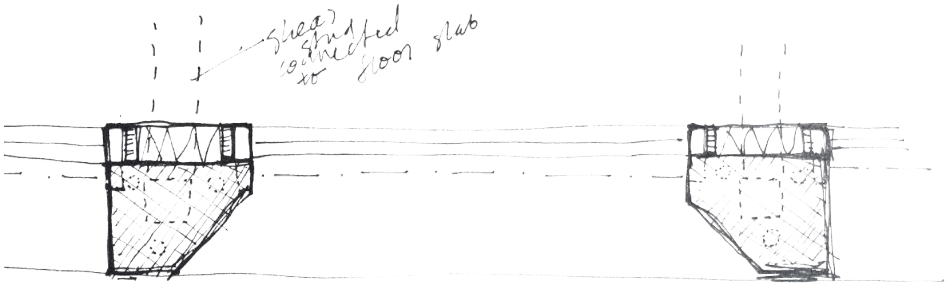


Figure 14. Sketch of detail showing integrated loadbearing structure and facade system.

SITE

Description

The chosen site for the design proposal consist of a plot in central Gothenburg adjacent to the historic moat. Today, the plot is used for car-parking but is part of a bigger exploited area with buildings of different time and style. Next to the site, the north side of the moat, one of Gothenburgs most emblematic buildings are found, the indoor fish market, Fiskekyrka. Also in close proximity is Draken (main venue during Gothenburg International Film Festival), the quarters of historic and touristic Haga, the bar and restaurant friendly neighborhoods around Järntorget, the citys most central green area Kungsparken that is especially well used during the warmer months and also the commercial city center of Gothenburg. In the near future the area called Nya Masthugget is to be exploited and during the last years the area Rosenlund, in direct proximity to the site, has experienced a regeneration. There are far advanced plans from the city of a pedestrian bridge connecting Rosenlund with the yet unexploited parking.

Figure 15. Location in central Gothenburg (Göteborg Stad, 2017)

Figure 16. 1. Järntorget 2. Draken 3. Planned development of Nya Masthugget 4. Fiskekyrka 5. Neighbourhood of Haga 6. Kungsparken 7. Undeveloped parking 8. Location for planned pedestrian bridge 9. Rosenlund (Göteborg stad, 2017)

Figure 17. View of site, seen from Pusterviksbron.

Figure 18. View of site, unexploited parking.

Figure 19. View of site, seen from Fisktorget.

Figure 20. Fiskekyrka on other side of the moat, solid yet neo-gothic character.

Figure 21. Office building on other side of the moat. Employs a filigree construction that is made visible as facade expression.

Analysis

The site of Pustervikspl atsen is placed at what is today a bigger area consisting of parking space. The unexploited parking area is placed on a central location connecting to a lot of attractive neighbourhoods that are all used in different ways. Although, the street of Norra Allégatan just south of the plot divides it from direct connection to the dense urban texture of Haga. On the north side of the plot, more than visual connection is also hindered due to the moat. This leaves the plot with much of open air to the south and to the north. One way of dealing with the plot would be as an open area, simply as an elongation of the green park that borders the moat. Although, when looking at how the green park relates to its surrounding along the moat, the plot of

Figure 22. Relationship between the moat and the surrounding city in central Gothenburg.

Pustervіksplatsen does behave a bit differently. For example, the plot and the park gets narrower to the west which leads to it being more affected from the adjacent traffic on Norra Allégatan. The position of the plot is also less advantageous regarding sun conditions compared to the rest of Kungsparken, where the most used part of the park is the widest one that also gets evening sun from the west.

Hence, the dealing of the plot as a continuation of the urban fabric is seen as a preferred way to border the moat and further define it. This also connects it more to the urban blocks of Pustervik.

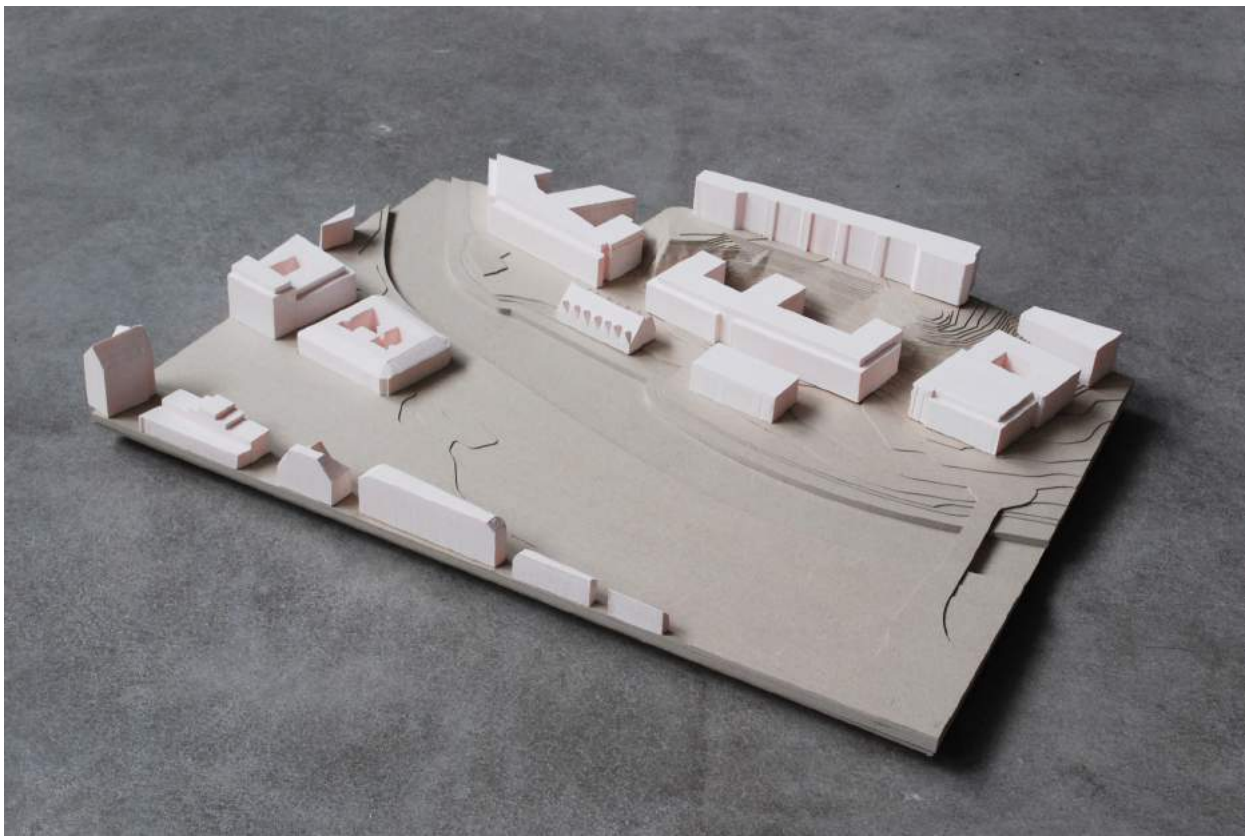


Figure 23. The site as it looks today, clearly showcasing the palpable gap in the urban structure caused by the combination of the old moat, the car-parking and the trafficked street south of the site.

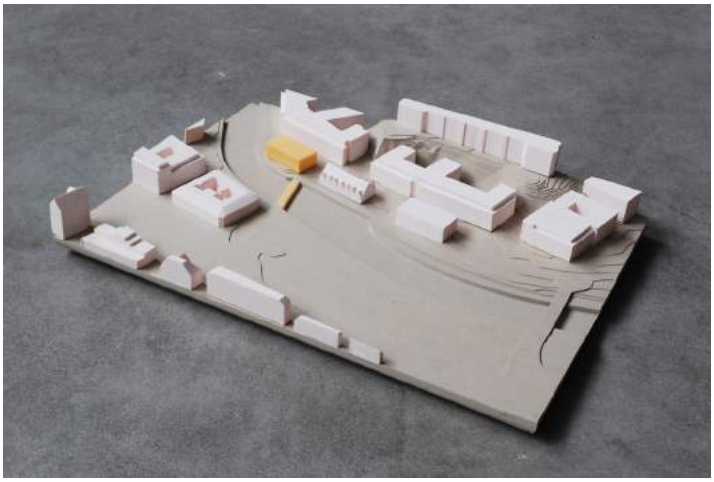


Figure 24. New volume added as pavilion on site next to Fiskekyrka. The site is today used for car-parking but has a advantageous location right next to the moat and possibilities for directing public functions to the sunny south. Although, the volume does not have enough space to house all necessary functions.

An additional pedestrian bridge connects the site to Pustervik and Haga.

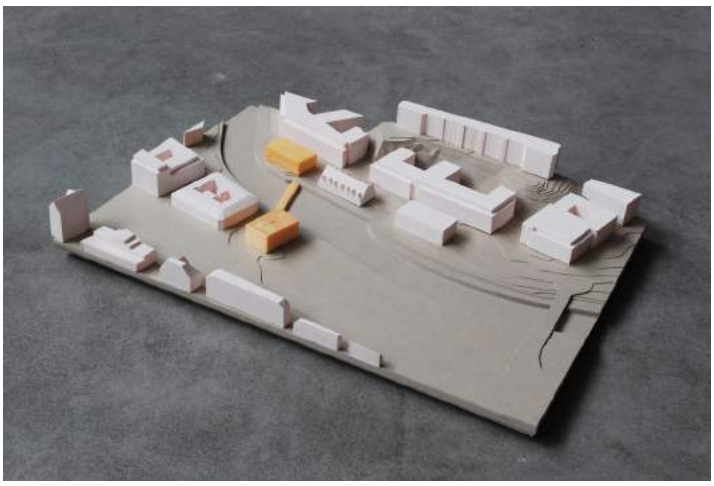


Figure 25. A second volume containing supportive functions such as conference, education and offices is placed south of the initial site. The advantageous placement for public functions on the north of the moat is kept and yet, there is enough space for all functions.

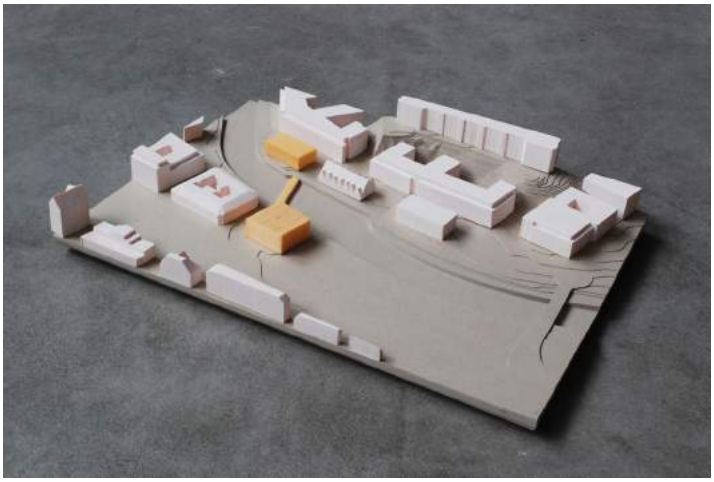


Figure 26. The size of the south volume is adapted to better fit that of a block rather than a freestanding pavilion as is the case north of the moat.

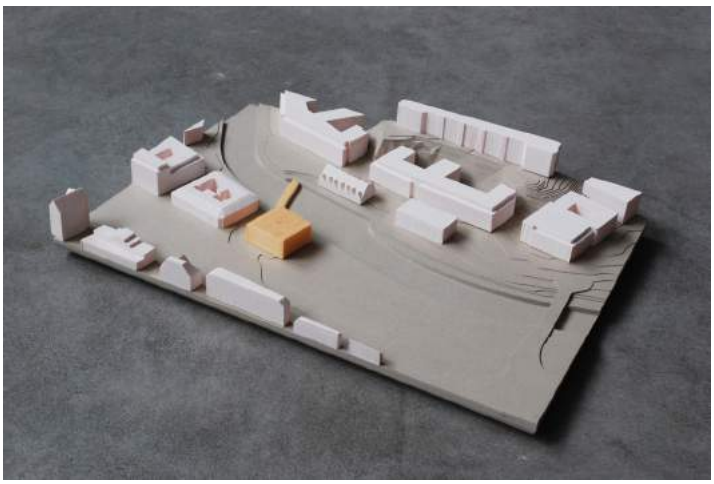


Figure 27. An iteration is made of a volume containing all necessary functions within one building. There are communicative advantages but the placement of the volume as a public building is less clear.

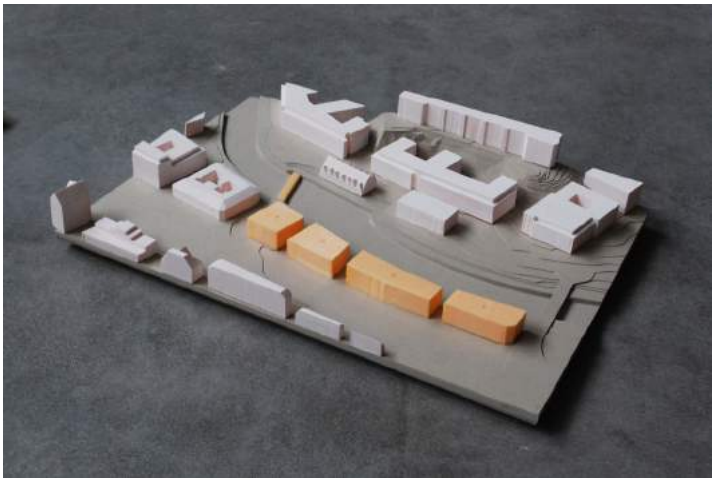


Figure 28. A hypothetical future block structure is added to better understand in which context the Film House could be placed. The volumes of the new blocks are divided by extending the already existing streets and block structure.

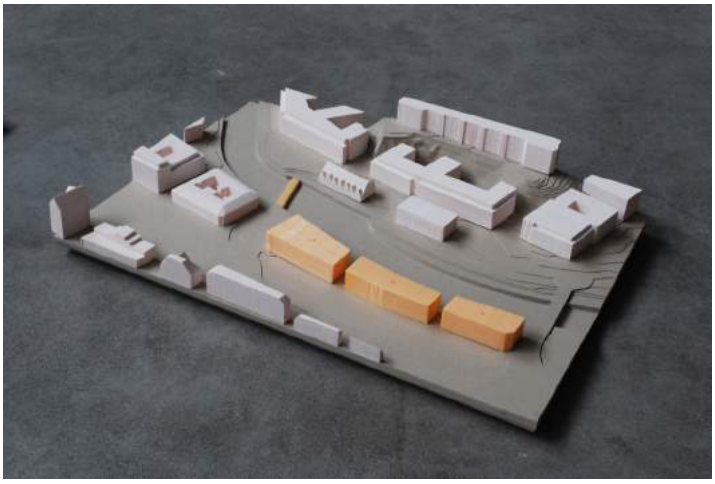


Figure 29. Because of the more small-scaled block structure in front of the chosen site a small square can be placed in front of a building better relating to already existing block structure of Pustervik.

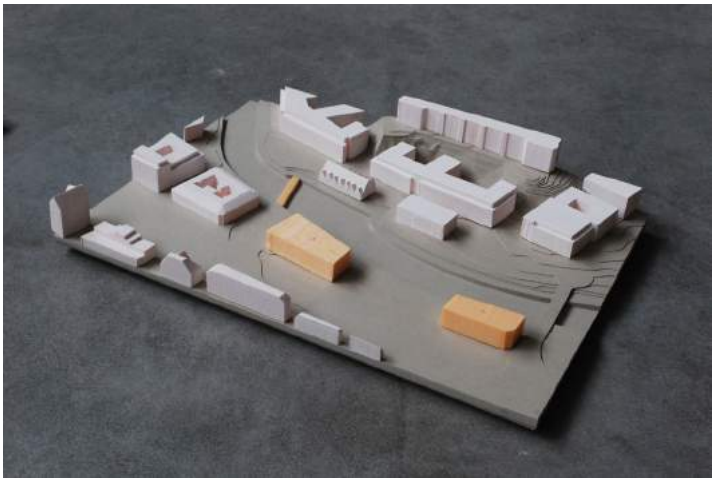


Figure 30. An iteration of the possibility of placing the volume in a less dense block structure making it behave more as a solitaire, placed in an open surrounding.

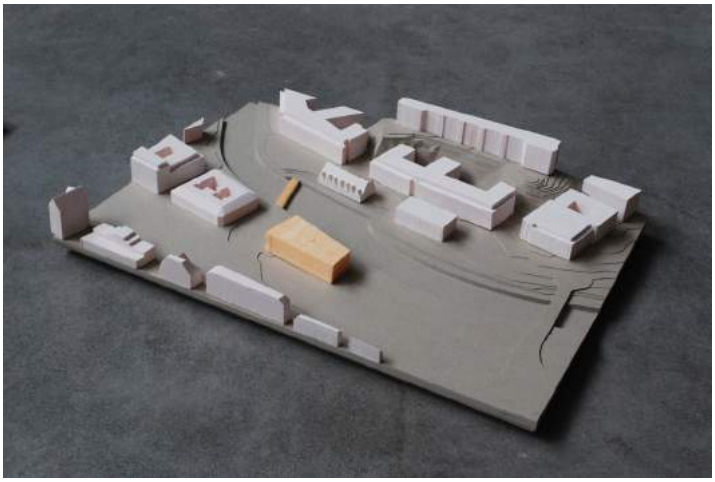


Figure 31. There is even the possibility of placing the volume completely as a solitaire letting the former parking lot convert into an extension of Kungsparken ending in the new Film House.

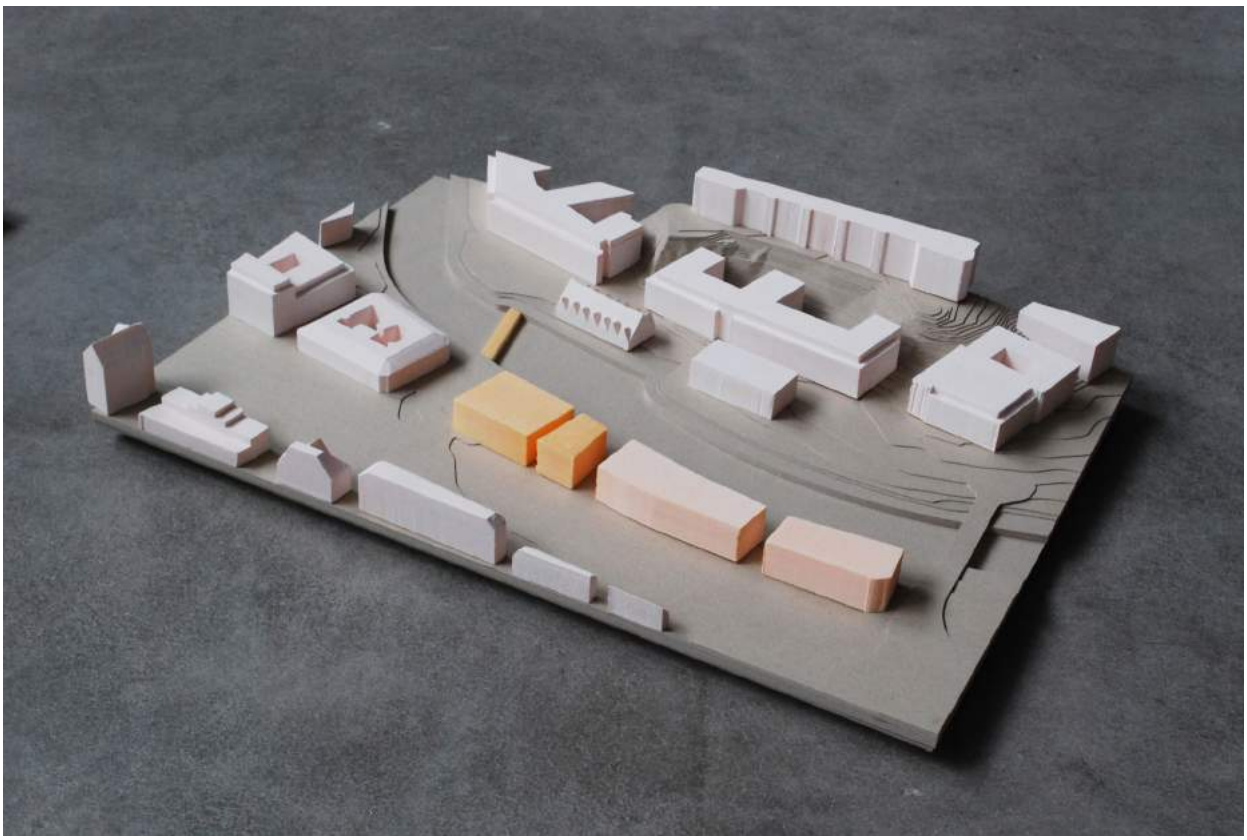


Figure 32. Final iteration with pedestrian bridge, a small square in front of the entrance facade, the Film House divided into two volumes containing functions of different character and need for enclosure. All is placed in a hypothetical future block structure.

Figure 33. The unexploited parking area (marked in grey) is subdivided in accordance with the adjacent streets and surrounding blocks.

Figure 34. Left are three building volumes, a small square (created by adapting the block division to surrounding building block) and a proposed new pedestrian bridge as an elongation of Kaponjärgatan, connecting the two parts of the city.

PROGRAM

Background

Today there is no public visitor center for film in Scandinavia. The closest we come in Sweden is Filmhuset at Gärdet in Stockholm. Filmhuset is home to the state financed Swedish Film Institute who govern Swedish film politics, but the building also holds facilities for screening and shooting. Filmhuset in Stockholm serves mostly as an institution for the film making business and is less used for public activity.

The Film Factory of the geographical area of Gothenburg and Västra Götalandsregionen, serves as a place for film production where about 40 feature films are produced in the region each year. These films are mainly produced by production companies based in Stockholm but the manufacturing of these productions employs about 500 people in the Gothenburg region each year. It's considered the biggest film producing factory in Scandinavia. (Toll, B. 2017)

Also, Gothenburg is the home of the Gothenburg Film Festival that each year showcase about 250 newly produced films from around the world. It's one of the most popular public film festivals in Europe and attracts thousands of visitors each year. Year 2017, 33 000 people where paying members of the festival and the festival sold 130 000 tickets for the screenings. (Toll, B. 2017)

The City of Gothenburg, although its evident position as a cinematic capital in Scandinavia, lacks a venue beyond the cinemas for the film interested public and for the business itself.

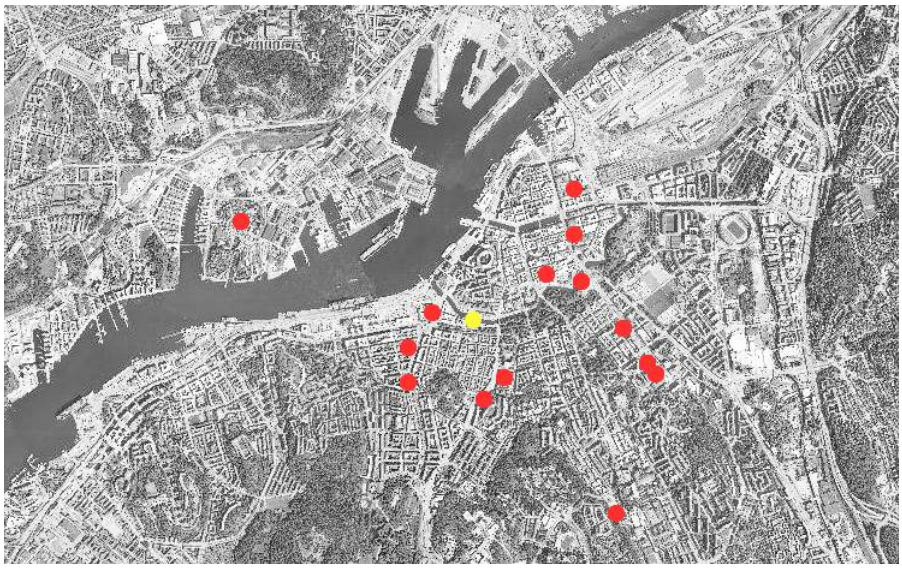


Figure 35. Venues during Gothenburg Film Festival. (Göteborg stad, 2017)

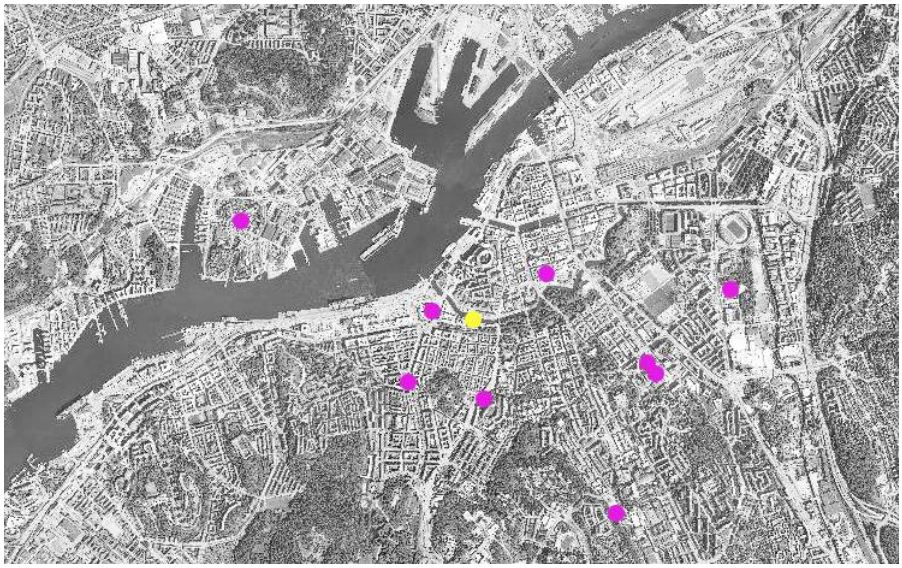


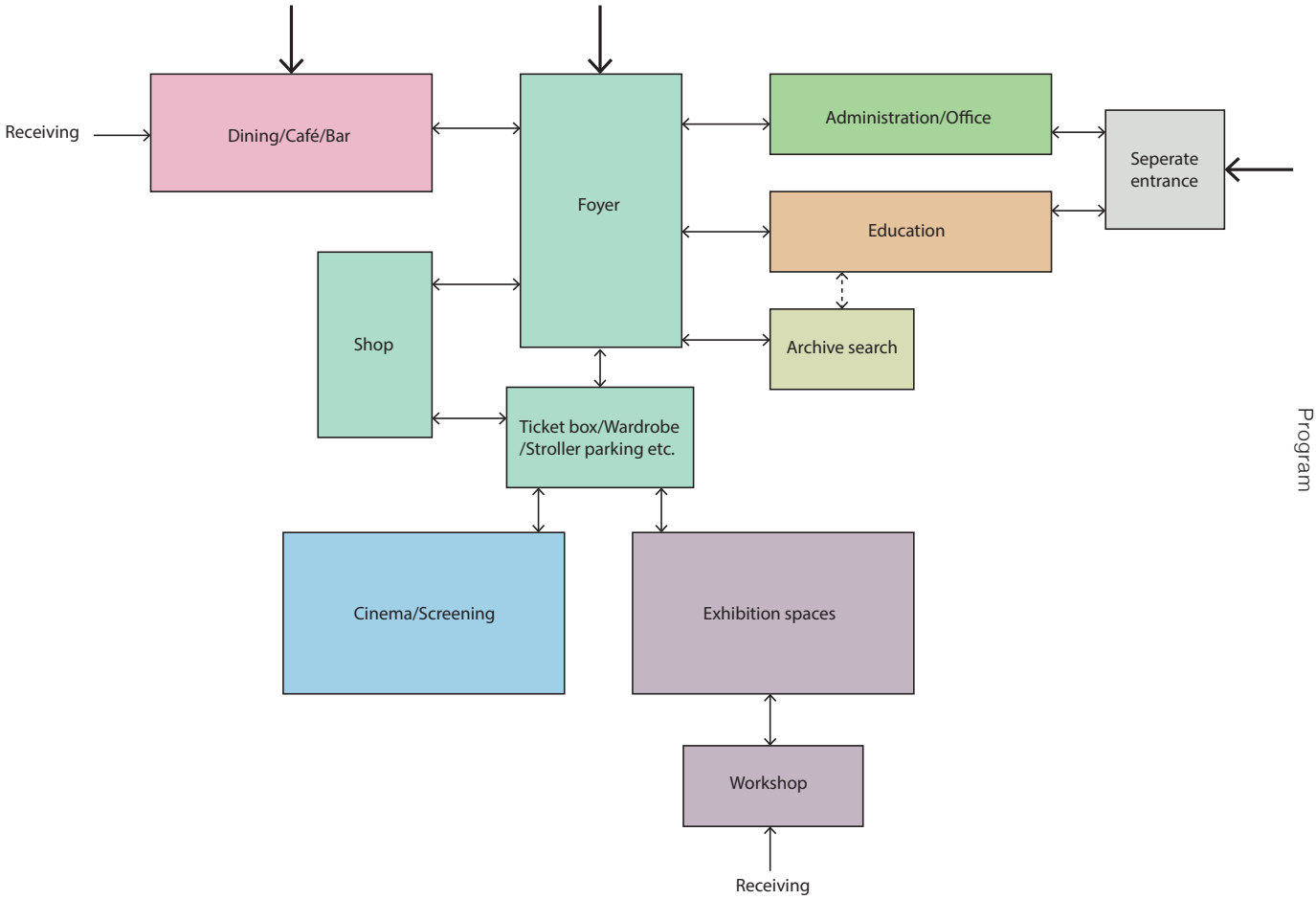
Figure 36. Cinemas in central Gothenburg. (Göteborg stad, 2017)

Figure 37. Museums in central Gothenburg. (Göteborg stad, 2017)

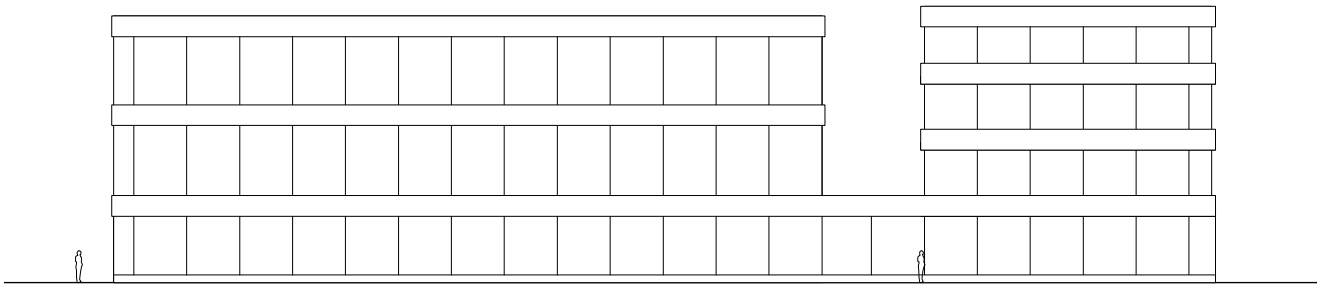
Specification

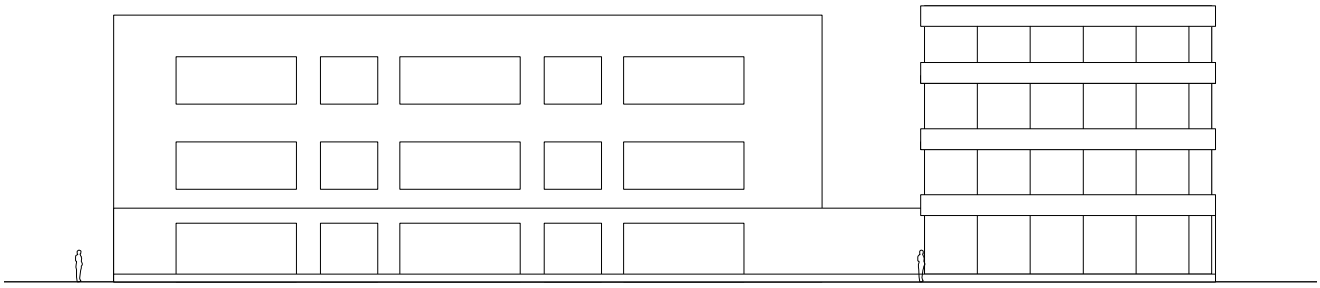
Assigned areas				
	Total Sq. M	Sq. m	Percentage	Notes
Exhibition	880			
Exhibition spaces		800		Partly need for daylight
Workshop		60		Basement. Elevator
Receiving		20		Access to elevator.
Lobby	270			
Foyer		140		Daylight
Shop		40		
Stock room+office		30		
Wardrobe		20		
Desk		20		
Stroller parking		20		
Dining	255			
Restaurant/Bar/Café		120		Daylight
Kitchen		60		
Receiving		20		
Garbage room		20		
Storage		15		
Office/Lockerroom/Toilets		20		
Offices	802			
Administration offices		420		Daylight
IT/serverroom		60		
Copy		6		
Quiet Rooms		20		
Group room		40		
Storage		60		
Break room & lounge		80		Daylight
Lockerroom		30		
Conference		80		Daylight
Resting room		6		
Archive	150			
Study room		60		Daylight
Helpdesk		30		
Searching		60		
Screening	490			
Cinema		250		Closed off from Daylight
Studio		200		Can have daylight. Furnishable
Machine Room		20		No daylight
Storage		20		No daylight
Learning	450			
Seminar rooms		100		
Studio for screening		100		
Workshops		150		
Group rooms		100		
Maintenance	300			
Ventilation		200		Basement
Electrical		30		Basement
Heating		70		Basement
Total	3597	3597		

Space configuration

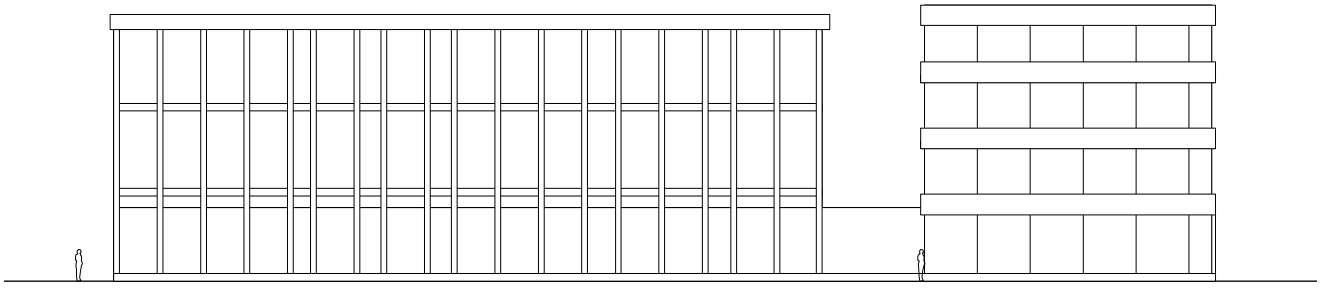


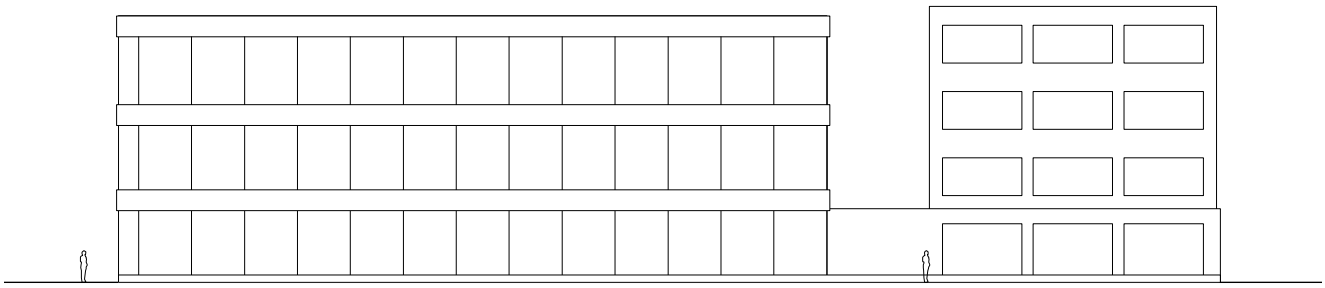
FACADE STUDIES

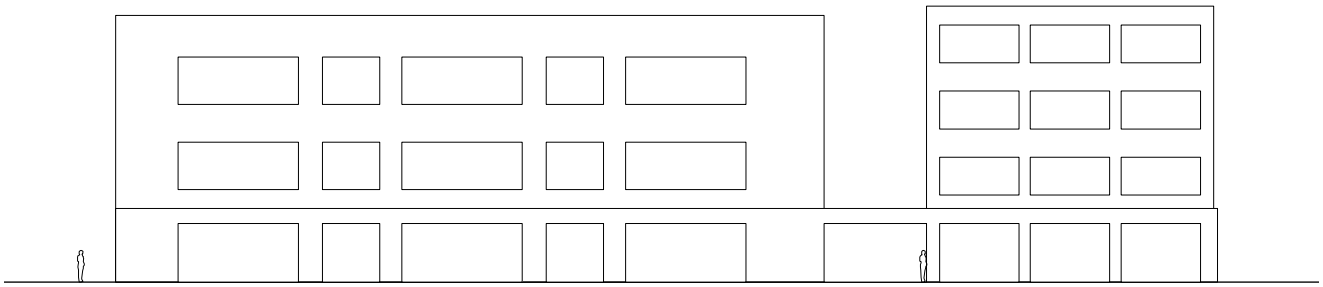


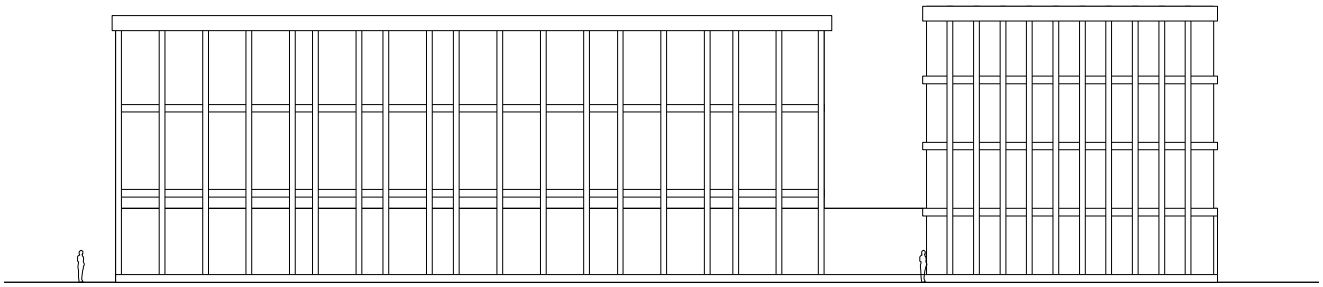


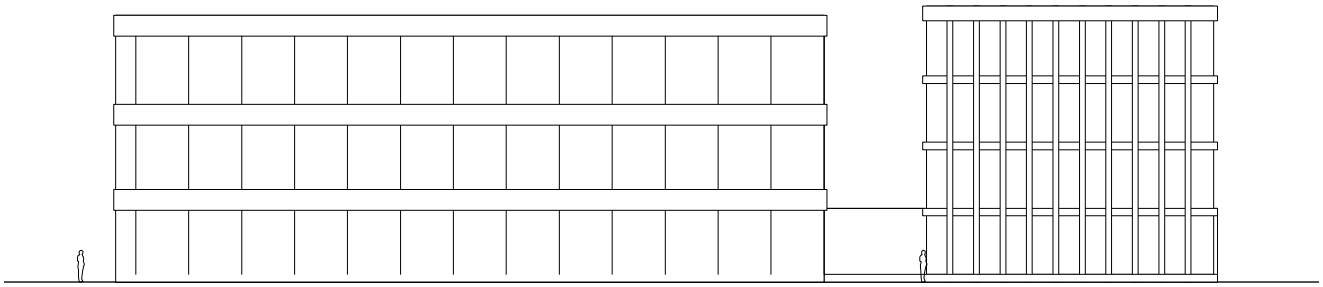
Facade studies

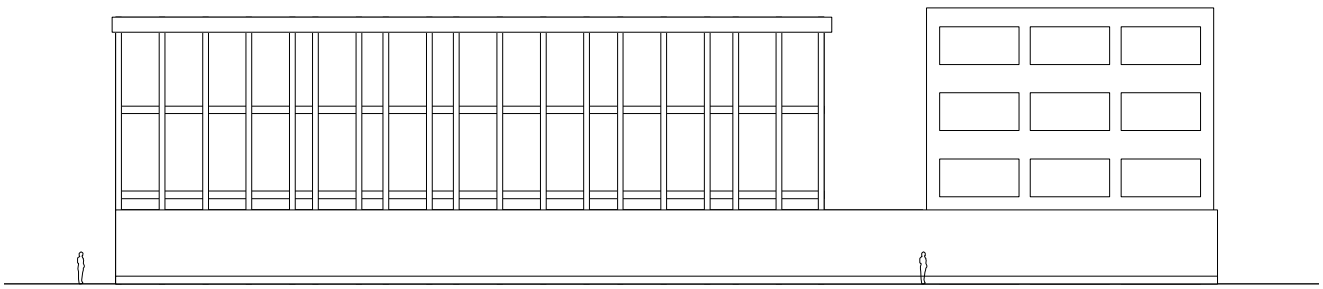


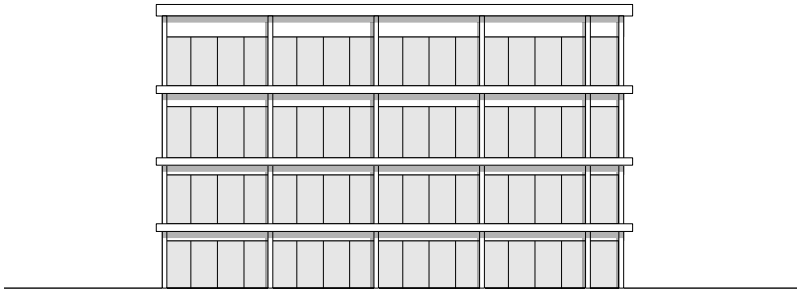


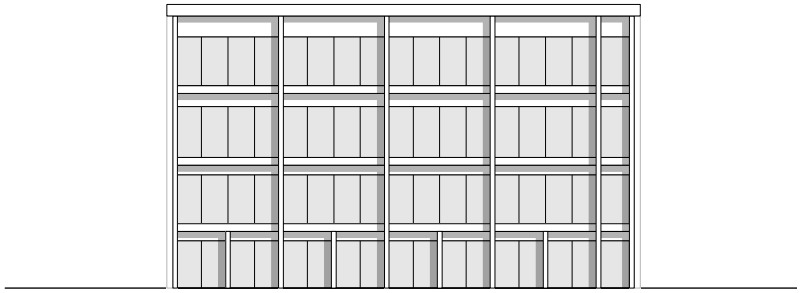


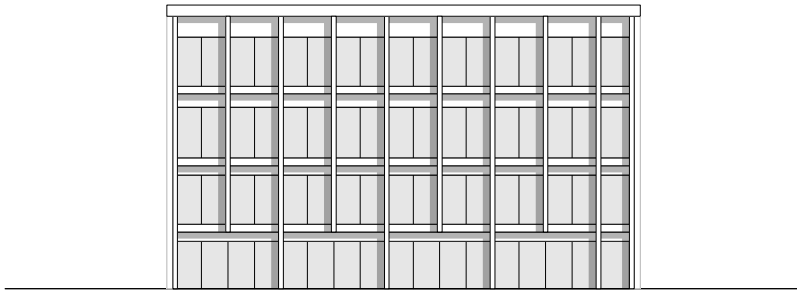


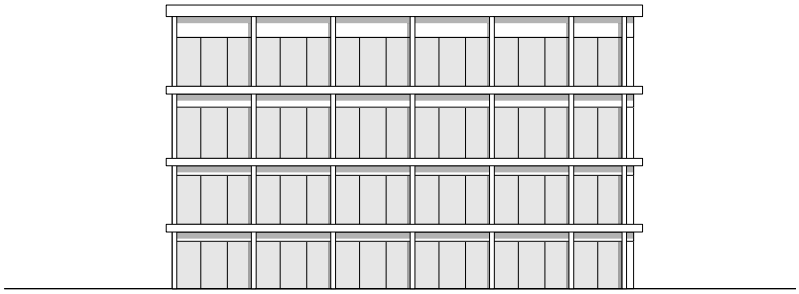


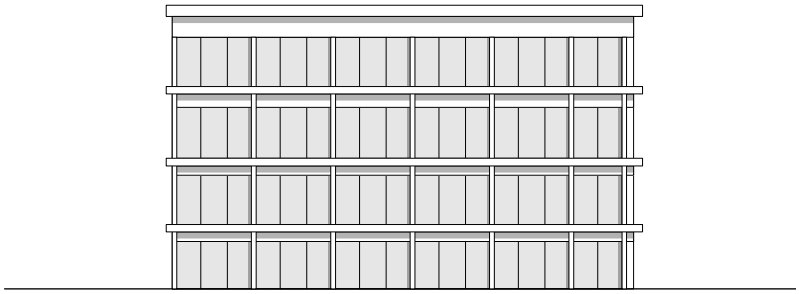


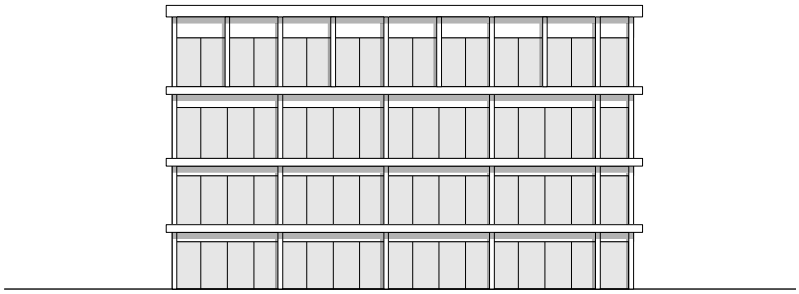


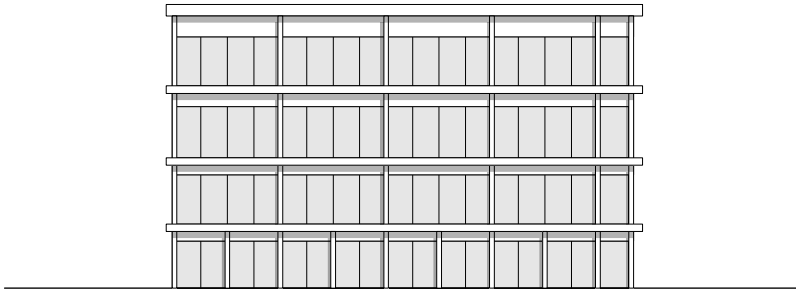












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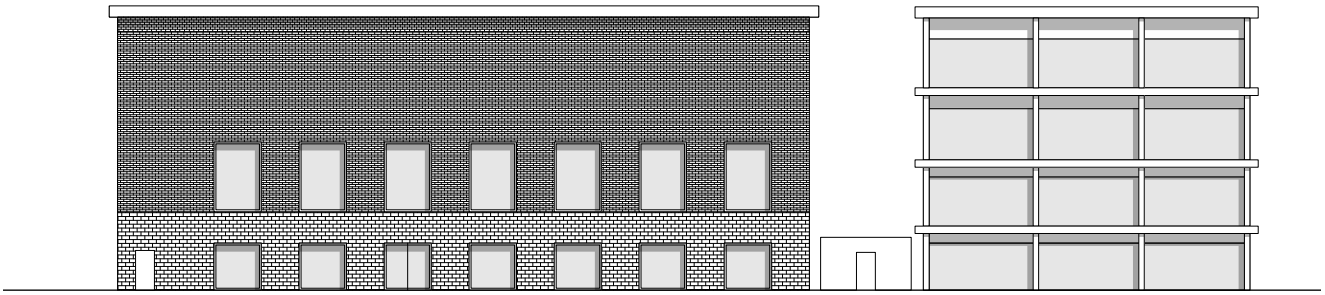
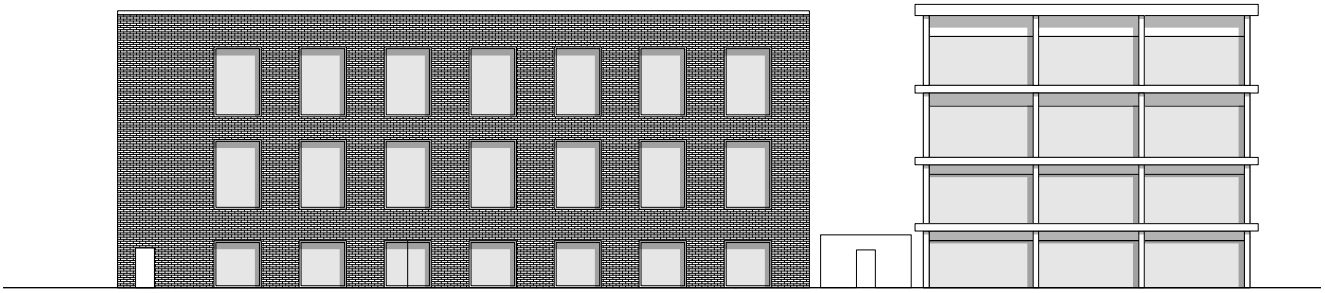
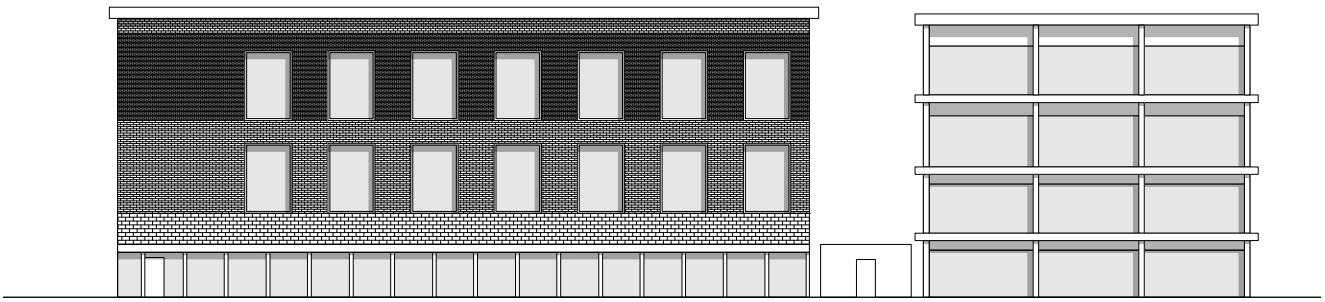
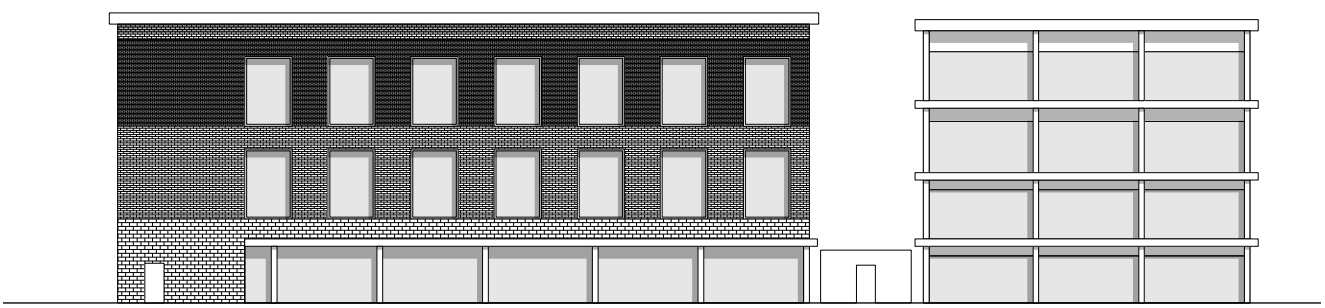
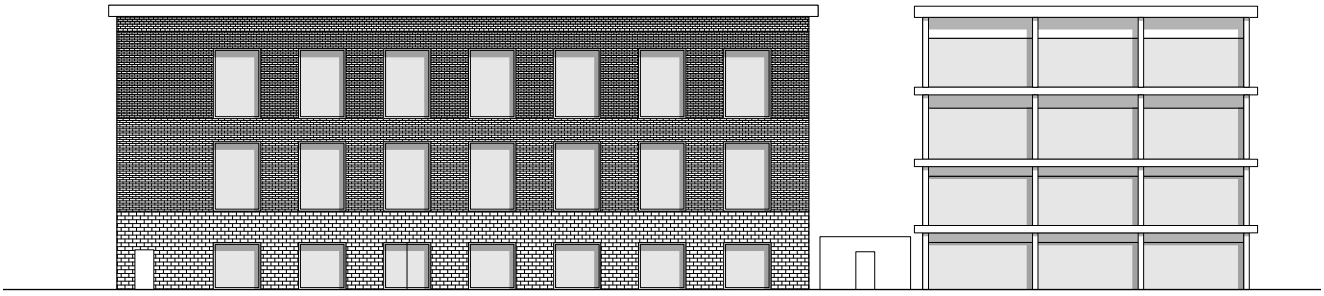
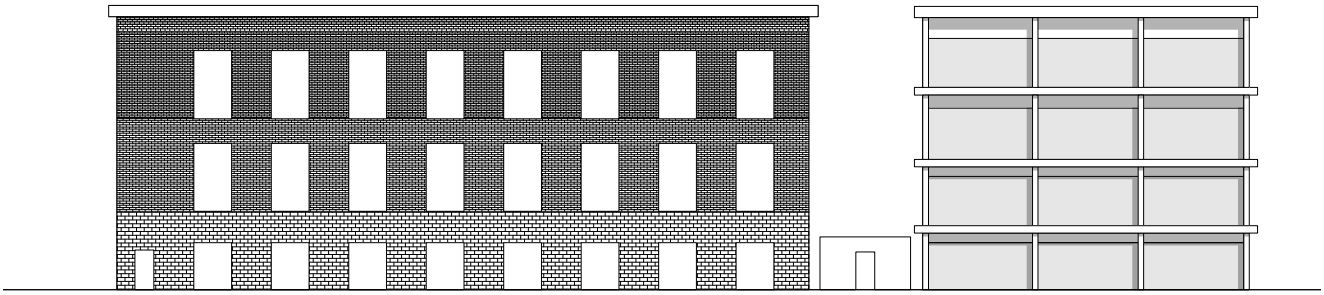


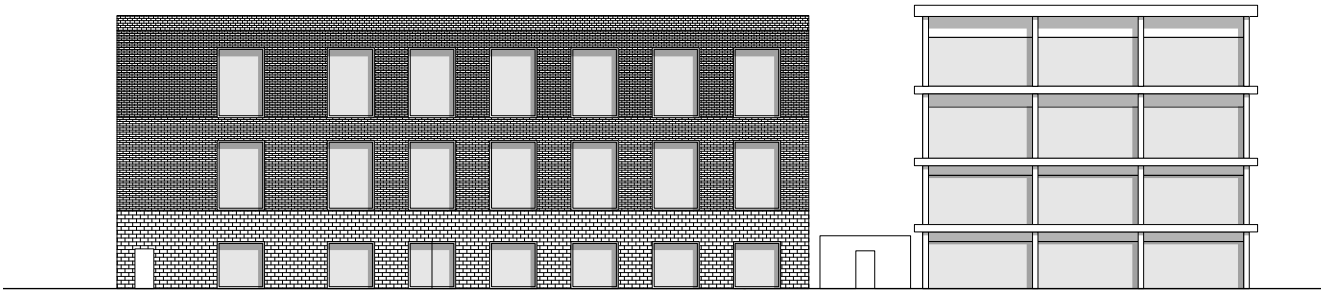


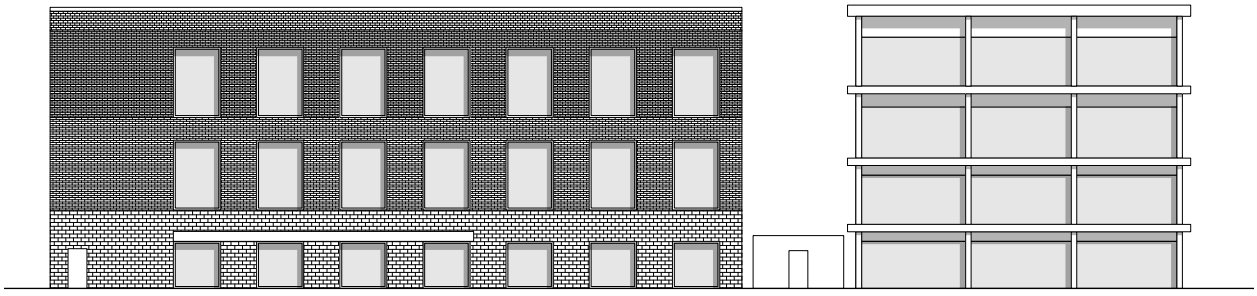




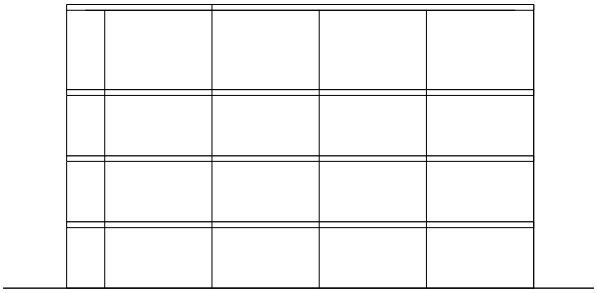


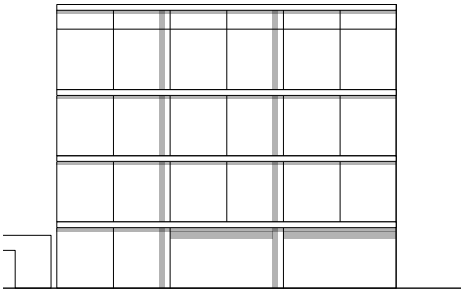


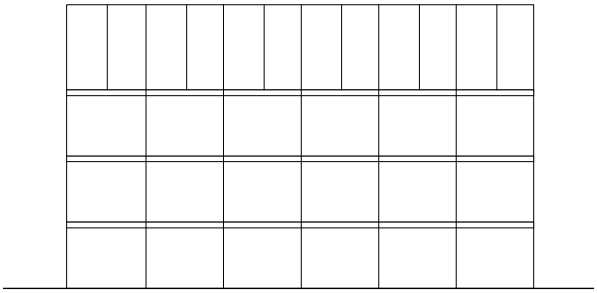


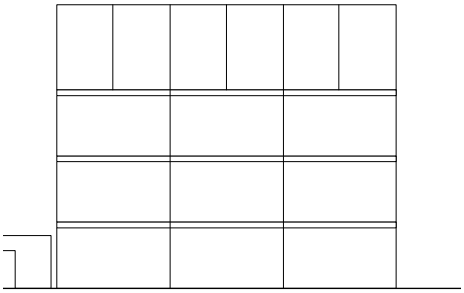


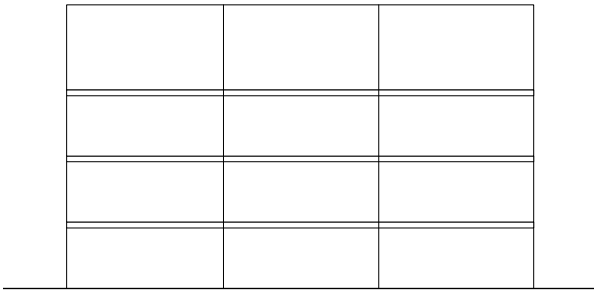
Facade studies

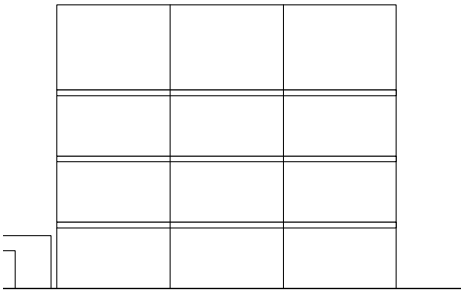


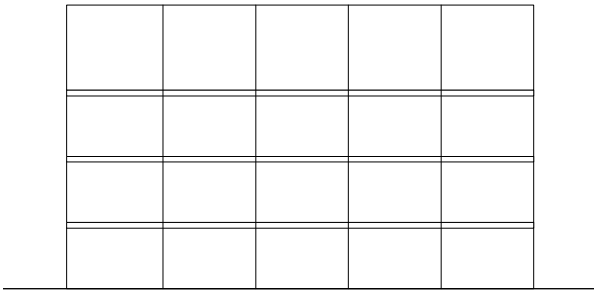


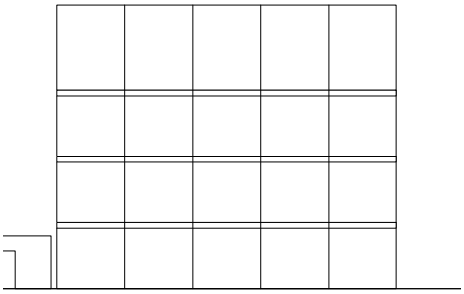


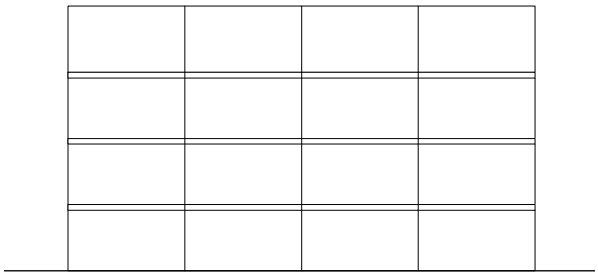


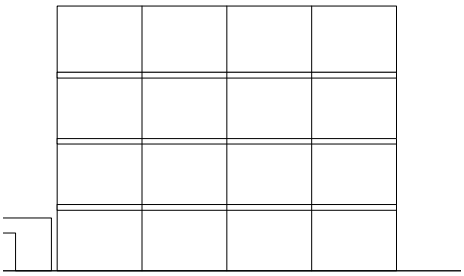


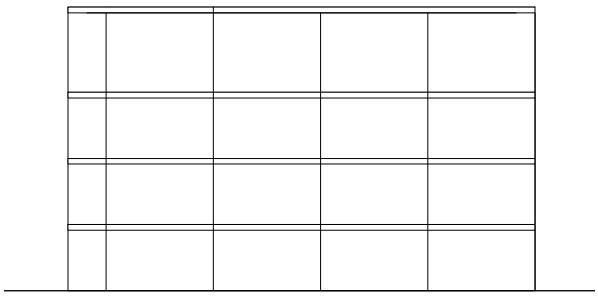


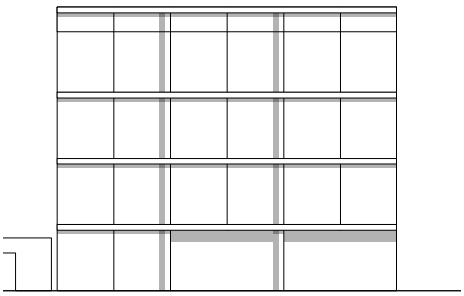


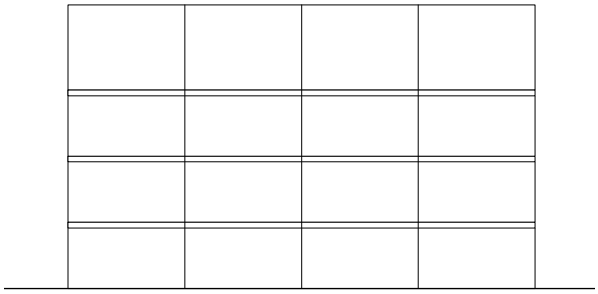


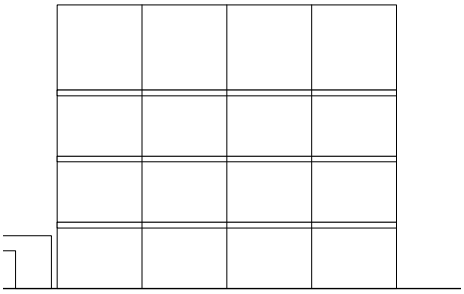


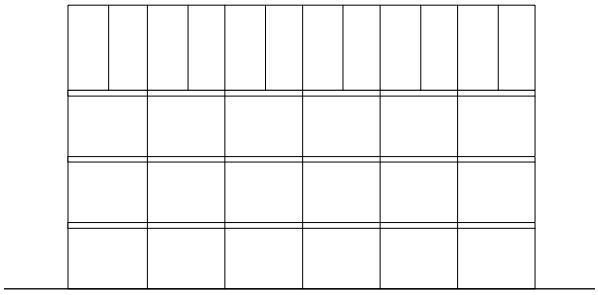


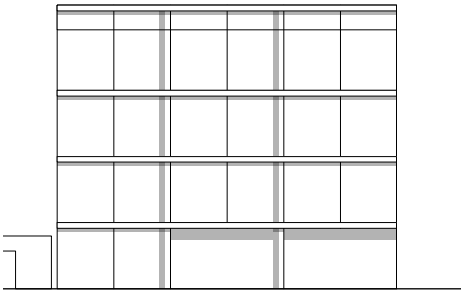




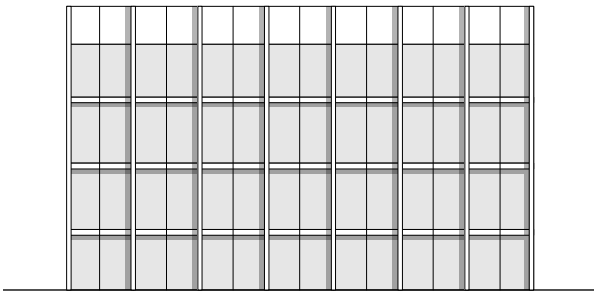


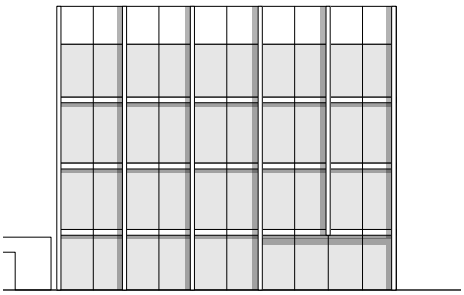


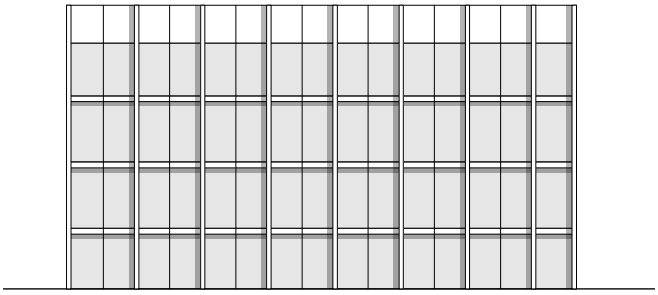


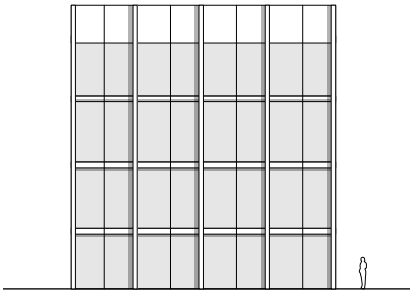


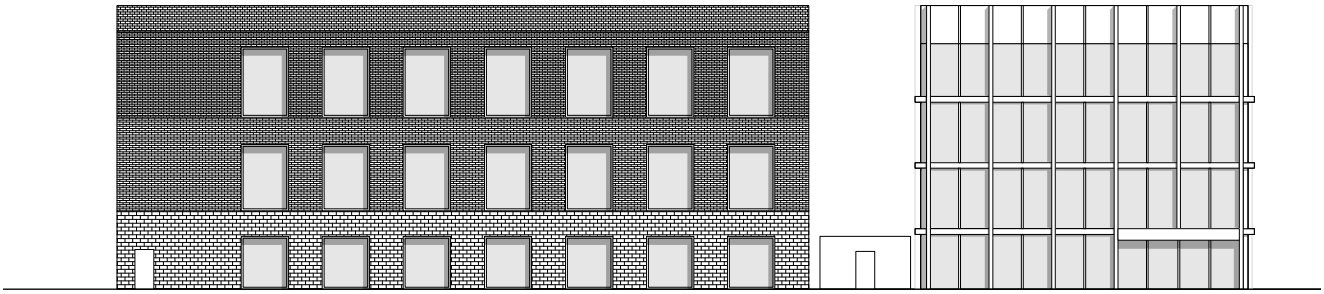
Facade studies

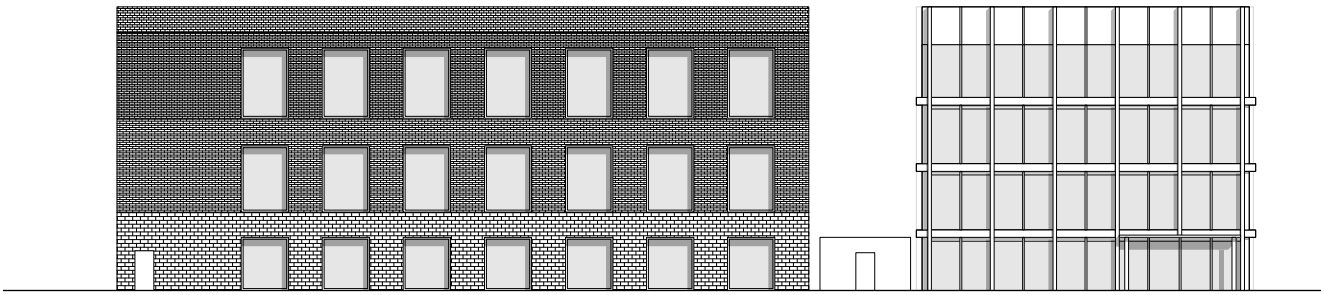




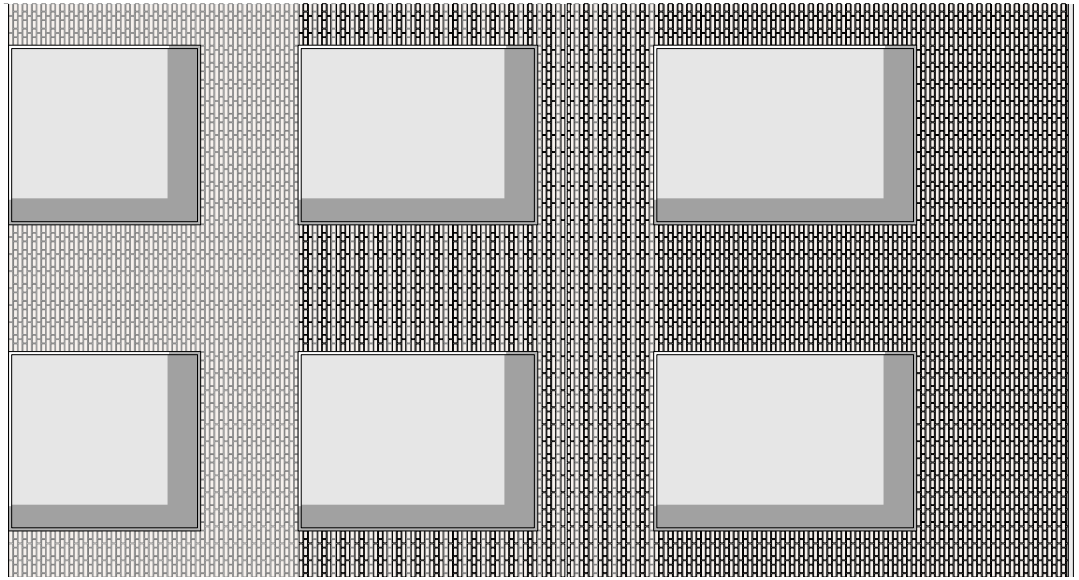


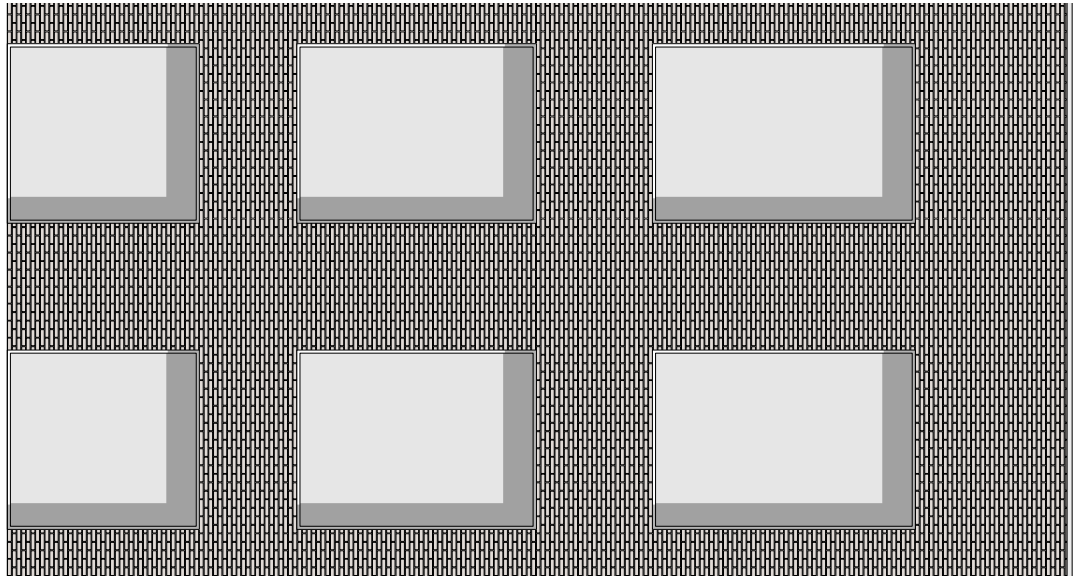


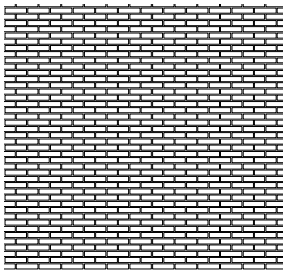




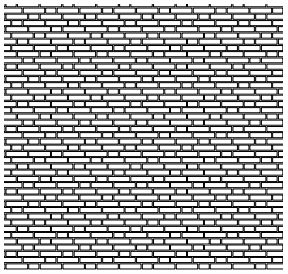
Facade studies



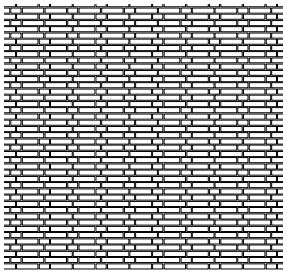




Stretcher bond



Monk bond 10 courses



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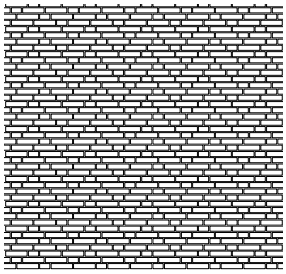

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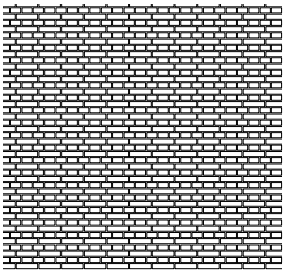
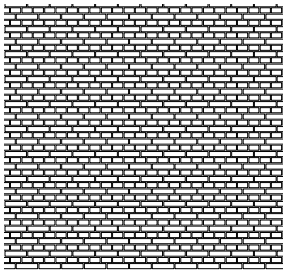
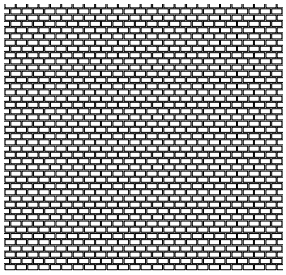


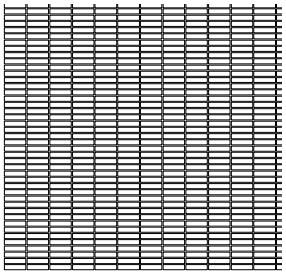
English bond



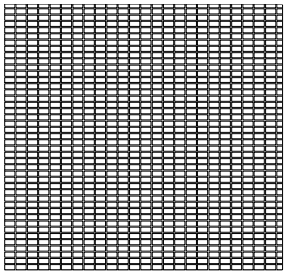
English cross bond



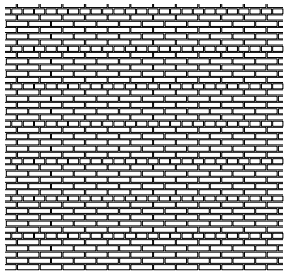
Header bond



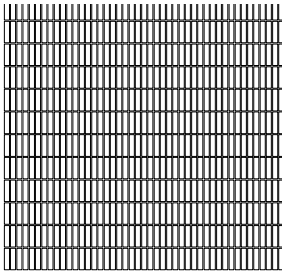
Stock bond stretchers



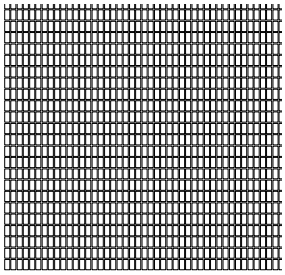
Stock bond headers



American bond



Stock bond soldiers



Stock bond rowlock

MODELS

Figure 38. Initial site model for analysis 1:1000

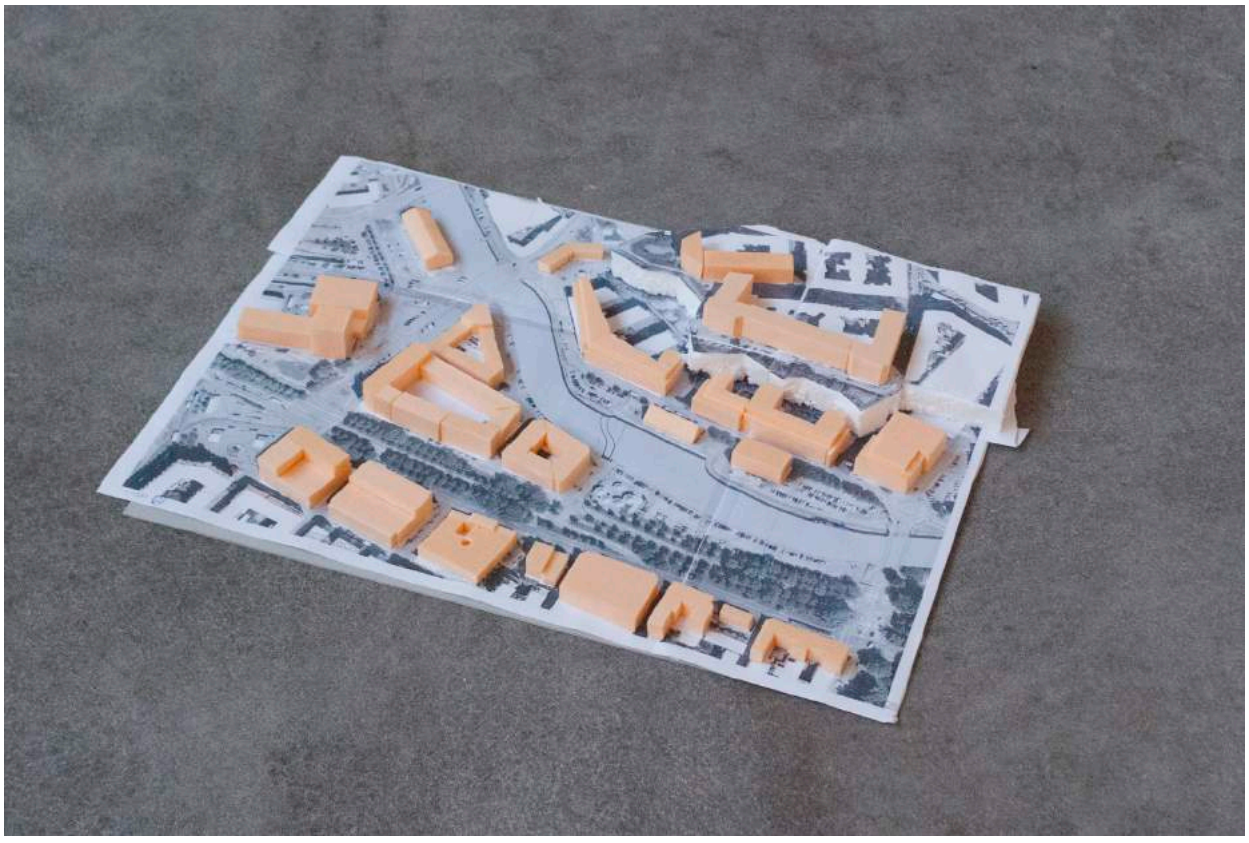


Figure 39. Initial site model for analysis 1:1000

Figure 40. Final seminar site model 1:500

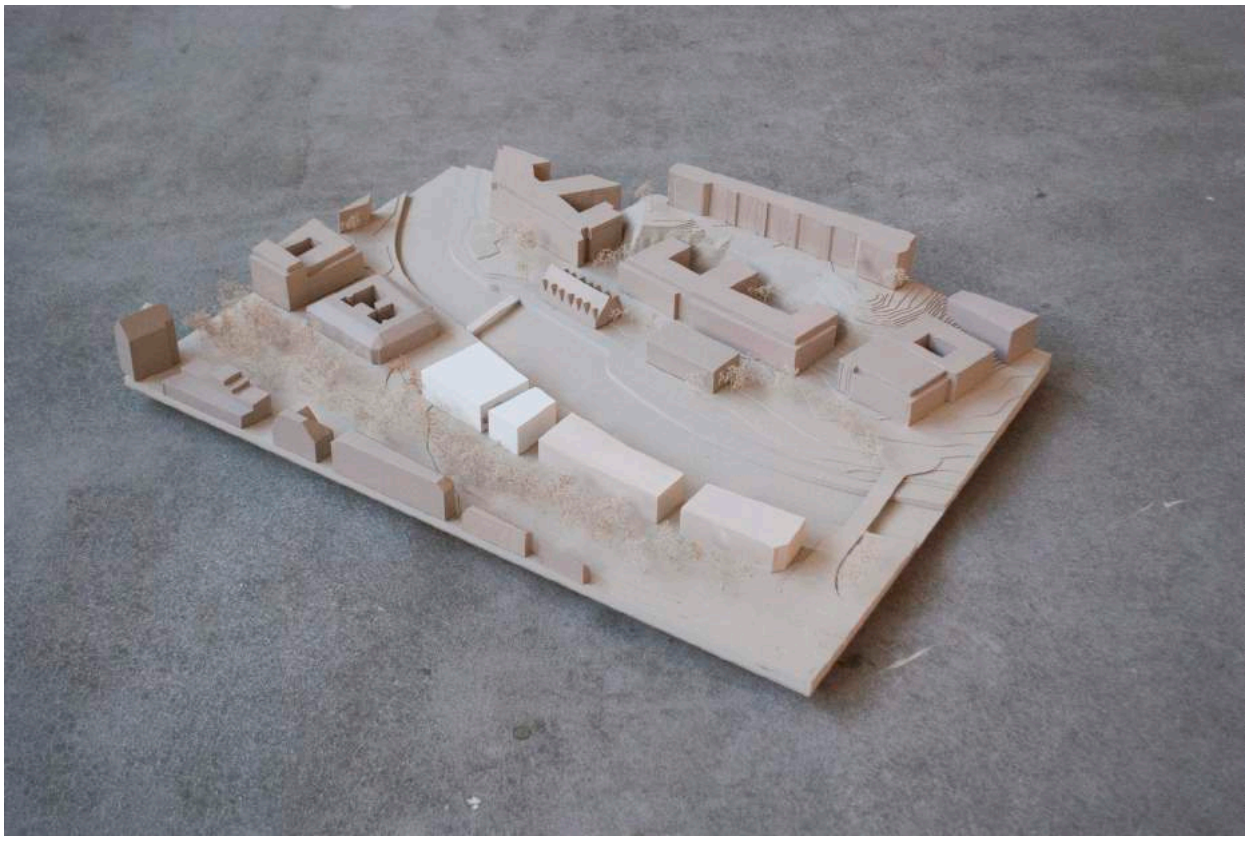


Figure 41. Final seminar site model 1:500

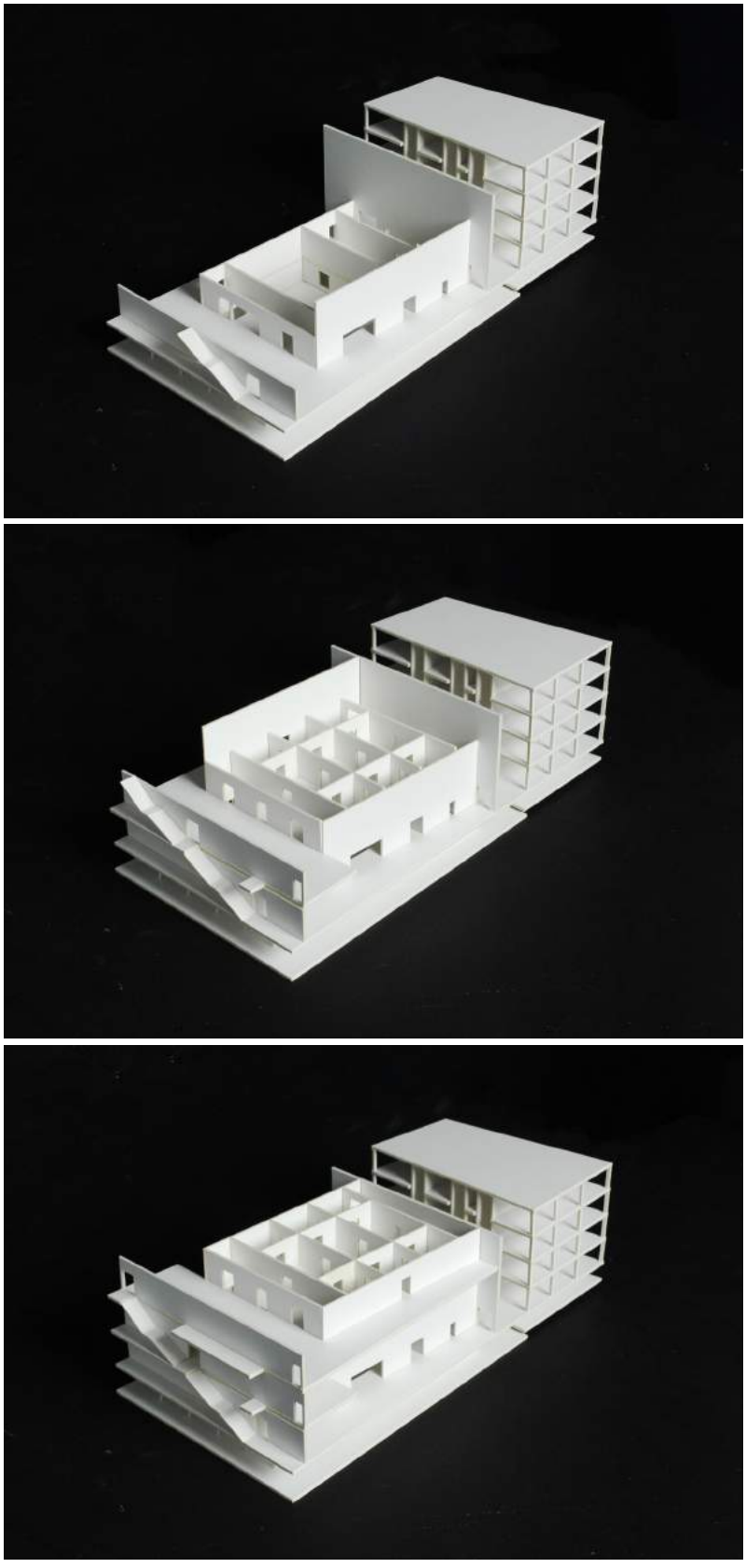


Figure 42. Mid seminar structure model 1:200

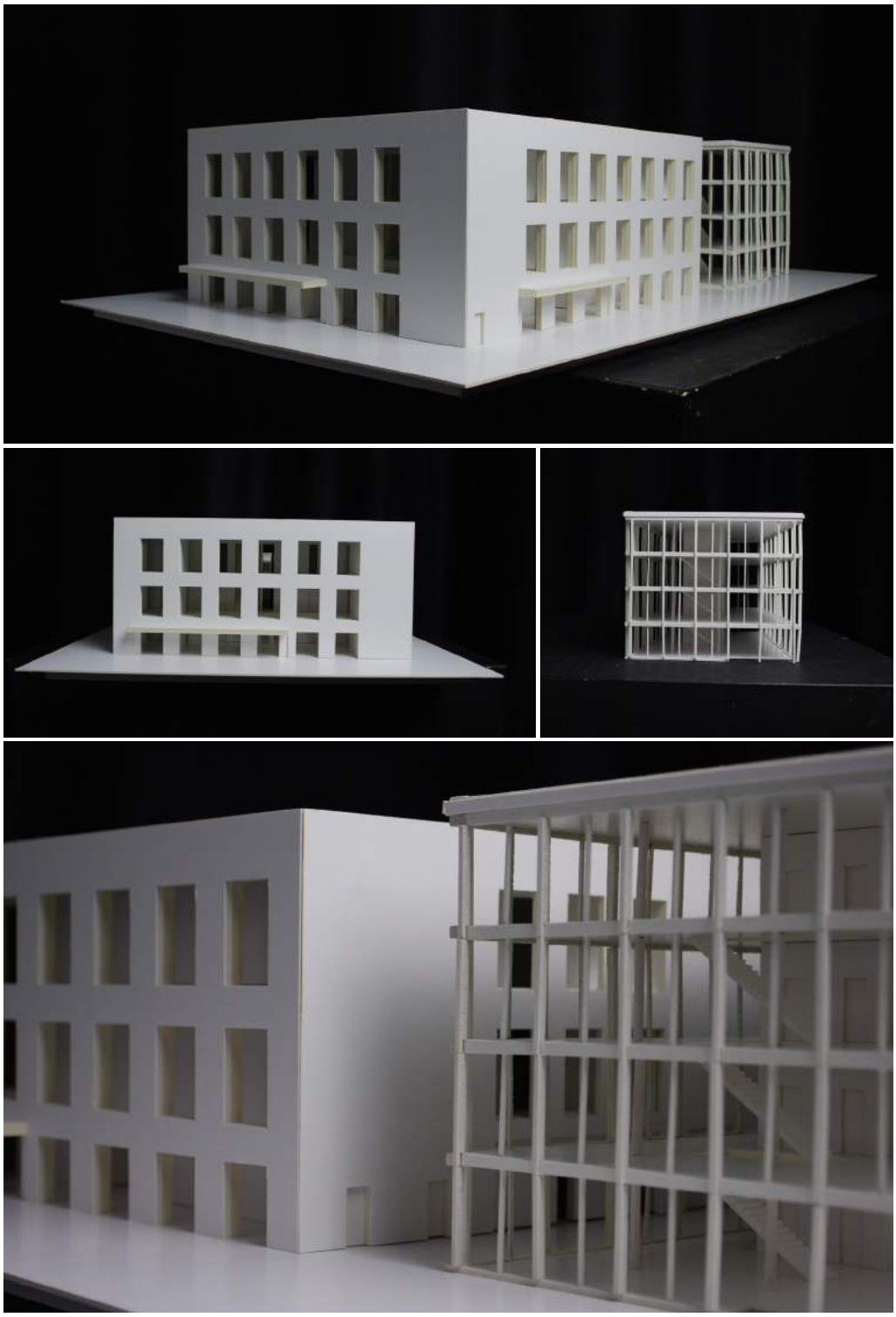


Figure 43. Final seminar building model 1:100

DRAWINGS

It became clear that the different parts of the program would be more or less suited for the different structural principles. For example, the cinema-theater and the exhibition spaces would benefit from a distinct enclosed space without distractions from either internal structure or from the outside. Office spaces on the other hand could benefit from a system of repetition that is often combined with filigree construction.

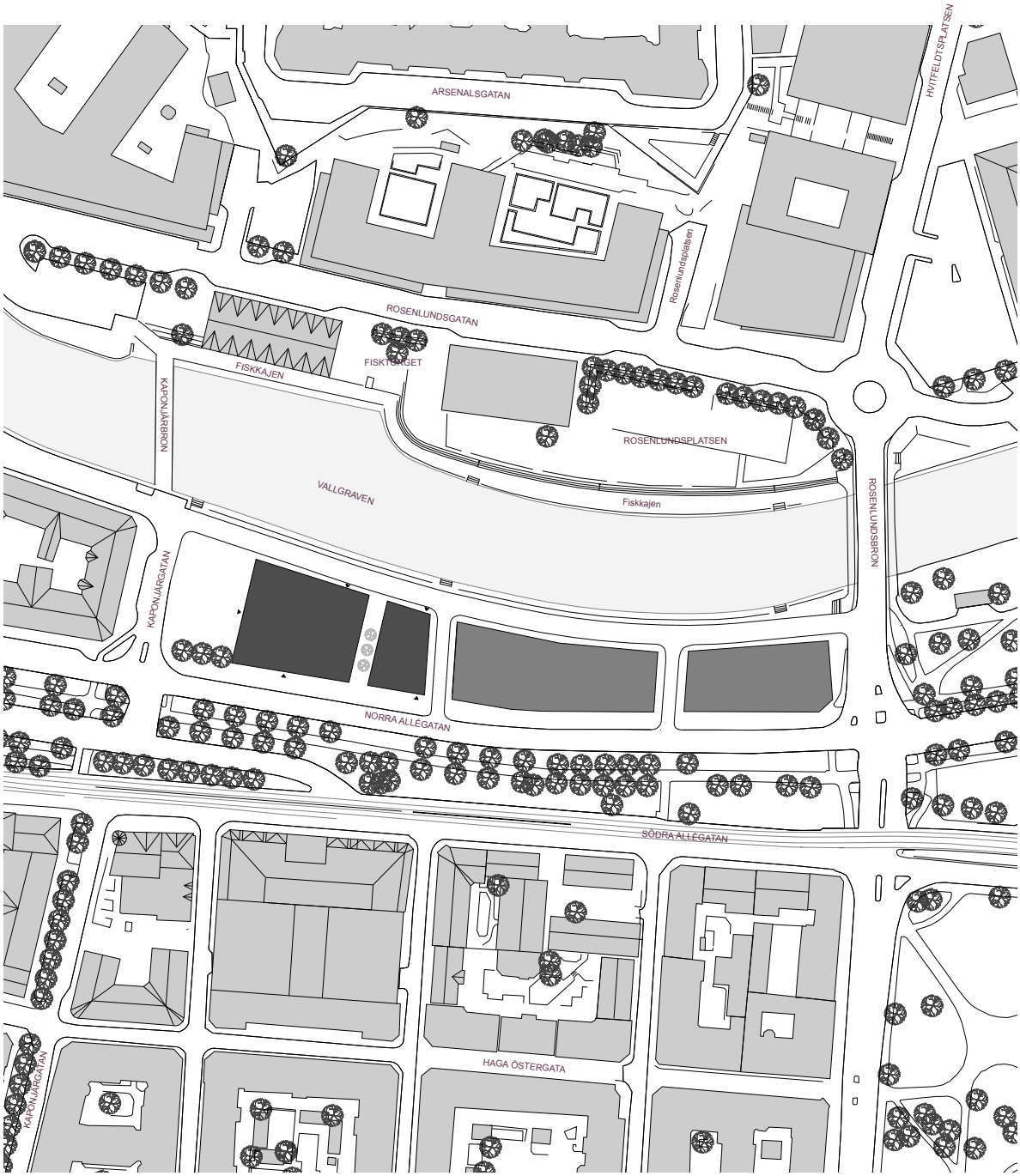
The first part of the building contains all the functions of a more public use. There is the entrance foyer with double ceiling height, reached by passing through a solid concrete passage. Here you find all supportive functions behind a solid concrete wall. These concrete walls are the loadbearing principle of this building in accordance to principles of solid construction. By the use of installation cavities in the floors, the concrete slab in the ceiling can be exposed which creates a continuous homogeneous enclosed space. Saying, you are surrounded by these concrete walls on all sides. On each side of the foyer are two bays, one holding the restaurant with a view over the moat and the other holding the separate ticket box and entrance for the cinema.

Entering these bays you pass through a smaller room with a single-storey ceiling height before you once again step out into a space that lifts towards the ceiling. As a way of giving rhythm to the long rooms the window placement is picked up as recessed niches in the wall, instead of the use of protruding parts. Simply - by removing instead of adding.

From the foyer you reach the second floor passing through the enclosed stair, where you actually walk inside of a convex, stereotomic shape. To reach the main exhibitions you again walk through a passage of solid concrete walls to arrive in the completely enclosed core. On the upper floor the two bays are used for exhibitions as well as the bigger hall. On both exhibition floors there are recessed balconies at the other end of the exhibitions, where one can walk out from the enclosed rooms and look out upon what would be the counterpart of the space one is currently occupying.

Scale 1:2000

0 50m

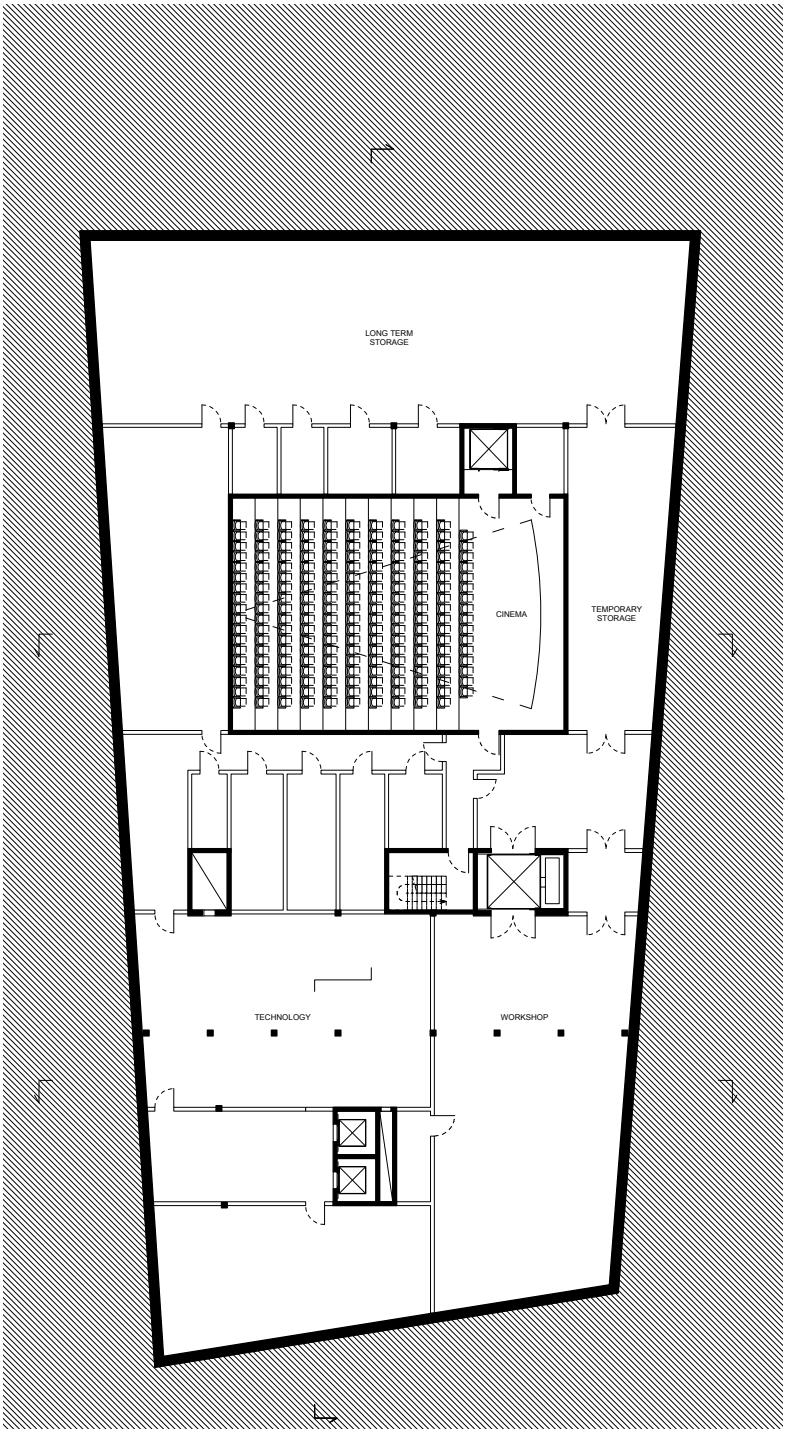


Site plan

Drawings

Scale 1:400

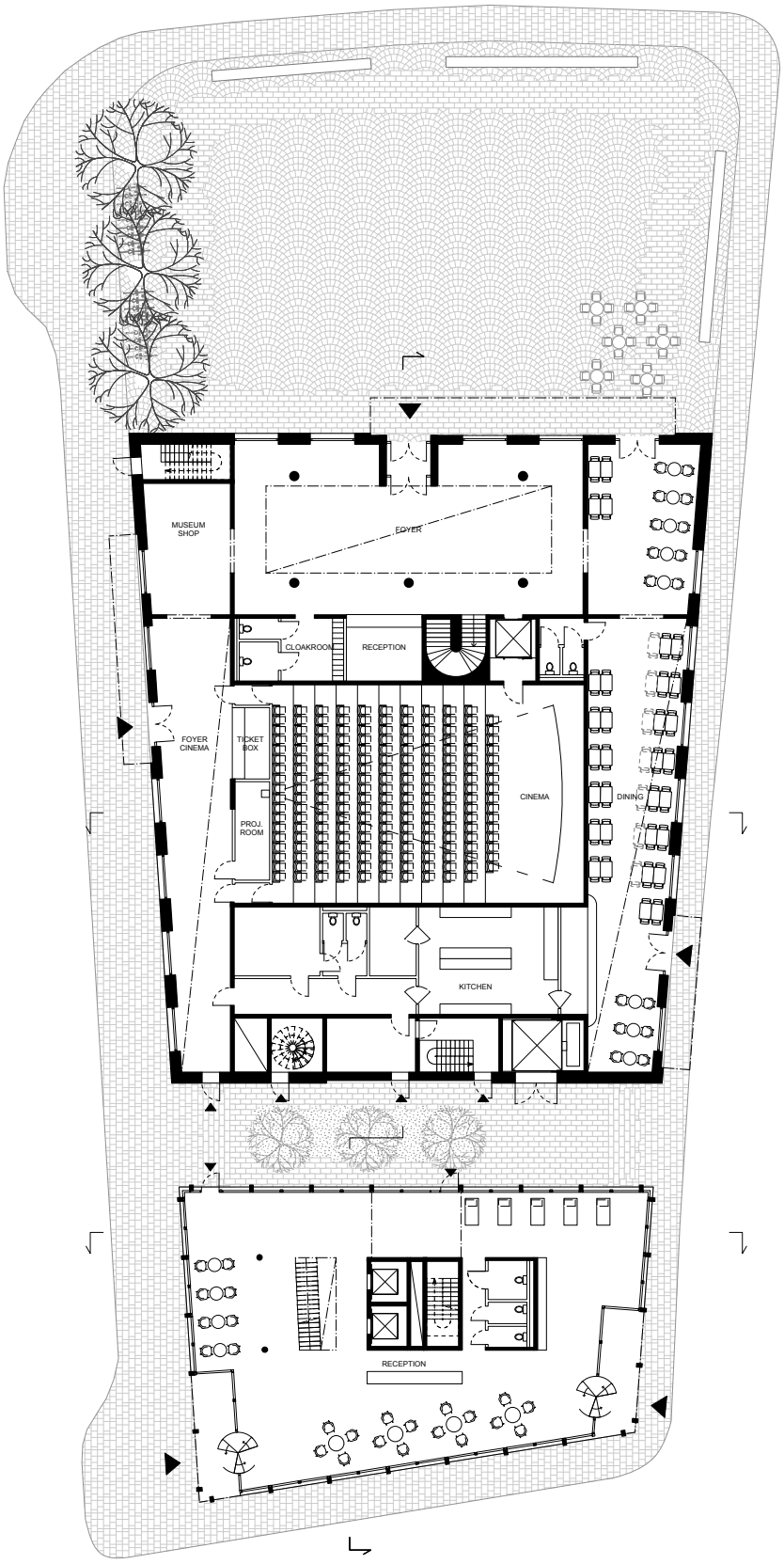
0 10m



Floor -1

Scale 1:400

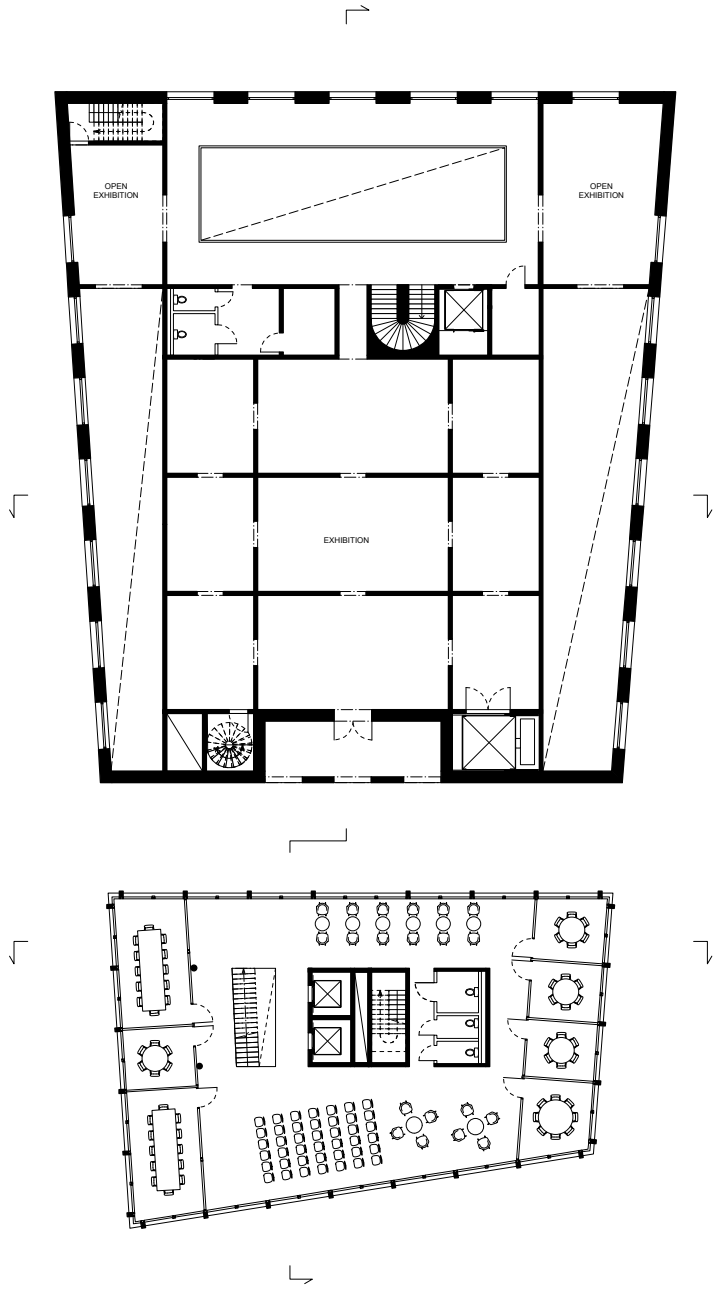
0 10m



Ground floor

Scale 1:400

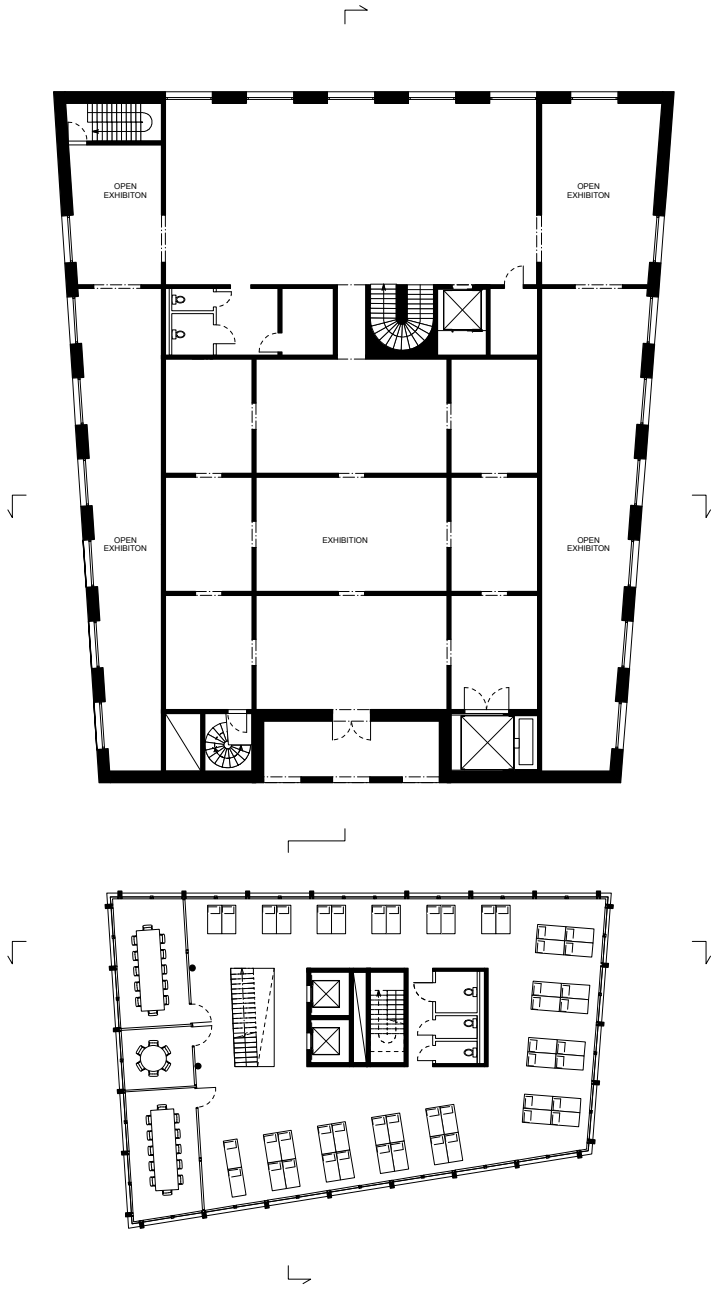
0 10m



Floor 1

Scale 1:400

0 10m



Floor 2 (and 3)

Its more transparent neighbor, the filigree building, holds the more supportive functions of the Film House making it more fitted for the tectonic approach. It is pretty straight forward. All floors follow the same basic plan layout with two freestanding concrete cores holding the supportive functions and then a main staircase, also as a freestanding entity in the room. By this repetitive approach both in floor plan and facade system, the building allows flexibility and answers to the programmatic needs of staff offices, educational facilities and access to- and working with the digital archives. The spatial experience is repeated as you move through the building, each floor the same as the previous one and it makes an open space where the gaze can wander uninterrupted.

The loadbearing structure consists of pre-casted vertical elements creating the repeated partitions of the facades, connected to the on-site casted floor slabs by shear studs. The horizontal facade elements are also connected to the floors by studs and are shaped to create space for sun-screening, making the shading also part of the facade system as an infill between linear parts.

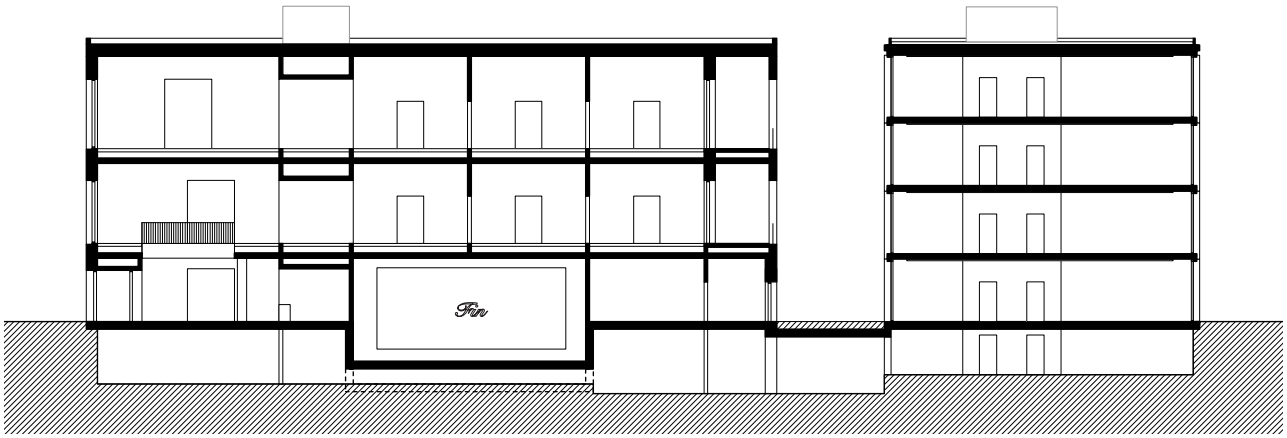
In the filigree building the structure is showcased in the facade. The vertical elements are the most protruding parts giving an unbroken shadow effect while the secondary horizontality is created by the elements marking the floors. The window partitions creating a standing shape, further adds to the vertical expression of the facade that is then finished off with a non-broken horizontal element.

Looking at the solid building it consists of a brick facade rendering a homogeneous surface. Like in the filigree building, it has windows with a standing shape giving it sort of an upward direction. As a way of adding an element of horizontality, for the windows to contrast from something, the brick surface is treated differently with the use of recessed courses giving it a subtle gradient which is then finished off with a distinct fries corresponding with the unbroken concrete element of the filigree building.

Another important facade treatment is dealing with the entrances. Here, the solid building have protruding parts together with a recessed niche. It might be just a detail but it is regarded to work as a contrasting element to the rest of the facade. Since there are no other protruding parts, this really marks the entrance. In the same way the recession in the filigree building creates a visual contrast from the rest of the facade also marking the entrance. Another common gesture in both buildings is to place the entrances "to the side" in the facade with the intention of breaking the symmetry and risked monotony.

Scale 1:400

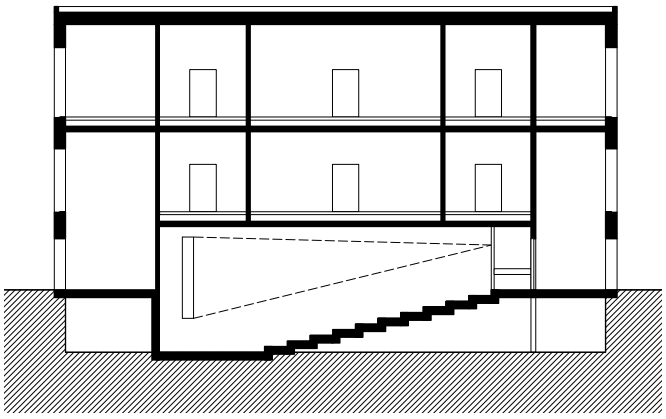
0 10m



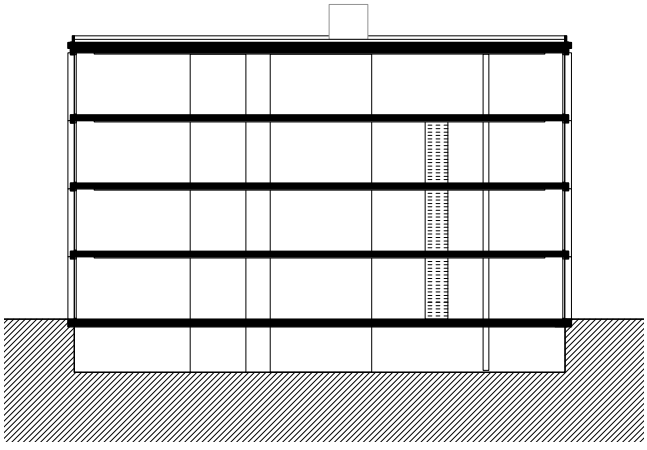
Longitudinal section

Scale 1:400

0 10m



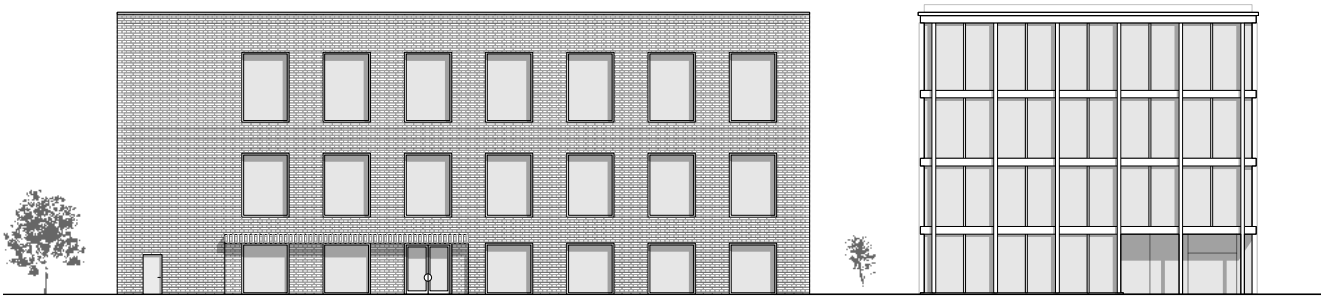
Transversal section A



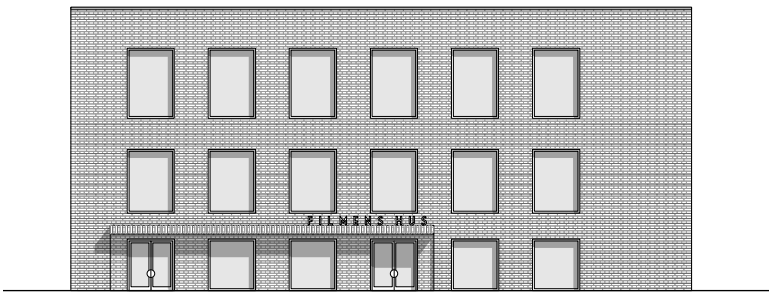
Transversal section B

Scale 1:400

0 10m



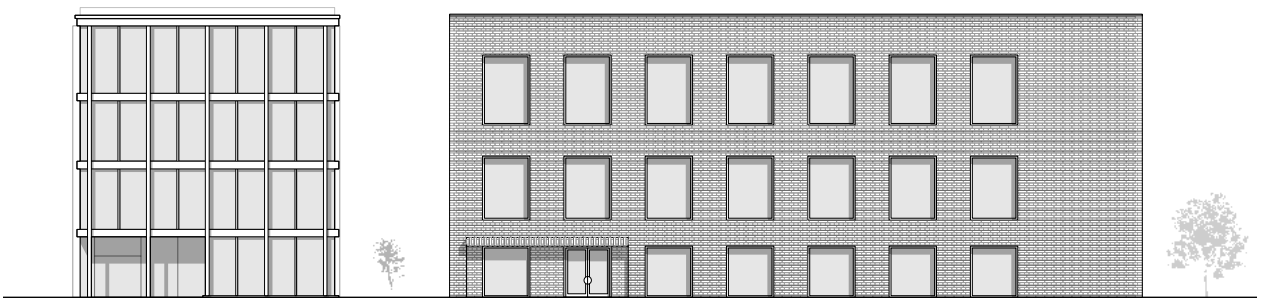
South facade



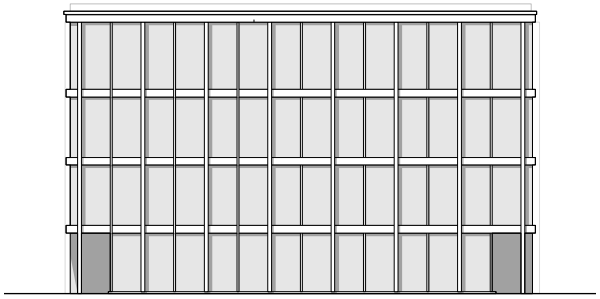
West facade

Scale 1:400

0 10m



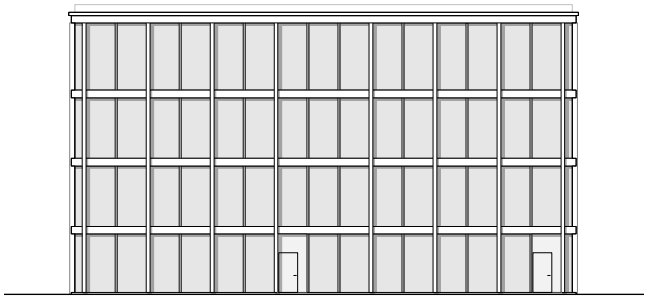
North facade



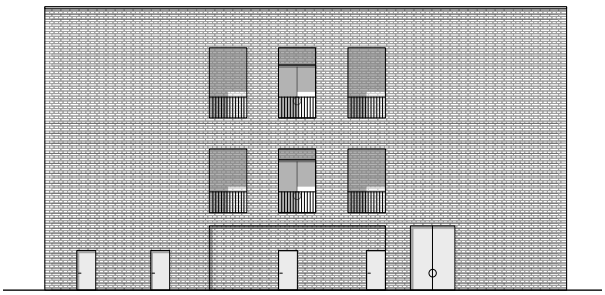
East facade

Scale 1:400

0 10m



West facade

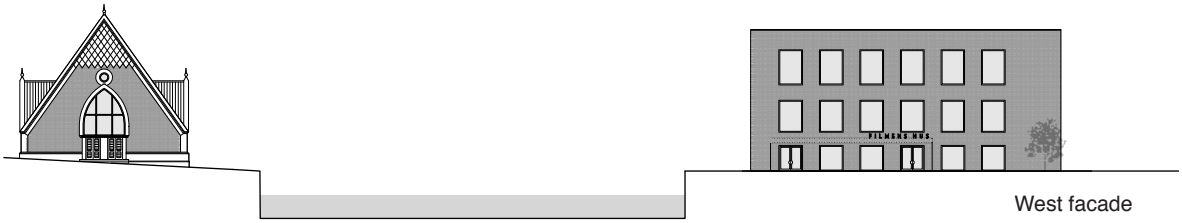


East facade

Scale 1:800

0 20m

South elevation

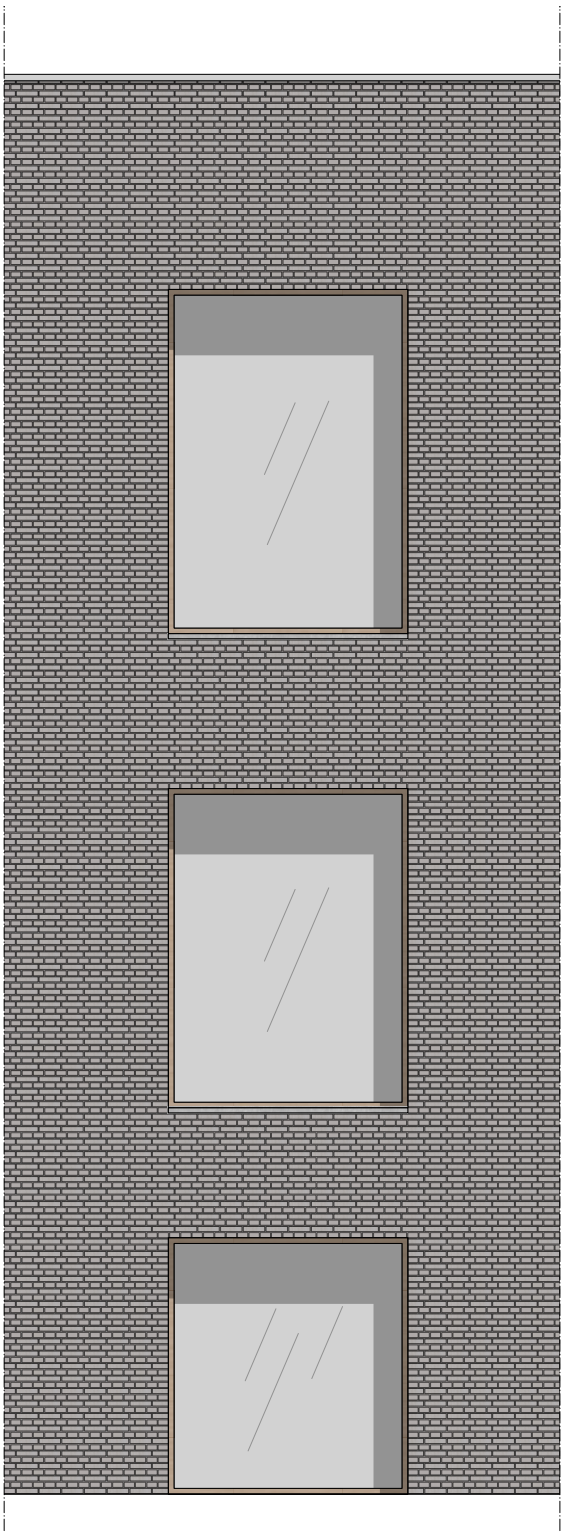


West facade

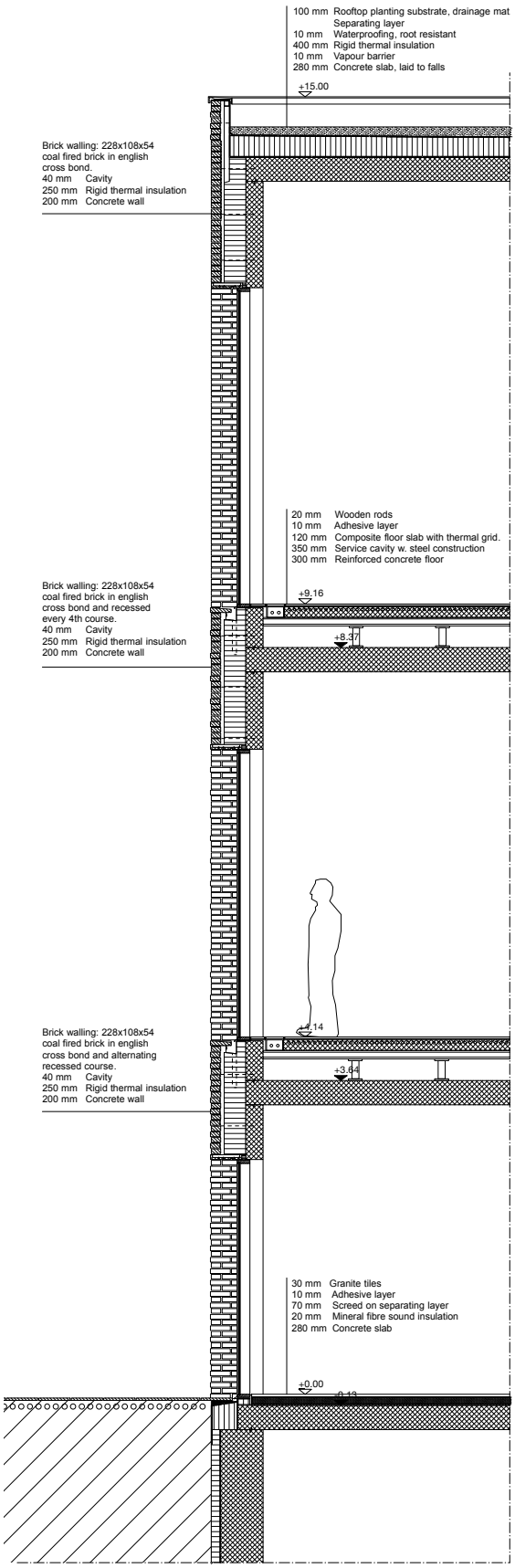
West facade

Scale 1:80

0 2m



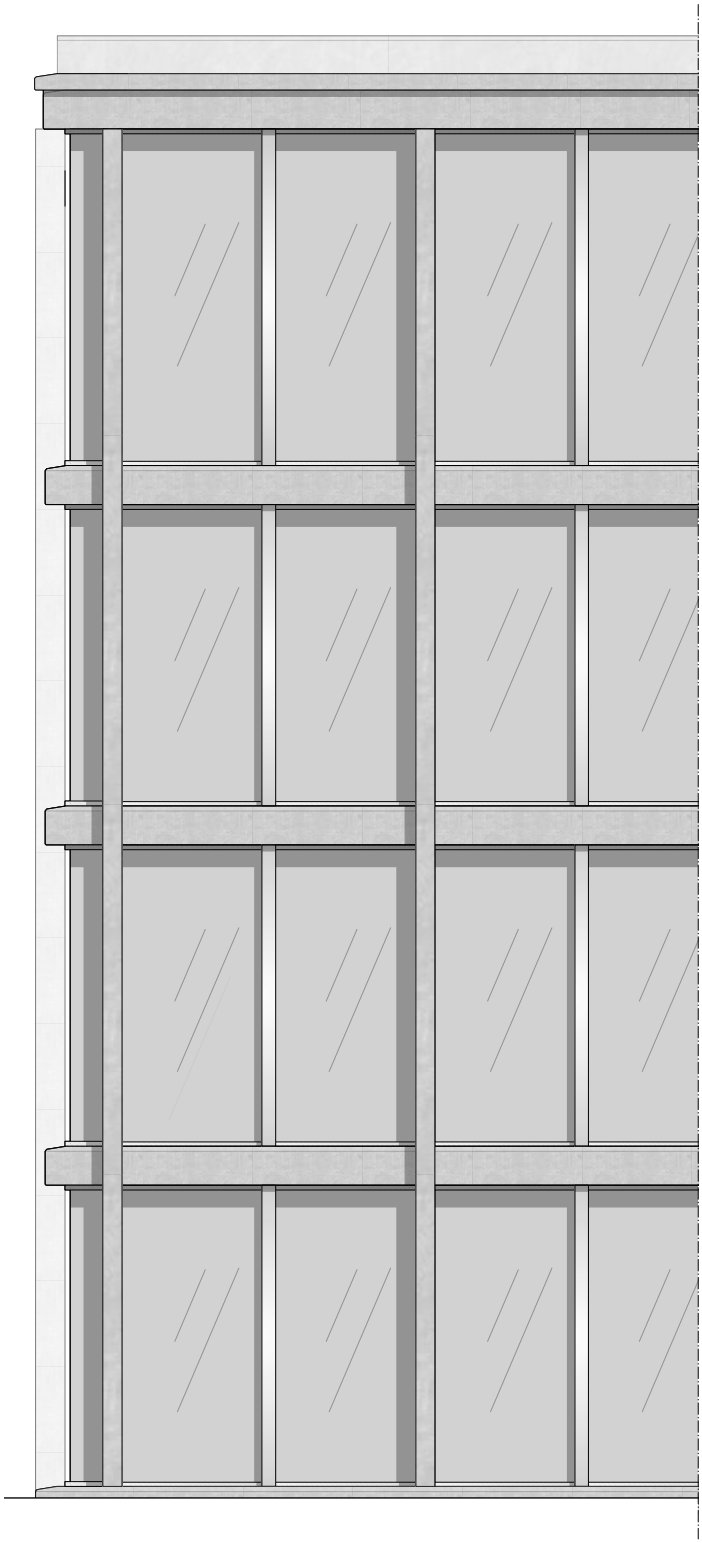
Facade

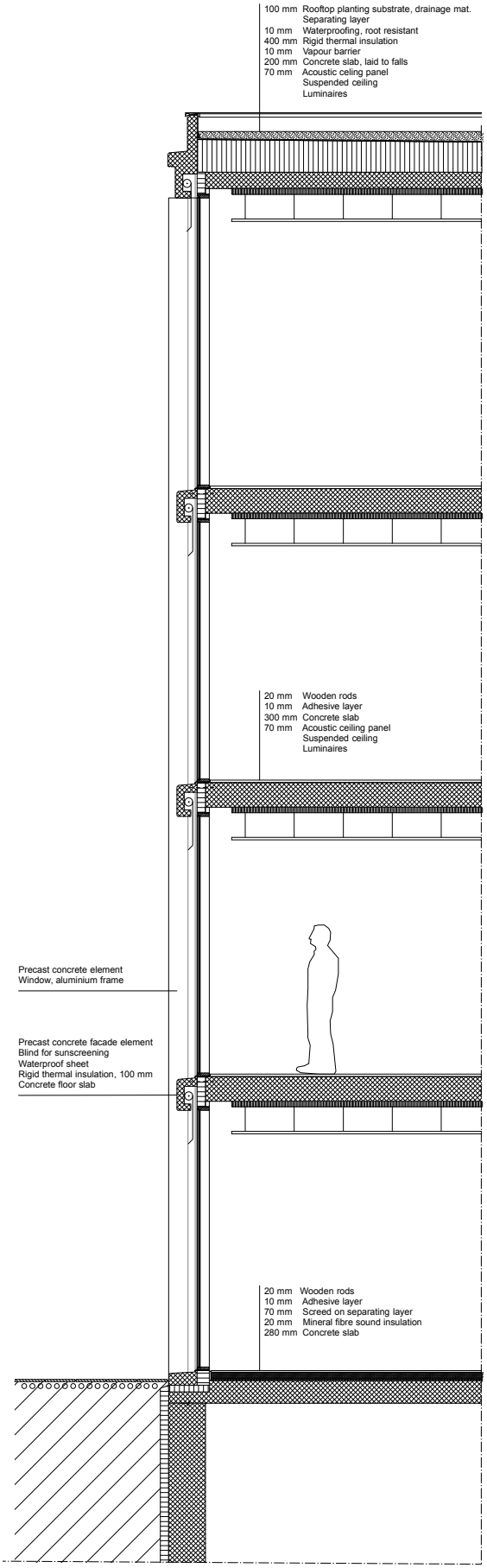


Detailed section

Scale 1:80

0 2m



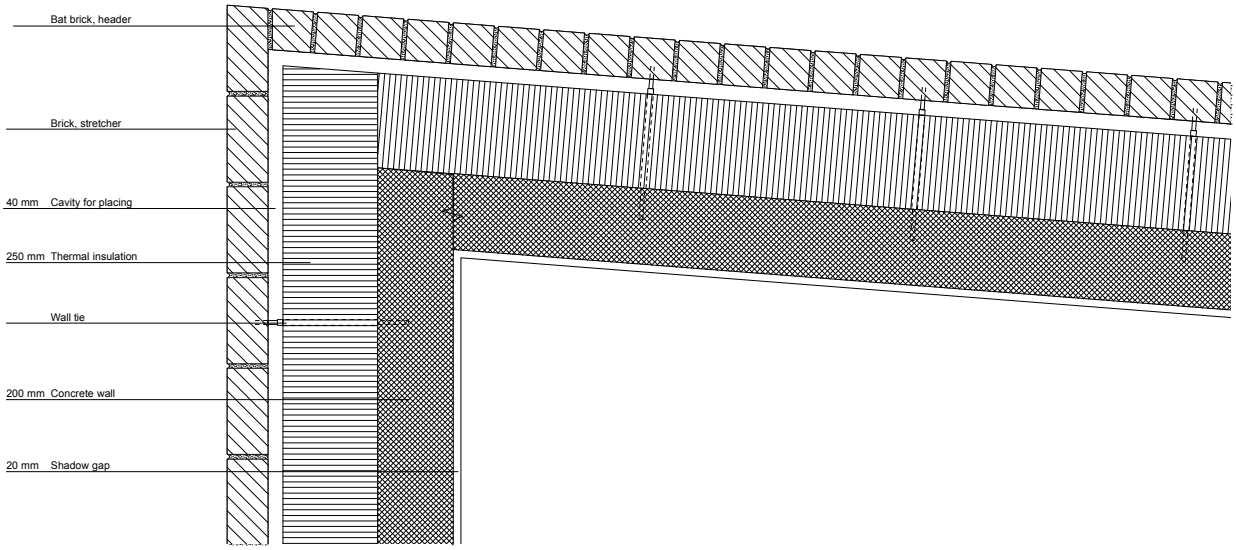


Facade

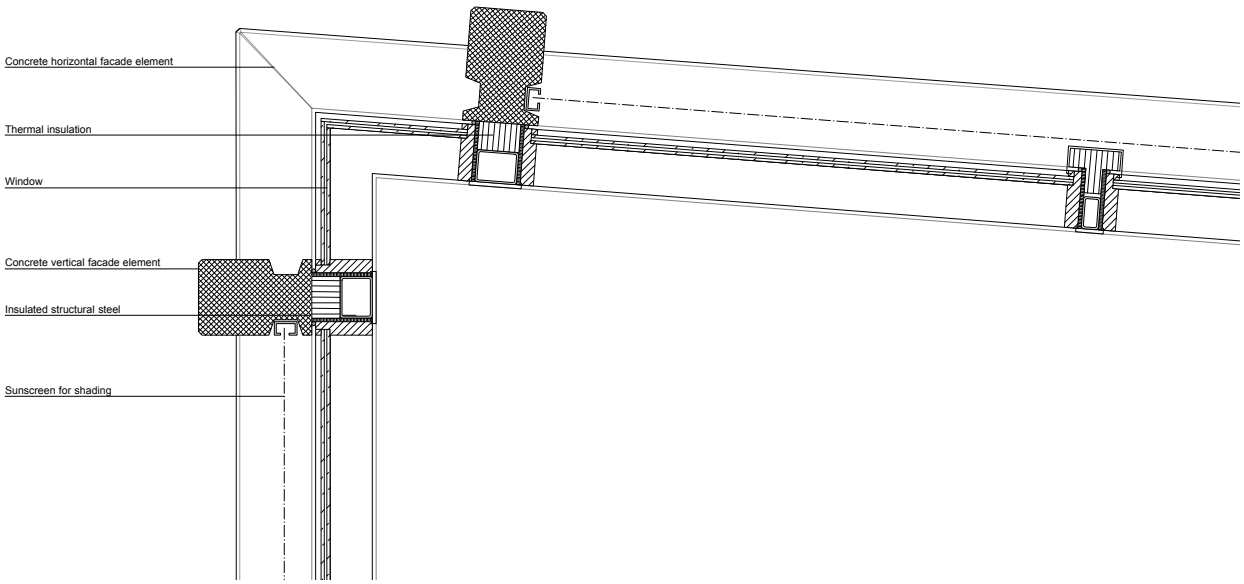
Detailed section

Scale 1:20

0 0,5m



Horizontal corner detail



Horizontal corner detail

VISUALIZATIONS

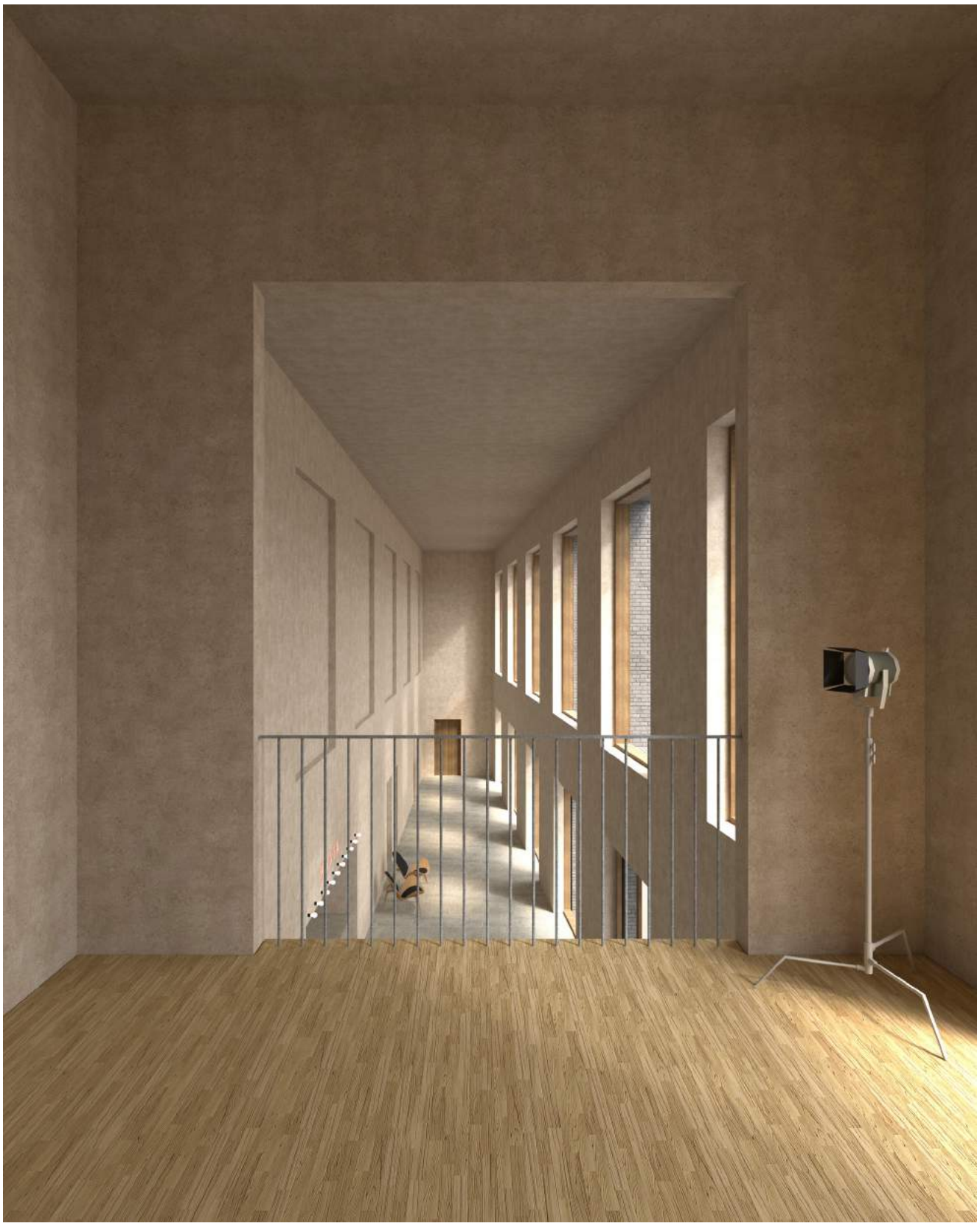


Figure 44. Interior view from balcony

Figure 45. Interior view foyer

Figure 46. Interior administration building

Figure 47. View from Pusterviksbron

Figure 48. View from Norra Allégatan

CONCLUSION

Reflection

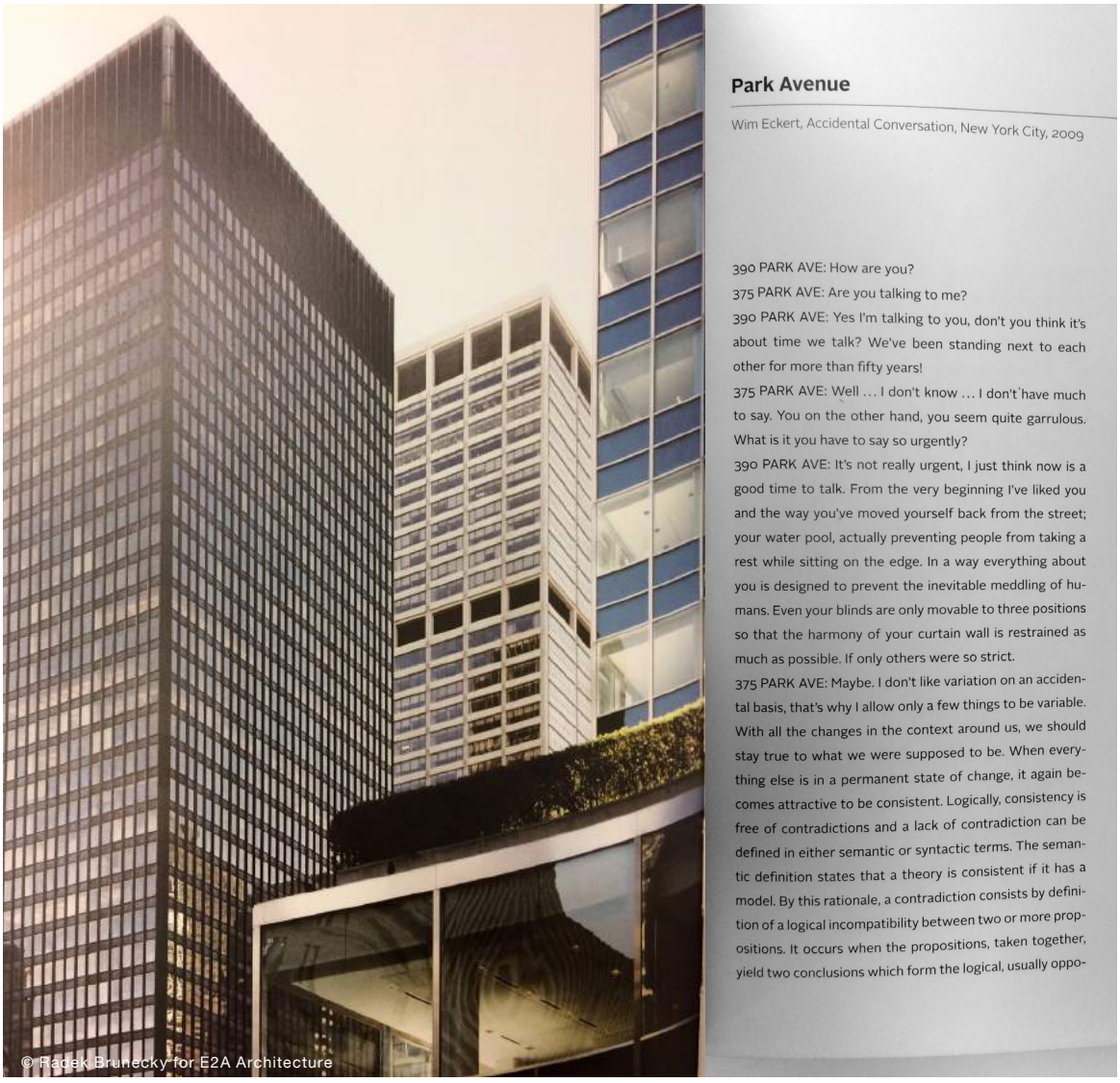
Working with two separate building volumes and structural systems throughout the project has been rewarding for the buildings as individuals. By separating them their qualities have appeared more clearly. A few examples are the different treatment of vertical communication, the impact of the outer layer separating inside from outside - the overall movement from one room to another or just in one open.

Furthermore, the division of program being visual from the outside creates a tension and perhaps a dialogue between the building volumes. Two clearly independent volumes can be made more prominent when in dialogue with one of a different nature but still with some shared values.

The use of two rather different building expressions within one shared program has shown to add something unexpected to the exterior relation between the volumes. Which came first? Is one an extension to the other? This is something that in way is understood first within the buildings.

To get back to the research question: *How can mode of construction take part in the creation of expressive value in a space or a building?* - As part of the answer, emphasize should be put on the actual contrasting of expressions inherent in both the tectonic and the stereotomic principle. Maybe the answer given by this thesis isn't found in each of them individually but in the interaction between them. That is where the key expressive value in the design proposal is found. Although subjectively evaluated it is believed that our collective experiences and associations make it possible to empathize with the characteristics suggested by each constructive principle in this proposal.

Lastly, the design proposal suggests one way of constructing a Film House at Pusterviksplatsen in Gothenburg.



Park Avenue

Wim Eckert, Accidental Conversation, New York City, 2009

390 PARK AVE: How are you?

375 PARK AVE: Are you talking to me?

390 PARK AVE: Yes I'm talking to you, don't you think it's about time we talk? We've been standing next to each other for more than fifty years!

375 PARK AVE: Well … I don't know … I don't have much to say. You on the other hand, you seem quite garrulous. What is it you have to say so urgently?

390 PARK AVE: It's not really urgent, I just think now is a good time to talk. From the very beginning I've liked you and the way you've moved yourself back from the street; your water pool, actually preventing people from taking a rest while sitting on the edge. In a way everything about you is designed to prevent the inevitable meddling of humans. Even your blinds are only movable to three positions so that the harmony of your curtain wall is restrained as much as possible. If only others were so strict.

375 PARK AVE: Maybe. I don't like variation on an accidental basis, that's why I allow only a few things to be variable. With all the changes in the context around us, we should stay true to what we were supposed to be. When everything else is in a permanent state of change, it again becomes attractive to be consistent. Logically, consistency is free of contradictions and a lack of contradiction can be defined in either semantic or syntactic terms. The semantic definition states that a theory is consistent if it has a model. By this rationale, a contradiction consists by definition of a logical incompatibility between two or more propositions. It occurs when the propositions, taken together, yield two conclusions which form the logical, usually oppo-

Figure 49. (E2A. 2012)

Bibliography

Printed references
Deplazes, A. (2005) *Constructing Architecture, Materials Processes Structures, A handbook*. Basel: Birkhäuser

El Croquis (2010). *El Croquis 150 David Chipperfield.* Madrid: El Croquis.

Frampton, K. (1995) *Studies in Tectonic Culture.* Chicago: Graham Foundation for Advanced Studies in the Fine Arts.

Janson, A; Tigges, F (2014) *Fundamental Concepts of Architecture: The Vocabulary of Spatial Situations*. Basel: Birkhäuser.

Rasmussen, S.E. (1959) *Experiencing architecture.* London: Chapman & Hall.

Toll, B. (2017) *Filmens Hus - Internationellt center för rörlig bild i Göteborg. Förstudie för Västra Götalandsregionen kulturnämnd och Älvstranden Utveckling AB.* Göteborg: Toll Film AB

Seminars
Toll, B. (2018, February 1st). *Nybygge i Sveriges filmhuvudstad.* Seminar presented during Gothenburg International Film Festival. Kulturarena Auktionsverket, Gothenburg.

Image sources
Figure 01. Emigholz, M. (2012) *Hypostyle hall of the Musee national des Travaux publics* [Movie still from the movie Auguste Perret in Frankreich und Algeria, Online image]. Reprinted with permission. Retrieved June 10, 2018 from https://pym.de.

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Figure 05. Li Wan Po, D. (2016) *Facade Kunstmuseum Basel* [Online photo] . Reprinted with permission. Retrieved June 11, 2018 from http://liwanpo.net

Figure 07. Diener Diener. (2000) *Facade Centre PasqueArt* [Online photo]. Reprinted with permission. Retrieved June 6, 2018 from http://www.dienerdiener.ch

Figure 08. Miller+Maranta. (2001) *Entrance facade Volta school Basel* [Online photo]. Reprinted with permission. Retrieved June 14, 2018 from http://www.millermaranta.ch

Figure 11. Walter, M. (2008) *Facade Im Birch school* [Online photo]. Reprinted with permission. Retrieved March 16, 2018 from http://www.nextroom.at

Figure 13. David Chipperfield Architects, (2010) *Entrance facade laboratory building Novartis* [Online photo]. Reprinted with permission, Copyright: Ute Zscharnt for David Chipperfield Architects. Retrieved June 8, 2018 from http://davidchipperfield.com

Figure 15. Göteborg Stad. (2017) *Orthophoto from Sweref 99* [Online source map]. Reprinted and elaborated with permission. Retrieved March 16, 2018 from http://geodata.chalmers.se

Figure 35. Göteborg Stad. (2017) *Orthophoto from Sweref 99* [Online source map]. Reprinted and elaborated with permission. Retrieved March 16, 2018 from http://geodata.chalmers.se

Figure 36. Göteborg Stad. (2017) *Orthophoto from Sweref 99* [Online source map]. Reprinted and elaborated with permission. Retrieved March 16, 2018 from http://geodata.chalmers.se

Figure 37. Göteborg Stad. (2017) *Orthophoto from Sweref 99* [Online source map]. Reprinted and elaborated with permission. Retrieved March 16, 2018 from http://geodata.chalmers.se

Figure 49. E2A. (2010) *Spread from chapter Accidental Conversation in E2A Architecture* [Printed photo]. Reprinted with permission, Copyright: Wim Eckert, «Park Avenue, Accidental Conversation, New York City.» in: E2A Architecture. Piet Eckert & Wim Eckert, Ostfildern: Hatje Cantz, 2012. Page 436, Photo: Radek Brunecky

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