

# HOME FREE HOME

a polyvalent approach to housing

Johanna Glán Brinkenberg  
& Sonja Miettinen



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**CHALMERS**

Chalmers University of Technology, Gothenburg  
Department of Architecture and Civil Engineering  
Masters Programme of Architecture and Urban Design (MPARC)  
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Examiner: Ola Nylander  
Supervisor: Kaj Granath

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## ABSTRACT

Dwelling is a time-based subject. Unpredictable demographic transitions and housing changes are in constant progress. Diversified courses of life and life patterns generate increased need for adaptability in a dwelling. These developments reflect the residents' demands for living that should meet their individual needs for space over time. Hence, the space has to respond to extensive and unknown changes. One solution to these challenges is a polyvalent approach to housing.

The thesis underlines the lack of generic housing that can be adapted to unspecified uses and for different users in a long-term perspective. It is an investigation on spatial logics that connects architectural qualities, long-lasting variability and scale variations. The generic and neutral spaces are a result of polyvalence, a concept brought to architectural discussion by architect Herman Hertzberger and further developed by professor Bernard Leupen. In order to provide multi-usability and interchangeability of uses between spaces, the thesis prioritizes the

unmeasurable and unpredictable changes in use both when it comes to the internal organization, connection and isolation of activities, as well as openings and closings of spaces and sightlines. The method research by design, where the focus is on spatiality and adaptability, results in a design project asking; how can we rethink the use of space?

The design proposal addresses the dependence between a dwelling, building and urban milieu in order to create polyvalence. It is an urban infill and the site is located in Stigberget, Gothenburg, which is characterized by a mixture of people and cultural activities within a short distance from the city center.

Keywords: *polyvalence, spatiality, structure, usability, innovation, adaptability, variability, logics, identity*

## STUDENTS' BACKGROUND

### *The starting point*

Working together with a housing project during our first year of the Masters Programme, we wanted to question the way we define spaces and places in an urban and residential context. A particular place has to be given a particular character, and in order to reach that we proposed a housing project that seeks for more defined spaces in city level and less defined spaces in housing level.

Variety of scales from urban to dwelling scale as well as questions dealing with city and dwelling linked to wellbeing of the citizens and residents, lifestyle changes, segregation and use of materials, were starting points on developing further the ideas and researching the housing phenomenon more thoroughly in the master thesis.

The main focus on polyvalent approach was developed subsequent to the research on numerous strategies concerning adaptability, changeability and multi-usability, to name a few.

We saw potential on finding new design strategies that are in line with the future challenges, and furthermore to develop a design project in an urban context. The site in Majorna, Gothenburg, is situated in an intersection in Masthugget where it once had a content. By turning the anonymous and empty space into a new place in a city level, we then take the next step towards a typology that provides polyvalence in housing level.

### **JOHANNA GLÁN BRINKENBERG**

*Born in 1994, Gothenburg, Sweden*

Master programme  
Architecture and Urban Design,  
Chalmers University of Technology  
2017 - 2019

Internships  
2016-2017

Bachelor programme in Architecture,  
Chalmers University of Technology  
2013 - 2016

### **SONJA MIETTINEN**

*Born in 1993, Helsinki, Finland*

Master programme  
Architecture and Urban Design,  
Chalmers University of Technology  
2017 - 2019

Bachelor programme in Architecture,  
Chalmers University of Technology  
2012 - 2016



## ACADEMIC FRAMEWORK

### *Method*

Systematic typological presentation of projects allows us to utilize the knowledge and references in a good manner, finding inspiration for our own project on floor plan solutions. Therefore, the principle method for the thesis departs from literature research combined with studies on spatial architectural concepts, such as flexibility, adaptability and polyvalence. The research and iterative sketching as a result of new findings create foundation for the design proposal.

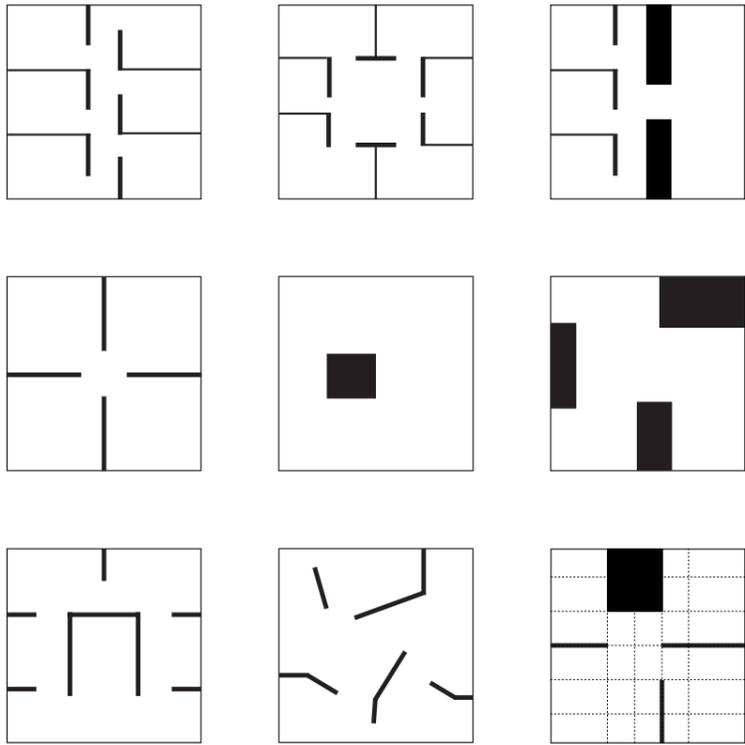
As the spatial logics and concepts are many, the research part has been crucial in order to define what kind of spatial concepts and form that are relevant in order to create adaptability and more generic housing in combination with the urban context and preconditions they provides us.

The research through articles, literature, reports and plan solutions in combination with sketching, aims to examine general and flexible spaces that provide adaptability for different household constellations and their future needs in a long-term perspective. The gained knowledge and research method result in a building and an urban milieu that are able to adapt to change and provide spaces for wellbeing through spatial arrangements.

### *Focus and limitations*

The project focuses on inclusion in different scales - from city-level to neighbourhood, from building to dwelling with a polyvalent approach. Flexibility and polyvalence are often set in relation to each other as a space can be flexible even without physical interventions. Thus, the thesis defines the characteristics of a polyvalent space seen from a perspective that relies on earlier research on the subject dealing with flexibility (i.e. changeability, multi-usability, transformability, variability, generality etc.). Instead of flexibility, the proposal underlines the spatial polyvalency in combination with time based thinking as living changes over time. Combining different spatial logics may indicate that a sharp division between polyvalence and flexibility does not provide the most optimal solutions, instead it is the combination of these two concepts.

The thesis does not focus on construction, building techniques or economy. In conclusion, the project is an investigation of space that is responsive and adaptable to the fluctuations of social and cultural changes, therefore making the design recreating its context and conditions and promoting social sustainability and wellbeing.



**LOGICS**

# I

## BACKGROUND

### History

#### *The modernist housing production*

Dating back to the beginning of the 1900s, modernism by industrialism left its stamp even in architecture. Le Corbusier was one of the pioneers who brought rationality and functionality into architecture. These objectives could be used as a means to change the social order and as a result smaller dwelling concepts were seen as a solution to provide homes for a bigger group of people after the First World War. New homes had to be quickly planned, and based on science or the “measurable”. However, this led into putting aside the non-measurable aspects in terms of changes in future use (Leupen 2006b).

A dwelling became an entity consisting of practical spaces and specific functions. The liberation from traditional structures led into autonomy and defined universal standards (Krokfors, 2017). Daily activities and household constellations were studied and as a result a number of rooms were not used efficiently during a day (Schneider & Till, 2007). Flexibility was one way to provide efficient floor plans on behalf of less space. The development took two routes. First, flexibility that was achieved through rooms with undetermined uses and secondly, flexibility through architectural determinism where the building can be altered according to the users’ needs with folding and unfolding elements.

Social and economical forces affected housing in the 1920s, meanwhile technical influences took over in the 1930s (Schneider & Till, 2007). The industrialization of housing resulted in mass production and decrease in housing typologies. Standardization of architectural dimensions and building turned home almost into a machine and increased the uniformity of living among people (Krokfors, 2017). Spaces were introduced as “efficient” solutions to living, which contributed to the use of minimum space standards. Residents were instead seen as a part of the system in which users’ time-based actions are controlled. It is the act of control that produce inflexibility in form of designated rooms for a specific use, which results in rigid configurations and sizes (Schneider & Till, 2007).

In the 1960s and 1970s user choice and involvement became the driving forces for housing. This “democratisation” of the planning process resulted in new understanding of architectural objects that can be transformed into new configurations in order to allow the residents to adapt the floor plans to their needs. What characterizes the development from the beginning of the 1900s is that adaptable and flexible housing has been one solution to time-based pressing needs (Schneider & Till, 2007).



Figure 1. Consumer institute, two persons in a trial kitchen (Studio Granath, 1971). CC BY-NC-ND.

## BACKGROUND

### Future challenges

#### *Ongoing transformation and unpredictability*

The second demographic- and housing transformation are currently taking place. This includes urbanization, differentiation and diversification of people's aspirations, changed and mixed household structures (Braide Eriksson, 2016; Gromark et al., 2016). Time spent at home is also increasing as working conditions are going through major changes; work at home, varying stages between steady jobs and unemployment, short term jobs and self-employment (Krokfors, 2017; Anacker et al., 2018).

The courses of life are diverse and changing. Tarpio mentions that pluralistic household constellations have become more common in the 20th century (2016). Some household constitutions have for example different demands for their home due to the changing number of household members in short periods of time. Therefore, the different events in life set time-based demands for housing.

The ongoing demographic transitions in the world results not only in large changes in population structure, but we also go towards more multicultural societies with a diversity of how we adapt our home in terms of residents' needs (Braide Eriksson, 2016; Akenji & Chen, 2016; SCB, 2018a). Desires, habits and expectations change over time. One example is an increasing interest in common shared spaces in residential architecture and how we continue to see a rise in those spaces.

Residents' life patterns will be more diverse in the future; as modern societies further develop, the residents have greater opportunities to invest on living which results in higher demands for housing in terms of experience, spatiality and personality that mirror one's identity. Conclusively, the future challenges indicate that there is a need for homes that could adjust to the unpredictable and changing conditions.

#### *Population changes*

The population of Sweden has grown strongly during the millenium. Since 2000, the population has increased by over one million, from 8.9 million to over 10 million inhabitants. According to SCB's forecast the population will pass 11 million citizens in the upcoming ten years. Moreover, in 2040 the population will be estimated to be 11.6 million (SCB, 2019), in 2050 over 12 million and in 2070 near 13 million inhabitants (SCB, 2018). The factor which has contributed the most to the population increase during the 2000s in Sweden is immigration followed by growing elderly population.

At a regional level, population development is also affected by movements within the country and has a particularly large impact on the age structure of big cities; the largest proportion of children live around big cities and the high birth rates have increased the number of children and young people living in big cities. This leads to more children living there in the future than before (SCB, 2019).

#### *Household developments*

Population changes have an influence on household developments, which are considered as global trends. Eurostat's statistics (2018a) show that the most common and increasing household type in Europe is a one-person household 33.6 %, followed by two persons household 31.9 %. Diversification indicates that family practices can be bound to unrelated persons and diffuse short-lived configurations of varying sizes (Česnuitė et al., 2017; Anacker et al., 2018).

Individualism is increasing in Sweden and since 1980 one-person households have been the common household type. 48.5 % of Swedish households were one-person households in 2014. These developments are similar in other Nordic countries (Boverket, 2017; Eurostat, 2018b). The average household sizes were lowest in Sweden with 1.9 members, compared with the highest number in Norway, 2.2 members (UN, 2017). The household size in Sweden has diminished over time from 3.2 persons in 1945, down to 2.1 persons in 1990 (Boverket, 2017).



## BACKGROUND

### Future challenges

#### *Dwelling size*

The average dwelling size in Sweden is 68 sqm, while the small house averages 122 sqm (SCB, 2017b). Multi-residential housing is more common in larger cities and the living area is considerably smaller compared to single-family homes (SCB, 2016a). The most common dwelling type in Sweden is a two-room and kitchen, 36.3 %, with an average living area of 60 sqm, followed by a three-room with kitchen, 31.5 % (SCB, 2017a). The most common dwelling size in the three biggest cities, Stockholm, Gothenburg and Malmö, is two-room and kitchen or kitchenette of 57 sqm (SCB, 2016b; Skanska, 2016).

Figures from SCB show that one- and two-room dwellings are smaller than they have been in over 50 years. One-room dwelling in Sweden is today on average 39 sqm. Looking back to the 1960s an average one-room dwelling was 40 sqm and in the 1980s the size increased to 47 sqm. This means that the size today has downgraded to the same figures as in the 1960s. In the 1980s two-room dwellings were more spacious, 64 sqm, compared to today's 58 sqm. A similar process can be observed for other dwelling sizes as well (Skanska, 2016).

In comparison, the average size for the smallest dwellings in Gothenburg, Malmö and Stockholm is 36 sqm, 3 sqm smaller compared to the national average. Small dwellings are often centrally located; in central Gothenburg (Center, Lundby and Majorna-Linné) 60% of the housing consists of small dwellings. The larger dwellings are often located in the outskirts of the city, resulting in monotonous divisions of dwellings sizes in the city centre (SCB, 2016b). The more urban you live, the smaller the dwelling becomes. This could be seen as a compromise to live in a limited space yet in a central area.

#### *Living space*

The space is also a discussed issue. RIBA report (2011) acknowledges the importance of sufficient space for residents lifestyle needs. The question of how much space we need is relevant in the era in which we consume more and own more stuff. England is an example of a country where insufficient space for furniture, possession and socializing has been reported in private homes, as well as shrinking room sizes. In comparison, a three-room bedroom for five people needs to be 86 sqm in London, whereas 100 sqm is required in Germany and Ireland. Nevertheless, usable floor area per person is relatively high in the UK, meaning that people have more bedrooms compared to their needs in order to have enough space (RIBA, 2011).

In Sweden each person has on average 41 sqm of living space. In the inner parts of Gothenburg, the average living area per person is 33-42 sqm, and in the suburbs 42-46 sqm per person (SCB, 2018a; 2016a). The figures indicate that there are differences between the neighbourhoods. Nevertheless, the average living space per person for the entire Gothenburg is 39 sqm (Faktum, 2011). Furthermore, each person has an average of 23 sqm in a household with two adults and three children renting a dwelling, while a single person without children has around 70 sqm of living space (SCB, 2016a).

In comparison, homes are larger in Denmark and Germany; on average 52 sqm and 46.5 sqm living space per person (Statistics Denmark, 2015; Destatis, 2017). According to SCB, especially people over 65 are living with "a high space standard", 114 sqm, meaning that the residents have more than one room per person in their dwelling (2018a; 2018b). The figures indicate an uneven division of living space; overcrowding, for example, varies over time and is related to age, location and immigration.

**11  
mil.**  
citizens  
the upcoming ten  
years in Sweden



**DEU**  
**52m<sup>2</sup>**  
average  
dwelling

**SWE**  
**68m<sup>2</sup>**  
average  
dwelling

**GBG, MMÖ,  
STHLM**  
**57m<sup>2</sup>**  
average  
dwelling

**DNK**  
**54m<sup>2</sup>**  
living space  
per person

**SWE**  
**41m<sup>2</sup>**  
living space  
per person

**GBG**  
**37m<sup>2</sup>**  
living space  
per person

## BACKGROUND

### Scaling the space - from city to dwelling

#### *Urban layers*

Housing is a combination of multifaceted layers from individual to society level. Home is a place for individual growth and a bedrock of life - or a place facing household challenges. A homeowner could see housing as a source of long-term wealth, or it may have caused one's economic plight. For a neighbourhood it may be an area that enables vital community-life - or an area consisting of undefined spaces (Anacker et al., 2018).

Flexibility can be discussed in varying scales: adaptability in city-, building-, dwelling- or room level. The urban flexibility could relate to size, shape and plot division of a block that enables several building types (Tarpio, 2015). Moreover, as the RIBA report notions (2011), three major parameters affecting people's home choice are outdoor space, 49 %, the size of the rooms, 42 %, and proximity to local services, 42 %. It is a combination of both the dwelling and the neighborhood that determine how good a place and space is for living. Neighbourhood is a place for potential social interaction and therefore understanding the community life is part of the residential planning.

#### *Spatial adaptability*

A separation between spatial configurations of dwellings and the urban milieu is a result of modernism. Flexibility has been closely related to a dwelling and furthermore to concepts of transformability in which a space can be transformed. However, flexibility is included

even within the building and urban context when analysing space from a long-term perspective (Krokfors, 2017). Herman Hertzberger's Diagoon House, 1917, is an example of this kind of adaptability that encourages freedom of use in different layers. In order to activate social life within the area, the urban milieu needs to be linked to the building. Krokfors means that if a building cannot be adaptable to changing needs and produce diversity, the urban space cannot either be self-organizing (2017).

The social context needs to be interwoven to the spatial adaptability, and therefore we find it important to also think outside the boundaries of a dwelling in order to enhance longevity and adaptability on a societal level. Thus, the design proposal aims to promote a paradigm shift where space in different scales contribute to resilience in residents' living situations.

Befriande arkitektur (Gromark, 1993) shows a longing for architecture that frees people, both in public and private spaces. Gromark suggests re-thinking the roles and borders between the city and a dwelling by implementing more city into housing and more housing into city (1993). This could give the dwelling a more undefined character since general spaces would not define in which way to live. In contrast, the city would get more articulated and allocated spaces turning a space into a place surrounded by non-profit functions.



*Figure 2. Diagoon house by Herman Hertzberger (n.d.).*

Diagoon House | Herman Hertzberger | Delft, Netherlands | 1971

## BACKGROUND

### Basic activities in a dwelling

#### *Unilateralism or unpredictability?*

Since the beginning of the 20th century planners realized the urgent need for building housing for the masses. A scientific approach to planning prioritizing the “measurable” was implemented into housing. This, according to Leupen, led into putting aside the non-measurable aspects in terms of changes in future use of a dwelling (2006b). Different spatial logics concerning multi-usability can be approached by thinking a dwelling in a more universal and general way through activities and functions. Various uses can be adapted to a room, but as Leupen points out, it is also important to accommodate different life patterns in a dwelling (2006b).

#### *Universal domestic activities*

Jyrki Tarpio refers to architect Esko Suhonen’s thoughts on the difficulty to set a higher priority between domestic activities as there is no one-fits-all solutions when it comes to each resident and households changing needs over time (2015). Hence, a home has to be adaptable instead of causing demands for radical changes in a dwelling.

Some universal activities can be addressed and they are divided into three groups: gathering, private and services (Tarpio, 2015). Seen from an international perspective, Japanese Kiyoyuki Nishihara introduced a division of living functions comparing the spatial configurations of a traditional Japanese and a Western dwelling (1986). Leupen translated these functions into six essential basic activities: Sleeping, Get Together, Eating, Cooking, Bathing and Working. Furthermore, polyvalence of a home is related to activities which can be organized in multiple ways (2006b). It is reasonable to reduce the endless number of activities in a dwelling into a set of universal basic functions.

#### *Swedish context -BBR*

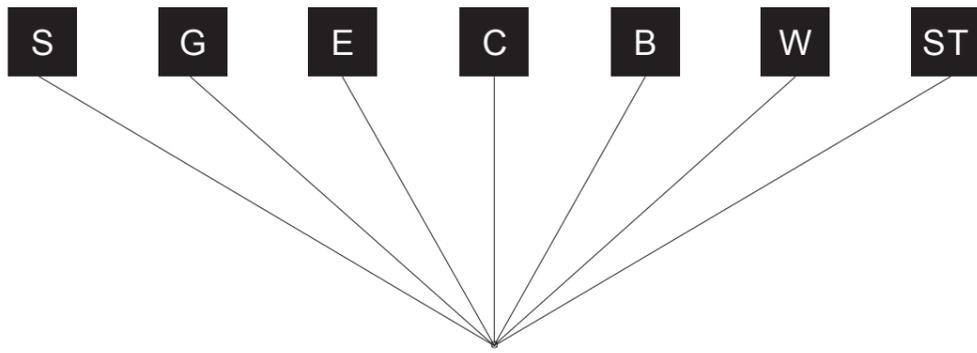
The Swedish Standard Regulations for building works (BBR) lists eight general functions that a dwelling should be able to provide for long-term usability: personal hygiene, get together, sleeping, cooking, eating, storage, laundry, entrance and storage for outdoor clothes (BBR, 2011).

Comparison between BBR’s and Leupen’s division of basic activities shows that “working” is not categorized as an activity in BBR. Tarpio highlights the same phenomenon as well in Finnish building regulations. The post-industrial and modern society today indicate how home and work overlap each other in greater extent. People work more from distance and concepts for hybrid solutions combining housing and working are increasing (Tarpio, 2016). Working as an activity should therefore be a relevant addition to the thesis and to the general guidelines in BBR on functions concerning housing.

Considering the long-term usability, BBR’s common guidelines for housing include a requirement for storage, either in the individual dwelling, in the public common spaces in the building or both (BBR, 2011:6). The common public spaces should also include storage for strollers, bicycles, wheelchairs, walkers etc. In countries like Sweden with four different seasons per year, it is important to have space for everyday outdoor supplies and to also have in mind that it takes up some square meters.

Insufficient storage spaces in a dwelling could result in that the residents are compelled to use the active living spaces for storage (Braide Eriksson, 2016). A RIBA report (2011) calls for the lack of space that residents have addressed. Instead, by inherently integrating storage in a dwelling the floorplans elaborate long-term solutions as the active living space becomes unrestrained.

Even though BBR’s recommendations and other standards have been adapting to current and future challenges, the guidelines need to be translated into more innovative spatial arrangements with a focus on activities rather than predefined rooms. As Hertzberger proposes, a flexible space stems from an observation that no situation is the right one (Krokfors, 2017).



SLEEPING, GET TOGETHER, EATING, COOKING, BATHING, WORKING, STORAGE

**ACTIVITIES**

## BACKGROUND

### Reflections

As the city of Gothenburg grows continuously there is a need for more housing and variation in dwelling sizes for diverse households. People in Sweden are more likely to live alone (SCB, 2015), which is a reflection of increased individualism. Families are becoming more untraditional and the constellations can instead consist of i.e. a group of friends. Therefore, planning for more diverse households is a counteract to increasing loneliness. Moreover, the dwellings should be adaptable to changing needs and consequently we need to reflect on multi-usable functions and space preferences.

We consider that there is a fine line between recognizing the difference between living under the minimum space recommendations, living with insufficient space for residents' needs, and living overcrowded due to the increased possessions. We build and live in smaller dwellings today. Moreover, the unfair division of living space is not in line with the inconstancy of life. The living space has diminished in Sweden, and for many life is forced to adapt within the limits of one's home instead of their homes adapting to life. Time- and space aspect can be discussed i.e. when children move out, parents get time for other things such as for interests that have not been allowed to take place before.

One parameter of polyvalence in a dwelling is that it demands enough space. Instead of custom-made dwellings for a specific use, they should be more general in order to be adaptable for changes. For example, having 3 sqm smaller

living space in Sweden compared to Germany can have consequences on the usability of space and affect the unmeasurable aspects in a dwelling. 3 sqm more can be of higher importance than we may think, if it is used in a right way. Considering space as designated room definitions and status connected to the number of rooms or how big one lives, should be put aside. Instead, the focus should be in plural functions and proportions in a dwelling that prioritize the unmeasurable values and life changes. It is therefore important to have the usability of space in mind, rather than only focusing on the square meters to determine the size of an adequate space.

The dwelling should have enough storage to facilitate everyday life, but we also need to question and rethink what we can share, how much we should own and how design can support sustainable actions (Akenji & Chen, 2016). In order to make a dwelling contribute to its residents health and wellbeing, they should be compensated with other shared functions within the building. One solution is to share even more in order to not compromise quality of life in a dwelling. This means that adaptability of a floor plan and what can be shared within the building or the neighbourhood needs to be in correlation with the living space. Living higher-density strengthens engagement as public urban spaces contribute to street life and a larger mass of people allows better supply of public services and closeness to work, schools, activities and public transportation.

## **CHALLENGES**

**TRANSFORMATION AND UNPREDICTABILITY**

**POPULATION CHANGES**

**HOUSEHOLD DEVELOPMENTS**

**DWELLING SIZE**

**LIVING SPACE**

## **FOCUS POINTS**

**VARIATION**

for diverse household constellations

**ADAPTABILITY**

multi-usable functions

space preferences

**GENERAL DESIGN**

unmeasurable values

## II

### POLYVALENT APPROACH

#### History

##### *Residential usability*

Adaptability, flexibility, polyvalence and changeability are concepts discussed from different perspectives in research on residential usability<sup>1</sup>. General spaces that through plan configurations reflect varying life situations could give the residents a possibility to define the usage of these spaces in comparison to dwellings with predefined use of spaces.

The unpredictable is often linked with the words flexibility and changeability. In the 1920s and '30s the idea of a minimum dwelling provoked flexibility in housing by aiming to the most efficient use of space. Many solutions were characterized by use of sliding doors, foldaway beds, movable partitions and alternative plan layouts. Leupen examines the permanent instead of the changeable. By this he means the long-lasting component of the building provides as a frame for changes (Leupen, 2006a).

Moreover, flexible space is seldom used compared to adaptability that is a more effortless strategy. Nonetheless, both concepts are used as a method to reach residential usability (Braide Eriksson, 2016). As Schneider and Till point out, hard use demands more specifically determined use of space, whereas soft use of dwelling calls for more space and repetition (2007). This is a more subtle approach to planning and allows indeterminacy for the users to adapt the plan to their needs.

##### *Salle Polyvalante*

Use of the term polyvalence has a long history in a context of a multi-purpose hall or *salle polyvalente*, a building found in French villages or smaller towns, that can be used for different public activities (Leupen, 2006b). An important aspect for the thesis proposal is the combination of neighbourhood and dwellings as determinants for how good a place and space is for living. Therefore, the historical perspective on polyvalence in the context of *salle polyvalente* is vital - the public continuous use of a space is translated into polyvalence in housing that relates to exchangeable activities between rooms.

A similar kind of typology is found in Swedish context. *Folkets hus* ("people's house"), *fritidsgård* ("youth center") and *bygdegård* ("community center") are examples that refer to public activities without a commercial character. Combining the concept of polyvalence into housing is, as we see it, a way to connect multi-usability of a dwelling and the urban space more closely to each other.

<sup>1</sup> I.e. Herman Hertzberger (1991), Bernard Leupen (2006) Tatjana Schneider and Jeremy Till (2007), Anna Braide Eriksson (2016); Jyrki Tarpio (2015), Karin Krokfors (2017); Anacker, Carswell, Kirby, Tremblay and Association H. E. R. (2017).



Figure 3. *Église Notre-Dame-de-Bethléem de Remoulins (Échelle 1, n.d).* With courtesy of Gabrielle Welisch.

Church Notre-Dame-de-Bethléem | Remoulins, France | 1817 / 2015-

## POLYVALENT APPROACH

### History

#### *Polyvalence* (*pɒli ˈveɪləns*)

Transformability refers to change, modification and multi-use. This idea can be connected to Herman Hertzberger's and Bernard Leupen's thoughts on polyvalence that focuses on undefined spaces with multiple uses (Krokkors, 2017). Polyvalence was presented to the architectural discussion by Hertzberger through his Diagoon House in 1967. By allowing freedom to the users, they are encouraged to define the function of a space.

Hertzberger saw the house as an incomplete frame that allows individual freedom for the users in terms of their needs and desires for activities and number of rooms. Central placement of the communal living spaces with fixed cores, one with staircase and the other with kitchen and bathroom, and several half-floors imply for various possibilities of the uses of spaces. The framework reflects spatial arrangements and thus leaves the spaces open for different interpretations (Schneider & Till, 2007).

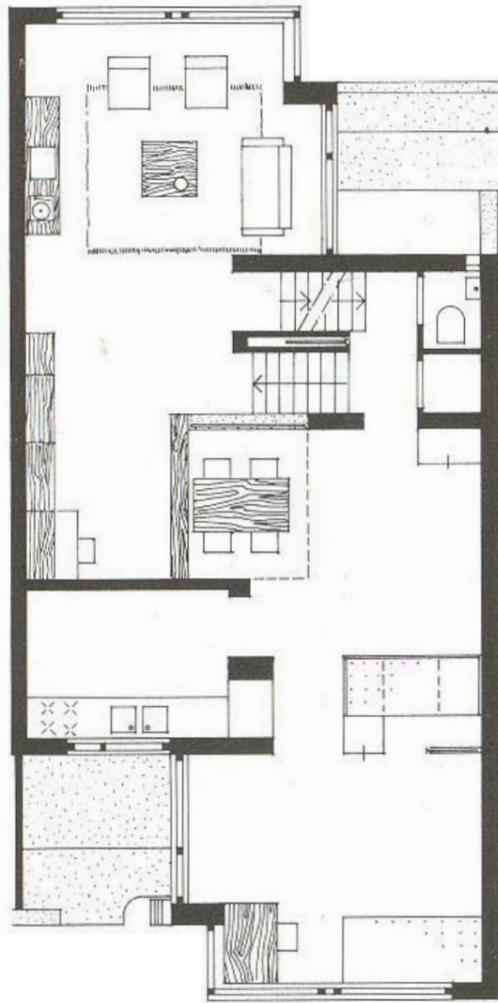
Polyvalence relates to a building that can be used in different ways, and in contrast to flexibility polyvalence is rather a feature of flexibility and connected to multiple uses without structural interventions. When it comes to housing, the term is used to describe interchangeability of activities and relationships between rooms (Leupen, 2006b). A polyvalent space is consequently multi-usable but does not necessarily require changes to be flexible as notioned by Krokkors (2017).

Leupen lists five basic principles of a polyvalent dwelling based on the analysis of different polyvalent housing projects (2006b):

1. The size of the rooms
2. The number of large rooms
3. The underlying spatial structure of the dwelling
4. The relationship to rooms with fixed activities (bathroom and kitchen)
5. The relationships between the rooms

He notions that for example spaces that are bigger than 16 sqm could be suitable for any basic activities. The number of larger rooms also provide freedom to divide the basic functions. In contrast, rooms that have access to other rooms without an alternative way have a decreased ability to accommodate basic activities, i.e. sleeping. Lastly, relation to rooms with fixed service functions, i.e. bathroom and kitchen, affect the degree of polyvalence.

Leupen notes that interchangeability of the dwellings have been present in the spatial configurations even until the 1920s, thus, making these homes somewhat polyvalent. Rooms were rather defined by their status than functions allowing the inhabitants to define the rooms according to their preferences (2006b). However, the location of the rooms contributes to the use of spaces, especially through their relation to service areas and openings.



Diagoon House | Herman Hertzberger | Delft, Netherlands | 1971

Figure 4. Experimental houses Diagoon type, Delft, Netherlands, 1967-70 (Kroko, 2008).  
CC BY-NC-SA.

## POLYVALENT APPROACH

### Logics

#### *General*

Spatial logics refer to certain types of internal organizations that articulate different conceptions of living. They are interpreted in internal configurations, openings and closings of the rooms, relationships between rooms, connections and sightlines (Heckmann & Schneider, 2017). Heckmann & Schneider divide floor plans into nine spatial logics:

#### Corridor

The living room as circulation center

#### Zoning

Neutral / ambiguous floor plan

Dividing elements floor plan

Continuous floor plan

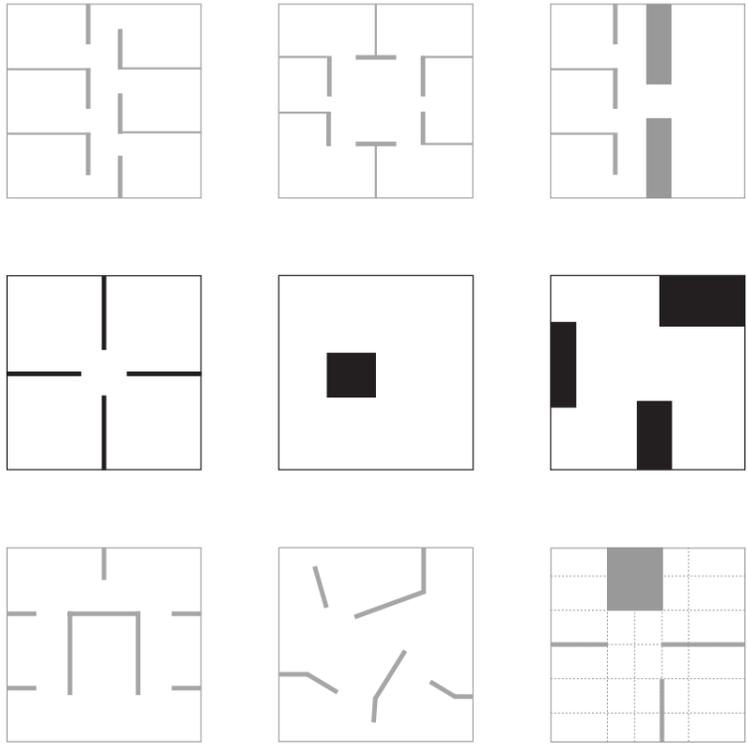
Floor plan with circular path

Organic floor plan

Flexible floor plan

The thesis focuses on exploring three of the nine logics; dividing elements, continuous floor plan and neutral floor plan. We consider these logics interesting to further explore in the context of polyvalence and innovative floor plan solutions. Furthermore, from an international perspective the examples in Swedish housing architecture are few.

Developing these logics further and finding ways to combine them results then in a new typology that is presented in the proposal in part IV. The spatial ideas emphasize spatial organization, social interaction and adaptability to activities in various ways. Floor plans may articulate different characteristics in a balanced mixture or, on the other hand, prioritize others. When it comes to the thesis proposal, it is the intersection of different spatial ideas in combination with polyvalent approach that results in a design project.



**SPATIAL LOGICS**

## POLYVALENT APPROACH

### Logic references

#### *Neutral / ambiguous floor plan*

The use of the space is not determined by the size, form or configuration of rooms. This contributes to the adaptable use of the floor plan for varying activities. The dwelling is inherently polyvalent and physical interventions are not necessarily needed in order to meet new demands for the use of spaces. The logic provides premises for the users to reflect their identity and living through the dwelling.

Furthermore, individual needs can be realized in a dwelling by arranging the interior. This enables also a mixture of different residents and households as the same floor plan functions for different users. Rooms are often characterized by certain size and proportion, and with independent access. The consequence is that more floor area is required for communication areas and rooms. Spaces are often inherently more generic and obscure, which increases the polyvalence of the dwelling. Instead of identical rooms with similar parameters, the neutral spaces could also be intentionally explored through unique characteristics, i.e. size, form, and light, hence reinforcing individual use (Heckmann & Schneider, 2017).

#### *Minus K House*

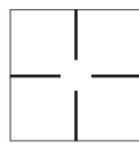
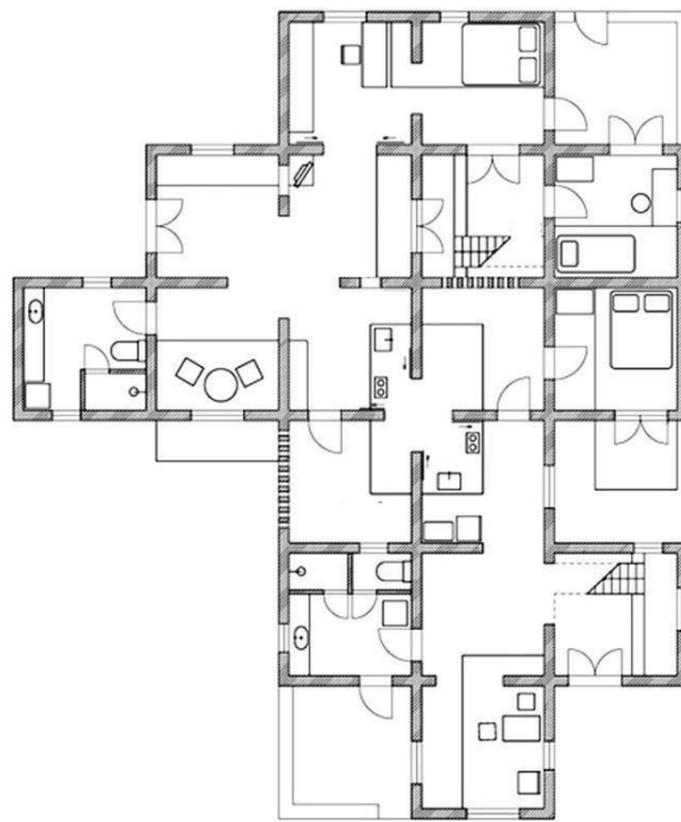
The floorplan of Minus K House Villa in Nanhui, Shanghai, by KUU Architects is characterized by internal flow and circulation through spaces that can operate together or separately. The floor plan for two residences consist of 3 m by 3 m volumes connecting to each other as a shifting grid.

The project has a high atmospheric value through a central table that functions as an anchor point for the house (Chinese-architects, n.d.). The kitchens are facing one another through a diagonal opening between the residences for interaction. Intersecting walls create flowing spaces with free movement and contrasts between openness and closedness.

If the two residences were instead seen as one unit without the central node and courtyards, the plan would allow even more possibilities for a variety of activities and households. The project underlines also the importance of the interplay between inside and outside, vertical and horizontal. The placing of the elements creates flowing views within a rigid plan layout, as well as they allow different degrees of privacy depending on residents' individual needs.

#### *Reflections*

As the floor plan does not need to go through modifications, the user has both the freedom and duty to create their form of living. Load-bearing system that divides spaces into neutral rooms often enhances arrangement and combination of functions that can differ from dwelling to dwelling and the interior can be rearranged for many individuals. Though, the neutral character of the floor plan demands for more floor area. Neutrality can be seen both as an advantage and disadvantage; the floor plan does not predefine the rooms but the individual character could be further explored through variation between the spaces.



### NEUTRAL / AMBIGUOUS FLOOR PLAN

Minus K House | KUU Architects | Nanhui, Shanghai | 2010

*Figure 5. Minus K House (KUU Architects, 2010). With courtesy of K.M. Tan.*

## POLYVALENT APPROACH

### Logic references

#### *Dividing elements floor plan*

The logic is based on an open space that contributes to the sense of the composition (Heckmann & Schneider, 2017). The dwellings are experienced generous due to the large open space with autonomous dividing elements or a core. The elements create movement, division and circulation in a floor plan. A dividing element can also function as a separator or as a linking element between rooms and corridors. For example, a core with bathroom can separate corridors leading to spaces for sleeping, while a core with kitchen, bathroom and integrated hallway can strengthen the connection between two spaces.

The elements primarily structure the space. Other room partitions, such as sliding doors or walls, can contribute to the openness or closedness of a space. Moreover, the placement of the elements creates spaces of various sizes and for different uses.

#### *Dapperbuurt*

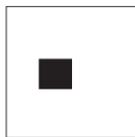
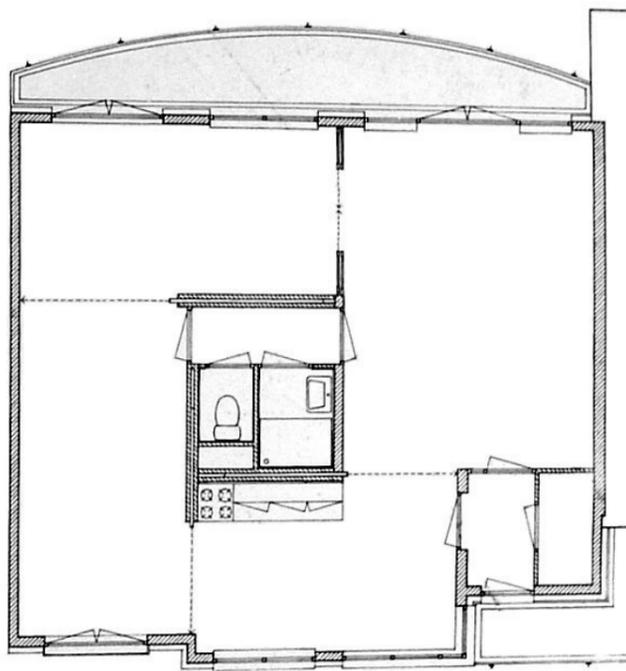
The multi-storey dwelling house Dapperbuurt in Amsterdam, Netherlands, by Duinker & Van der Torre consists of floor plans in which a spatial element is located centrally in the dwellings. A smaller entrance hall in the corner leads into the living space. The dwelling faces both sides of the façade maximizing the daylight access. A circular structure enables the use of spaces from two directions. The service core separates the bathroom and WC from other living spaces in terms of privacy and utility.

Moreover the access across the dwelling enables undisturbed and independent useability of each space. Three sides of the box contain pockets for sliding walls which can divide the open space into four rooms. The use of a static structure with service functions in combination with the sliding doors generates a variety of configurations in terms of useability in a space-effective dwelling (Leupen, 2006a).

#### *Reflections*

The dividing elements create circulation, define and divide the spaces, as well as guide the movement through or around the elements. The floor plan can be experienced as one large space despite the size of the dwelling. Variation can be achieved by exploring the number of elements that separate rooms and create neutral links between them.

The sequences of spaces can additionally be divided with walls or recessed walls sliding in the dividing elements. Nevertheless, it is critical to consider the placement of the elements, since they often are permanent service cores in plan. Furthermore, the space around them has to allow several functions to take place, as well as the rooms should have right proportions in order to avoid them to become too large, small, wide, narrow or deep.



**DIVIDING ELEMENTS FLOOR PLAN**

Dapperbuurt | Duinker & Van der Torre | Amsterdam, Netherlands | 1988

*Figure 6. Dapperbuurt housing (Duinker van der Torre, 1988).*

## POLYVALENT APPROACH

### Logic references

#### *Continuous floor plan*

Room boundaries are minimized to few walls in a continuous floor plan. The placement of these walls has an important role for the creation of dividable spaces. Due to the connecting communication areas, spaces often merge with one another and open to sightlines. The dwellings are experienced generous and open as rooms relate to the entire space.

The logic can be investigated through both the horizontal and vertical interaction. For example, in horizontal approach different activities melt together with corridors, and in vertical approach varying heights and relationships between rooms add a new layer to the movement. Spatiality can be strengthened by the use of light in combination with the plan configuration; for instance, placement of openings enhances the movement in the space (Heckmann & Schneider, 2017).

#### *High-Rise*

High-Rise is a concept of a multi-storey dwelling block in London, United Kingdom, by E2A. It is characterized by an idea to divide a central core into four units that are connected to the façades. The plan has in overall a generous open character, yet it is still flexible due to the possibility to divide the spaces into smaller units.

The in-between spaces create living areas that are not defined by default, instead the residents have a freedom to shape them. Communication spaces

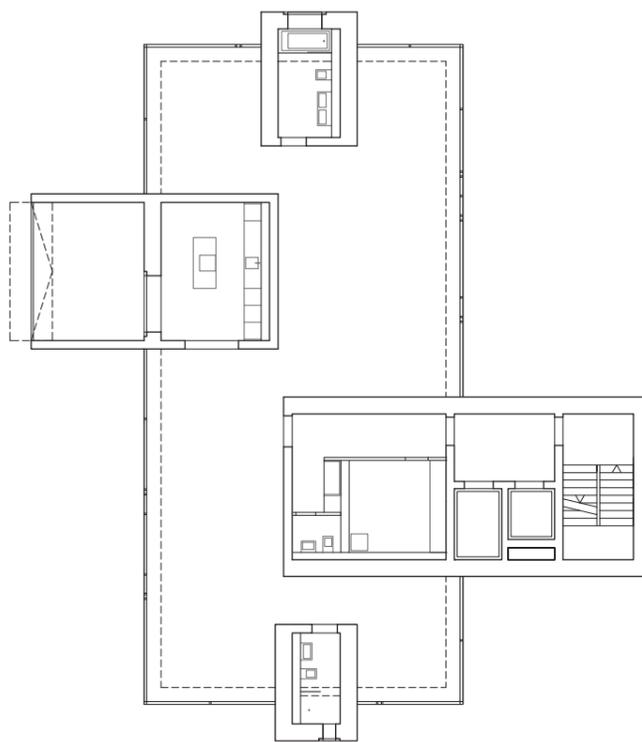
are interwoven with the overall layout which can be examined in several ways; the communication spaces are a consequence of the functions and divisions of the uses.

The ground floor spans three stories and resonates to the city by creating a plaza for social interaction with residential, commercial and office functions. The four cores are placed in an unconventional way both seen from the structural, spatial and technical aspects (E2A, n.d.). This allows naturally ventilated bathrooms and daylight to access the core zones and interior spaces. An interesting aspect is that the spaces are more generic and rooms are not labelled, but still the project maintains high architectonic value as it has a strong expression in its wholeness.

#### *Reflections*

Reduced room boundaries and few walls contribute to a continuous sequence through the rooms. As the borders between communication areas and living spaces often are vague, the rooms become a part of the entire space.

The disadvantage of the floor plan relates to the lack of neutral access to the rooms. Communal living spaces are often interconnected to rooms that require more privacy to allow neutral access which decreases the possibilities to vary the functions. The combination of dividing elements- and continuous floor plan would therefore answer better to the changing requirements for a dwelling.



## CONTINUOUS FLOOR PLAN

High-Rise | E2A | London, United Kingdom | Concept 2015

*Figure 7. High-Rise (Eckert, 2015). With courtesy of Monika Annen. © E2A Piet Eckert und Wim Eckert Architekten.*

## POLYVALENT APPROACH

### Reflections

From part II about polyvalent approach we have underlined a set of guidelines that are a result of looking into different spatial logics and their qualities in relation to adaptability. Neutrality is one of the key conceptions of a space that invites for different uses through form and dimensions. Activities are the base for spatial composition, and in order to provide a great variety of constellations we propose five size categories of the dwelling units: XL, L, M, S and XS.

Sizes and relationships between generic spaces determine the polyvalence of the dwellings related to varying arrangements or combinations of activities they can permit. Therefore, the floor plans are a result of finding a balance between proportions that are interpreted in internal configurations, openings and closings, connections, sightlines and circulation.

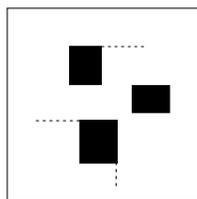
When it comes to the use of space, sharing functions both between the residents but also between the public actors responds to people's increased interest in new forms of collaboration and urban culture. Shared spaces do not necessarily have to be bound to only one function, instead their configurations can overlap.

## DWELLING

**SPATIAL STRUCTURE**      **XL, L, M, S, XS UNITS**  
polyvalence of the dwelling      for varying constellations

**COMMON SPACES**      **SIZE OF SPACES**  
sharing functions      proportions  
space efficiency      generality

**ACTIVITIES**      **RELATIONSHIPS IN SPACES**  
for spatial composition      internal configurations  
openings and closings  
connections  
sightlines  
circulation  
division



### III

## URBAN CONTEXT

### History

#### *Stigberget, Majorna-Linné, Gothenburg*

The site is an urban infill and located in Majorna, Gothenburg, ca 2.2 km west from the city center on a steep northeast hillside between Stigbergsliden and Kjellmansgatan. The site has good public transport connections as trams are trafficking on Stigbergsliden. Two public squares are situated near the site, Stigbergstorget ca 150 m to the west and Masthuggstorget ca 350 m to the east, in combination with commercial services, offices, housing and cultural activities.

Cultural historical buildings surround the site, such as Sjömanshuset from 1831 next to the project site with white-plastered façades and roof of red clay tiles. Despite the fact that the building has gone through reconstructions and several changes in its programme and configuration, it still is a well-preserved stone building in the city. Masthugget hill has an important recreational and touristic meaning for both the visitors and the residents in the area. For instance, Masthugget

Church, 1914, up on the hill and St. Johannes Church, 1866, lower down are visible landmarks for Stigberget.

#### *Before*

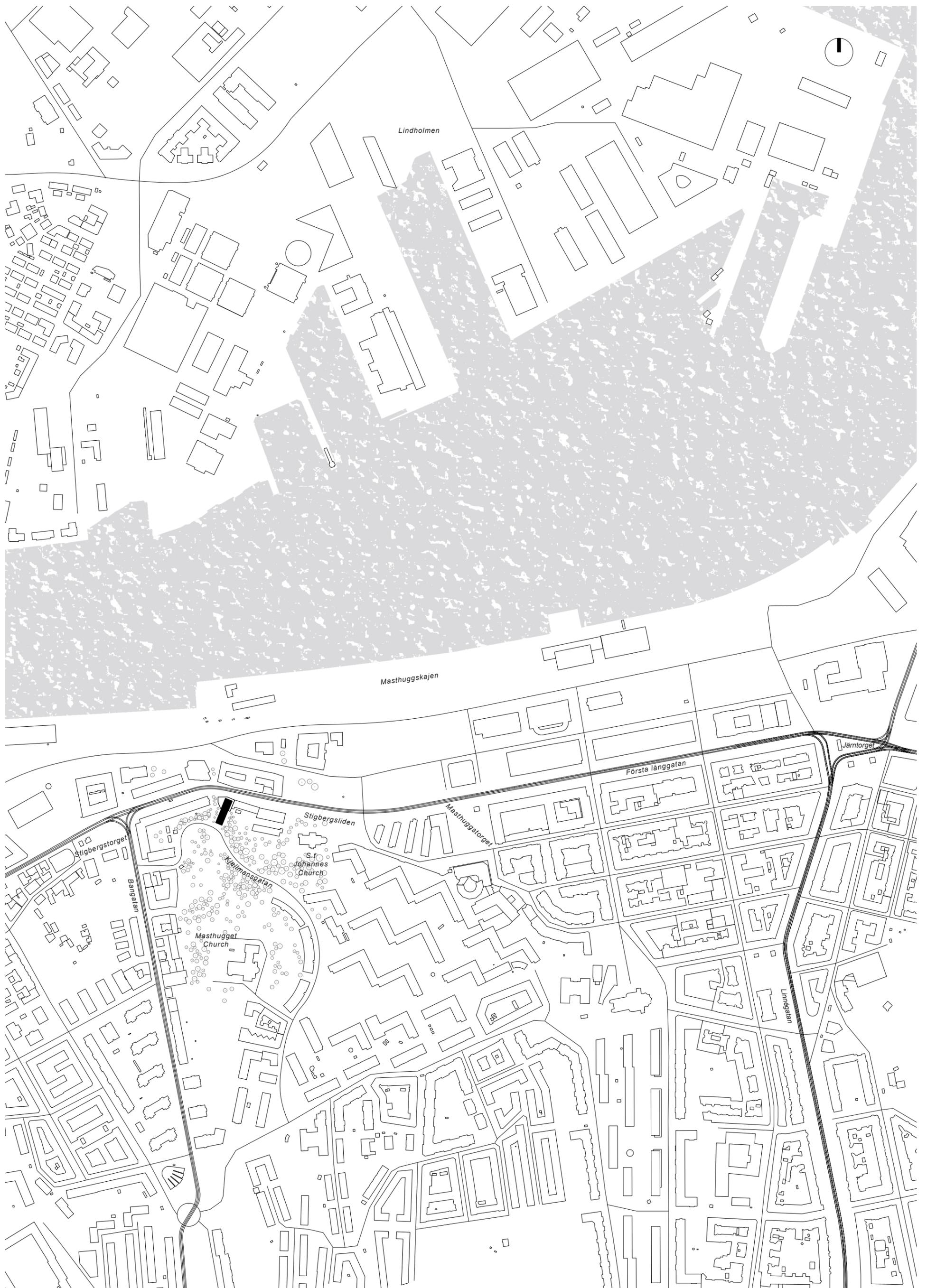
Stigbergets hillside from Fjällgatan towards the Göta river was built during the 1700s mainly with sparsely placed residential timber buildings. The density has been higher nearer Stigbergsliden and under the 1800s the low building stock was replaced with higher dwelling houses. The harbor and port of Gothenburg has influenced Stigberget drastically during the 1600s and 1900s, and institutions mainly for sailors were built in the area (Göteborgs Stadsbyggnadskontoret, 2018).

The first trams in Gothenburg were taken into use between Brunnsparken and Stigbergsliden in 1879 (Göteborgs spårvägar, n.d.). In 1958 real estates were torn down in order to widen Stigbergsliden from 10 m to 30 m and the new street was completed in 1960 (Rydell, 2010).



Figure 8. Sjömanshuset & its surroundings in the end of 1960s (Göteborgs stadsmuseums arkiv, n.d.).

The building on the left was replaced with a 6-storey building meanwhile building to the right was demolished.



Site plan  
(1:5000)



Figure 9. Stigbergsliden 1890-century (Göteborgs stadsmuseums arkiv, n.d.).



Figure 10. Stigbergstorget and Masthuggsbergen 1950 (1950). With courtesy of Morgan Lundberg.

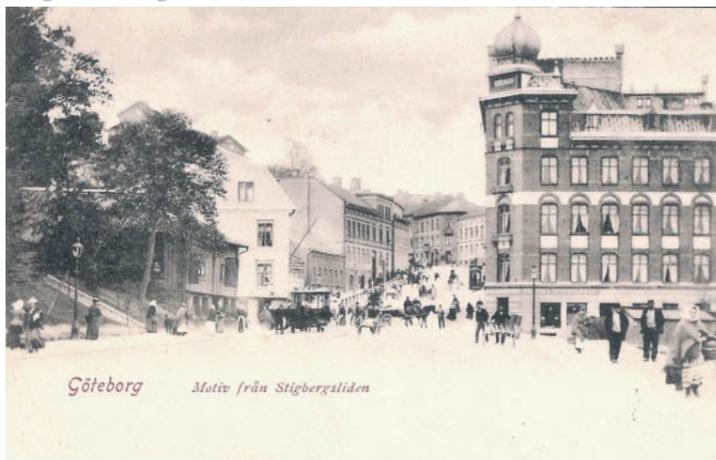


Figure 11. Stigbergsliden with horse tram, before 1906 (n.d). With courtesy of Morgan Lundberg.



Figure 12. Stigbergsliden 1923 (1923). With courtesy of Morgan Lundberg.



Figure 13. Stigbergsliden (n.d.). With courtesy of Morgan Lundberg.



Figure 14. Stigbergsliden 1914 (1914). With courtesy of Morgan Lundberg.



Figure 15. Masthugget (© Lantmäteriet, n.d.).



## URBAN CONTEXT

### Site premises

#### *Today*

The area is a mixture of commercial, cultural, and residential functions. The site has been empty since the 1960's and is used for parking today (Göteborgs stadsmuseum, 2017). This empty and undefined space next to Sjömanshuset is according to Gothenburg city's general plan designated for housing, green- and recreational uses. Thus, a mixture of housing and public functions is desired (Göteborgs Stadsbyggnadskontoret, 2018).

A new detail plan has been requested to implement housing, offices or other services and functions between Stigbergsliden and Kjellmansgatan. At the same time a link between the roads and activation of the site would contribute to the city life and add a better connection through the area.

#### *Premises*

The dramatic topography has a 40 m height difference between the characteristic landmark Masthugget Church and Fjällgatan.

The site is situated between two parallel streets, Stigbergsliden and Kjellmansgatan, on different levels. The northern urban street consists of housing, commercial and cultural activities, and has good public transport connections, meanwhile the other street functions mainly as a trafficked road, but with some green paths from Masthugget Church to south.



**SURROUNDINGS**

## URBAN CONTEXT

### Project references

#### *General*

The building and urban context references are divided into three categories: volume, façade and stairs. They present both local and international examples that we find relevant in terms of the site premises.

#### *Volume*

Otterhall, 1929, is an example of a split level volume with a top floor. In contrast, the offset housing volume with a commercial base in Esperantoplatsen, Gothenburg, has good sunlight conditions towards west. The rooftop of the first building volume functions as a semi-private terrace for the residents. Lastly the old bank vault in Skanstorget, Gothenburg, with a public plateau activates the rooftop and adds an access to the hill.

#### *Façade*

The façade of City Library of Gothenburg, 2014, uses scale variation and repetition as a means for showing the hierarchy of the floors. Openness and closedness of the façade also indicates the programmatic division between private and

public spaces. BL Invest Geel, 2016, shows how pieces of masonry can be arranged to provide variation within the masonry work, and how other few selected materials can complement the composition. Dwellings in Havneholmen, 2008, have extended balconies that appear as a monolithic whole. Moreover, the irregular placement of the balconies provide both better sunlight conditions to the balconies, as well as it gives the façades a more varying appearance.

#### *Stairs*

Götaplatsen, 1923, is an example of layering the public space into smaller sections by terraced plateaus. The main volume of Il Palazzo, 1989, is placed on a stepped base that leaves a public piazza within the entrance. The stairs become a connector between the street and the plateau and are integrated to the volume. The public stairs in Linné are an intersection between public and private. Here the dwellings are facing a public building on the opposite side, and a public stair in the middle that serves as a connection between a main- and a calmer road.



Otterhall | Harald Ericson | Gothenburg, Sweden | 1929



Unknown | Esperantoplatsen | Gothenburg, Sweden



Unknown | Skanstorget | Gothenburg, Sweden



Stadsbiblioteket, renovation and extension | Erséus Arkitekter | Gothenburg, Sweden | 2014



Figure 16. BI Invest Geel (Beneens Heynen Architecten, 2012).

BI Invest Geel | Beneens Heynen Architecten | Geel, Belgium | 2016

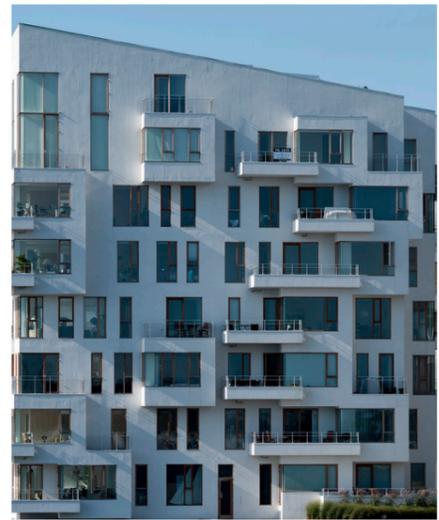


Figure 17. Havneholmen, Lundgaard & Tranberg Architects. (Mørk, n.d.). With courtesy of Lene Jeppe-Jensen.

Havneholmen | Lundgaard & Tranberg Architects | Copenhagen, Denmark | 2008



Lorensberg | Gothenburg, Sweden

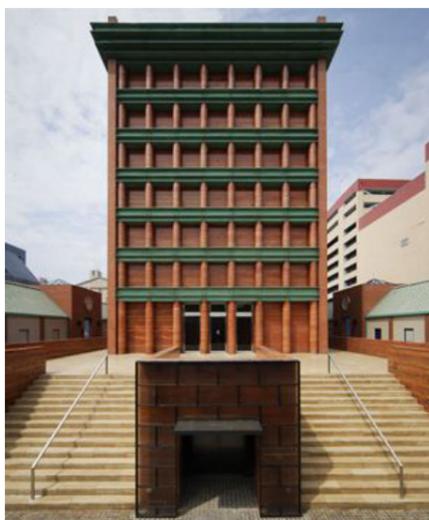
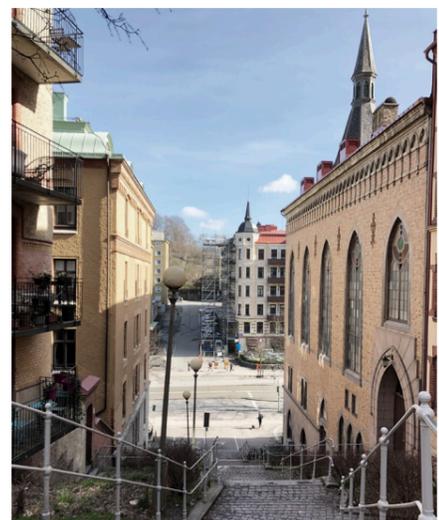


Figure 18. Il Palazzo, Aldo Rossi & Morris Adjmi Architects (Nacasa and Partners, n.d.). With courtesy of Jasper Pope.

Il Palazzo | Aldo Rossi & Morris Adjmi Architects | Fukuoka, Japan | 1989



Linné | Gothenburg, Sweden

## VOLUME / FAÇADE / STAIRS

## URBAN CONTEXT

### Reflections

Part III focuses on the urban context. The site premises set limits but also possibilities for the proposal. An urban infill project allows for experimental plan solutions as the site is multifaceted in its characteristics and has individual preconditions when it comes to the surrounding urban landscape.

Moreover, the unique situation between two roads on different levels and the sloping terrain invites for layering the public, private and common in new ways. The base volume for public and residential activities, public rooftop as a viewpoint and stairs as connectors motivate social interaction.

Lastly, variation in scales in terms of polyvalence, public and private, volume and façade aims for coherent design from a unit to the building in its wholeness.



INFILL PROJECT



IN BETWEEN STREETS



SLOPING TERRAIN

## BUILDING

### LAYERS

public, private, common

### ROOFTOP

public viewpoint

### BASE FLOOR

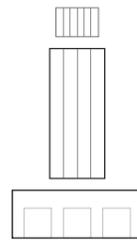
public + shared activities

### CONNECTING STREETS

by stairs

### SCALES

of polyvalence  
of public and private  
in volume  
on façade



## IV

### PROPOSAL

#### Guidelines

##### *General*

The design proposal shows one way of how adaptability could be defined, improved and understood in a dwelling, building and neighbourhood scale. The background (part I) underlined research on housing development and future challenges. From the research on polyvalence (part II) and the site analysis and its premises (part III) we formulated project guidelines.

##### *Spatial structure*

Polyvalence of the dwelling relates to the three logics and a combination of them. The spatial structure is a combination of spatial connectors and their relationships between the surrounding space.

##### *XL, L, M, S, XS units*

One objective is to discard the room labelings in order to reach adaptability. The dwellings are categorized into five sizes. This allows a mixture of different households with varying needs for space. The focus is in activities in a dwelling that prioritize the unmeasurable values and life changes. Therefore, the usability of a space is prioritized rather than only focusing on square meters.

##### *Common spaces*

Living spaces need to be in correlation with the floor plans and what can be shared within the building or in the neighbourhood. By examining which areas the residents could share, we want to argue that one for example pays for 40 sqm but gets 60 sqm where the additional spaces are common shared spaces for the residents. This is important from both social and environmental aspects.

##### *Size of spaces*

Proportions and generality when it comes to the sizes of the spaces provide neutral plans that are adaptable for various uses, taking on account the communal and private aspects of living. Generic spaces together with relationships between them provide more freedom in terms of activities. Moreover, the dwellings should be adaptable to changing needs and therefore we need to reflect on multi-usable functions and space preferences.

##### *Activities*

It is reasonable to reduce the endless number of activities in a dwelling into a set of universal basic functions. We listed a set of basic universal

activities: sleeping, get together, eating, cooking, bathing, working and storage. They can be organized in multiple ways and accommodate different life patterns.

##### *Relationships in spaces*

The relationships are notioned in internal configurations, openings and closings, connections, sightlines, circulation and divisions. Spatial elements and their relation to the surrounding space create a set of spatial sequences.

##### *Layers*

The project includes working with layers of public, private and common. A public ground floor, plateau, rooftop and outdoor stair for creating content for the local area, which also helps to generate a daily rhythm for the building and the area. Layering is also implemented in the façades and plans as variation and repetition.

##### *Rooftop*

The rooftop is considered as an extension of the public space for the residents and the citizens. By connecting the public stair with the rooftop, it serves as a viewpoint over the harbour and the city.

##### *Base floor*

Residential and public functions are combined in the base floor. Functions that had otherwise eaten up square meters in relation to the time spent on them in a dwelling can be shared and centrally located for the residents in order to not compromise the quality of life in a dwelling.

##### *Connecting streets*

Connecting the two parallel streets in different levels with a public stair not only adds a missing link between these streets but also extends the public life up to the calmer street and up to the rooftop. In addition, time aspect is taken on account and by connecting a public activity and the view with the outdoor stairs, it receives a social content instead of only serving as a communication.

##### *Scales*

The polyvalent approach includes scale variations in volume, public and private spaces, façade and configuration of the individual dwellings. I.e. the base-, main-, and rooftop volume follow the same principles, though adapting to their size, form and programme.



## GUIDELINES

<b>SPATIAL STRUCTURE</b>	<b>LAYERS</b>
polyvalence of the dwelling	public, private, common

<b>XL, L, M, S, XS UNITS</b>	<b>ROOFTOP</b>
for varying constellations	public viewpoint

<b>COMMON SPACES</b>	<b>BASE FLOOR</b>
sharing functions space efficiency	public + shared activities

<b>SIZE OF SPACES</b>	<b>CONNECTING STREETS</b>
proportions generality	by stairs

<b>ACTIVITIES</b>	<b>SCALES</b>
for spatial composition	of polyvalence of public and private in volume on façade

**RELATIONSHIPS IN SPACES**

- internal configurations
- openings and closings
- connections
- sightlines
- circulation
- division

## PROPOSAL

### Site

#### *Volume & site*

The building extends from Stigbergliden to Kjellmansgatan and reflects upon different scales of urban character by connecting an active public street and a calmer recreational street together.

Configuration of the building reacts to the dramatic height difference of the site and its surrounding buildings which makes it possible to layer both the program with different scales of public, private and common functions, as well as to provide access to the building from different levels. The mixed-use building is based on 3 volumes - base, housing and pavilion. The housing volume is vertically displayed to meet Kjellmansgatan, and horizontally to connect to the hill.

#### *Public connection*

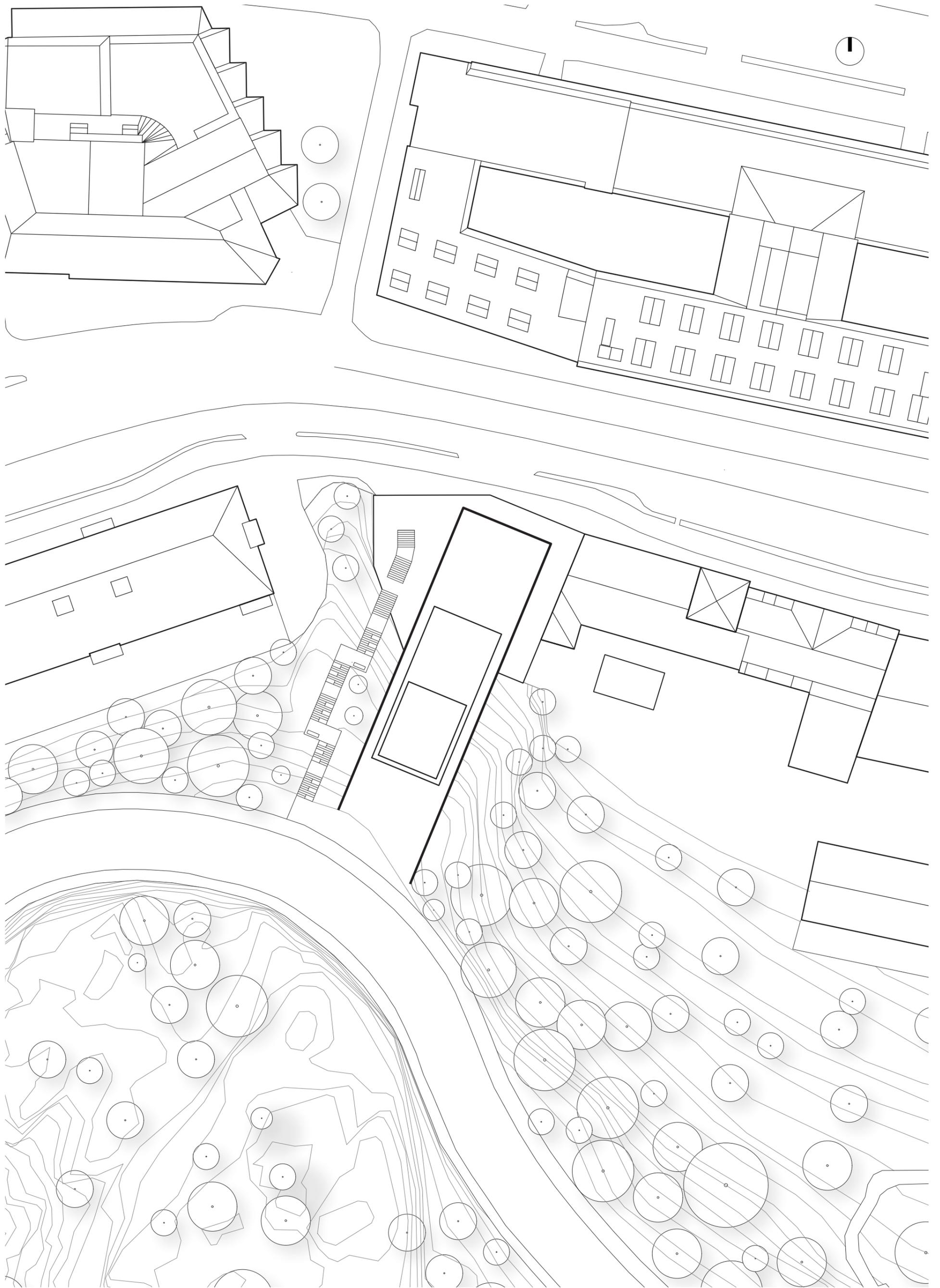
Public stairs connect the two streets together and become part of the axis from Oskarsgatan up to Stigbergliden. Thus, contributing to the lacking north-south access. The existing western cliff is preserved and used as a complement with new public stairs that lead up to the restaurant plateau and continues up to the rooftop and the street above. The base volume is connected to

Sjömanshuset meanwhile the main body is set back for the public plateau.

As a result, the project incorporates a public access to and through the area with a walking connection between Stigbergliden and Kjellmansgatan. The split volume with a public plateau in combination with the public stairs layer the public content within the volume and in the urban landscape. Furthermore, turning the undefined outdoor spaces into places contributes to social inclusion and a creation of a new place instead of making it an anonymous non-place.

#### *Parking*

Gothenburg city engages for a car-free future and invests on projects and benefits for a more sustainable transportation. A leasing contract for 35 plots is signed with Brf Masthugget in terms of the new detail plan. This makes it possible to use these places as an alternative to a garage within the new building. Near distance to public transportation, a common car pool located within 400 m from the site and a bicycle pool within the building contribute further to more sustainable ways of transportation.



Site plan  
(1:400)



*Public space*

The open base and the plateau are allocated for commercial and collective spaces for the citizens and the residents. The set-back main body includes housing and the rooftop with a pavilion serves as a public viewpoint over the city and the river.

(1:200)



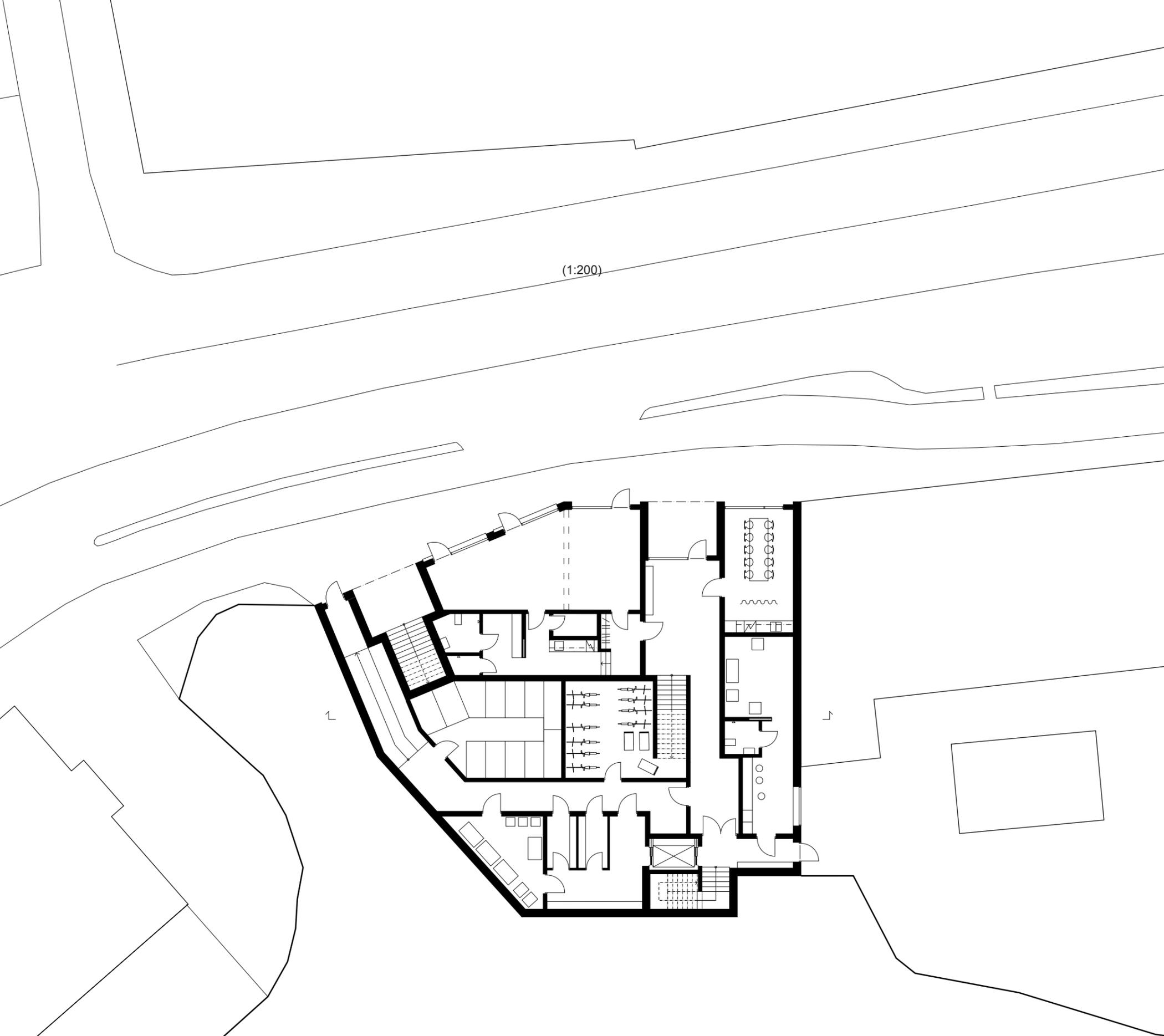
North façade



#### *Ground floor*

Public and residential functions are placed on the ground floor. A public stair in the core leads up to the restaurant floor and continues up to the residential floor plans. The recessed entrance serves both the residents and visitors. Functions that can easily be shared with the residents, such as laundry and a DIY-room, are placed on the ground floor. Moreover, a multipurpose room for the renters and the residents can be shared. These spaces enhance the communal aspects of sharing everyday life. Storage, bicycle rooms, recycle, and service spaces are separated in the core.

(1:200)



Ground floor

(1:200)



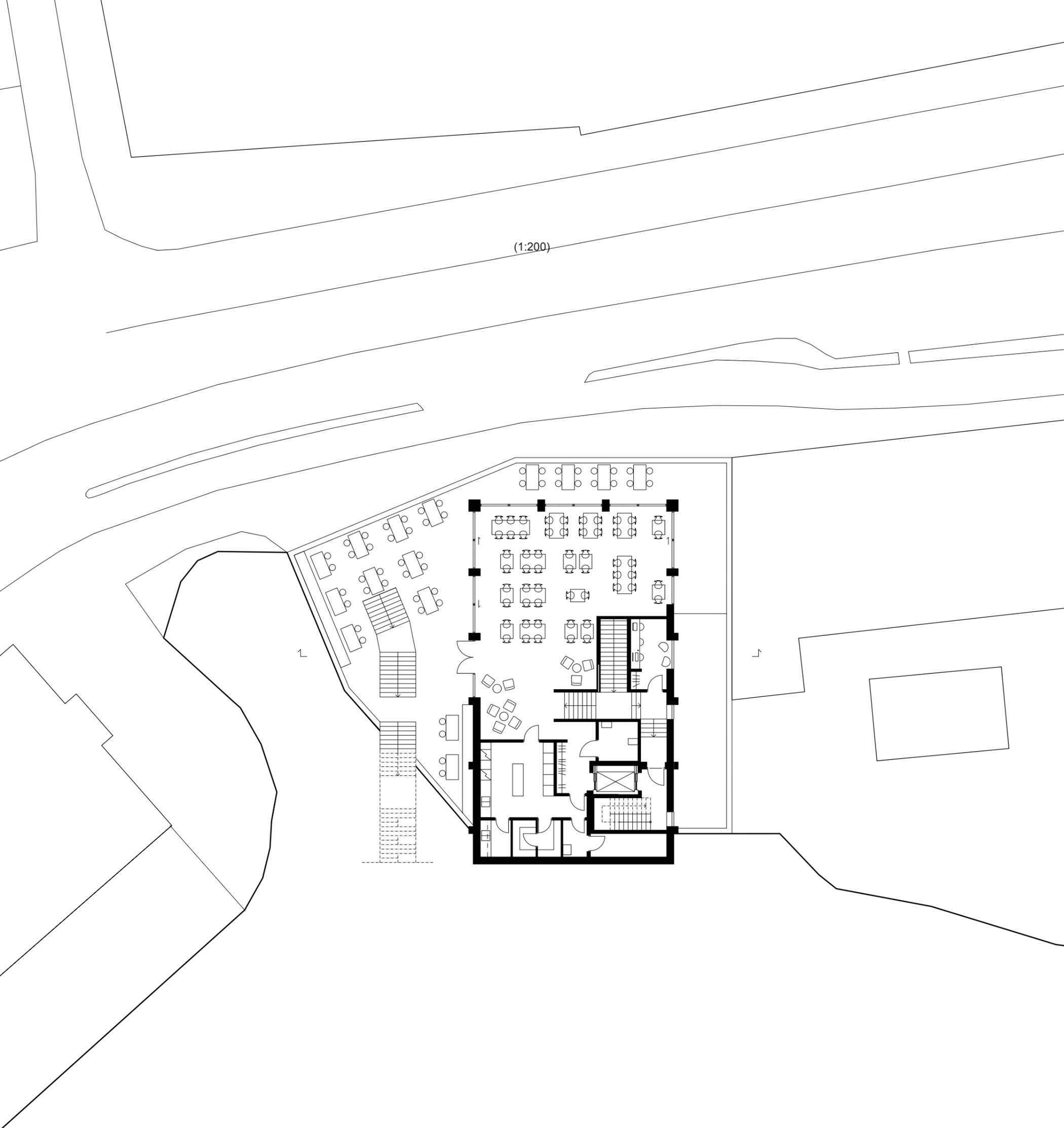
### Section

#### *First floor*

The section shows the layering of the mixed uses and public and private realm in differing scales. The public outdoor stairs on the western corner lead to a public plateau with a restaurant and an outdoor serving. The public plateau activates the space and contributes to a day around usage, as well as the connection via the hill creates a new passage in which the restaurant becomes a part of this movement.

Indoor spaces can be extended to the outdoor plateau with glazed partitions. In order to separate the public function from the residential functions during the closed hours, the open access to the restaurant from the internal stair is restricted during these hours.

(1:200)



First floor

## PROPOSAL

### Typology

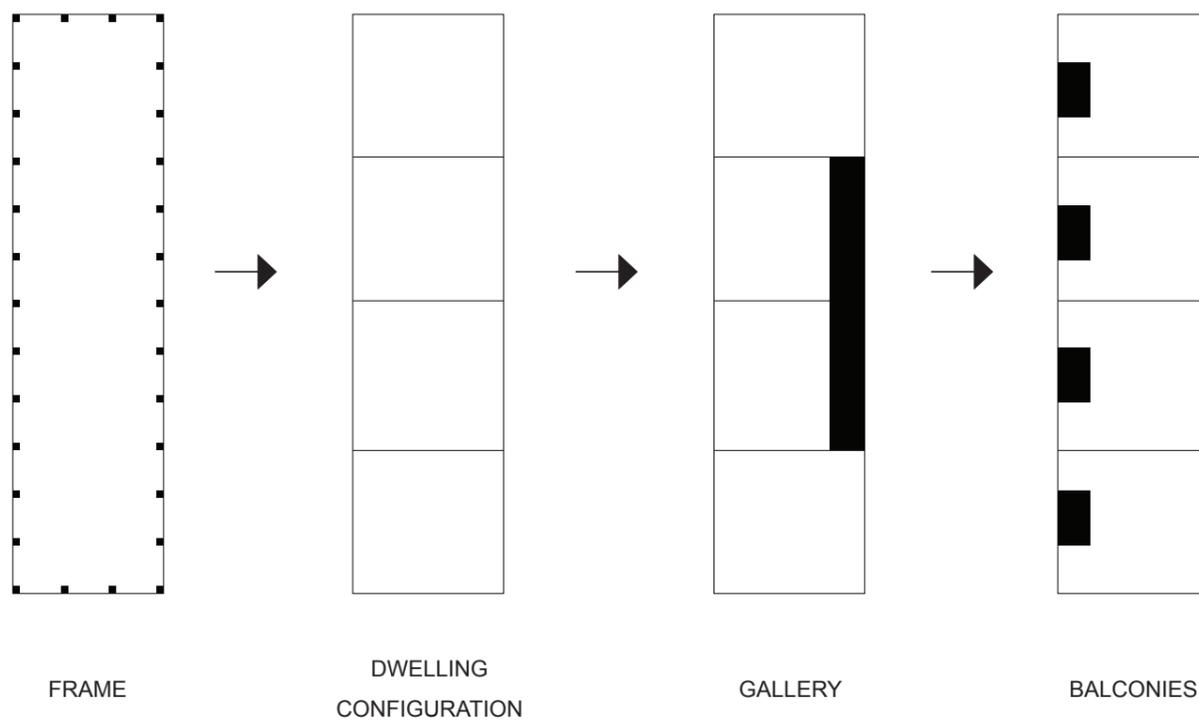
#### *Gallery house*

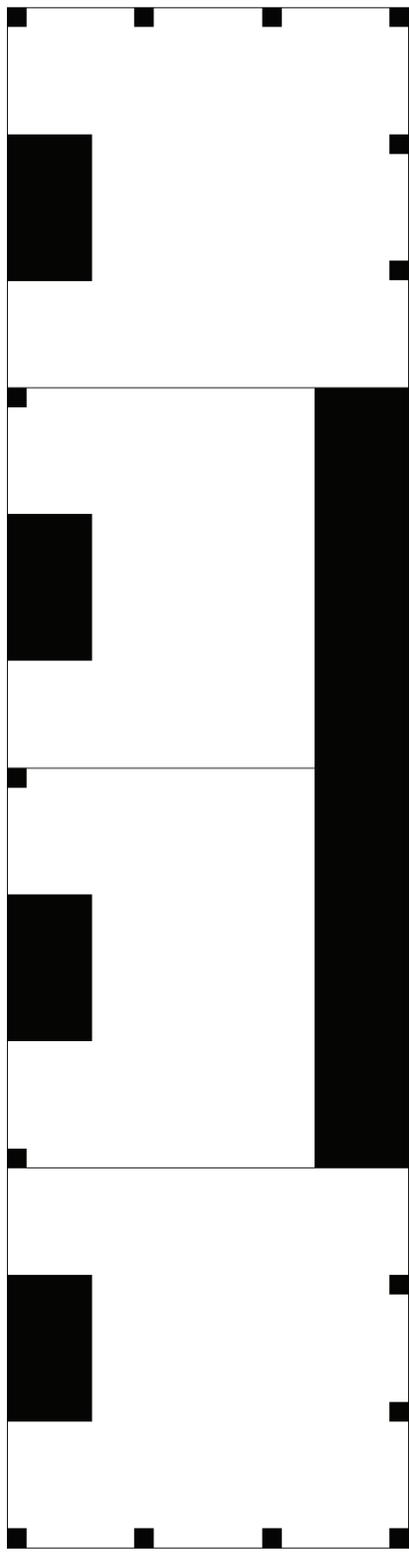
The narrow building volume follows a structural grid of 3.2 m x 3.2 m. The building frame defines the premises for the generic space for change in a long period of time for multiple uses in relation to the recessed balconies and the access gallery.

The four residential floor plans vary in their configurations and mixture of dwelling sizes. The dwellings are west-facing and accessed through the east-facing gallery access, whereby the entrances face onto a common gangway with an elevator and a staircase.

Eight dwellings have a private outdoor gallery access that is separated from the common gangway. On the contrary, four dwellings are reached directly from it. Thus, the entrances are offsetted inwards to create private niches and to allow communication to neighbouring dwellings.

In both cases the private sphere is elongated as a new layer which also features as a softer transition to one's dwelling. Moreover, the access gallery is partly expanded from the building volume in order to maximize the usability of the outdoor space.





**BUILDING CONCEPT**

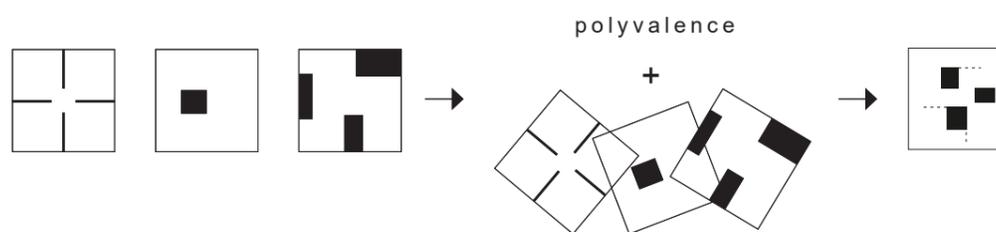
## PROPOSAL

### Floor plans

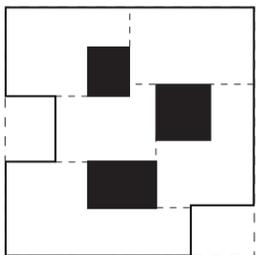
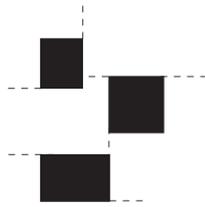
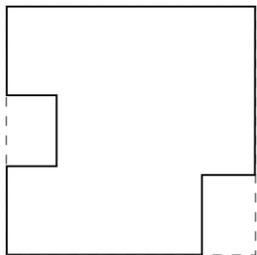
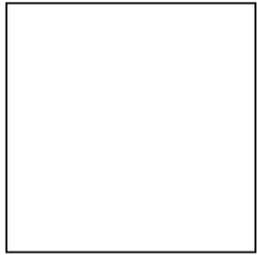
#### *The floor plan idea*

The floorplans are a combination of the three represented logics; neutral/ambiguous-, dividing elements- and continuous floor plan. We developed a new logic that aims for continuous movement, generality and adaptability by using spatial connectors.

Placement of the spatial connectors results in unceasing movement between the rooms, along the façades and the core. Extending these connectors creates openings both along the façades and across the core. Neutral access to adjacent rooms is also important for maximizing the usability and variation for different settings. Autonomous, yet connected spaces, are a result of the spatial connectors.



#### COMBINATION OF LOGICS



**GENERIC SPACE**

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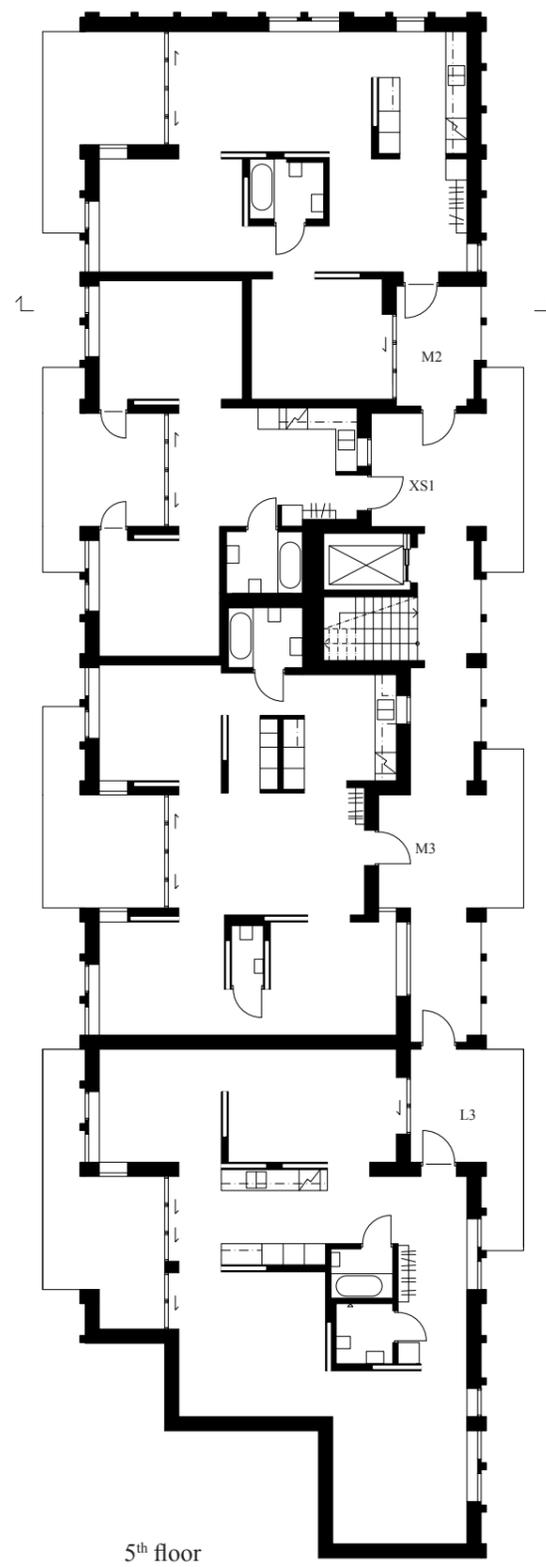
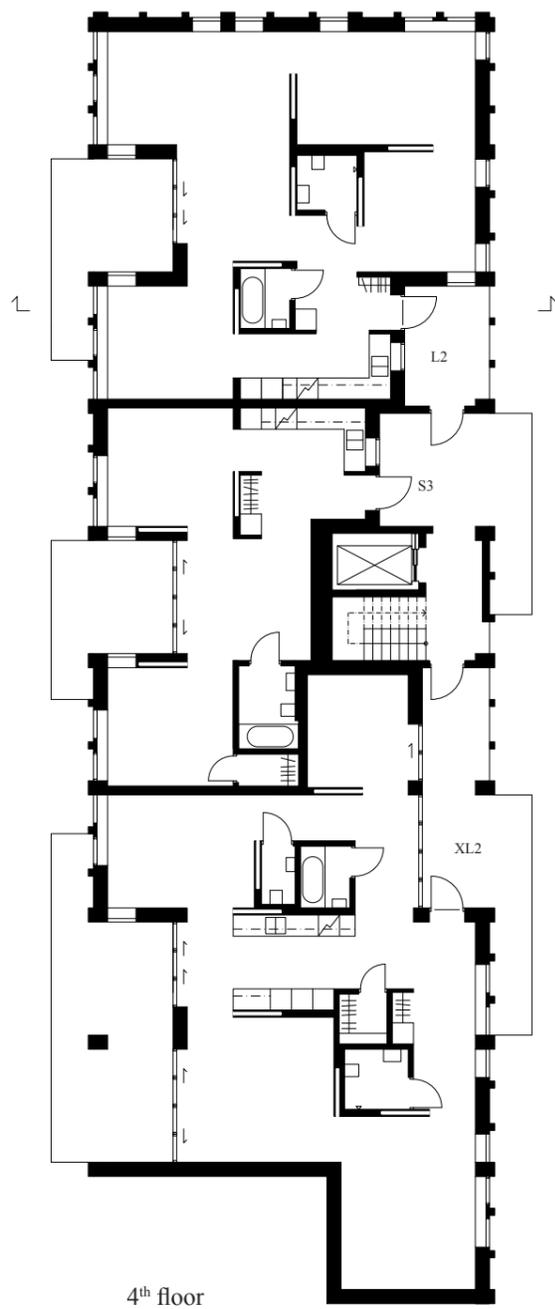


#### *Plan configurations*

The servant elements form a number of rooms that can be used as a one big continuous space or as several autonomous spaces with the help of spatial connectors and integrated pocket doors. The rooms can mainly be reached from a neutral transitional space or from the kitchen. The sanitary functions are separated from each other to ease the everyday life and they can be used more efficiently and by varying number of residents at the same time making the dwellings more suitable for more than just a nuclear family.

The connectors also enable place for storage. A high level of democracy is arranged through circulation, movement along the façades and from dark to light, as well as through relations between the spatial connectors. Some adjoining spaces can be private or operate together. Moreover, relationships between rooms and central common spaces make it possible to share the dwellings as a collective or rent out some of the rooms. Overall, the rooms can be used for different periods of life.

(1:200)



12 dwellings in total

- 2 x XL 107 - 111 m<sup>2</sup>
- 3 x L 92 - 99 m<sup>2</sup>
- 3 x M 78 - 79 m<sup>2</sup>
- 3 x S 55 - 59 m<sup>2</sup>
- 1 x XS 48 m<sup>2</sup>

*Size categories*

The dwellings are divided into 5 size categories: XS, S, M, L and XL ranging between 48-111 sqm. The cable dwellings are orientated towards three sides; Stigbergsliden in north and the calmer sides towards east and west. Rest of the dwellings have east- and west-facing façades. Each dwelling also has a balcony towards west as well as their entrance balcony in east.

## PROPOSAL

### Floor plans

#### *External access*

The entrance into the dwelling is divided into two sequences: from the public access balcony one proceeds to a private balcony that provides a transitional in-between space and an extension to the private sphere. Sightlines through the dwelling create a feeling of inclusion and openness. The private access balcony makes it possible to use the space in individual ways depending on the needs and desires. The recessed balcony brings more daylight into the core as well as indirect light to the surrounding rooms on both sides. It also becomes an extension of the indoor spaces both under the roof and outside along the façade.

#### *Division of spaces*

The dwelling is entered through a glazed door into a central circulation space that is in direct connection with a kitchen in the south-east corner. The living spaces are gathered around two circulation elements with sanitary functions that generate movement along the façades and through the core. Furthermore, these spatial connectors provide neutral access to the adjacent rooms. Separated sanitary functions ease the everyday life as bathroom and toilet are separated and can thus be used more efficiently and for varying number of residents.

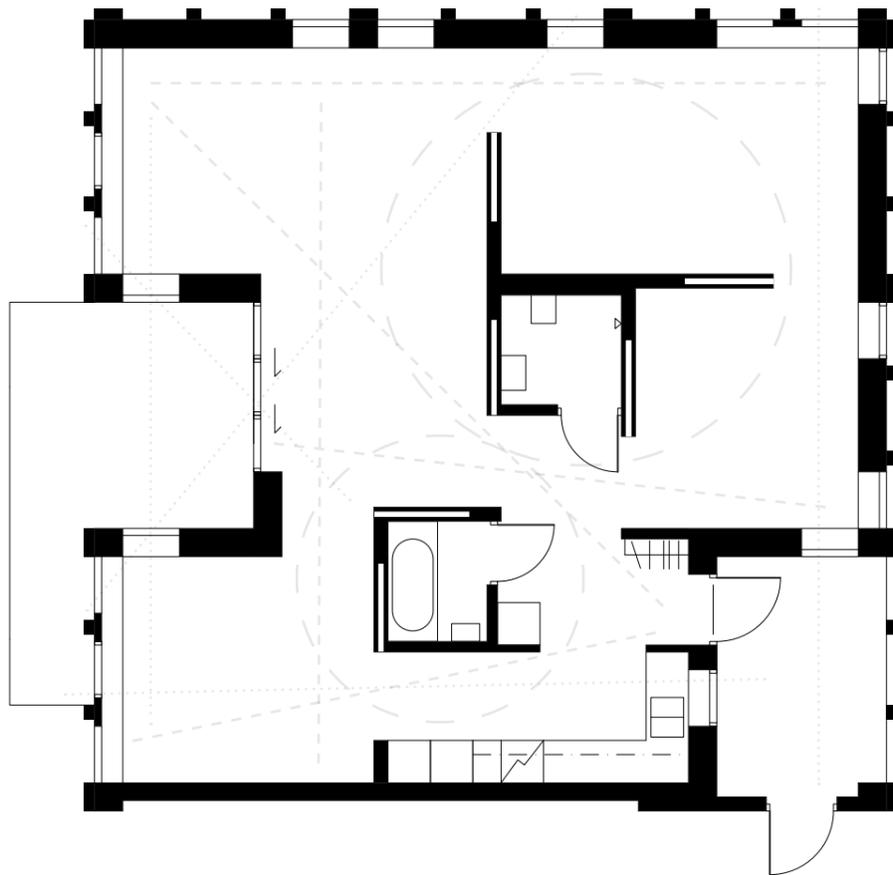
#### *Relationships in spaces*

The plan branches to three directions from the entrance, thus allowing optional routes and movement. The rooms are general enough to be used for different activities depending on interests. Each room is connected to two other rooms with a neutral access from the transitional space near the entrance or from the kitchen. On the contrary, the in-between space next to the east balcony could serve as a transitional space or prolonging of the adjacent rooms. Moreover, the spaces can be designated to shared functions that could overlap each other. The spatial connectors generate smaller niches around them that could facilitate storage or other functions.

#### *Sightlines*

Direct sightlines are perceived when moving along the façades and around the connectors. Nevertheless, the placement of the circulating elements enable small indirect and varying glimpses across the dwelling. Regardless of the direction of movement, the residents perceive sightlines when moving from one room to another. The view from the kitchen opens up to the private access balcony and to the city center. West-facing façade opens up to an intersection between greenery and to residential connection on the east side. Lastly, the views from the north side are towards the urban life on Stigbergliden.

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Movement

Movement & sightlines

Sightlines

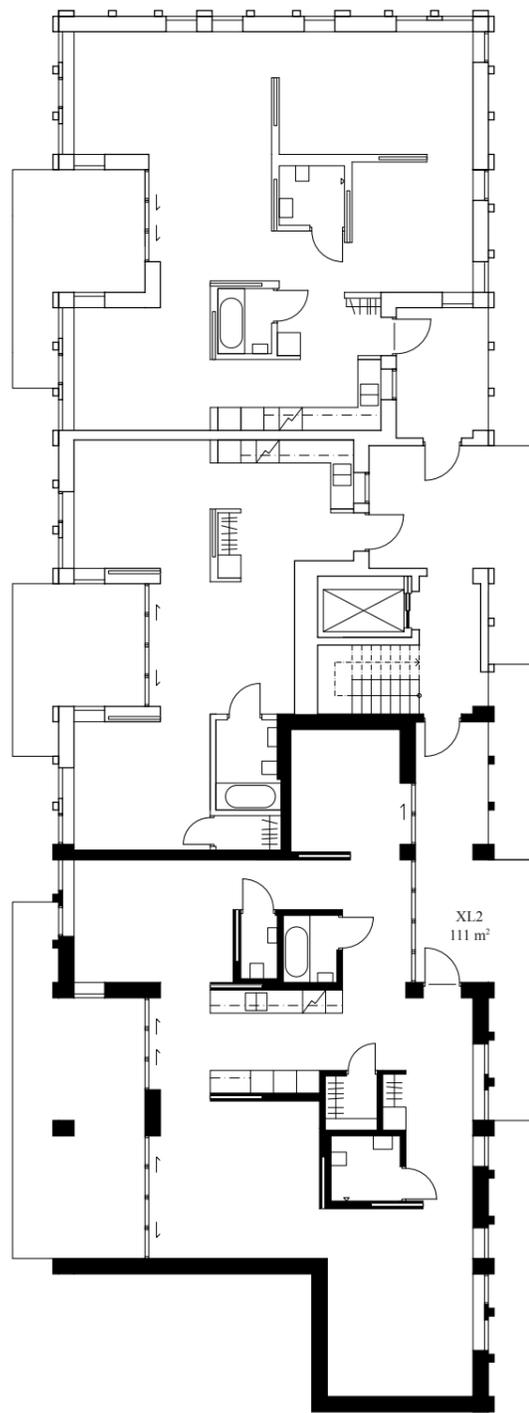
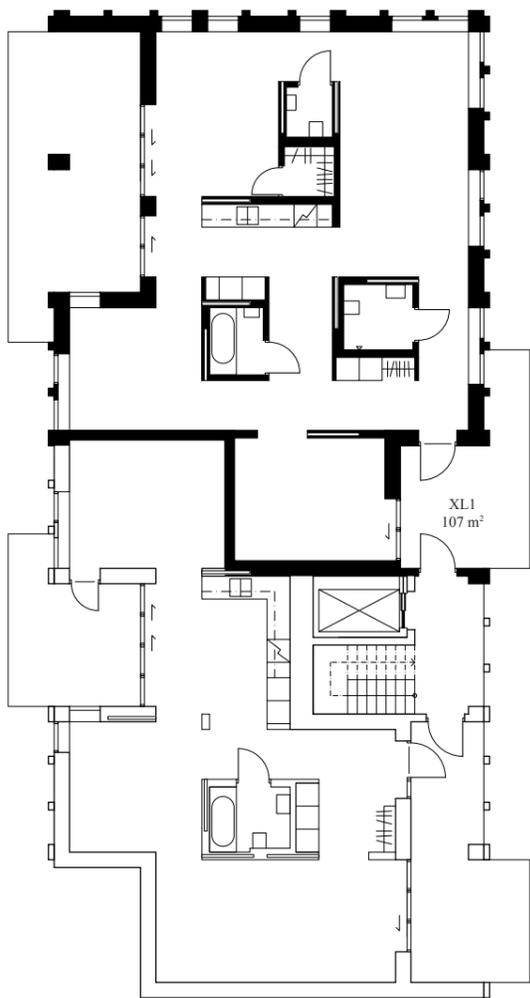


### *Dwellings*

Wooden surfaces has been left visible in the window niches and the floors are fitted with parquet. The wooden pocket doors are a contrast to the overall light appearance. The façades are load-bearing which allows free placement of spatial connectors in the living space. Integrated pocket doors function as a versatile architectural element; they provide both privacy and utility between the rooms. Moreover, they can be utilized as an extension of the walls, therefore providing new possibilities for furnishing one's home.

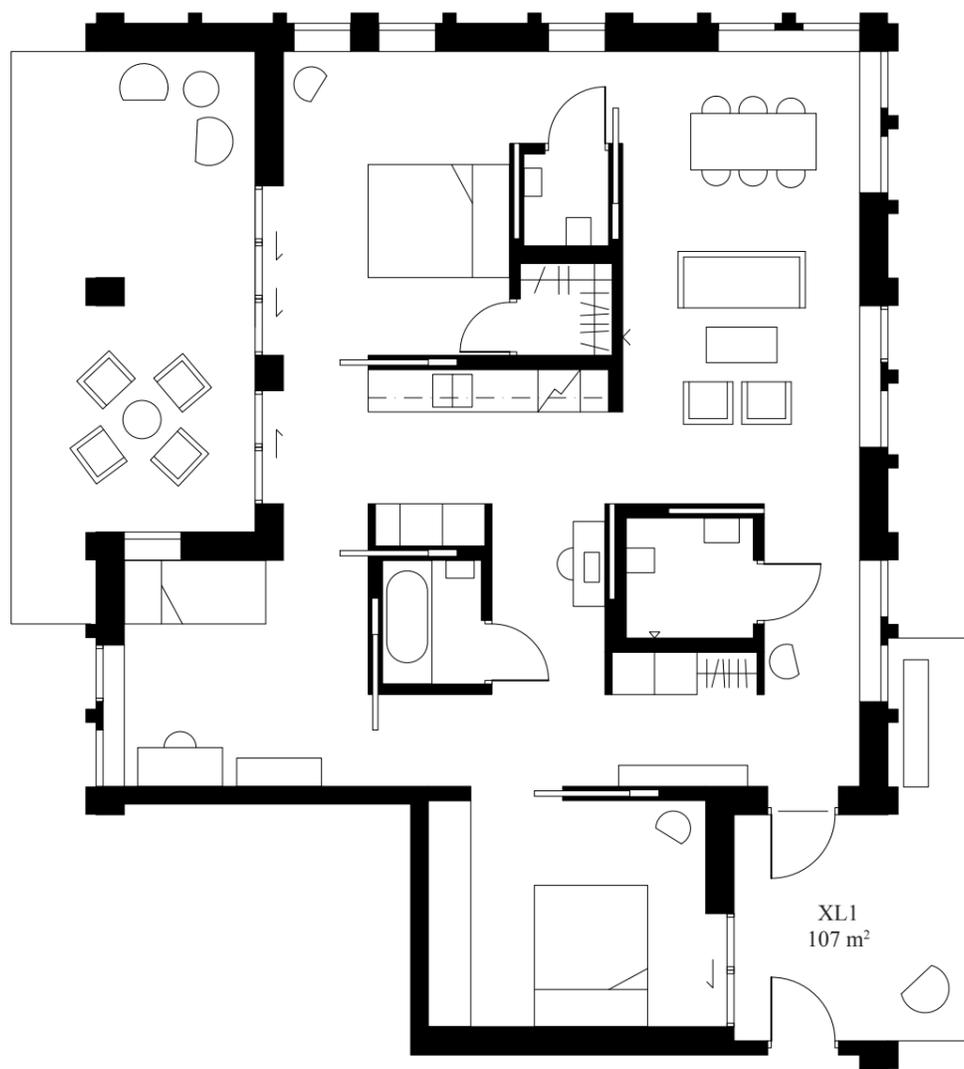
The pocket doors give better acoustics compared to typical hinged doors that usually have an insulation rate up to 25 dB. In comparison, the 40 mm thick sliding panels ensure high sound-proof performances up to 38 dB, frees up wall space and enable to join two separate rooms together when needed. The finished walls of 200 mm in combination with sliding panels allow a better acoustic absorption.

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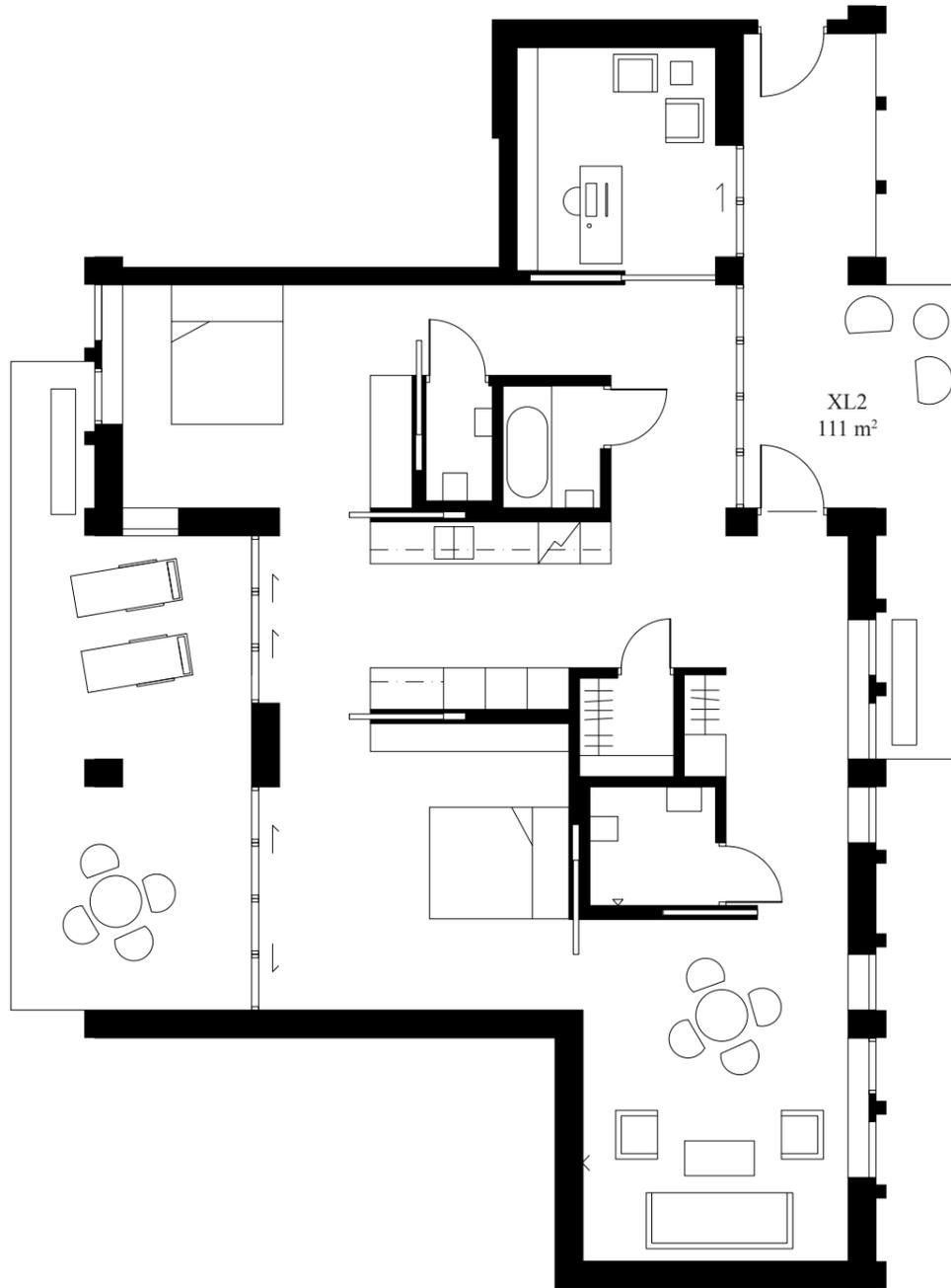
**XL SIZE**

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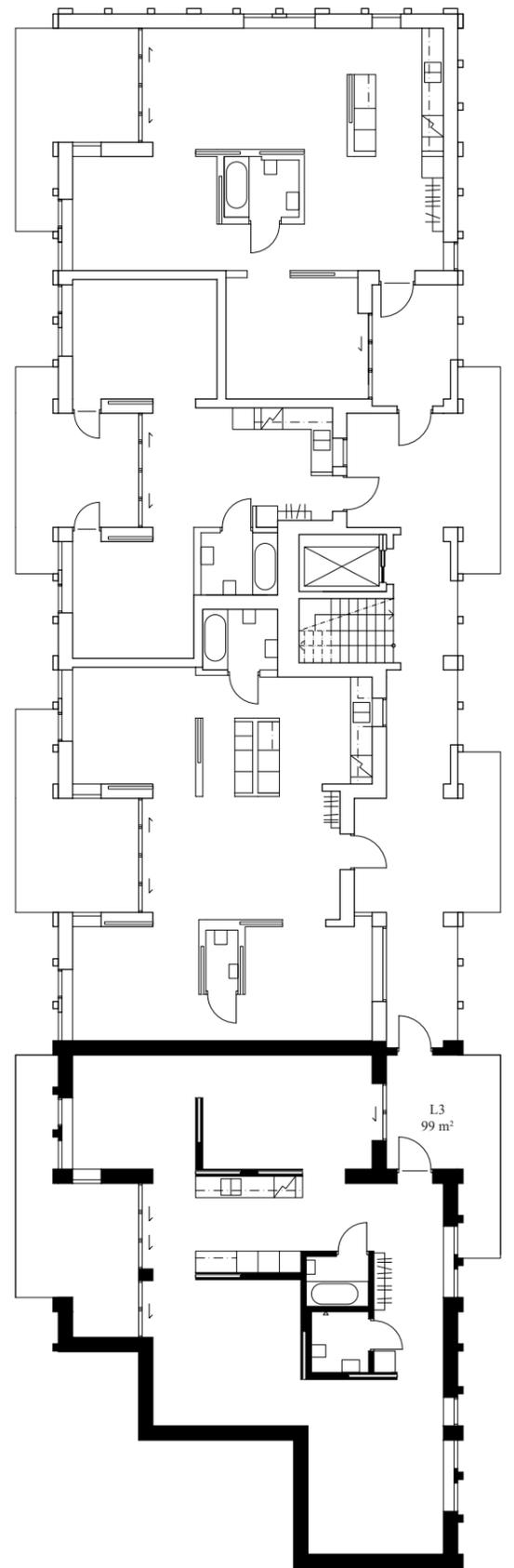
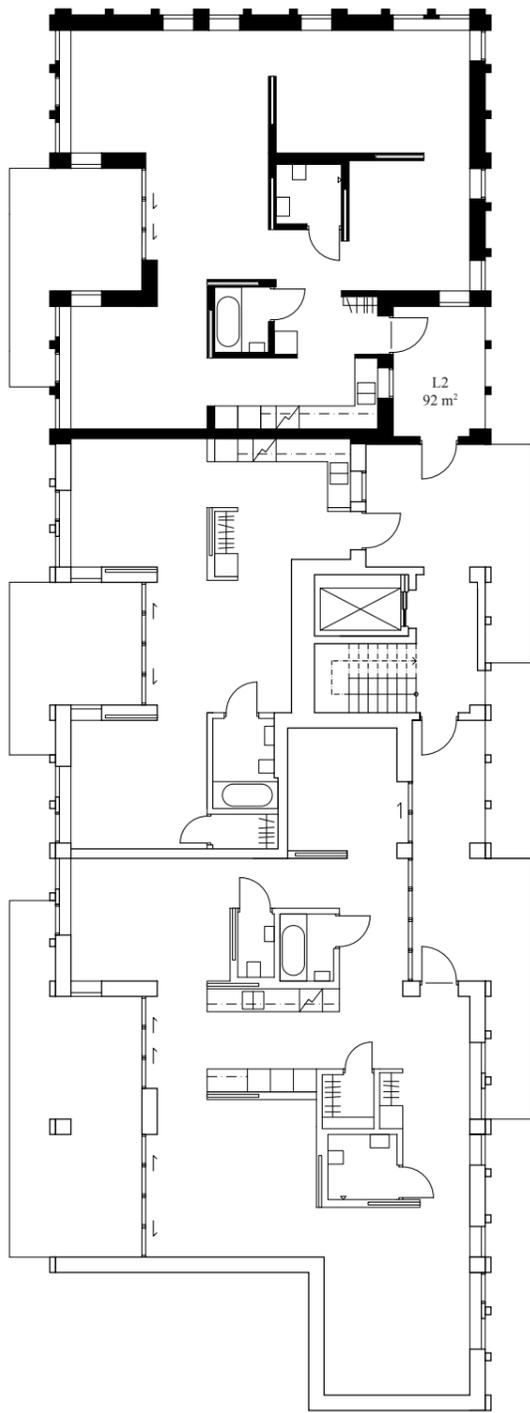
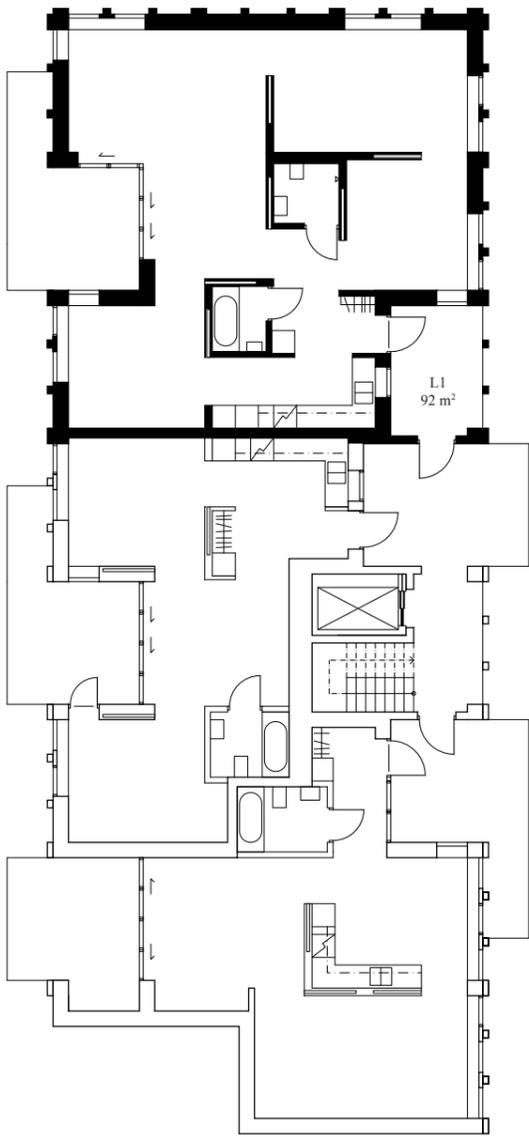
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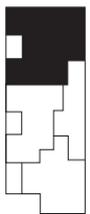
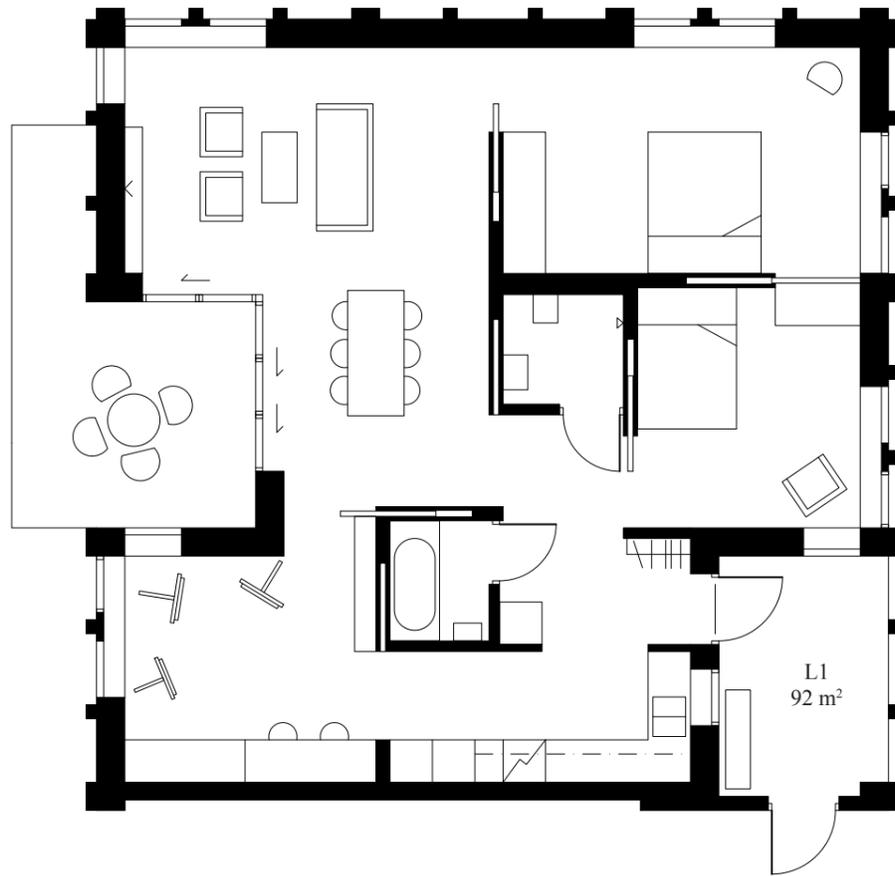
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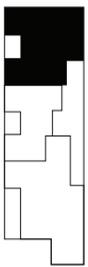
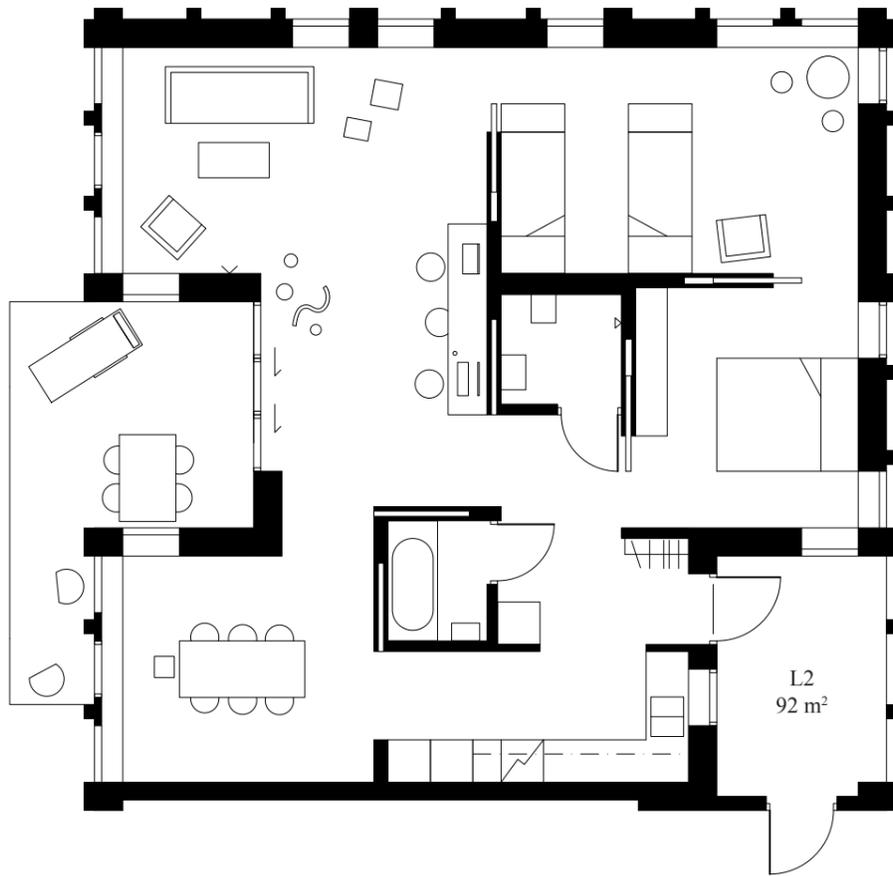
**L SIZE**

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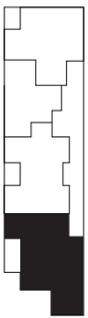
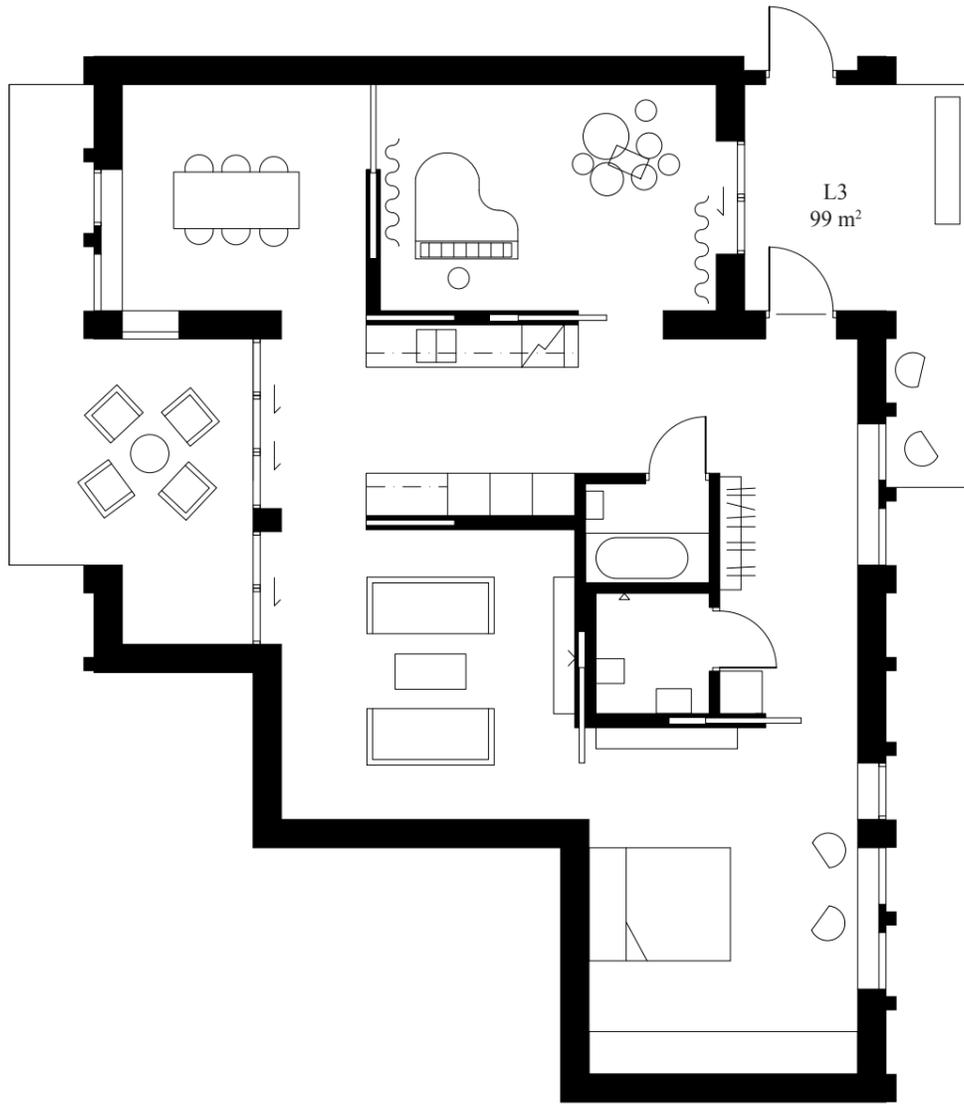
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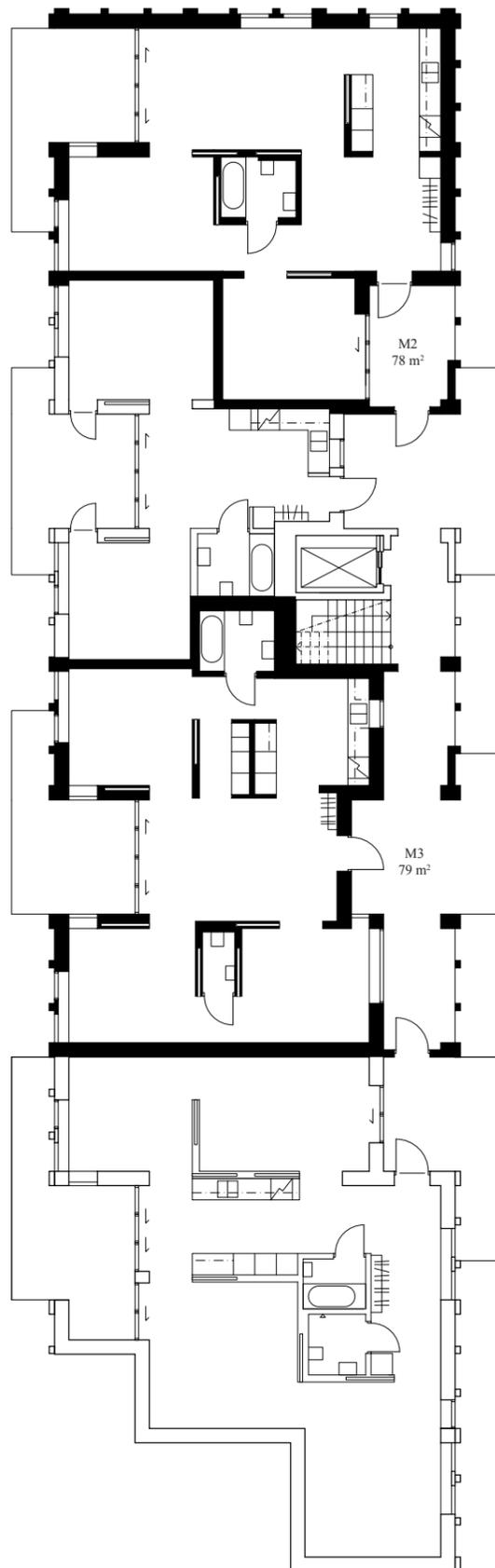
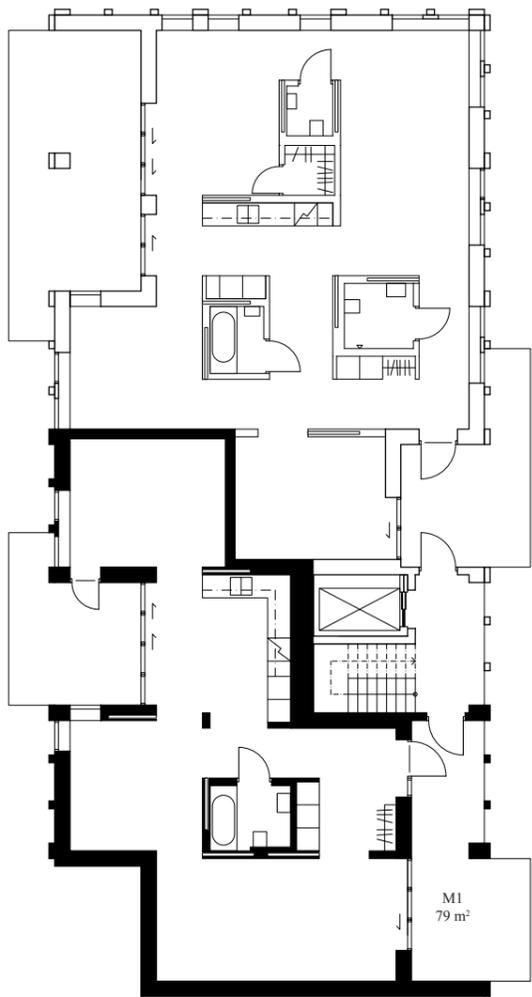
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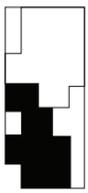
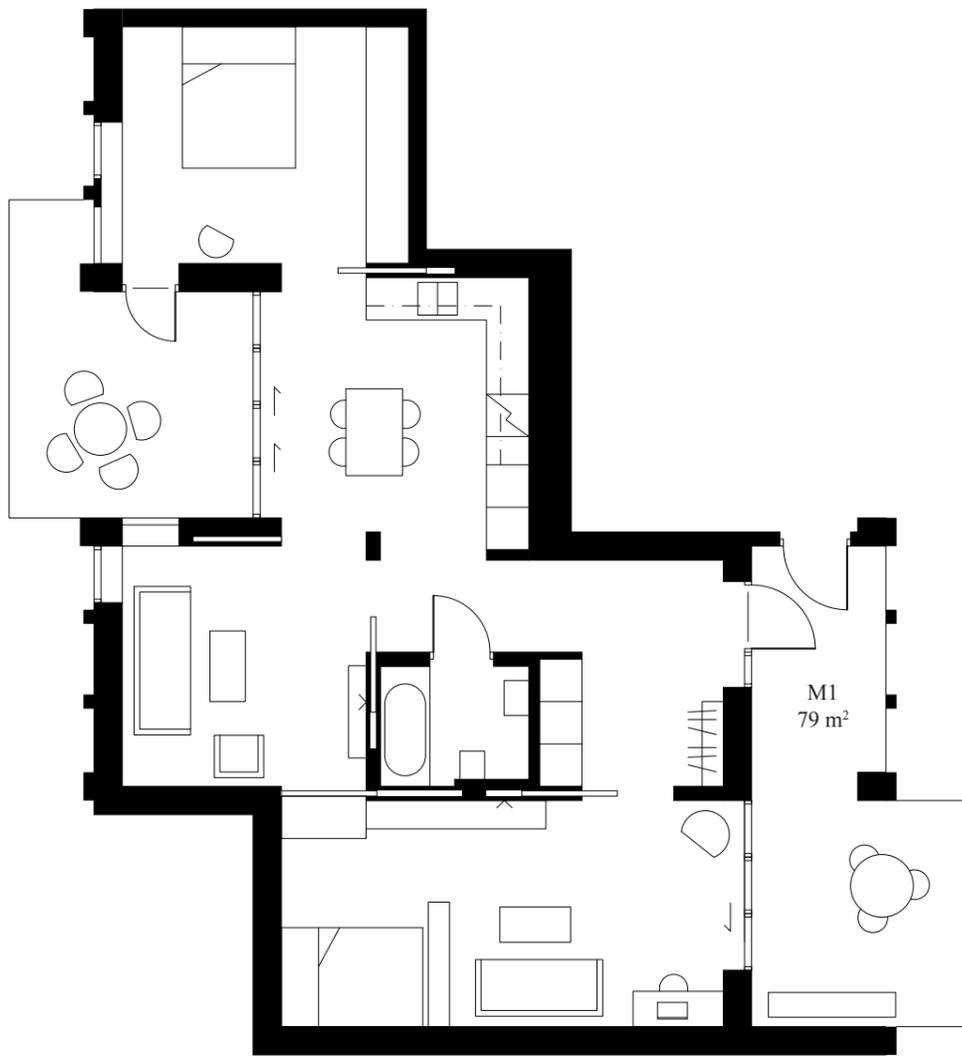
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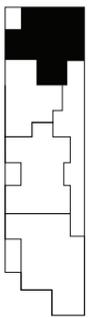
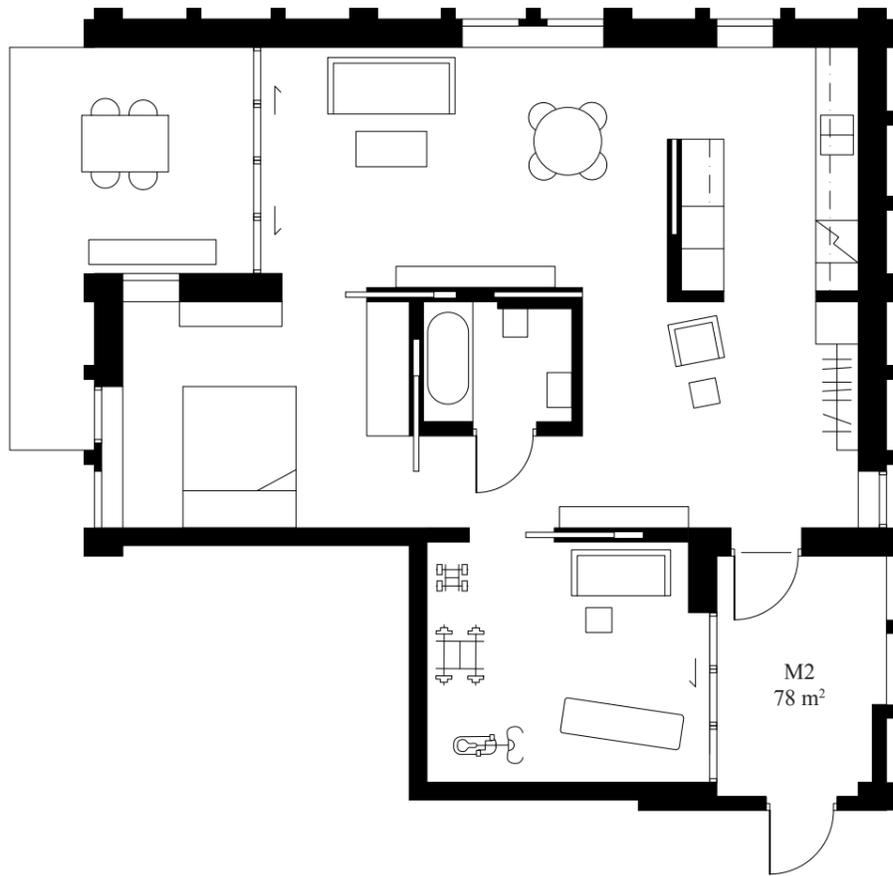
**M SIZE**

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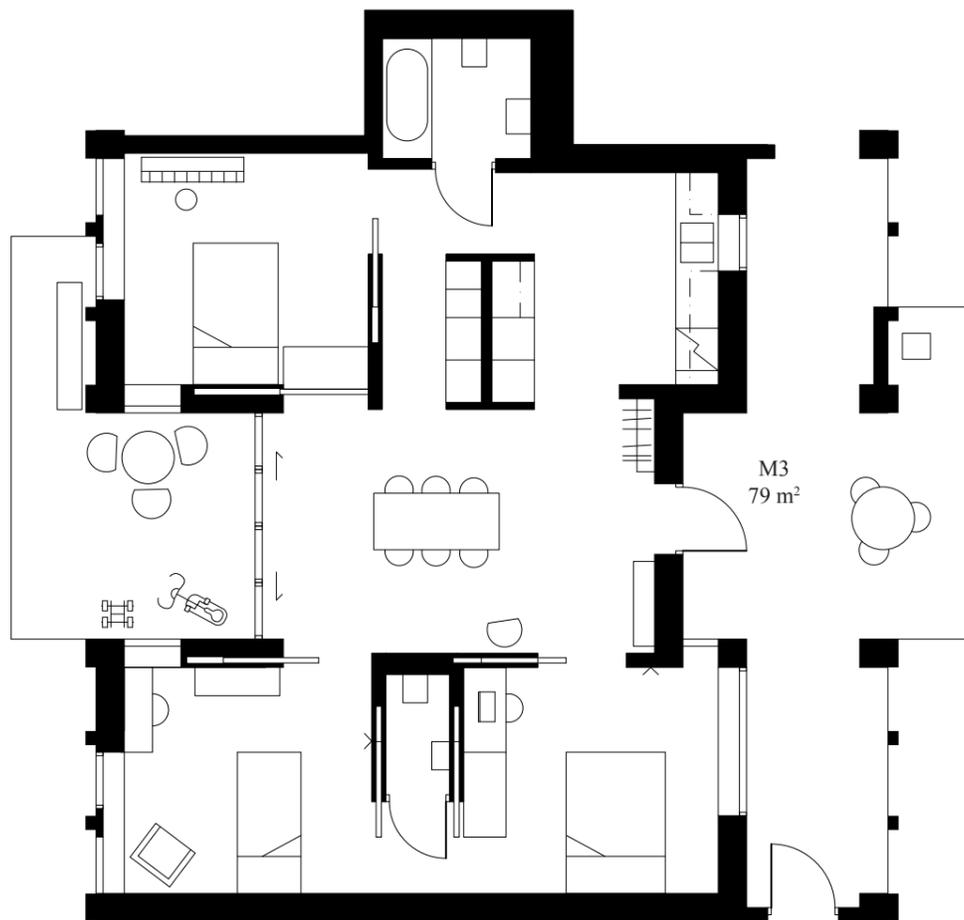
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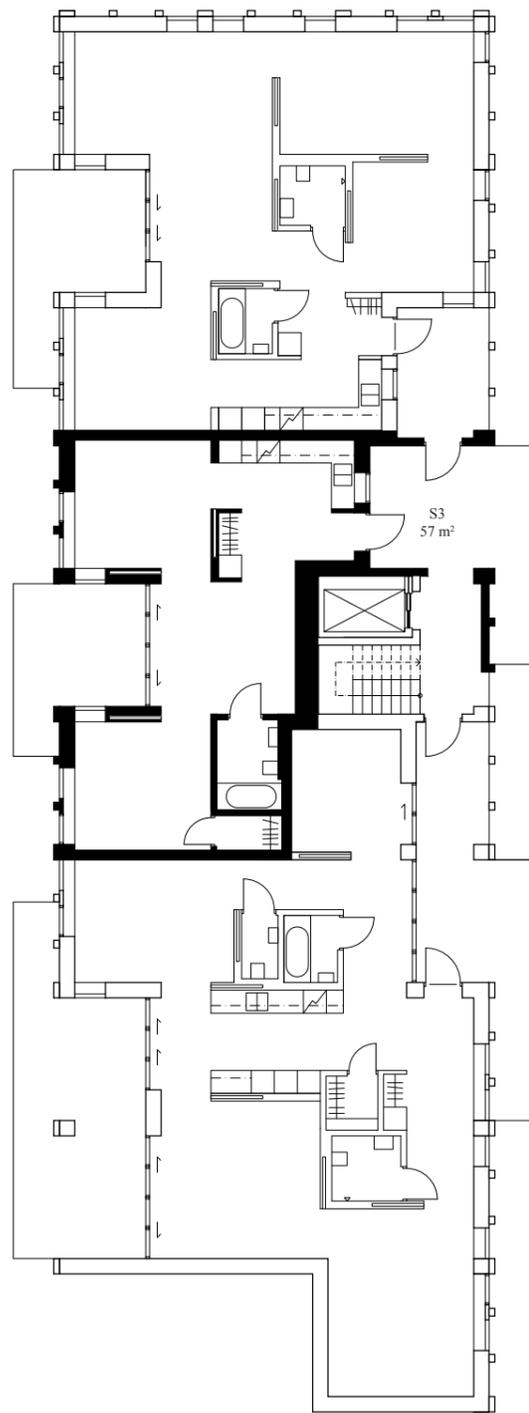
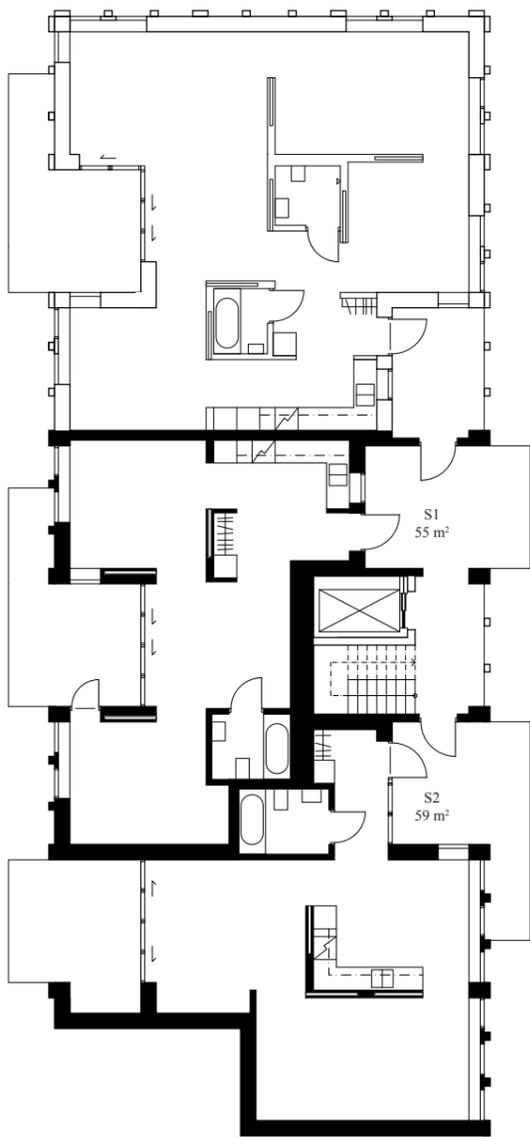
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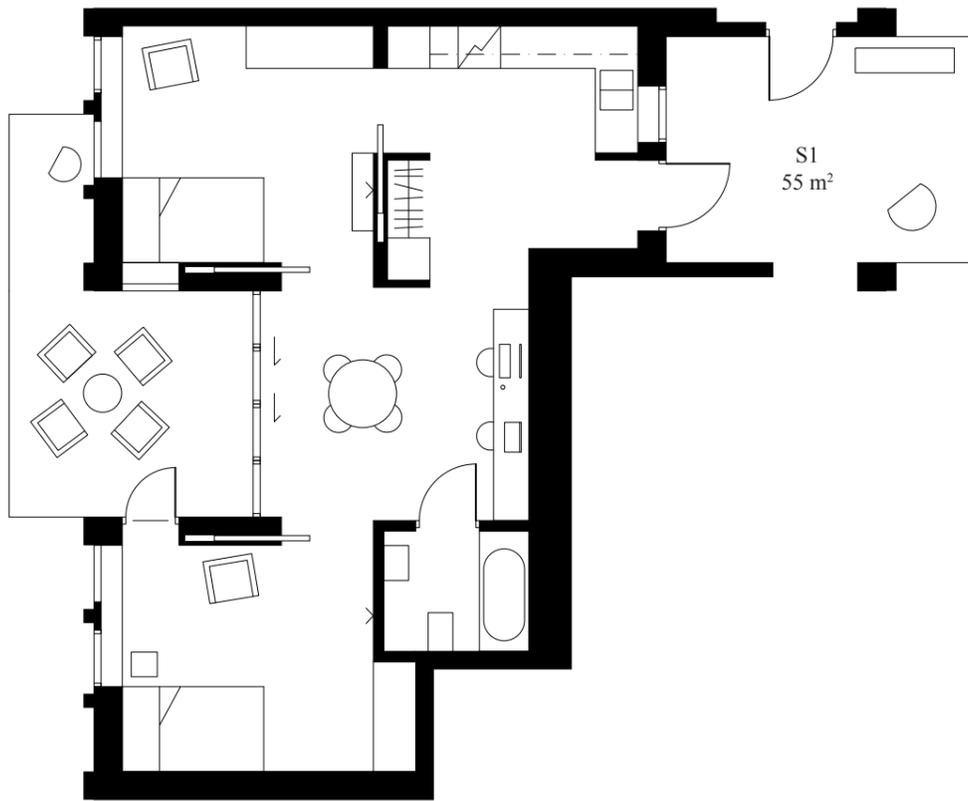
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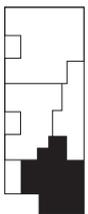
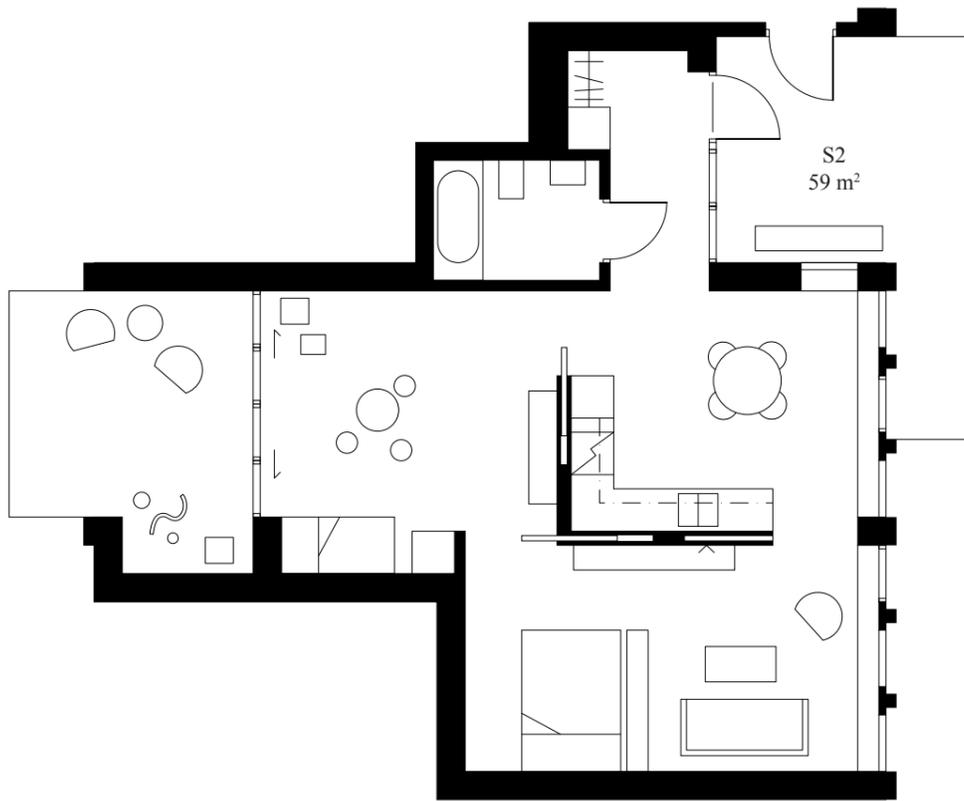
**S SIZE**

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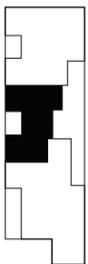
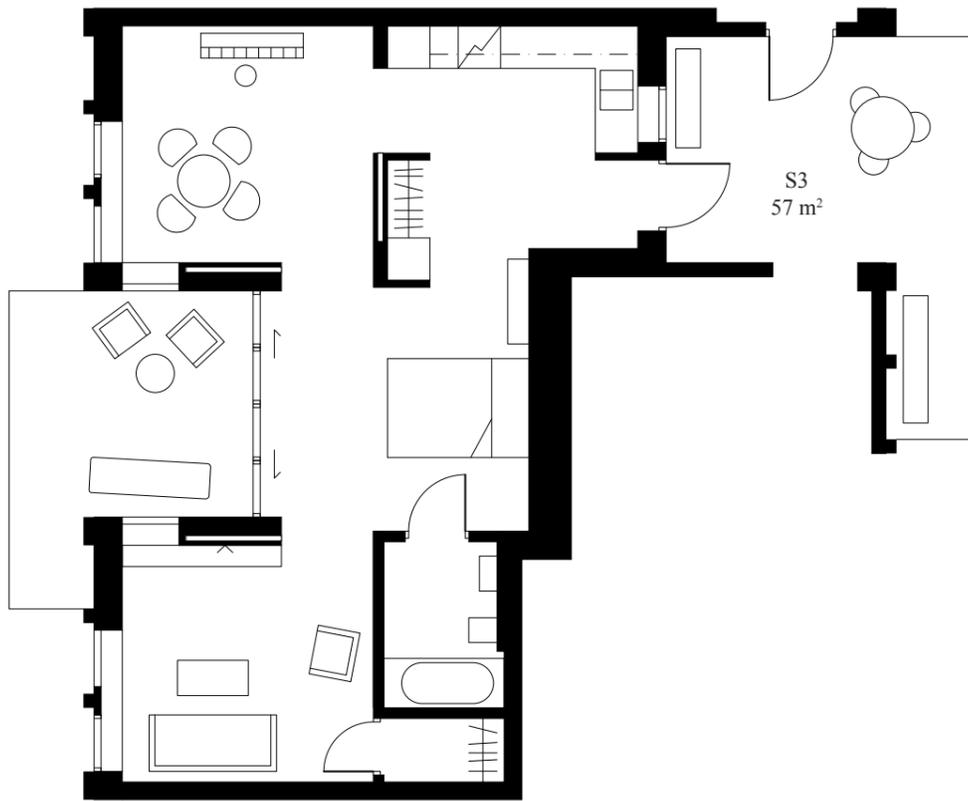
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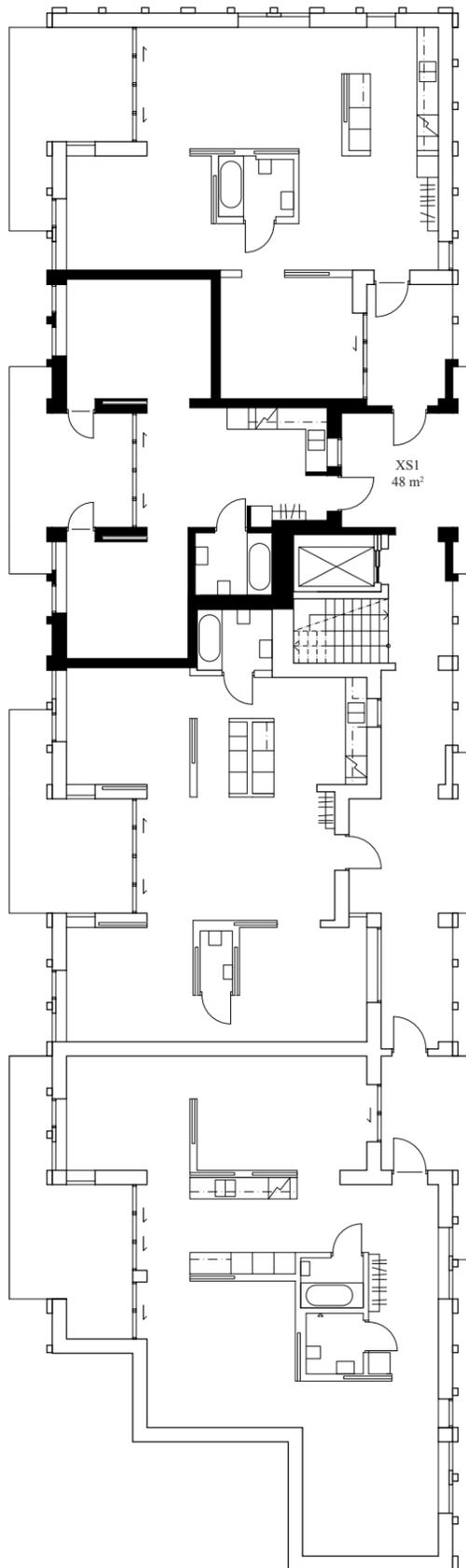
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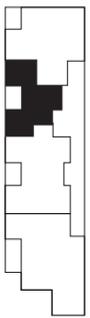
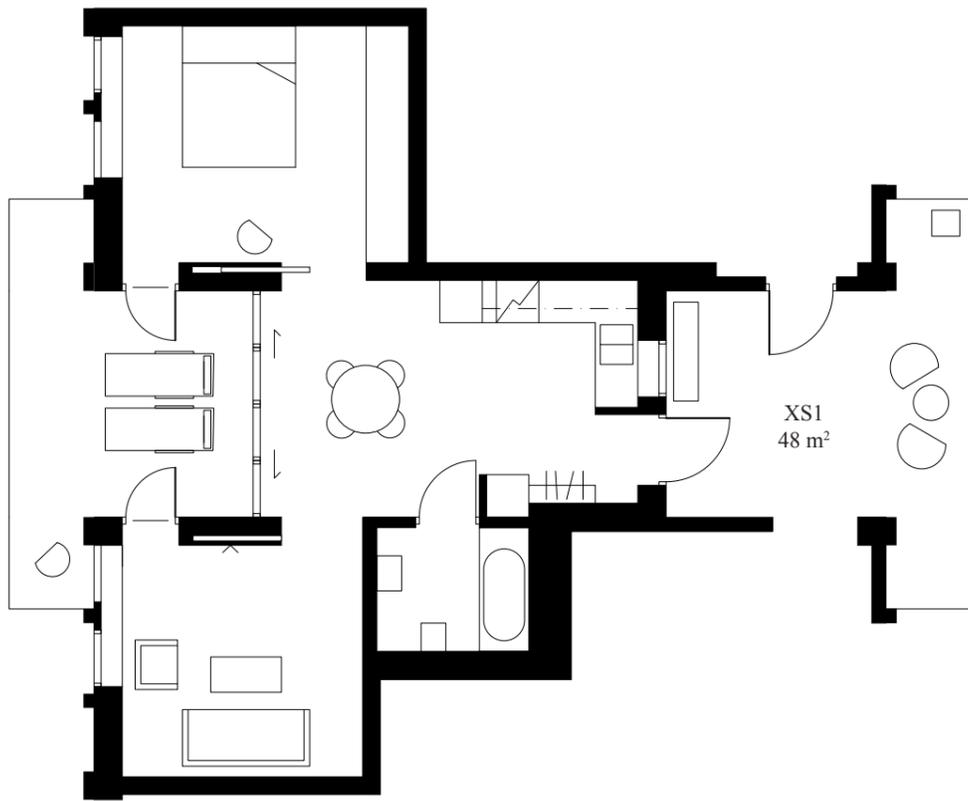
III

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**XS SIZE**

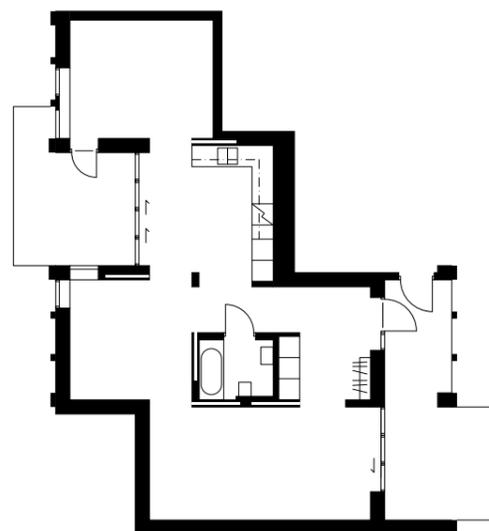
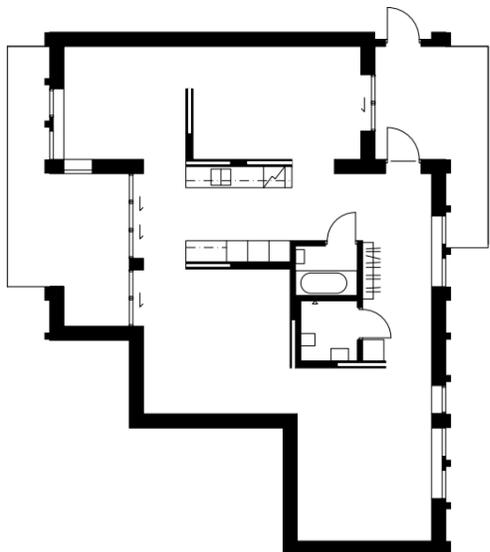
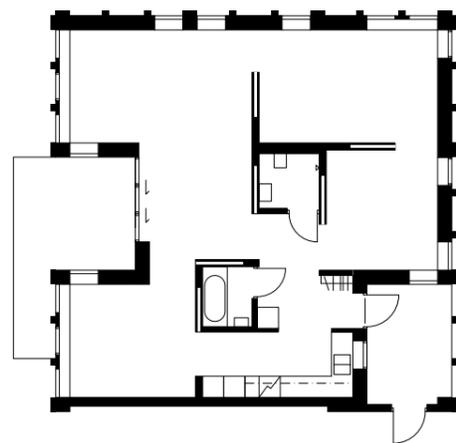
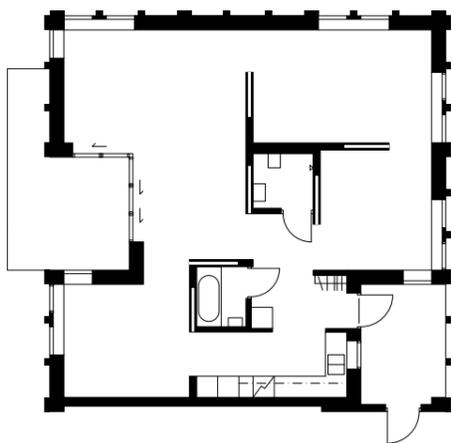
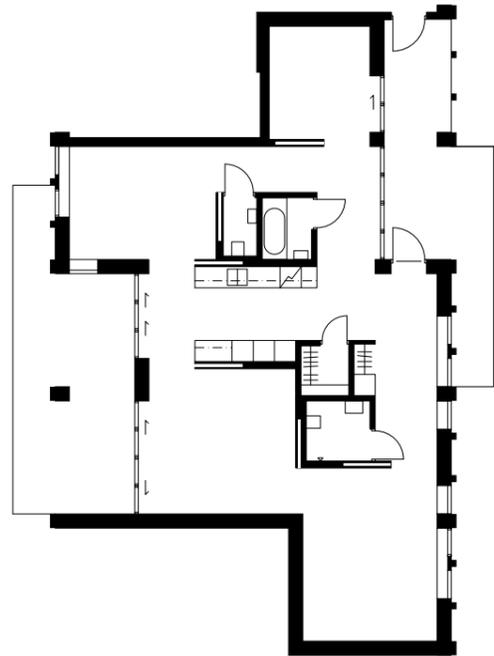
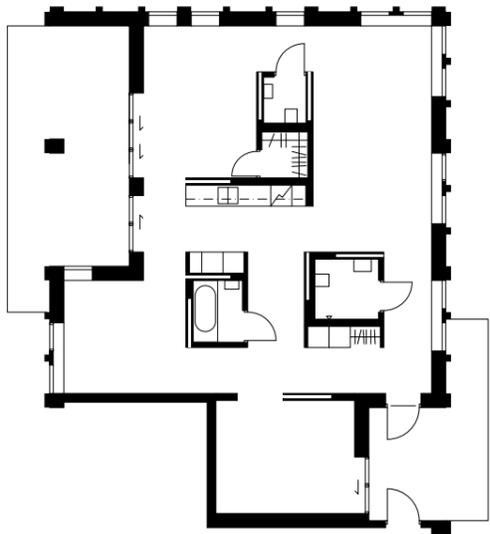
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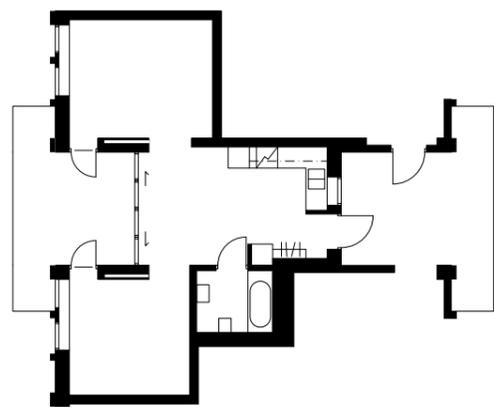
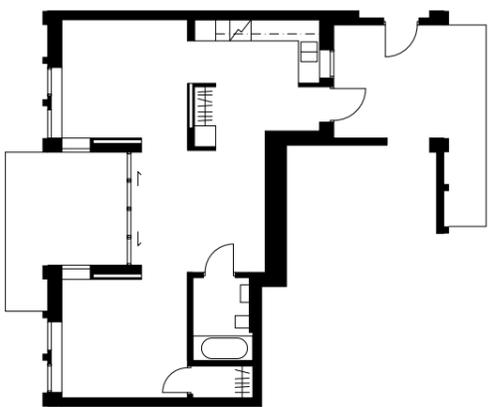
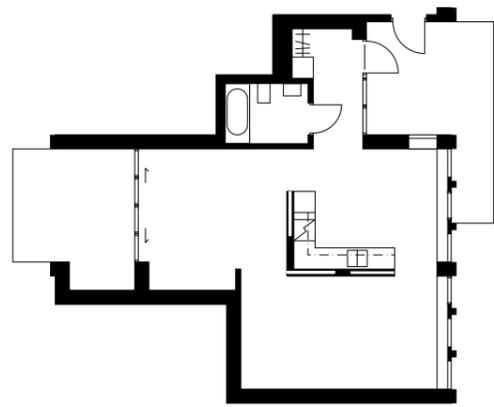
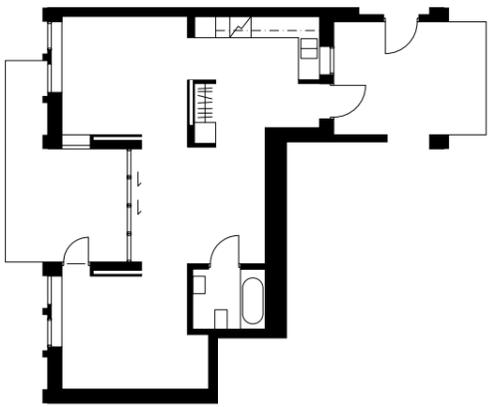
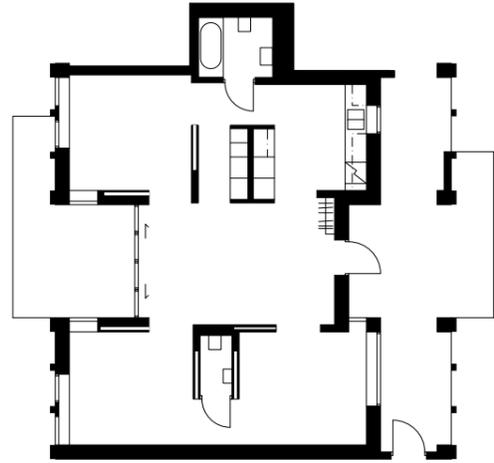
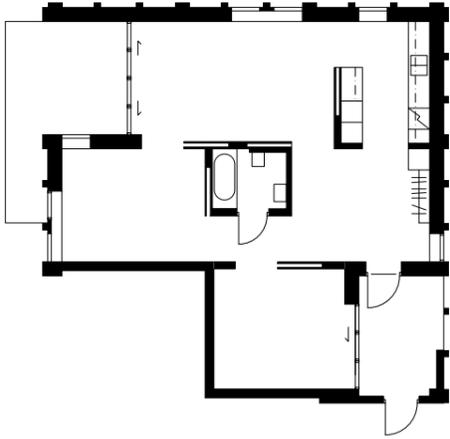
# PROPOSAL

## Floor plans



All dwellings

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All dwellings

## PROPOSAL

### Façades

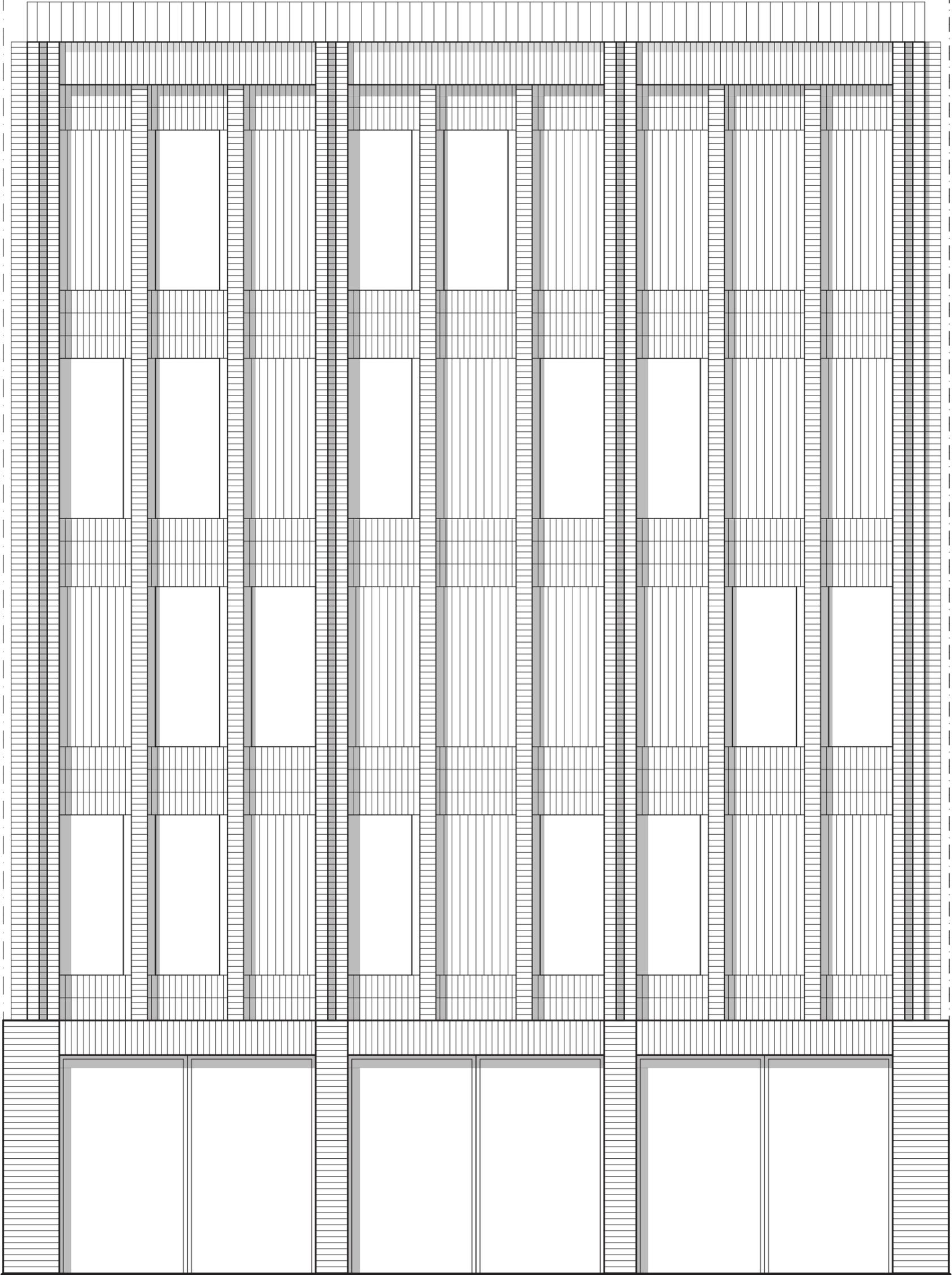
#### *Variety*

Scale variations have even been transformed in the façades. The west and east façades of the main volume follow the layout of the north façade, though reflecting their individual characteristics due to the added recessed balconies and the access gallery. The extended parts of the balconies fold up into being a part of the black steel balustrade and add some privacy for the residents. Moreover, the extensions of these balconies vary in every floor plan in order to create variation in the façade composition but also to provide better sunlight conditions for every dwelling balcony.

#### *Materiality*

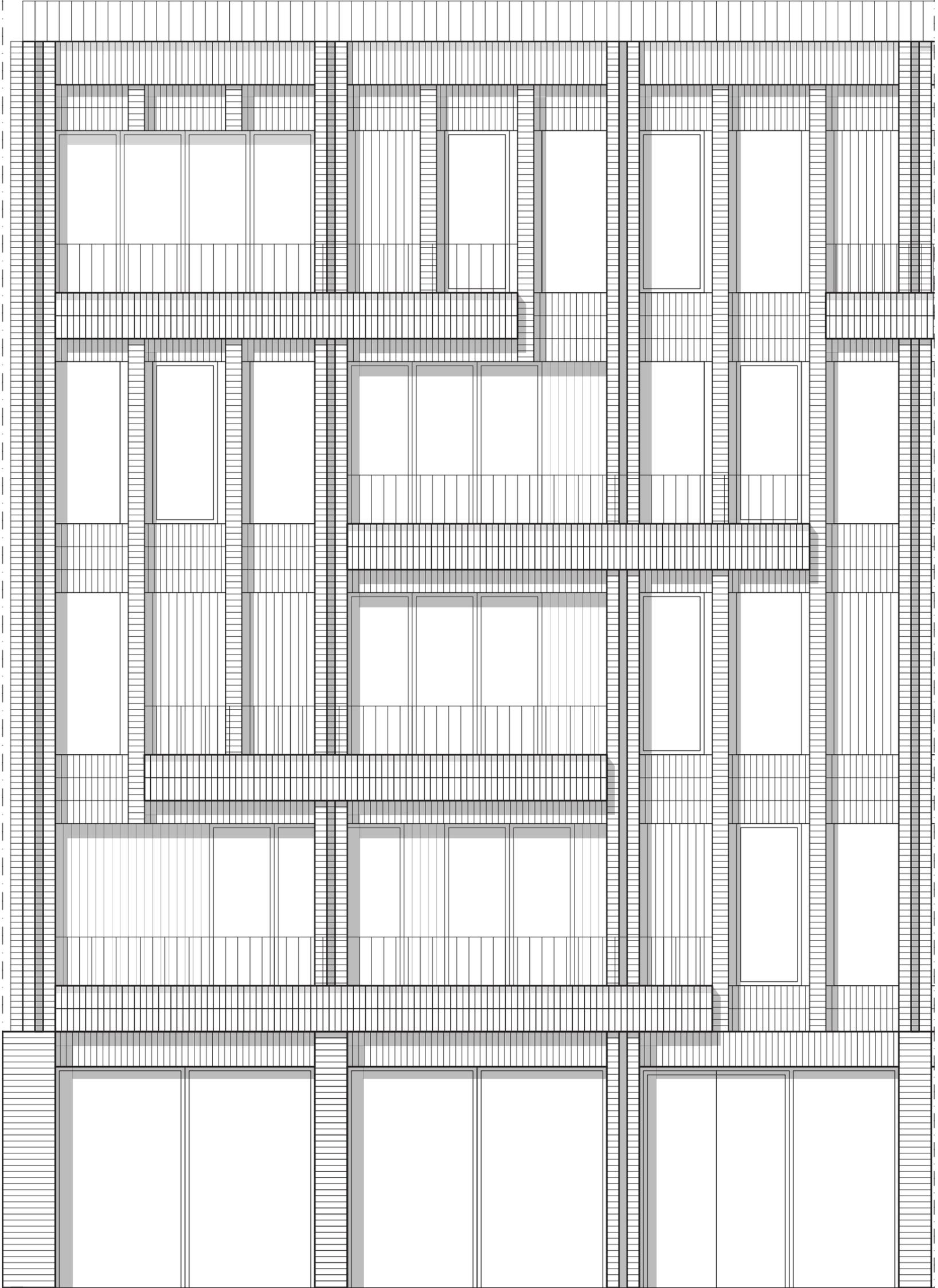
The façades consist of masonry work and in contrast dark timber panels are used within the outer frame of the main volume. The main volume follows a 3.2 m grid between the columns and it is further divided into smaller openings. On the restaurant plan larger openings between the columns give hierarchy to the composition. The base volume consists of horizontal stretcher bond which extends into a parapet wall up to the outdoor plateau. In contrast, the main volume is divided into a set of horizontal and vertical layers.

(1:50)



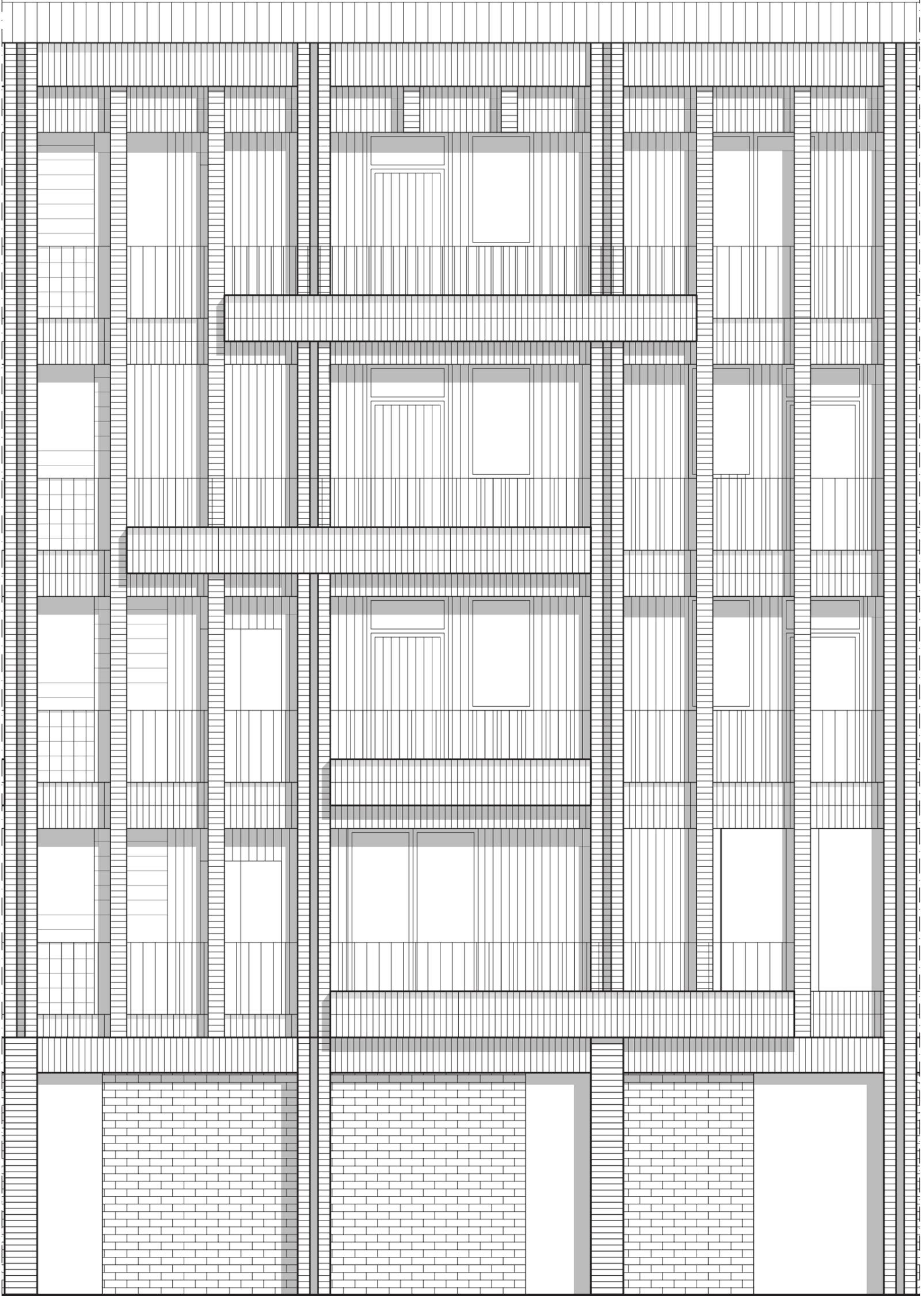
North façade elevation

(1:50)



West façade elevation

(1:50)



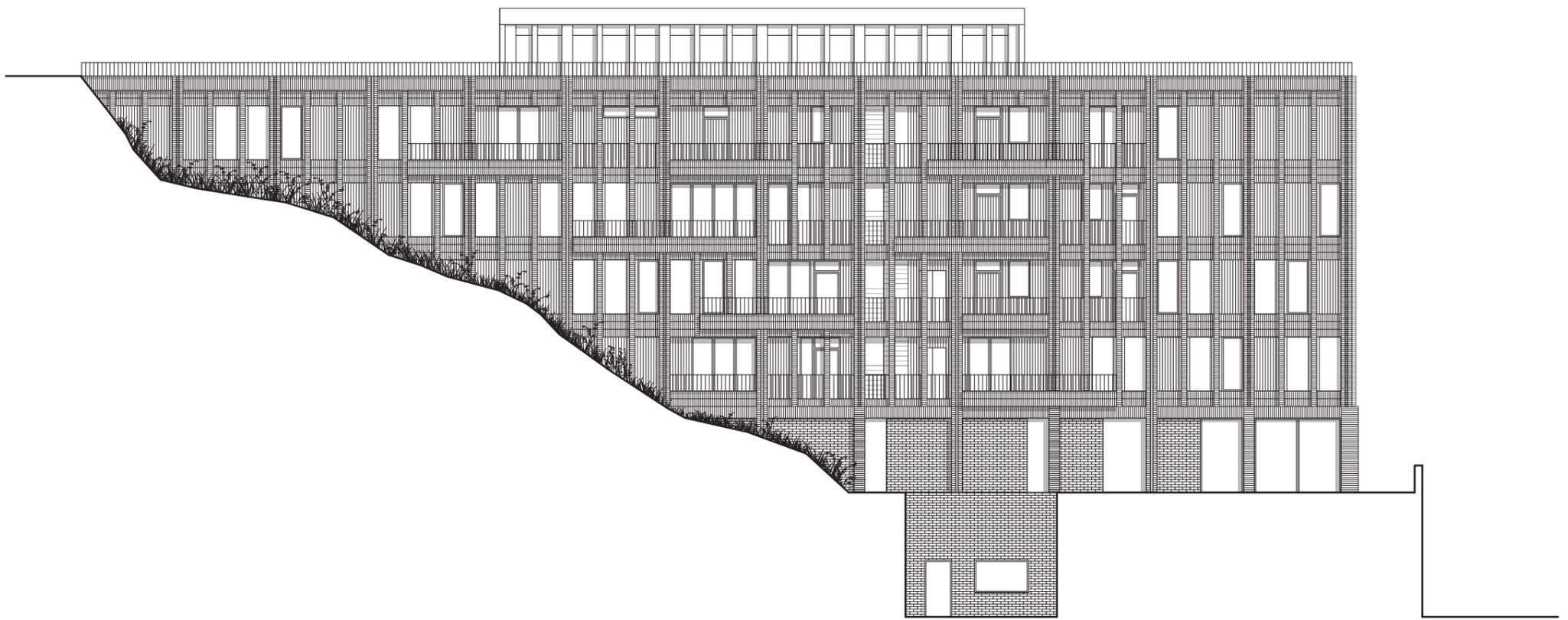
East façade elevation

(1:200)



West façade

(1:200)



East façade

## PROPOSAL

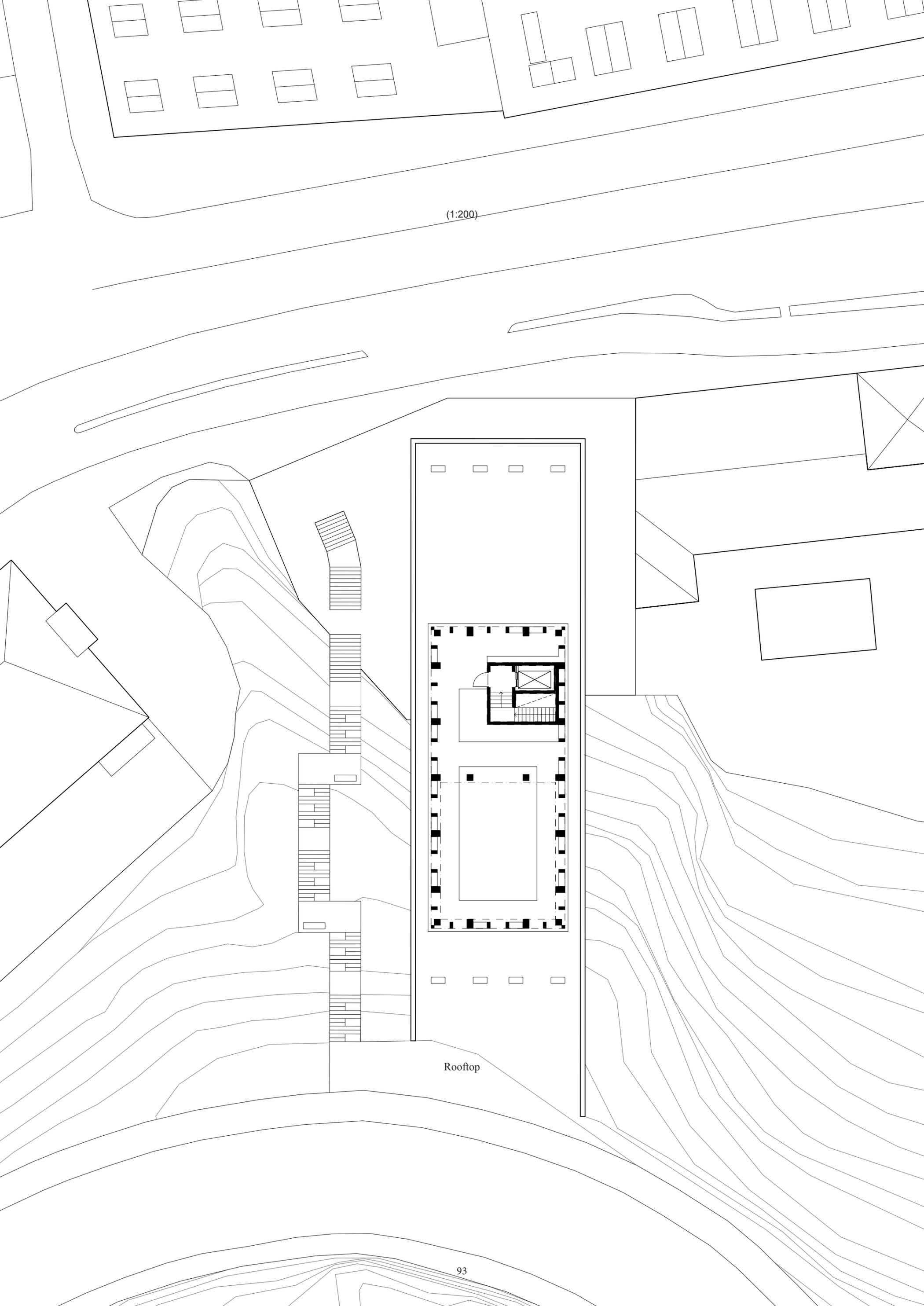
### Rooftop



#### *Pavilion*

The outdoor stairs continue up to Kjellmansgatan and to the public rooftop with a pavilion and a viewpoint over the city and the harbour. A green public space that opens up to Kjellmansgatan activates the street that until now has rather functioned as a monotonous trafficked street up to the hill. The northern part is covered with a roof as well as the seatings between the columns are sheltered. The volume follows the same grid division as the main building volume but here the standard lightweight masonry blocks of expanded clay create transitional arcades. The pavilion provides recreation for the citizens, residents and visitors of Masthugget. The open space could be used for arranging public activities, spontaneous meetings, play or exercise.

(1:200)



Rooftop

## PROPOSAL

### Reflections

The building frame defines the space for change as well as the architecture for a long period of time. In contrast, the space inside the frame is generic and undefined in a way that the plan layout is adaptable for multiple interpretations, activities and households even though the building is inherently static. Therefore the space allows different uses through its dimension and form.

The creation of a place through architecture that intertwines with different scales of staying, both long and short term, and activities that motivate social interaction can influence behaviour. Architecture affects everyone in our everyday life consciously or unconsciously. A home is a sphere that is both a picture of one's identity, a shelter and roots amid the modern society that is in constant change. Therefore, understanding the meaning of a home is of paramount significance as it lays the foundation for people's existence. Life situations change and unpredictability can also affect home. Inherently polyvalent dwelling is one way of providing long-term inclusion and a place for life that instead can respond to the changing desires, needs and challenges through its spatial composition.

Spatial logics are a way of understanding relationships between spaces and their use. Combining and comparing them can result in interpretations that support both today's challenges but also unknown future challenges. Re-thinking the use of space as a sequence of general rooms that are interconnected to each other through transitional spaces, circulation and relationships between the spatial connectors, enhances variation in the floor plans and furthermore allows varying activities and household settings.

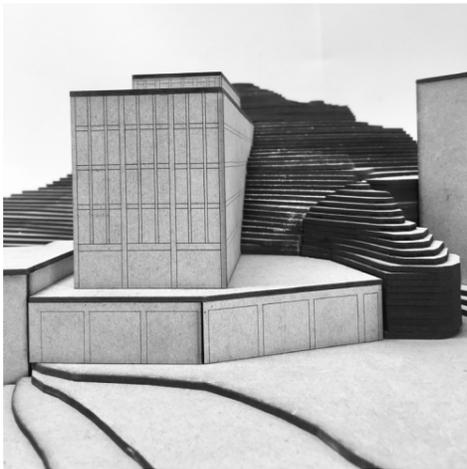
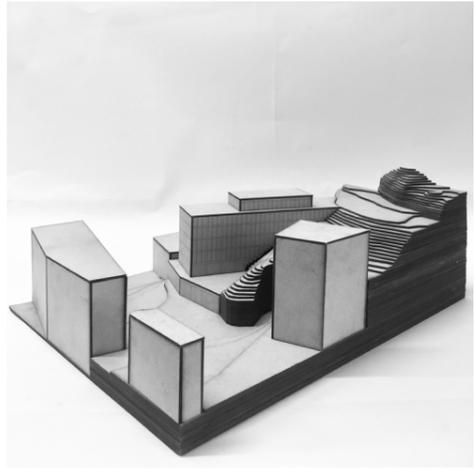
The polyvalent approach should also be applied to other spaces in the building, thus gradiating the borders of home instead of just limiting

them in front of one's private entrance door. A public entrance and public content, shared spaces between residents and public actors and access gallery with private and semi-private spaces unite the dwellings with the building but also with the urban surroundings. As a result, the conception of home includes several layers and transitions.

Zooming into a dwelling, these transitions and layers between common, private and semi-private can be formulated into diverse combinations between the interconnected spaces by varying the placement of activities and the degree of openings and closings. The communal aspects and question of what can be shared are also important elements when considering freeing up space for other activities in the dwellings, as well as when creating social interaction between the residents and even between the public actors in the building. Overlapping programmes can be seen as complementary parameters that positively affect urban life, the residents and public functions within the building.

The thesis has given us insights on investigating housing from a different perspective, and in addition highlighting architectural qualities. Static long-term variability in floor plans and in volume reflects a stable character of a home amid the changing courses of life. Our polyvalent approach puts the unpredictability in center and introduces a new typology that has been evolved from finding appropriate relationships between spaces, movement and elements that are adaptable and create diversity. Scale variations in size, façades, volume and in plans follow the same principles by considering the premises for the different parts of the building, programmes and the mixture of various users.

In conclusion, the approach is not only a reflection of spaces that allow a broad spectrum of different settings to take place, but it is also a reflection of a home that is an extension of one's identity.



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