

Cohousing:

shared living as a housing alternative

Masters Thesis

Tallinn University of Technology, Academy of Architecture and Urban Studies

Supervisor: Kimmo Sakari Lylykangas

Student: Vincent Marquardt

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This dissertation is research into the housing model of cohousing, with focus on communities in multi-storey apartment buildings. The findings of this research will establish a better understanding for the potential of cohousing in Estonia and highlight the benefits and possibilities of cohousing communities.

Key words: cohousing, housing, community, master thesis

01 INTRODUCTION

1.1 Background

The world's population today is 7.9 billion people and it is projected to increase to 8.5 billion by 2030. (United Nations, 2015) This rapid growth has a great impact on all urban environment around the world. Today's society is facing many new problems, one of them being housing.

Housing influences every aspect of human activity. It can be viewed through five paradigms that shape a whole range of housing issues, each operating as a lens, that privileges certain goals and problematises housing in a different way. They are: housing as an economic good, housing as home, housing as a human right, housing as providing social order, and housing as one competing land use in a functional system. (Iglesias, 2012)

The housing as an economic good paradigm means housing is financed, produced and distributed mainly by private development, therefore substantial capital gains and losses regularly occur in the market. Housing as home paradigm concentrates on the fact that homes are places where people create their lives, families and very selves- a haven. This means the right for privacy, freedom and safety. Housing as a human right means that adequate, safe and affordable housing is critical to proper human development. This paradigm urges, that all people have rights to housing protected by law. The housing as providing social order notes that the location and types of housing and who lives in them creates a particular social order. Where and among whom one lives, structures important parts of individual's lives. Housing as one competing land use in a functional system paradigm draws attention that housing is only one of many land uses that are necessary for a healthy, well-functioning city or town. (Iglesias, 2012)

Besides the five main aspects, a new emerging paradigm is being considered: housing as a focal point for self-governance. This paradigm focuses on the relationship between housing and civic and social engagement in one's housing community. Common interest and planned communities enable community formation, social capital building and citizenship skill building. (Iglesias, 2012)

While considering every aspect of the above, this dissertation is mainly driven by this newly emerging paradigm: looking at housing with the community in focus. As stated, housing is a complex topic that ties together different aspects of life and as a result different problems emerge. This thesis is a research into how our biggest contemporary challenges could be (and are) tackled through changing the way we live through restructuring our communities.

Most modern developments fail to form a sense of community, and thus become sterile environments. There are growing reports on loneliness and mental health issues, while the built environment doesn't provide the framework for a healthy, and active community life, instead there is an increasing lack of local connectivity.

Major global economic, social, demographic and environmental changes are currently having a significant impact on the needs of the living environment. On one hand, urbanisation and ecological efficiency focused on climate change require an increasingly dense urban structure, challenging the functionality and comfort of the environment. On the other hand, changes in family structure and ageing increases the need for targeted social support and contact. In addition, changes in working life, such as the increase in part-time employment, self-employment and teleworking all affect the use of living space facilities and services. (Tarpio, Maununaho, Kaasalainen, 2020)

These topics are the underlying evidence on why the modern standards for the living environment have shifted and why a new approach is needed. This will be discussed more thoroughly in the next paragraphs.

1.1.1 Economic changes

One important aspect that drives the need for change in housing strategies is the globally increasing need for more affordable housing among young people. The widening gap between house prices and income levels means young adults struggle to buy housing. In the United Kingdom, house prices have risen about seven times faster than the incomes of young adults over the last two decades, meaning home ownership among 25 to 34-year-olds has sharply declined. (Cribb, Hood, Hoyle, 2018)

In the US, millennial homeownership is at a record low, with no sign of these trends reversing. It is found that median home prices have increased at four times the rate of household incomes since 1960, meaning homeownership is increasingly out of reach for many people while rents, have grown roughly twice as fast as adjusted wages between 1960 and 2017. (Binkovitz, 2019)

Demand for smaller, more affordable housing is surging, as millennials move into their prime home-buying years, supply is not met, as the construction sector continues to build what it knows. (Joint Center for Housing Studies of Harvard University, 2019)

1.1.2 Sociological and demographic aspect

It is not only the lack of affordable housing that is driving the need for change in housing. It is also a change in social and demographic trends. Global trends of people living in single households and ageing of the population play also a role. (United Nations, 2015)

1.1.2.1 Ageing population

The global population is getting older, which also means there is a need for new housing. The living environment of elderly people is crucial to allow the “new ageing generation” to stay healthy and social and to keep participating in society. (Pagh, Williams, Braskov, Christensen, 2018)

The number of people older than 60 will rise from about 1 billion today to 2.1 billion in 2050. That means that 22 percent of the world’s population will be over 60, while in countries like Germany, Italy, Japan and the United States, one in three people will be 60 or older. Globally, the number of people over 80 will more than triple, from 137 million to 425 million. (United Nations, 2017)

This new elderly generation will have fewer family members to look after them and that means it's vital to design for new types of living environment, environments that provide social support structures and a sense of purpose, while playing a major role in the longevity and overall health of this group. (Pagh, Williams, Braskov, Christensen, 2018)

1.1.2.2 Single people households

As stated, studies have found that the trend of rising single-person households extends across all world regions, while the trend is more common in Northern European and western countries. (United Nations, 2017)

The main reasons for this being, that divorce is more common nowadays and rising numbers of people do not settle down, instead they move to new places to live, study and work. The problem may be, while people live alone, they may not want to live alone. However, the housing market consists largely of one-unit single-family homes, so many people end up living with flatmates in homes that aren’t designed for it. Shared-living spaces could be designed for just that, however, by prioritising people’s individual privacy while offering spaces for a vibrant community and a social lifestyle to enjoy. (Pagh, Williams, Braskov, Christensen, 2018)

1.1.3 Mental health and loneliness

Loneliness is a rising problem in all age groups of modern society. An analysis across 113 countries over the world found a significant and steady growth of people feeling “serious loneliness” over the last 20 years. The study also indicates, that the prevalence of loneliness is highly heterogenous across countries, even within the same region. Across different adult age groups, northern European countries consistently reported the lowest prevalence of loneliness, whereas eastern European countries reported the highest. A combination of high socioeconomic status, overall health, welfare generosity, and high social participation are linked to the low levels of loneliness in northern European countries. (Surkalim, Luo, 2022)

Studies also find loneliness to be linked to early mortality and a wide array of serious physical and mental problems, including depression, anxiety, heart disease, substance abuse, and domestic abuse. (Wang, Lloyd-Evans, 2020)

While there is a lack for scientific research on the effects on mental health of people living in cohousing communities, the correlation between strong communities and mental health have been researched by Michael Birkjær. In his research he concludes, that countries that were doing exceptionally well in terms of “social capital”, were often low-income communities as such as those in Latin America. Researching this link, he finds social engagement to have a huge impact on well-being. (Pagh, Williams, Braskov, Christensen, 2018)

1.1.4 Environmental sustainability

The construction sector is responsible for nearly 40% of annual global CO₂ emissions, of which, building operations are responsible for 28% and building materials and construction are responsible for an additional 11% annually, while the global building floor area is expected to double by 2060. To accommodate the largest wave of urban growth in human history, a 230 billion m² of new floor area to the global building stock is expected. (United Nations Environment Programme, 2020)

While environmental sustainability is a complex topic, in order to reduce CO₂ emissions, it is important to rethink the ways we are living in urban environments and look upon new housing models.

1.2 Focus and scope of the dissertation

This thesis proposes a model of contemporary cohousing to tackle different economic, social, demographic and environmental problems. While other models of cohabitation are presented, this thesis mainly focuses on intentionally planned community living in an apartment building.

The outcome of this dissertation may contribute as a reference for future cohabitation developments in Estonia.

1.3 Research question

To achieve the the aim of this thesis, a main research question and a sub-question have been formulated:

“Can cohousing provide for a high living standard without excessive use of square metres?”

“How can cohousing challenge the way we live in Estonian cities?”

1.4 Research methods and strategy

Housing in general is an extremely important and complex area with mutual dependence on economics, the physical, built and social environment. As this dissertation focuses on the

subcategory of cohousing, consequently, the research is based on the analysis of publications in the field of cohabitation mainly from authors in Northern Europe and North America.

To get a holistic overview of the topic, scientific publications, specialised directories, the online statistical data of various countries, statistical publications and other scientific publications of Estonian and foreign scientific institutions were studied. In addition, as there is a lack of local modern cohabitation examples in Estonia, comparative and visual analysis of three case studies from different countries in Europe was conducted. The particular case studies were chosen by criteria like size of the project, location, comparable information available and floor plan specifics.

1.5 Contribution of dissertation

The aim of this dissertation is to:

- Create an overview of the different aspects and types of modern cohousing and the development processes
- Assess the local housing strategies of the Estonian housing market
- Lay out criteria for a planned cohousing community living in a collective building
- Provide an example for Estonian context by proposing a project for a cohousing community in Estonia

1.6 Outline of dissertation

This thesis consists of an Introduction, 2 Sections, Conclusions, References and Annexes.

02 LITERATURE REVIEW

2.1 Previous concepts and terminology

Cohabitation in itself is nothing new, as there has been a desire to live closely together throughout human evolution. People across the globe have been living in communities for time immemorial. From Pythagoras' aspirations to build a community of strict vegetarians in Ancient Greece, to medieval times where, research suggests, homes were commonly gathering places for small groups of revolving residents rather than individual family units. Written history is riddled with examples of highly collaborative settlements offering new models for living together- often in response to deep desires for greater security and protection, as well as spiritual or economic liberation. (Ahn, Tusinski, Treger, 2018)

As the collaborative housing movement as a formal and distinct concept got more recognised, the need for precise terminology was necessary, as the meaning of different terms could change depending on where in the world it was used. The First International Collaborative Housing Conference was held in Stockholm, Sweden, in 2010, where the aim was to sort out differences and similarities between housing concepts in various parts of the world. It was considered desirable to find suitable concepts that could be used on an international level in order to achieve a standardised terminology. The main concepts under discussion during the conference were: collaborative housing, cohousing, collective housing, commune, cooperative housing and eco-village (Vestbro, 2010). These concepts are described by different collaborative housing researchers and advocates as the result of the Collaborative Housing Conference as follows:

- *Collaborative housing*: the widest conceptual term, as it includes various types of housing with shared facilities, where there is a collaboration between the residents. (Fromm, 1991)
- *Cohousing*: the most common term for English-speaking-people, referring to a house with both private and shared spaces and facilities (Durett & McCamant, 1988). The US cohousing network also defines *cohousing* as "a type of collaborative housing in which residents actively participate in the design and operation of their own neighbourhoods".

- *Collective housing*: almost the same as collaborative housing, but "shared facilities" does not necessarily mean collaboration between residents. Service facilities may be provided by a housing company. (Franck & Ahrentzen, 1989)
- *Commune*: communal type of living without individual apartments. (Vestbro, 2010)
- *Cooperative housing*: cooperative ownership but without shared facilities or common spaces. The term shouldn't therefore be seen as "housing with shared facilities". (Vestbro, 2010)
- *Ecovillage*: architect and researcher Graham Meltzer has defined ecovillages as human scaled, full-featured, harmlessly integrated with nature, supportive of healthy human development and sustainable living. Ecovillages may include collaboration between residents and common spaces, but these factors are usually not the main aims. Therefore ecovillages and cohousing communities should be seen as separate phenomena. One of the main differences with cohousing also is ecovillages usually exist on the periphery of mainstream society, whilst cohousing communities are embedded within it. (Vestbro, 2010)

This dissertation focuses mainly on the concept of *cohousing*, as the definition implies that residents not only live together, but also actively participate in the community and neighbourhood. More specifically, the definition of the Swedish term *kollektivhus* aligns well with the intentions and scope of this dissertation: "a collective building for multi-family housing with private apartments and communal spaces such as a central kitchen and a dining hall, where residents do not constitute a special category". (Palm Lindén, 1992)

2.2 Research gap

As the modern concept of cohousing is relatively new, little primary research is available on the topic. Many of the resources of this dissertation are articles or specialised directories and briefs published by (and for) interest groups of cohousing. A lot of information has been made available from researchers like Dick Urban Vestbro, Graham Meltzer, Matthieu Lietart and others.

Though it must also be mentioned, after a critical review of the cohousing literature, that the author of this dissertation finds there to be a lack of studies investigating the physical design of cohousing and a scarcity of primary studies on the long-term success and environmental

sustainability of cohousing communities. It has to be kept in mind how the existing literature has heavily informed this study, its findings and limitations.

The literature review will start by explaining what cohousing is, where it comes from and what the key characteristics and benefits of cohousing are. In the second part of this section, the development and designing for cohousing communities are discussed.

2.3 History of cohousing

The beginning of the cohousing phenomenon has its roots in Northern Europe. It is hard to pinpoint though where the first cohousing community emerged, as there are two separate claims. Most researchers (Meltzer, 2005, Williams, 2008, Lietaert, 2010) mark the beginning in the second half of the last century in Denmark. Two articles published in Danish newspapers had an important influence at the time on the cohousing movement:

- "The missing link between utopia and the dated one family house", which was based on the failed attempt to build a community of about a dozen of houses around a swimming pool and common dwelling in the 60's in Copenhagen. (Jeske, 1992)
- "Children should have one hundred parents", an article emphasizing the advantages of child-care in a safe, communal setting. (Jeske, 1992)

The positive influence of the two articles and the prior experience from the failed attempt to develop a cohousing community in Copenhagen, led to the emergence of three cohousing communities in Denmark between 1972 and 1976. (Jeske, 1992)

Some scholars (Vestbro, 2010) consider Sweden as the birth place for cohousing, mentioning dwellings with cohousing features that were built in Sweden between the 30's and 60's. These dwellings were developed due to the emerging feminist movement and had the main purpose of improving the lives of working women through a common meal system and child-care facilities. After the first purposely constructed cohousing community in Sweden was built, more modern cohousing communities started appearing in Sweden. (Vestbro, 2010)

Studies reveal three main waves of the co-housing models: the first is linked to the emergence of the first cohousing communities in Denmark, Sweden and later the Netherlands, which were mainly based on community and feminist values. (Williams, 2005)

The second wave is related to the publishing of architects McCamant and Durrett's book "Cohousing- a contemporary approach to housing ourselves" in the United States, which enabled the spread of the cohousing phenomenon on the American continent, with an increased focus on security and sustainability. (Jeske, 1992)

The third wave is linked to the emergence of cohousing communities in the Pacific Rim, South-East Asia, and in some other European countries, like Italy and the United Kingdom and is characterised by its emphasis on accessibility, sustainability, and regional adaptability. (Williams, 2005)

It can be said that today's modern cohousing movement is an extension of this last wave, as the main characteristics, driven by global economical problems like high housing prices and other social problems, are the same.

2.4 Cohousing

The main two physical typologies for cohousing models are:

- A multi-building neighbourhood of private houses that are situated around a communal building or facilities; or in bigger developments, clusters of private houses that are situated around common facilities, that are the focal point of interaction.
- Dwellings or flats in a single building, where private spaces are usually smaller than regular apartments but compensated with larger shared communal spaces. In bigger developments usually some type of shared facilities are located on the ground floor and transitional areas, to foster interactions between residents from different stories.

The definition of cohousing was brought up in chapter 2.1. It was defined as: "a house with both private and shared spaces and facilities". (Durrett & McCamant, 1988) This definition was appointed during the Collaborative Housing Conference that was held in Stockholm, Sweden, as it was necessary to distinguish the different types of cohabitation. Though it is not a

universally defined term. Different scholars have tried to define the concept more profoundly as:

“A neighbourhood development that creatively mixes private and common dwellings to recreate a sense of community, while preserving a high degree of individual privacy.”(Lietaert, 2010)

“A resident-developed, -owned, and -managed cooperative community in which individual households are clustered around village-like courts and streets and a large common house with shared facilities for group cooking and dining, work, play, social activities, and childcare. Shared gardens, orchards, workshops, and outside recreation areas are also common features. A variety of ownership and financing methods can be used, and the social composition is often a multi-generational mix of singles, families, and elderly persons.” (Sullivan-Catlin, 1998).

As these definitions are mostly centred around a multi-building cohousing neighbourhood, a combination of these definitions would be best suited for this thesis on cohousing in a single collective building. For the topic of this thesis, the definition of cohousing is:

“A resident-developed, -owned, and -managed development that creatively mixes private and common spaces to recreate a sense of community, while preserving a high degree of individual privacy.” (Sullivan-Catlin, 1998, Lietaert, 2010)

2.4.1 Key characteristics of cohousing

According to the literature, the main quality of cohousing is to create a supportive setting that enhances the sense of community, but also allows for personal space and privacy. This is endorsed through physical design, that fosters social interaction and also allows for the possibility of privacy. (Williams, 2005)

The role of physical design in cohousing is acknowledged by architect Charles Durrett, one of the authors of the book “Co-housing- a contemporary approach to housing ourselves” that initiated the cohousing movement in the US. In his research, he states that while the participatory process establishes an initial sense of community, it is the physical design that sustains it over time. (Durrett & McCamant, 1988)

In their book, McCamant and Durrett’s identify four key characteristics of cohousing, which later were expanded and rewritten to six characteristics by researchers Graham Meltzer and Matthieu Lietaert. These six characteristics are: the participatory process; the design for social interaction; the common facilities; the self-management of the community by its residents; the absence of a formal hierarchy; and separate incomes among residents.

- The participatory process

A crucial feature of cohousing communities is the participatory process, meaning that the residents decide together with various specialists the design and development characteristics, as well as the principles on which the future community will be based. (Meltzer, 2005)

- Design for social interaction

Physical design plays a crucial role in the life of cohousing communities through its capacity for fostering social interaction, thus enhancing the sense of community. (Meltzer, 2005)

- The common facilities

For most communities, these shared facilities are clustered in a communal dwelling, including at least one kitchen and dining room for shared meals. Shared facilities can also include guest bedrooms, storage rooms, entertainment rooms, shared laundry, library, exercise room, children’s playrooms and workshops, as well as outside spaces such as vegetable gardens and children’s play areas. (Meltzer, 2005)

- The self-management of the community by its residents

Cohousing residents are involved in all activities and decision-making processes needed to run the community on a daily basis (Lietaert, 2010). Together, they take decisions on finance, set guidelines for the admittance of new members, and address common concerns. Cohousing groups are usually conceived, initiated and controlled by those who reside in it. Resident participation and the distribution of daily tasks also encourages social interactions. (Williams, 2005)

- The absence of a formal hierarchy

Cohousing communities are formed on the backbone of democratic decision-making processes. The non-hierarchical structure means that all members have an opportunity to be heard and give their input. Decisions can either be taken by consensus, majority voting, or other approaches. (Lietaert, 2010)

- Separate incomes among residents

A key difference between a cohousing community and communes is financial management: in cohousing the incomes of residents are separate, and no 'shared economy' system is in place. Residents are either owning or renting their private homes, and generate their own financial means. The sharing of income between households is highly unusual. (Meltzer, 2005)

In this paragraph the most important characteristics of cohousing according to researchers Graham Meltzer, Matthieu Lietaert and Charles Durrett were described. These characteristics can be observed in most cohousing communities. While it was stressed that the built environment and designing for social interaction play a crucial role for a cohousing community, there are also scholars that have come to the conclusion, that although the physical design influences interactions, it by itself is not sufficient for the formation of cohesive communities. (Jarvis, 2011) It is concluded that cohousing is defined by interactions, more so than by the built environment, as research on how the built environment affects the longevity of cohousing communities has not been conducted.

If one would look up cohousing or co-living on Google, what appears is a range of cohousing as a service models, that are associated with startups and businesses. Commercial projects like Common, WeLive and The Collective offer a housing service, that does not fit the criteria of the key characteristics of this chapter and therefore are not subject of this thesis, as these models do not offer any involvement in design, community management or ownership.

2.4.2 Social wellbeing

This paragraph aims to showcase the link between being involved in a cohousing community and individual wellbeing while relying on PhD research done by Lisa Poley. It has to be noted, that little research has been done towards the field of individual happiness in cohousing communities, though no contradicting research was found.

As indicated in the introduction, in chapter 1.1.3, loneliness and social isolation are rising concerns in today's society. The research of Poley (Poley, 2007) measured elements of social capital in cohousing. In terms of civic engagement, the research shows significantly higher levels of interaction in cohousing compared to "regular housing", as compared to both the general population and to individuals with similar educational, income and racial characteristics. (Poley, 2007)

The research in form of an analysis of three neighbourhoods finds, that individuals were found to possess high levels of trust, social cohesion and norms of reciprocity. Residents were also found to be developing a range of democratic capacities, individually and collectively, particularly through engagement in community self-governance via consensus-based, community decision-making processes. (Poley, 2007)

While more research has to be done on the link between cohousing and individual wellbeing, the research in this chapter clearly indicates towards a higher involvement in communal activities by people living in cohousing communities, which is likely to have positive effects on personal wellbeing.

2.4.3 Development and barriers

2.4.3.1 Development of cohousing

In this chapter the different development models used to build cohousing communities are discussed based on the literature review of Williams, Cojan, Meltzer and Bamford.

According to Williams' classification, developments that are resident led are classified as "bottom up", developments where developers work with the future residents, and residents are responsible for some aspects of the development process are classified as "a partnership model" and developments built without the involvement of community are classified as "speculative, top-down". (Williams, 2008)

In the PhD dissertation of H.C.Cojan, sixteen cohousing developments were examined to understand the development process of cohousing communities. Out of the sixteen cases, seven developments had been led by their residents (with help from various specialists in

regards to planning, design, legal issues etc., that were contracted by the cohousing group) and eight other instances had been developed through a partnership, where a developer led the development together with the future residents. These developers can be divided between municipal housing associations and a private estate developer, in one instance a top-down model was identified. (Cojan, 2016)

The “top-down” approach differs significantly from the other models due to the limited input of the residents before moving in. The only example among the studied communities was from Sweden, where a municipality initiated the project and established the broad vision for the future community. The participatory process comprised only of a few meetings with the future residents. (Cojan, 2016)

A partnership with an external developer is necessary if the financial possibilities of the cohousing group are insufficient for the physical construction of the community. An external developer (most frequently a municipal housing association for the researched communities) brings the critical technical and especially financial support needed for the physical development of the community. It eases the development process as well, allowing residents to focus more on community building, common values, and interactions in the future community. However, such a partnership generally comes with strict conditions imposed on the residents that assure the long-term feasibility of the project for the developer. (Cojan, 2016) Williams in her work emphasises that a partnership can remove many risks of the standard, resident-led approach, since developers can be very helpful in facilitating the development of cohousing communities because they already have access to potential sites, expertise and finance. (Williams, 2008)

The “bottom up” process implies that a group of future residents organise and participate in the design and development of their project as each group defines both the physical structure and internal rules of the future community. (Meltzer, 2005) The long development process ensures that individuals get acquainted with each other and usually decide whether such a lifestyle would suit them or not, even before moving in. This can contribute to the initial cohesiveness of communities, as in theory the group that actually moves in is committed to the values of a particular community. Many households pull out in the development phase, and are replaced by others”. (Bamford, 2004)

However, this approach to development results in a time-consuming process, requiring many hours of participation, planning, and decision-making, leading the development process of cohousing communities could take many years. (Meltzer, 2005)

Sullivan-Catlin conclude: “A group must be formed, a process for decision making must be agreed upon, a legal entity must be created, a site must be identified and secured, plans must be designed, consultants, architects, and builders must be hired, zoning permits and approvals as well as financing must be obtained, and relationships among the members must be developed.” (Sullivan-Catlin, 1998)

As a conclusion of this chapter, all researchers have expressed that the “bottom up” participatory development process is challenging, but also important for creating an initial sense of community for the residents. Though it has been emphasised that the partnership approach removes many risks and stress from the community and could be the preferred approach for many.

2.4.3.2 Barriers of shared living development

Difficulties of the development of cohousing buildings, concerning both the “bottom up” and partnership model, begin during the design phase. In her research Williams notes: “in both communities resident involvement in the decision-making processes had also created conflict”; and “design decisions had created some of the biggest conflicts in both communities”. (Williams, 2005)

In a broader sense, as investors and developers are working to minimise risk and maximise profit, there is a strong tendency to keep building what they already know. And since the housing markets in bigger cities are generally very heated, there is little incentive to explore new designs. Most common investor models and modes of organisation do not support community-generated or community-owned development projects. To bring forward new modes of living and sharing, the investment structures, business models and planning processes must be addressed. (Pagh, Williams, Braskov, Christensen, 2018)

The design and construction of residential buildings focuses almost exclusively on “traditional” family set-ups, leaving little space for new forms of spatial organisation. This is largely the result

of the economic and political context. Construction is a cost driver and, within the dominant model of construction, it is considered hard to offer affordable “experimental” housing. Affordable, high-quality schemes exist, but they tend to demand more of the design process and require a more long-term understanding of “value” than just an immediate maximum return on investment. (Pagh, Williams, Braskov, Christensen, 2018)

Local authorities can support cohousing through: planning regulations that are positive towards resident-led developments such as cohousing (Williams, 2005); or by reserving some land for such developments, and helping to increase awareness regarding the cohousing model. Such partnerships can provide benefits as well, in terms of: the positive wider impact that cohousing communities can have on a specific area; and in terms of their agenda, including social housing tenants in cohousing projects supported by social housing landlords. (Williams, 2005)

In conclusion, the main barriers for cohousing development are linked to the lack of strategy from local authorities and disinterest from investors and developers, as it is more convenient to build “traditional” housing. Difficulties may start during the design phase due to the long decision-making process, lack of land availability and the existing economic and political housing context.

2.4.4 Design considerations

This chapter introduces some initial aims for the physical design of cohousing according to the literature. As there are no concrete guidelines on how to design for cohousing communities, the guidelines mentioned are expressed as considerations. Two interesting contradicting strategies in terms of physical design are emerge, on one hand enhancing the sense of community and on the other hand, the high standard for personal privacy. More specifically, the literature mentions design parameters for increased social interaction, and at the same time the need for privacy.

2.4.4.1 The size of co-habitation communities

One important aspect of cohousing communities, is the size of a community. In one of their recent works, McCammant and Durrett highlight the importance of size when developing

cohousing. They found that American cohousing communities tend to give inadequate consideration to the size of the development. The size and composition of households must be closely considered with regard for common facilities, division of responsibilities, desired activities, and the social environment”. (Durrett & McCammant, 2011)

However, the literature does not dictate an ideal size for cohousing. For some the ideal size ranges between 12 and 36 housing units while others suggest a range between 15 and 35 as optimal. (Lietaert, 2010)

McCammant and Durrett believe that a cohousing community that contains 20 to 50 adults seems to be an optimum size. In our experience. Above 50 challenges the capacity for a cohousing community to operate in the spirit in which it was built, and when a community contains fewer than 20 adults, the likelihood that every resident will form solid social connections is challenged. In other words, every adult in a cohousing community should ideally have four or five others that they really connect with. (Durrett & McCammant, 2011)

For very large cohousing communities, consisting of over 100-150 adults, the option to create smaller housing clusters within their physical boundaries. This clustering is aimed at bringing closer together people with shared interests or people in similar life situations. (Durrett & McCammant, 2011)

2.4.4.2 Interaction vs privacy

The literature on cohousing mentions design parameters for increased social interaction, and at the same time the need for privacy.

Physical design of cohousing in communities in blocks or flats of a single building was researched by Palm-Linden. In her research on the Swedish communities, the author emphasises the importance of casual interactions, and the role of transition zones like entrance areas, stairs and elevators in achieving this (Palm-Linden, 1992). Though, in her research Palm-Linden does not mention the role of communal shared spaces.

Other researchers have also found the importance of buffer zones for private spaces, as a mean of enhancing personal privacy. (Meltzer, 2005, Williams, 2005) They highlight the importance of

the gradual transitions between public and private space. Williams also emphasises the importance of outdoor privacy in cohousing, especially in communities with a higher density of the built environment, as they mention outdoor private front yards and backyards as an important design measure that can affect the long-term success of communities, by enhancing the possibilities for privacy of the residents. (Williams, 2005)

2.4.4.3 Adaptable housing

While adaptability is not mentioned in the reviewed cohousing literature, it is the authors proposal to consider adaptability as a design strategy for cohousing in communities in a single apartment building.

Adaptability is a key aspect in making housing more sustainable. The major approach to adaptability is internal transformability of buildings, meaning the possibility to make modifications to the spaces and their equipment within the existing building envelope. This aspect is often taken into consideration in the design and implementation of office buildings. However, in housing the situation is different, and internal transformability is very seldom implemented in apartment buildings. (Tarpio, Huuhka, Vestergaard, 2020) Though, flexibility in dwellings could be of great benefit in cohousing communities, where the residents or needs in an apartment setting may easily change.

The potential to adapt is not limited to dwellings that were originally designed to be flexible. There are also factors in the normal housing stock that contribute to the ability of dwellings to adapt to changes in their use and operating environment. (Tarpio, Huuhka, Vestergaard, 2020)

According to Jyrki Tarpio, the ability of a dwelling to adapt to different needs can rely on four different spatial principles, which he refers to as:

- Preform
- Room series
- Volume

- Initial mass and places to grow

A “preform” is a semi-complete space which will be subdivided and equipped in accordance with the users’ needs. When the users or needs change, the dwelling can be adapted to a new situation by transforming the subdivision within the preform. Also a suitably organised “room series” may possess the potential to adapt to different uses. The subdivision of space into rooms is permanent and fixed, but by using different spatial logics the rooms can be made multi-functional and some of them even switchable from one dwelling to another. Flexibility can also be based on the idea of retaining the dwelling as a single “volume”, as open plan, in which places suitable for different purposes can be marked out using furniture. Furthermore, the flexible dwelling may consist of an “initial mass and places for growth” such that it can gradually be extended. Of these principles, the preform is an idea strongly associated with the modern age, but the other three are substantially older. All the principles are nevertheless still useful in the design of flexible dwellings. (Tarpio, 2016)

Considering the above, some concepts of providing transformability within an apartment building are: (Tarpio, 2016)

- Big apartments can be divided to two or more
- Small apartments can be joined to make a big apartment
- Switchable rooms (or small units) that can be connected to several apartments
- Empty floor areas that can be divided in many ways
- Fixed wet spaces

2.4.4.4 Other strategies

Other design strategies, according to literature, include reduced size of private spaces: private spaces in cohousing communities, although designed to encompass all facilities of a self-sufficient unit (including a kitchen), are usually smaller in size than conventional homes. This measure is aimed at fostering social interaction in cohousing, by encouraging the use of the common facilities available for residents. (Meltzer, 2005, Sundberg, 2014)

The loss of space in the private units is supported by the provision of communal facilities such as communal kitchen/dining areas, laundry, gym, workshop/hobby room, guest bedroom, entertainment room, garden, storage space. The common spaces are treated like the extension of private spaces. (Williams, 2005)

This chapter gave an overview of possible design strategies to consider when designing for cohousing communities according to literature. The main strategies most researchers mention are size of community, designing for casual interactions while maintaining private spaces, reduced size private spaces and the importance of transitional zones between private and shared spaces. While most parameters remained vague, strategies like transitional zones between private and non-private spaces and reduced private spaces will be used in the project part of this thesis. In chapter 2.4.4.3 the author proposes adaptability to be considered as a design strategy for cohousing, as it may be beneficial in an experimental housing model, with many "moving parts".

2.4.5 Environmental sustainability of cohousing

Considering current sustainability issues faced by humanity globally, it is important to also consider the environmental benefits of cohousing. For this topic, the different research outcomes of Meltzer, Sundberg and Williams were compared. The literature review on the topic showcased cohousing as potentially more environmentally sustainable than regular housing, the main benefits being:

- dwellings are smaller than regular housing (Meltzer, 2005, Sundberg, 2014, Williams, 2005)
- reducing daily living costs due to lower resource requirements (Meltzer, 2005)
- enhancing the possibility to receive support from programmes from authorities and developers (Williams, 2005)

2.4.5.1 Cohabitation vs regular housing: size

Using quantitative comparisons, Graham Meltzer concludes in his research, that in the United States, cohousing dwellings are about half the size of a typical new-built house. (Meltzer, 2005),

while Williams states in her research that cohousing residents use about two thirds the space of US mainstream housing. (Williams, 2005)

In his Master Thesis, F. Sundberg concludes in his comparative case study of Swedish cohousing, that compared to average regular Swedish buildings, the floor area of private flats in a Swedish cohousing communities is smaller by about a quarter. (Sundberg, 2014)

While the results of all three researchers in this category differ, in conclusion the similar results indicate a similar global trend.

2.4.5.2 Resource consumption

For the research on the topic of resource consumption, in her research Williams concludes, that cohousing communities are founded on the basic premise of economies of scale, sharing space, goods and services within larger households or between several households, which will reduce individual resource consumption and enhance the sharing of resources and the dissemination of pro-environmental ideals among residents. (Williams, 2005)

In her work she concludes that significant savings were achieved compared to mainstream averages: 57% electricity savings and 8% goods savings were achieved. (Williams, 2005)

In his research, Sundberg concludes that cohousing residents use one fifth less energy than Swedish mainstream housing (Sundberg, 2014), while Meltzer in his research notices an overall reduction in privately owned goods, gardening tools and second cars in cohousing compared to US mainstream averages. (Meltzer, 2005)

Similarly to the last chapter, more important than specific results of each research, it is more relevant that they come to similar conclusions as to why cohousing can be more environmentally sustainable than regular housing.

2.5 Estonian housing

In order to understand the relevance of the topic of this dissertation in local context, it is important to comprehend the evolution and peculiarity of the housing situation in Estonia. For this purpose, this paragraph summarises housing in Estonia, while giving insights on the

different housing models and the ideological shifts in housing policies, with focus on the city of Tallinn. This part of the thesis relies heavily on the work done by researchers Katrin Paadam, Liis Ojamäe and Angelika Kallakmaa-Kapsta.

2.5.1 Summary of Estonian housing history

The history of Estonian housing is correlated to the societal transformations in the last century. The change of ideology in the country brought with it a change in policy in how housing is approached. Through this observation, three main phases of development can be distinguished during the historical events of :

- The first period of independence between 1918-1940
- Soviet occupation between 1940-1991
- Regained independence since 1991

During the first period of independence between 1918-1940 wooden residential buildings dominated in the country and in Tallinn. Active construction of residential buildings started in the second half of the 1920s and continued in the 1930s with many stone buildings added in the course of the development of the central area of the city. Relatively small blocks of flats were a dominating housing type, consisting in the main of 1- and 2- room flats. In the 1930s the share of 3-room flats increased: the average number of rooms per flat was 2.5 by 1934 and the average floor space per resident before WW II was 13.8 m² (National Statistics Bureau, 1937). Private rental housing dominated in the urban areas, 91 per cent of housing constructed in 1918-1930 was in private ownership (Tallinn City Government, 1931), while municipal share of housing ownership increased a few percents in the 1930s. Renting was a norm, also for the middle classes, co-operative construction activities emerged in 1920s and then again at the end of the 1930s while national loan programmes were introduced. (Paadam, Ojamäe, 2008)

During the soviet occupation time in 1940-1991, war time damages and in-flow of Soviet immigrants caused a serious housing deficit, especially for quality housing, which lasted until the end of the period in the late 1980s. The main act of the occupational government concerned land and housing property nationalisation. Owners, especially of rental blocks in

cities were expropriated of their property, often deported or evicted from their houses or flats occupied by their families, and the property distributed to new tenants under the control and order of municipal authorities. Public housing became a dominating housing type, costs were low and highly secured by public funding. Construction of large-scale housing started in the 1960s and flourished until the end of the 1980s. Residential blocks were maintained and repaired by institutional owners, residents had no role or responsibility in these activities, except for co-operative blocks. As a result these buildings had and maintained a higher quality compared to the public blocks. Design and size of buildings was highly controlled and standardised, the dominating type of flats consisted of two rooms, while the number of 3-room flats grew in the 1980s. The average floor space per capita grew from 9.3 m² in 1945 to 21 m² in the end of 1980s. (Tallinn City Government, 2002) Living was defined by the new official ideology of shared collective living, however, this never really was accepted by the individuals, possessing a different experience from the pre-occupation period. Ownership became the life-style that people dreamed of, these dispositions were also passed over to the next generation. (Paadam, Ojamäe, 2008)

Since the regained independence in 1991, the construction of residential blocks virtually ceased for the first years of independence due to the re-structuring of all activities in all fields in society as well as agents' re-positioning in the social space. The first and most important act paving the way for the restructuring of housing was denationalisation of property- restitution of expropriated land and housing property and privatisation of the state, municipal and company housing by the sitting tenants. This massive acquisition of homeownership resulted in an even higher percentage of private housing in the total fund than in the pre-war time. From 2003-2004 onwards the real estate market was booming in parallel with the housing loan market, as a result of which a number of new property areas have emerged in the suburban areas outside Tallinn. Between these years the floor space of 22.9 m² per capita increased to 26 m² in 2005, while at the beginning of the 1990s the housing costs made up 2-3 per cent of household expenditures, by the end of the 1990s they already made up 19 per cent on average (Statistical Office of Estonia, 2001), with a slight decrease to 16% in 2003 (Statistical Office of Estonia, 2004). Maintenance responsibility passed over in full to individual owners. In order to manage property flat owners are bound by legislation to found flat-owners associations (governors assigned in houses with no association by maintenance companies having provided service earlier). Denationalisation caused three types of problems:

- concerning tenants in the restituted housing- unequal opportunities for obtaining ownership of housing,
- privatisation in low income groups are in difficulties maintaining their homeowner status, pointing up the need for social policy measures,
- almost full-scale privatisation left no resources managing the public needs for social and municipal housing- the need for new residential buildings. (Paadam, Ojamäe, 2008)

In conclusion, Tallinn (and Estonia) has a 96 per cent privately owned housing stock, while 4 per cent belongs to the public housing fund. In the process of restructuring the housing market, Estonian authorities privatised the existing public rental housing stock in the belief that private home ownership would maintain the existing housing stock and, on the other hand, to redistribute housing wealth. This decision was supported by the EU Housing Policy Guidelines. The tenure split of the EU27 members reveals that Eastern European countries Estonia, Romania and Bulgaria lead the owner-occupancy rate, which reaches close a hundred percent. Unfortunately, the high home ownership rate in these countries is also accompanied by a high rate of housing deprivation- corresponding to 28,6% and 28,8% in Romania and Bulgaria, 12,2% in Estonia. (CECODHAS, 2011)

Understanding the historical context of forced expropriation and living is an important aspect for this thesis, as it is the authors opinion, that most people, even younger generations, to this day carry the mentality of wanting their very own apartment or property, while not being forced to lose out on privacy. As an own apartment is still the desired "life-style", this dissertation is an attempt to broaden the aspects of ownership and show the benefits of sharing. Cohousing may still be a form of owning property, though more affordable, while having the benefit of community. Still many Estonians may find the idea strange due to socialist history and generational passed down habits of thinking.

2.5.2 Affordable housing

Social housing in Estonia from the transitional times during regained independence to the present has had two main incentives. While there was no general interest towards social housing in the beginning of the 21st century, the municipality of Tallinn came out with

addressing the problem of lack of affordable modern living space in the city. The Residential Construction Program adopted in 2002 envisioned the construction of two thousand municipal dwellings and three thousand privately owned (but rented to the municipality) dwellings between 2003 and 2007. (Kährrik, Kõre 2013)

The main criteria for choosing potential locations for social housing developments were the following:

- the land is available to the municipality or is owned by the municipality;
- the areas are not attractive to private sector developments and cannot be regenerated without public support.

The low political priority for formulating a social housing strategy, the lack of finance, the policy of treating social housing as a temporary form of housing, the unstable political environment, and the minimum criteria on social housing standards all led to a relatively poor status of social housing. (Kährrik, Kõre 2013)

The second program that was passed in 2008 broadened its ambition: it planned to support more key workers the city relies on and improve the housing conditions of young families. The term key workers refers to public sector professionals with below-average income, such as people working in educational institutions, social welfare services, health services, police officers and rescue services. The main difference between the program passed in 2008 and the previous program is that a shift occurred away from specifically targeted social housing tenure to much broader eligibility criteria, with the quite ambitious goal of integrating social rental housing in the overall housing market. (Kährrik, Kõre 2013)

As an outcome of the first programme, 914 housing units were built in municipality ownership and 680 as private ownership between 2003 and 2008. Most of them are five- and eight-storey apartment buildings and they are rented to tenants for a period up to 5 years. As a result of the second programme 1,214 social housing units were built by private developers between 2009 and 2011. All of the newly built dwellings are located in buildings with 100 percent social dwellings. In total, 3,259 new social dwellings were built between 2000 and 2010. The lack of social housing in Estonia today means that it is not an integrated part of the housing market in

direct competition with other tenures. For this same reason the effect of social housing on social equality is slight. However, despite its inflexibility and problems, social housing plays a modest role in eliminating housing market deficiencies and enabling housing access for the most needy. (Kährik, Kõre 2013)

A study conducted by Kährik and Kõre among municipalities reveals that the need for social housing exceeds the existing supply in most of Estonia. On average, the existing supply covers 80 percent of the need, and the need for social housing is estimated as higher in larger cities, where the existing stock covers two thirds of estimated need. (Kährik, Kõre 2013)

Their analysis revealed a highly spatially segregated pattern of social dwellings in Tallinn and the distribution of social housing to more disadvantaged areas in Tallinn. They state:

“Based on sociospatial dialectics, we can argue that the vulnerability of social housing clients is reinforced by the lower-status location of their residence, which affects their lives and future prospects. The concentration of social housing and lower-social-status tenants, however, also makes it harder for the locality to improve itself. Beyond the positive effect on improving access to housing for eligible groups, the impact of increased segregation levels of social housing in certain subareas is likely to have severe side effects. Such segregation is reinforced by the concentration of social housing in large multifamily buildings containing 100 percent social dwellings.”

Although there has been an effort to encompass a broader range of population groups in the allocation of social housing, in conclusion to Kähriks and Kõre’s research, the situation of social and affordable housing regarding location, quality and availability is substandard.

2.5.3 Estonian housing in numbers

In order to have an up-to-date understanding of the metrics of the housing market of Tallinn, a statistical overview of the “Statistical yearbook of Tallinn 2021” (Tallinn City Government, 2021) was made.

The contents of Table 1 show the key metrics that characterise the general housing market of Tallinn.

Table 1. General metrics of the housing market of Tallinn

Household by place of residence and type of dwelling: apartment	86,1%
Floor space per dwelling	60,1 m ²
Floor space per occupant	24,9 m ²
Numbers of occupants per dwelling	2,4
Price per square meter of apartments in Tallinn	€2161

The contents of Table 2 show, that only 1124 social housing units are currently provided by the city municipality. The contents of Table 3 show the amount of applicants for units rented out by the Tallinn municipality, not limited to social housing units, but also fixed-rent dwelling and dwelling for young families and workers necessary for the city.

Table 2. Social housing in Tallinn

Number of rooms, flats	1124
Number of residents	1281

The contents of Table 4 show clearly, how demand for affordable housing is not met by supply, as for every category the number of accepted applicants is at least 3 times lower. The biggest demand is for apartments for young families and employees vital to the city, where the number of applicants is 40 times higher than the number for accepted applicants.

Table 3. Applicants for renting a dwelling from the Tallinn Municipality

Applicants total	2353
Applicants for renting a dwelling	898
Applicants for renting a social dwelling	509
Young families and workers necessary for the city	946

Table 4. Number of dwellings to be let by the Tallinn Municipality

Leased to tenants of dwellings returned to rightful owners	235
Social dwellings	100
Leased to young families and employees vital to the city	24

2.5.4 Cohousing in Estonia

After conducted research, the author of this thesis finds no confirmation of intentionally developed cohousing communities in Estonia. As stated before, Estonians may find the concept of cohousing strange due to socialist history and generational passed down habits of ways of thinking about private property. Though younger generations may neglect past habitudes and the evidence found in the last paragraphs, 2.5.2 and 2.5.3, indicates clearly a broad demand for affordable housing. While the concept of cohousing doesn't necessarily mean government involvement, in fact, it rarely does, it is a way of designing with less space for more people, thus being more affordable. While urbanisation will bring more people to the cities and development prices reach new yearly highs, following global trends, more and more affordable housing will be necessary in Tallinn's urban environments in the future. This thesis suggests the concept of cohousing to be considered as part of a possible solution, as it not only accommodates more people with less space, but also helps building sustainable, involved, well-integrated communities. While the practical part of this dissertation aims to be considered an example of materialising this concept of cohousing in local context, the next section will introduce case studies from other countries approaches to affordable housing by designing for communities.

03 CASE STUDIES & ANALYSIS

In this section of the dissertation three alternative case studies were examined and analysed in order to investigate the most effective design strategies for the practical part of this thesis. Due to the absence of existing local cohousing projects in Estonia, the case studies were chosen from different countries in Europe by criteria proposed by the author of this dissertation.

3.1 Case study criteria

As stated before, the term cohousing can have different meanings and range from privately owned developments to cohousing as a service model. Formulated in chapter 2.4, for the purpose of this thesis the definition of cohousing is: a resident-developed, -owned, and -managed development that creatively mixes private and common spaces to recreate a sense of community, while preserving a high degree of individual privacy. Other models were defined as not the objects of this analysis and instead projects were chosen by proposed criteria:

- Built projects

Only existent already built projects were considered for this analysis.

- Cohousing in a single-building community or cohousing cluster apartments inside a "regular" apartment building

As this dissertation on cohousing mainly focuses on single-building communities, other concepts of cohousing were excluded. In some cases, examples with cohousing cluster apartments in "regular" cohousing buildings were chosen as a research of the different possible models. Cluster apartments are defined as smaller than regular, independent apartments with basic functions provided, that benefit of shared spaces and facilities.

- Type of private space

To get a better understanding on the relationship between private and shared space, projects designed for different amounts of privacy were chosen. This includes cohousing apartments- apartments that consist of small units that are private and independent, but are tied through a shared common space-, and the -single room with a shared space- approach.

- General target group

Projects were chosen by having a diverse target group of tenants. The solutions were not designed for a specific type of user, rather for anyone that would like to live in a shared community- families or single user.

- Size of community

Another important characteristic was the size of community. Projects with different amounts of users were chosen, to understand better the positive and negative aspects of community size. Although the general number of tenants in a building may vary, the number of people in a shared unit usually was approximately the same.

- Common spaces

With the practical part of the thesis in mind, it was important for the chosen case studies to have some kind of shared facilities for communal activities incorporated, other than shared living rooms and kitchens, as those are the core for most cohousing projects.

3.2 Analysis

Based on the previously defined criteria three projects were chosen as case studies. The analysis is conducted to investigate the most effective design strategies for the practical part of this thesis. The analysis method used is mainly visual, as the research subject besides some key metrics is of architectural nature, which means analysing architectural drawings. Key characteristics that were examined are:

Project size; cohousing units per building; typology of units; number of residents per cluster; square meters per resident; the floor plan layout, shared space vs private space; spacial flexibility; shared facilities; and other strategies used.

3.2.1 Dialogweg 6, Duplex Architekten

Zurich, Switzerland

The building is part of the urban project Mehr als Wohnen (More than residing) in the Hunziker area in Zurich, a neighbourhood consisting of different mixed-use residential buildings with projects from different architects, all-together about 450 apartments, shops, workshops etc.

Dialogweg 6, a project by Duplex Architekten, is a 6 storey building, characterised by a central courtyard or atrium, that is the core of the building, which is meant to be the main point for interaction between residents. The atrium is surrounded by cohousing units, which consist of so called "cluster apartments"- independent apartments with basic functions provided, and shared spaces. The cohousing units open up towards the atrium and the streets, so one could stand in the centre of the building, while looking outside through someones apartment. This clever layout of the private cluster apartments is described by the architects as being treated like buildings in a public space. Each apartment is meant for 7 to 12 tenants and hosts a diverse group of people, from youngsters to the elderly. On the ground level shared spaces like ateliers, workshops, a gallery and a laundry room are meant to promote casual interactions between the residents. (Duplex Architekten, 2015)



SHARED SPACE

- Communal spaces usable by all residents
- Shared areas inside the cluster apartments: type 1
- Shared areas inside the cluster apartments: type 2



PRIVATE SPACE

- Private units inside the cluster apartments: type 1
- Private units inside the cluster apartments: type 2



Typical units



- Positive:*
- All basic functions are provided
 - Zoning of night and day areas

- Negative:*
- No buffer zone entering from communal areas



- Positive:*
- All basic functions provided
 - Buffer zone between private and shared spaces

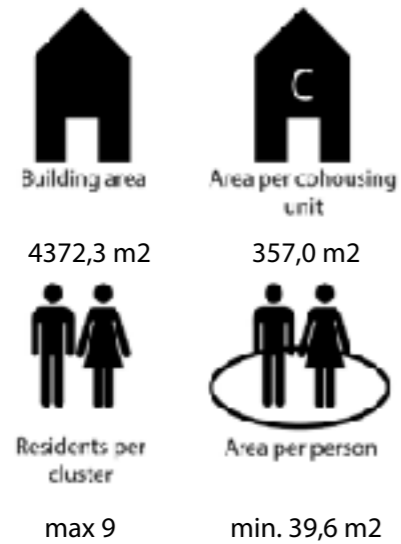
- Negative:*
- No zoning for night and daytime activities



- Positive:*
- Buffer zone between private and shared spaces
 - Separate sleeping areas

- Negative:*
- No zoning for daytime activities
 - Absence of living area

Summary



-The building

The analysed floor plan is repeated on every storey, on each floor there are two cluster apartments, meaning the building is 100% cohousing oriented. On the ground floor there are communal facilities for all residents to be used. The floor plan, while being unique, does not allow for flexibility in changing units or their sizes, should the needs or functions of rooms change.

-The cluster

The meander cluster layout is unique and allows for spacial separation, creating zones for different uses and levels of privacy. The centrally located kitchen and communal living room, laundry room and balconies prosper casual interactions.

-The units

The private units are not meant for families, although in some cases rooms are joinable. All units are equipped with the necessary equipment to be independently used. Some units are missing buffer zones and open up directly into the shared areas.



3.2.2 Spreefeld (Haus 1), BARarchitekten

Berlin, Germany

Spreefeld is a three building ensemble at the Spree river in Berlin, Germany. For each building, a different architectural firm was contracted. As a result a lively neighbourhood emerged, with intentionally designed spaces for the community at ground floors of every building. Community spaces include workshops, dining and event rooms, a kindergarten, roof terraces, a boat house and a community gardens.

Building 1 (Haus 1) was designed and developed by BARarchitekten. It is a 8 storey building that consists of regular apartments and a cohousing unit. The cohousing unit in a form of cluster apartments on the 2nd and 3rd floor, is the biggest cluster apartment addressed in this analysis, hosting up to 22 residents. The apartment is divided through 2 stories, with the shared kitchen being on the 2nd floor and the living room on the 3rd floor of the building. The cluster apartments are of different size, but hold all basic functions like a living area, a bathroom and a small kitchen. Each apartment also has access to a balcony. The open staircase of the building allows for community access of the rooftop terrace 6th floor. On the ground floor of building 1 there are option spaces (undefined and temporary uses) equipped with a kitchen and a laundry room. (BARarchitekten, 2012)



SHARED SPACE

Communal spaces inside the cluster apartments

Floor plan 2nd floor



- Positive:*
- Shared space separation through different stories
 - Guest room for people visiting
 - Communal balcony
 - Furnishing equipped for many people
- Negative:*
- Unused shared space in corridors

Communal kitchen

Communal dining

Guest room
11,8 m²

Floor plan 3rd floor



- Positive:*
- Shared space separation through different stories
 - Communal balcony
 - Furnishing equipped for many people
- Negative:*
- Unused shared space in corridors
 - Little spacial separation in the living room

Shared living-room

Communal balcony

PRIVATE SPACE

- Private units inside the cluster apartment
- Regular apartments

Floor plan 2nd floor



Private unit
37.9m²
Positive:
-Buffer zone
Negative:
-No daytime zones
-Not all functions provided

Private unit
39.7m²
Positive:
-All functions provided
Negative:
-No buffer zone from shared areas
-Not separation between day-and nighttime zones

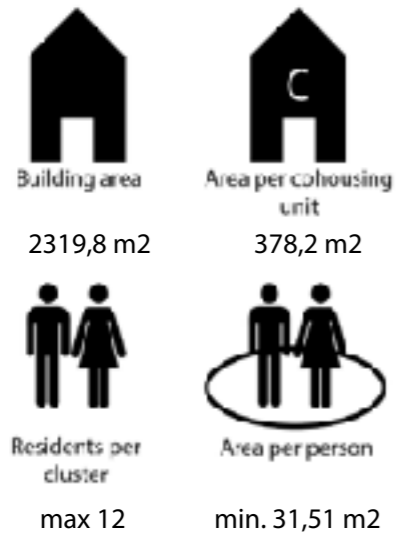
Private unit
48.9m²
Positive:
-Fully equipped apartment with separations and a buffer zone from shared areas

Floor plan 3rd floor



Private unit
37.8m²
Positive:
-All functions provided
Negative:
-No buffer zone from shared areas
-Not separation between day-and nighttime zones

Summary



-The building

The analysed cohousing apartments are part of a regular apartment building, with cohousing clusters located on the 2nd and 3rd floor. On the ground floor there are communal facilities for all residents to be used.

-The cluster

The cluster apartment is spread-out between two stories, with private spaces and shared facilities on both levels. This is considered a good strategy, as it allows for more privacy in communal spaces while still enhancing interaction. The guest room is good to have for visitors.

-The units

The private units are well equipped to be independently used, in some cases a buffer zone between private and shared space is missing. Private units are spacious and are mostly meant for couples or single use.



3.2.3 StadtErle, Buchner Bründler Architekten

Basel, Switzerland

The building is located in the Erlenmatt neighbourhood, where the cooperative “Zimmerfrei” (*Roomfree*) aimed to create an affordable living space with a focus on community, sustainability and modesty. The planning and building process involved participation of the members of the cooperative.

The building consists of 6 stories, that are connected through and exterior staircase and access balconies. The first 5 floors are equipped with rather small-sized regular apartments which are supplemented by central communal spaces, like a community kitchen, laundry rooms, guest rooms, a music room and a workshop. The extension of living spaces to public areas makes the access balconies attractive to spend time on. From the socially as well as architecturally connecting access balcony, apartments are entered directly via an eat-in kitchen facing the yard, thus the more private functions are faced to the other side. On the 6th floor are cluster apartments with shared facilities: a shared living room and kitchen area with access to the roof terrace.

A noticeable strategy of this development is, for the almost 100 residents there are 4 car and 150 bicycle parking spots available. (Buchner Bründler Architekten, 2017)



SHARED SPACE

- Communal spaces usable by all residents
- Shared areas inside the cluster apartments

Ground floor with shared facilities and regular apartments



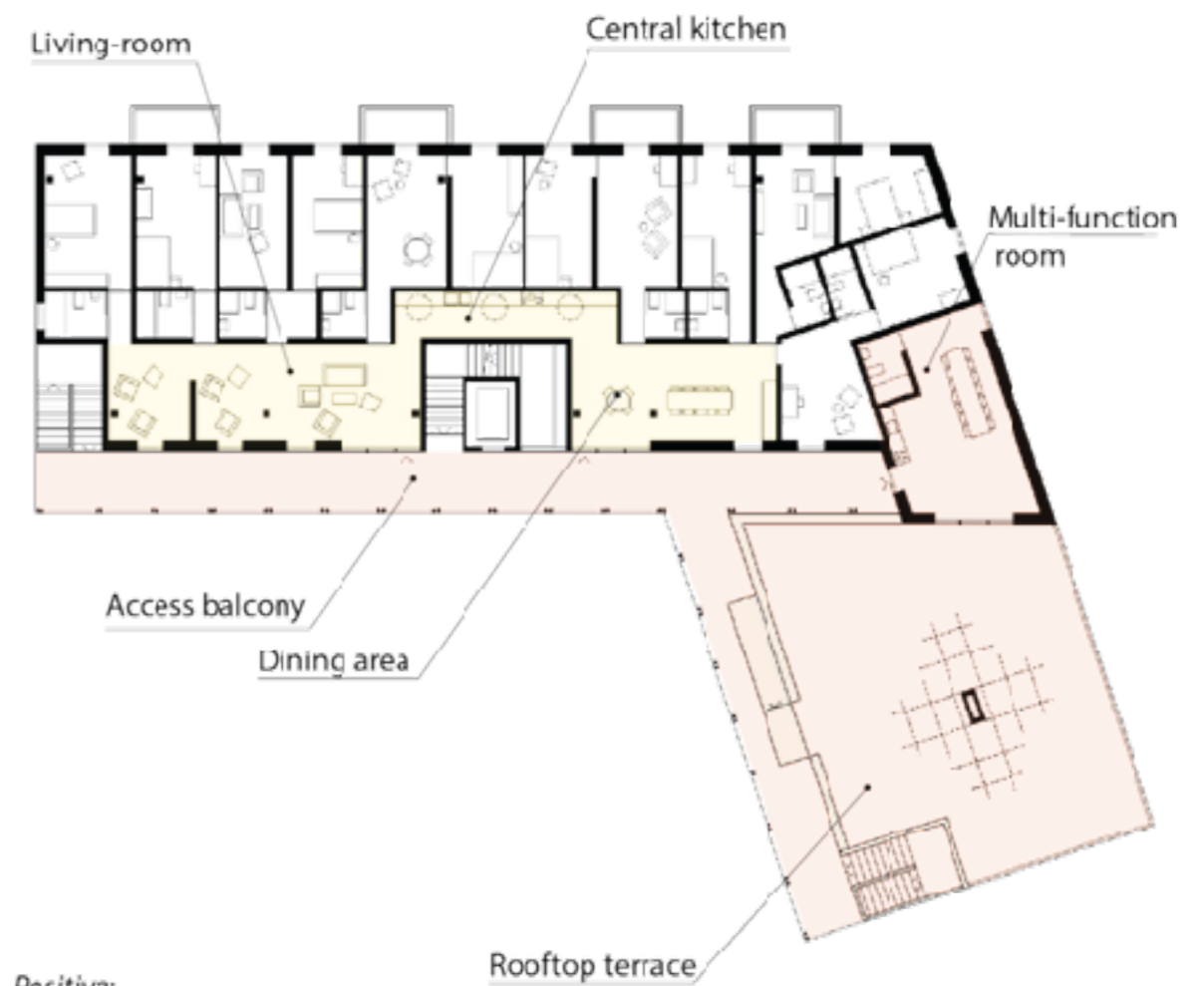
Positive:

- Communal facilities on the ground floor for all the residents to interact
- The access balcony acts as an extension of the inside areas

Negative:

- Relatively tight shared space in the closed cluster apartment, some "waste space" due to the long corridor

Floor plan of cluster apartments



Positive:

- Spatial separation between dining and living-room area
- Centrally located kitchen
- Multi function room for different activities
- The access balcony and roof terrace act as an extension of the inside areas

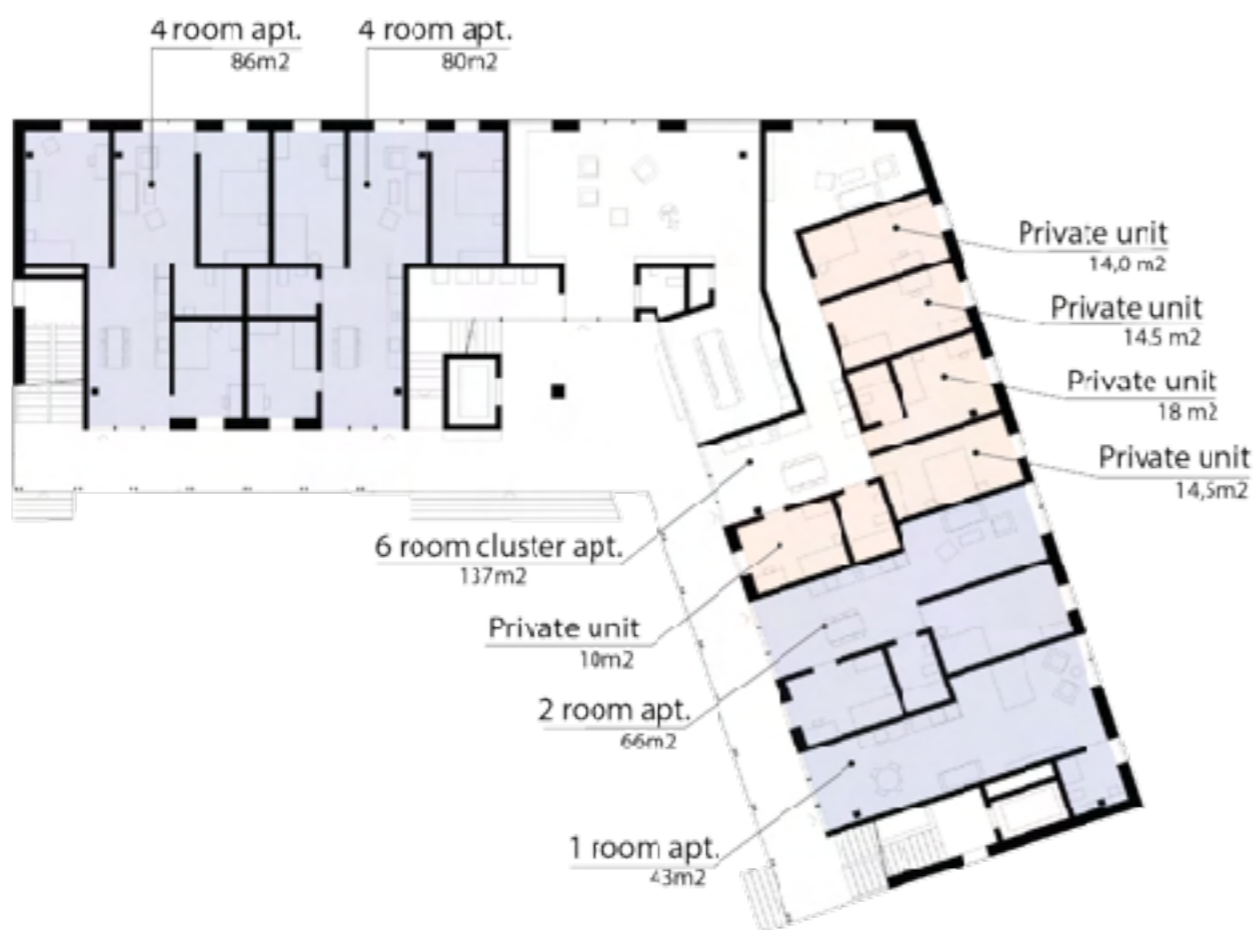
Negative:

- Little to none spacial separation in the two communal living areas for more private corners
- Communal areas are small relatively to the amount of residents

PRIVATE SPACE

- Private units inside an open cluster apartment
- Private units inside a closed cluster apartment
- Regular apartments on floors 1-5

Ground floor with shared facilities, closed cluster- and regular apartments



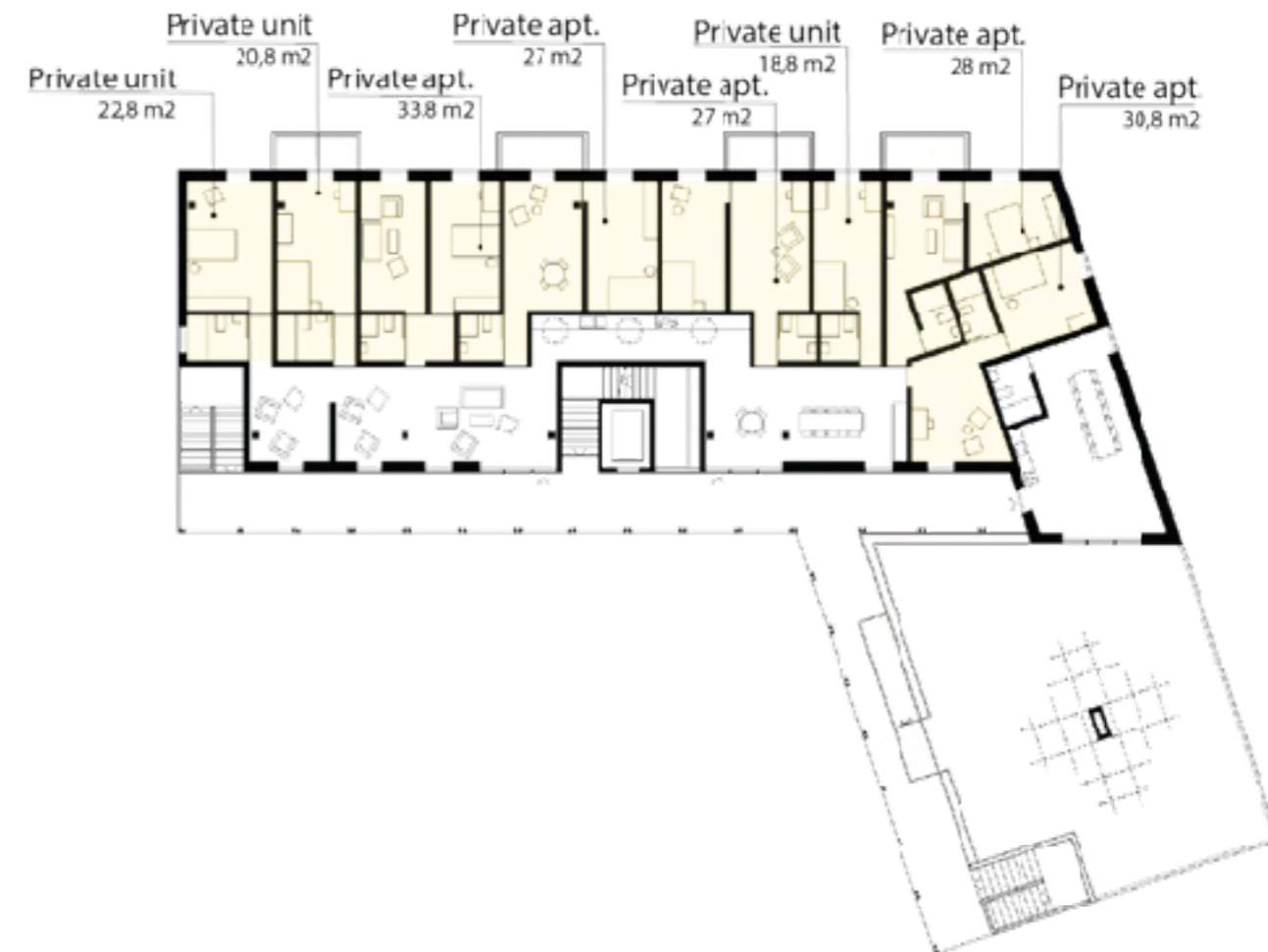
Positive:

- All apartments are through the building, opening up towards the access balcony, to enhance interactions between residents, while allowing for privacy
- Different sizes and typologies of regular apartments, from 50m² to 100m²

Negative:

- Private zones in the cluster apartment are not equipped with basic functionalities and no buffer zones between shared and private space

Floor plan of cluster apartments



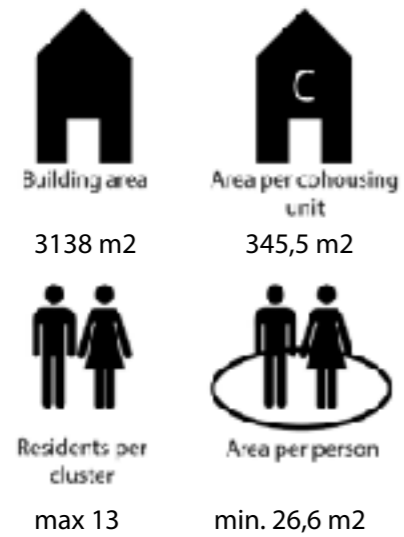
Positive:

- In private units privacy is enhanced due to transitional buffer zones
- Different sizes and typologies of regular apartments for different needs
- Separation for night- and daytime activities in some apartments
- Balconies for some private units

Negative:

- No private units or apartments are equipped with a kitchen
- Some units are not furnished for daytime activities, meaning the residents are forced to spend time in communal spaces

Summary



-The building

The building is mostly a regular apartment building, with cluster apartments on the first and 6th floor. On the ground floor there are communal facilities like a dining and laundry room for all residents to be used. The access balconies are extensions of indoor spaces and a great feature for enhancing interactions between residents. Having multi-function rooms and other shared facilities on each storey, is also a great strategy.

-The cluster

Both cluster apartments have relatively small shared areas in relation to how many people they host. From a flexibility point of view, the floor plan allows for changes by residents according to need.

-The units

Most private units are equipped with some daytime furniture, while others only have a sleeping area. No private unit is equipped for independent usage, meaning residents are forced to spend time in communal areas.



3.3 Conclusions

The analysis of case studies concludes, that there are various ways of approaching the design for cohousing communities, depending on the needs of the end-user and purpose of the community. Also the strategy of cohousing doesn't need to be implemented on every floor, as some apartments could be "regular", while still having the benefit of being part of the community and having common areas on the ground floor, as analysed in some cases. This should allow for different types of residents and a more diverse community.

In the analysed cases, communities in a cluster apartment are 9-13 (maximum) people in size, while there is 26,6m²-39,6m² of space per person. On average, in these cases, the cluster apartment size is 350m². All three examples had shared facilities on the ground floor and balconies as the extension of the indoor areas.

The author finds one key aspect to be, whether apartments can grow or shrink, according to the needs of the residents. Small private units without basic facilities inside cluster apartments may be fit for the needs of some user, while others needs extend to more space and independence. This can be better achieved in the floor plan typologies of cases 2 and 3.

Based on the analysis of case studies, strategies that raise the quality of a project in terms of privacy and community involvement, and that will be implemented in the project part of this thesis are:

- Mixed typologies of cluster apartments and regular apartments inside one building
- Shared facilities on the ground floor of the building for enhanced interaction between residents
- If possible, cluster apartments through multiple stories, as it seems to provide for more semi-private spaces, while still enhancing interactions
- Buffer zones between shared and private spaces
- Different levels of privacy in the shared areas
- The kitchen as the central point of the shared space
- Atrium area as the place for interaction for different residents
- Reduced "waste space" in corridors, if necessary, corridors should be functional

04 CONCLUSION

In conclusion, based on the visual and comparative analysis of three case studies and the review of literature, modern cohousing could indeed provide for a better living situation for many, while not having to sacrifice privacy and instead having the benefit of community involvement. While this dissertation found there to be a lack of studies about individual happiness of residents in multi-storey cohousing apartment buildings, research did conclude that in terms of civic engagement, cohousing residents have significantly higher levels of interaction compared to residents in "regular housing", and possess high levels of trust, social cohesion and norms of reciprocity. Residents were also found to be developing a range of democratic capacities, individually and collectively, particularly through engagement in community self-governance. (Poley, 2007)

While cohousing development has a long design-process phase, in terms of development barriers, the main obstacles have to do with lack of interest from authorities and developers, as there is little incentive to explore new designs. This can mainly be altered by local authorities changing the planning guidelines towards more positive regulations concerning resident-led developments. (Williams, 2005)

During the analysis of Estonian housing, no examples of intentionally developed cohousing communities in Estonia were found. An overview of local housing history revealed excessive home ownership ratio among Estonians. On the other hand, analysis of key metrics of the housing market statistics in Tallinn revealed there to be a lack of affordable and social housing, as demand was up to 40 times higher than available units in some cases.

As defined in paragraph 2.4, key characteristics of cohousing are, that it is resident -developed, -owned and -managed. At the same time, without strategic guidelines and regulations towards cohousing by local authorities, resident-led developments are hard to realise in the competitive environment of the housing market. This thesis, with its project part, aims to provide an example of the different possibilities in cohousing. As there is a clear need for affordable housing in Tallinn, implementing different cohousing strategies could potentially balance the need for affordable housing, while creating sustainable communities.

In the analysis of case studies, different strategies and possibilities in cohousing models were explored. As cohousing is resident-led, the physical design and layout of a cohousing developments depends on the needs and types of the end-user. Since there are no definite parameters or guidelines for designing cohousing, based on literature and the case studies, the author provided approaches that would raise the quality of a project in terms of privacy and community involvement. These are defined in chapter 3.3.

Kokkuvõte

Antud töö eesmärgiks oli uurida kaasaegse ühiselamise viise ja võimalusi. Kolme juhtumiuuringu visuaalsele ja võrdlevale analüüsile ning läbitöötatud kirjandusele tuginedes võib öelda, et kaasaegne kooselamine pakub kvaliteetset eluolu, säilitades privaatsuse ja jagatud ruumi tasakaalu, ning pakudes lisaväärtusena kogukonda kuuluvust. Kuigi antud töös leiti, et mitmekorruseliste ühiselamis-korterimajade elanike individuaalset õnnelikkust või rahulolu ei ole uuritud, jõuti uuritud kirjandusele põhinedes teadmisele, et sotsiaalse aktiivsuse osas on ühiselamise elanikel oluliselt kõrgem suhtlustase võrreldes tavaelamute elanikega ning leiti, et elanikel on kõrgemad usalduse, sotsiaalse ühtekuuluvuse ja jagamise normid. Samuti leiti, et elanikud arendavad individuaalselt ja kollektiivselt mitmesuguseid demokraatlikke omadusi kogukonna otsustamismehhanismide kaudu. (Poley, 2007)

Kogukonna kujunemine algab juba väga pikast disainifaasist, mis nõuab elanike kaasamist ning kujundab ühistegevusena kooslustunnet. Ühiselamisearenduste barjäärideks või peamisteks takistusteks võib välja tuua ametiasutuste ja arendajate vähest huvi, kuna uute elamislahenduste uurimiseks ja arendamiseks ei tunta vajadust ega finantsilist motivatsiooni. Seda saab muuta peamiselt kohalike omavalitsuste planeerimisseaduste ja regulatsioonide muutmisega elanike juhitud arenduste suunas. (Williams, 2005)

Eesti elamu analüüsi käigus ei leitud ühtegi näidet taotluslikult arendatud ühiselamisest Eestis. Ülevaade kohalikust elamuajaloost tõi esile ülemäärase koduomandisuhte eestlaste seas. Seevastu Tallinna eluasemeturu statistika põhinäitajate analüüs näitas, et taskukohased ja sotsiaaleluasemed ei ole kättesaadavad, kuna nõudlus oli kohati kuni 40 korda suurem saadaolevatest korteritest.

Määratletud antud töö punktis 2.4, on ühiselamise põhiomadusteks toodud, et arendus on elanike arendatud, omanduses ja hallatav. Samas, ilma kohalike omavalitsuste strateegiliste suuniste ja regulatsioonideta on elanike juhitud arendusi kinnisvaraturu konkurentsivõimeliseks teostada. See lõputöö, koos oma projektiosaga, püüab näitena tuua esile erinevad ühiselamise võimalused. Kuna Tallinnas on selge vajadus reguleeritud üüriga -ja sotsiaalelamute järgi, võiks erinevate ühiselamise strateegiate rakendamine potentsiaalselt tasakaalustada vajadust antud elamute järele, luues samas jätkusuutlikke kogukondi.

Juhtumiuuringute analüüsimisel uuriti erinevaid lähenemisi ja võimalusi ühiselamise kontseptuaalsuse materjaliseerimiseks. Kuna ühiselamud on elanike juhitud, sõltub kooselu arenduse füüsiline disain ja planeering lõppkasutaja vajadustest ja tüüpidest. Kuna ühiselamise arenduste disainimeseks puuduvad kindlad parameetrid või juhised, pakub autor, tuginedes juhtumiuuringute analüüsile ja kasutatud kirjandusele, välja lähenemisviisid, mis tõstaksid ühiselamise projektide kvaliteeti privaatse ruumi ja kogukonna kujunemise osas. Need on määratletud peatükis 3.3.

Abstract

This thesis is research into the housing model of cohousing, with focus on communities in multi-storey apartment buildings. For the purpose of this dissertation, cohousing is defined as: "A resident-developed, -owned, and -managed development that creatively mixes private and common spaces to recreate a sense of community, while preserving a high degree of individual privacy." (Sullivan-Catlin, 1998)(Lietaert, 2010)

The thesis consists of an Introduction, 2 Sections, Conclusions, References and Annexes.

The introduction describes the relevance of the investigated topic and outlines the main reasons for the need of housing alternatives. In subsections of the introduction, the focus and scope of the dissertation; research question; research methods and strategy; contribution and outline of the dissertation are specified.

Section 2 reviews the related scientific literature. This part is divided into five subsections. Firstly, the terminology of different cohousing related models is defined. Secondly, the main researchers in the field and a lack for primary studies in the subject of cohousing are identified. After that, a historical overview of the origin of the cohousing movement is described, while the next subsection focuses on cohousing, its characteristics, development and design. The last subsection is an overview of the local Estonian housing situation and its potential for implementing cohousing to provide affordable housing.

In Section 3, three cohousing case studies from Central European countries are analysed by criteria identified in former literature and by the author of this dissertation in order to investigate the different possibilities in the design of cohousing developments.

In conclusion the findings of this research will establish a better understanding for the potential of cohousing in Estonia and highlight the benefits and possibilities of cohousing communities.

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Appendices

The Silo: Exploring the ways of coliving

Master Thesis project

Tallinn University of Technology, Academy of Architecture and Urban Studies

Supervisor: Kimmo Sakari Lylykangas

Student: Vincent Marquardt

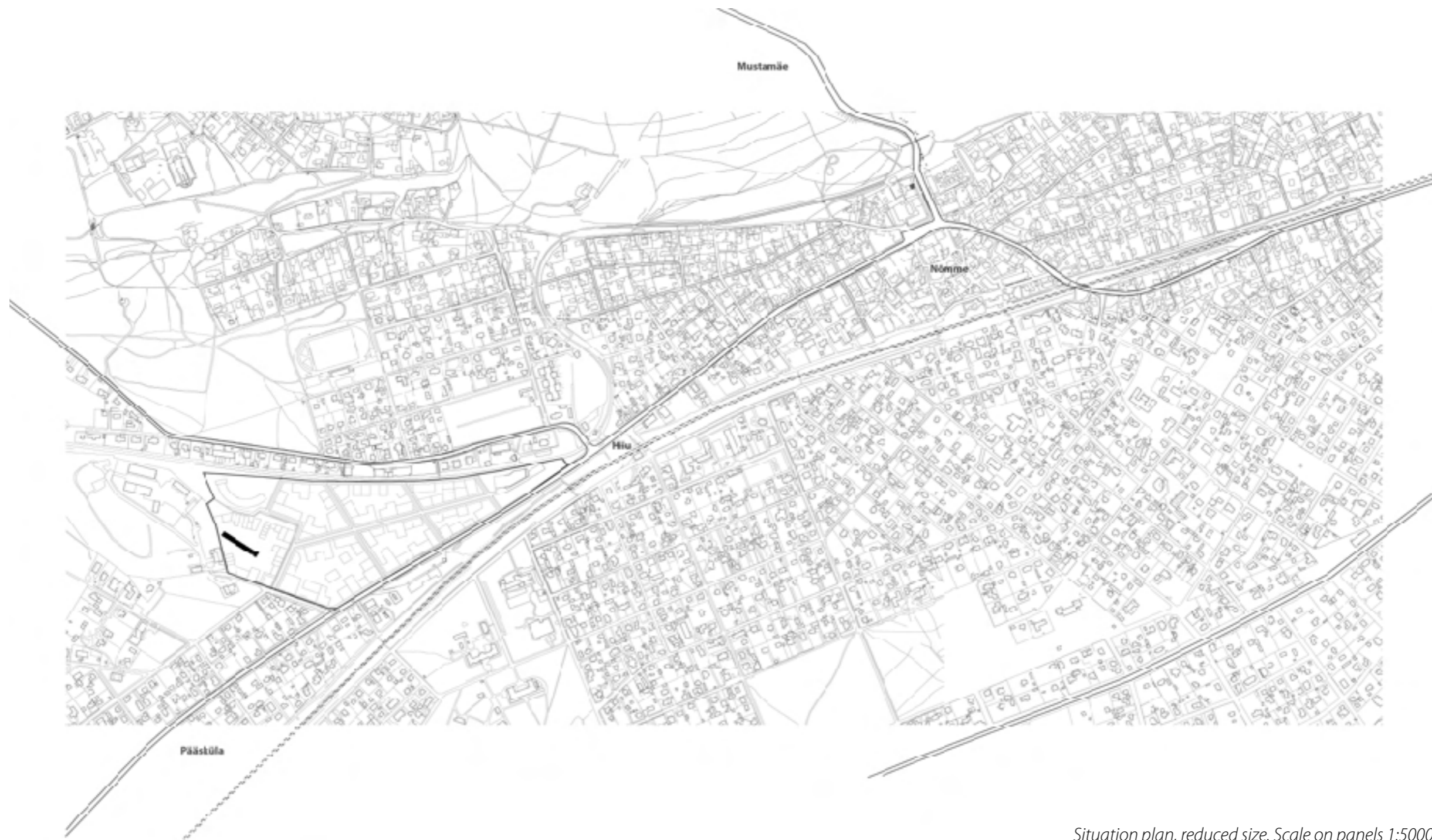
Spring 2022



Intorduction

After researching the diversities of cohousing, for the project part of this thesis, the author proposes a cohousing development in the outskirts of Tallinn, Estonia. The project is located in

an existing and abandoned grain elevator building, on an industrial site in Hiiu, in the district of Nõmme- a low density, low-rise residential area with mainly private houses surrounded by pine forests.

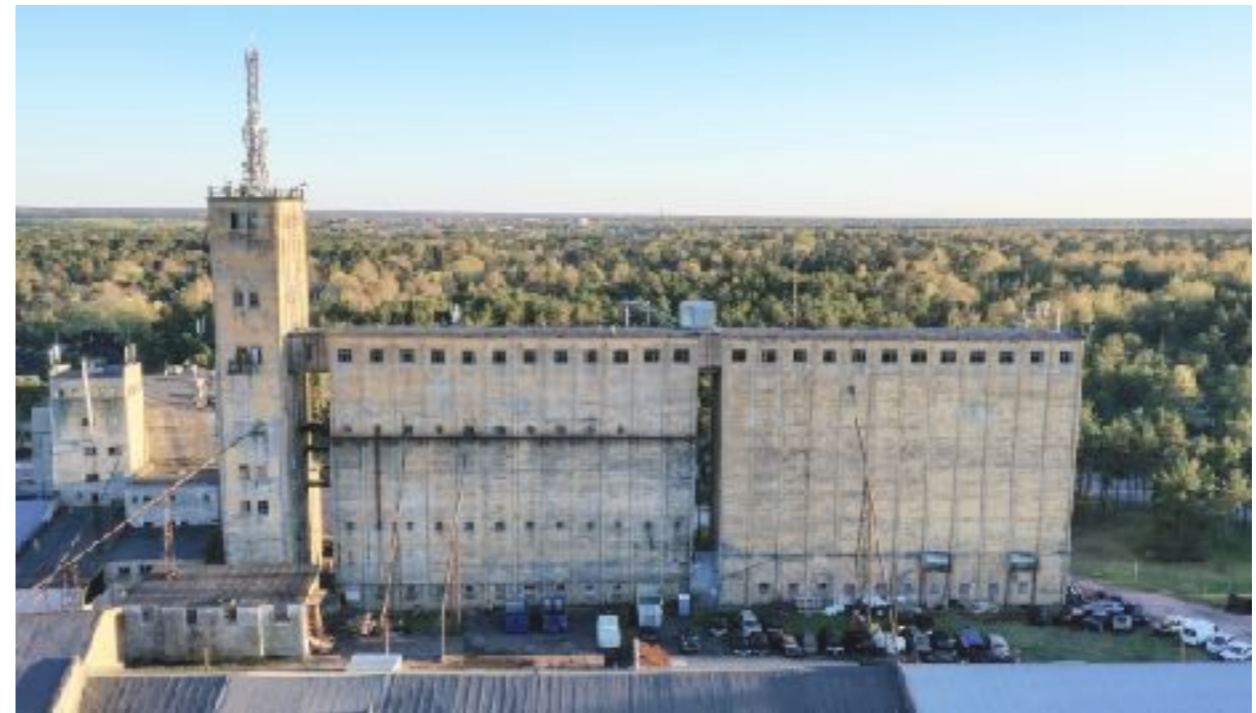


Situation plan, reduced size. Scale on panels 1:5000

Location choice

The building with its location was chosen for this project mainly because of two reasons:

1. The 45m high abandoned grain elevator building is a unique landmark, which can be seen from far away, as there are no buildings or surroundings of that height in the area. This has led to many attempts to find a new purpose for the building and different proposals for renovation, or demolition of the building, unsuccessfully. As of 2022, a new (private) architectural competition for the whole industrial area was announced, in order to convert the site into a mainly residential neighbourhood, including the grain elevator building
2. The abandoned grain elevator building has a unique form: the slender building envelope holds inside it a 3,2m x 3,2m grid structure of concrete walls, going from the bottom to the top of the building, each square acting as a storage unit to hold grain. With a length of 80m, the whole storage capacity is about 11000 tonnes of grain. While having an existing building envelope with interior walls, in order to become a residential building, only slabs for each floor would have to be added and also openings cut into the existing concrete walls. The reuse of an existing structure and the potential for flexibility in a defined building grid, made for a very exciting preform and attractive subject to explore the possibilities of cohousing on.



Existing building structure

Site

The highlighted project site has a triangular shape and is bordered from the north with the Nõmme-Harku pedestrian pathway, from the south with the Pärnu highway (*Pärnu mnt*) and the west with pine forests, so access to the site is granted mainly from the south (access streets are marked with arrows). The existing architectural layer consists mainly of old, partly abandoned industrial and office buildings mostly from the 80-90s era. By 2018, a “Hiiu grain elevator area structural plan” was put in place by local authorities, which proposes a restructuring of the area, with most buildings demolished. It is noted, that any deviation from the official layout has to consider the site in a holistic way. For the purpose of this project, the

whole area of the “Hiiu grain elevator area structural plan” is redesigned and reconsidered, with most buildings demolished (except the ones highlighted in the “*Existing neighbourhood*” plan), to resurrect a dense, pedestrian oriented, mixed-use neighbourhood, following the guidelines of the Nõmme general plan. The new neighbourhood is divided into 9 blocks, with a central two-way road towards the landmark and focal point of the development, the grain elevator building. The site is accessible from the Pärnu highway with one-way access streets into the neighbourhood. Each block is circled by either a one- or two-way street, while the blocks themselves are car-free. Each building plot has a different height regulation, with a maximum of 13m of height or 3 storeys. Onwards, this project focuses on the block around the grain elevator building more specifically.

Situation plans, reduced size. Scale on panels 1:3000

Existing neighbourhood



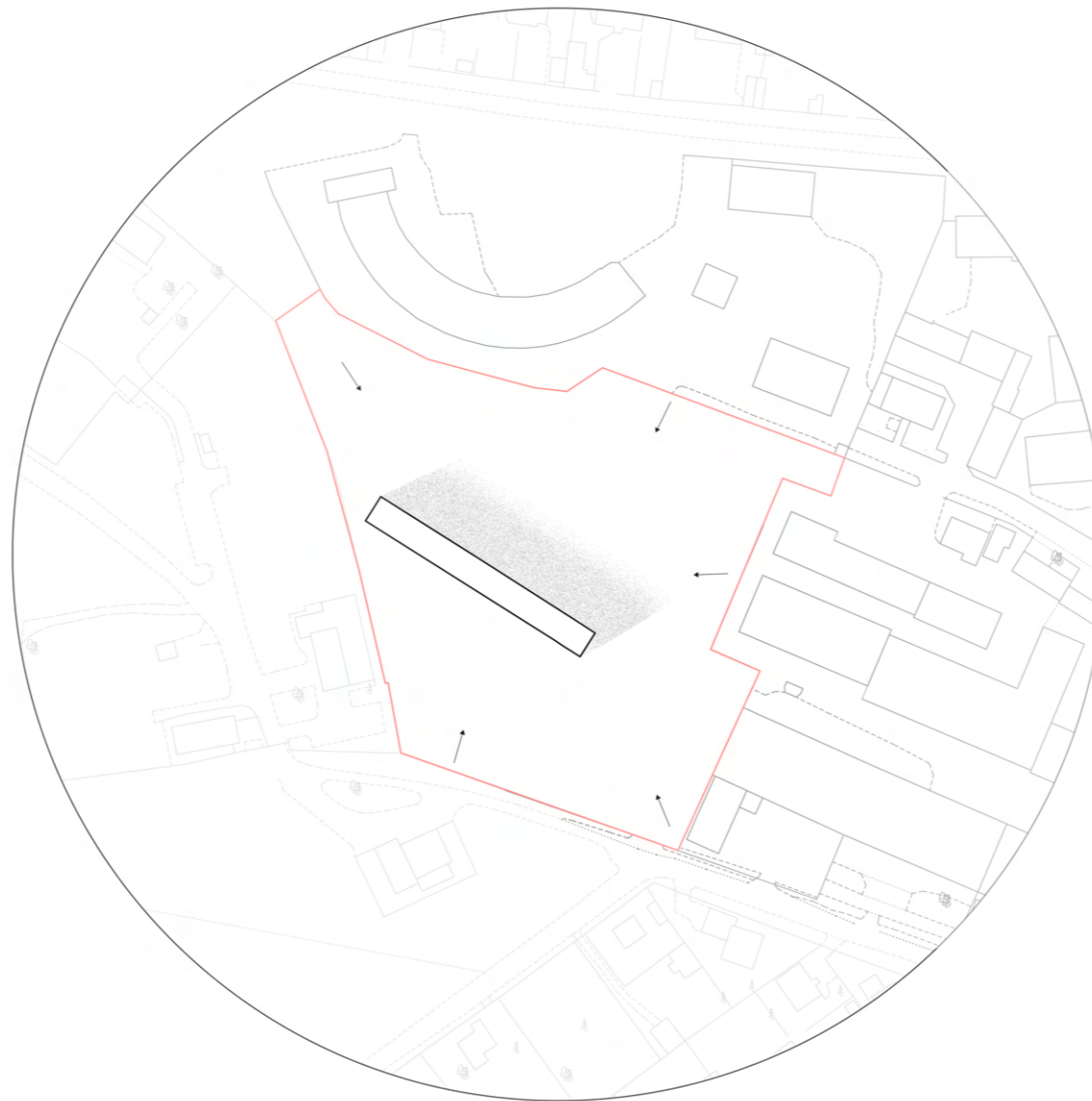
Proposed neighbourhood



Site plan

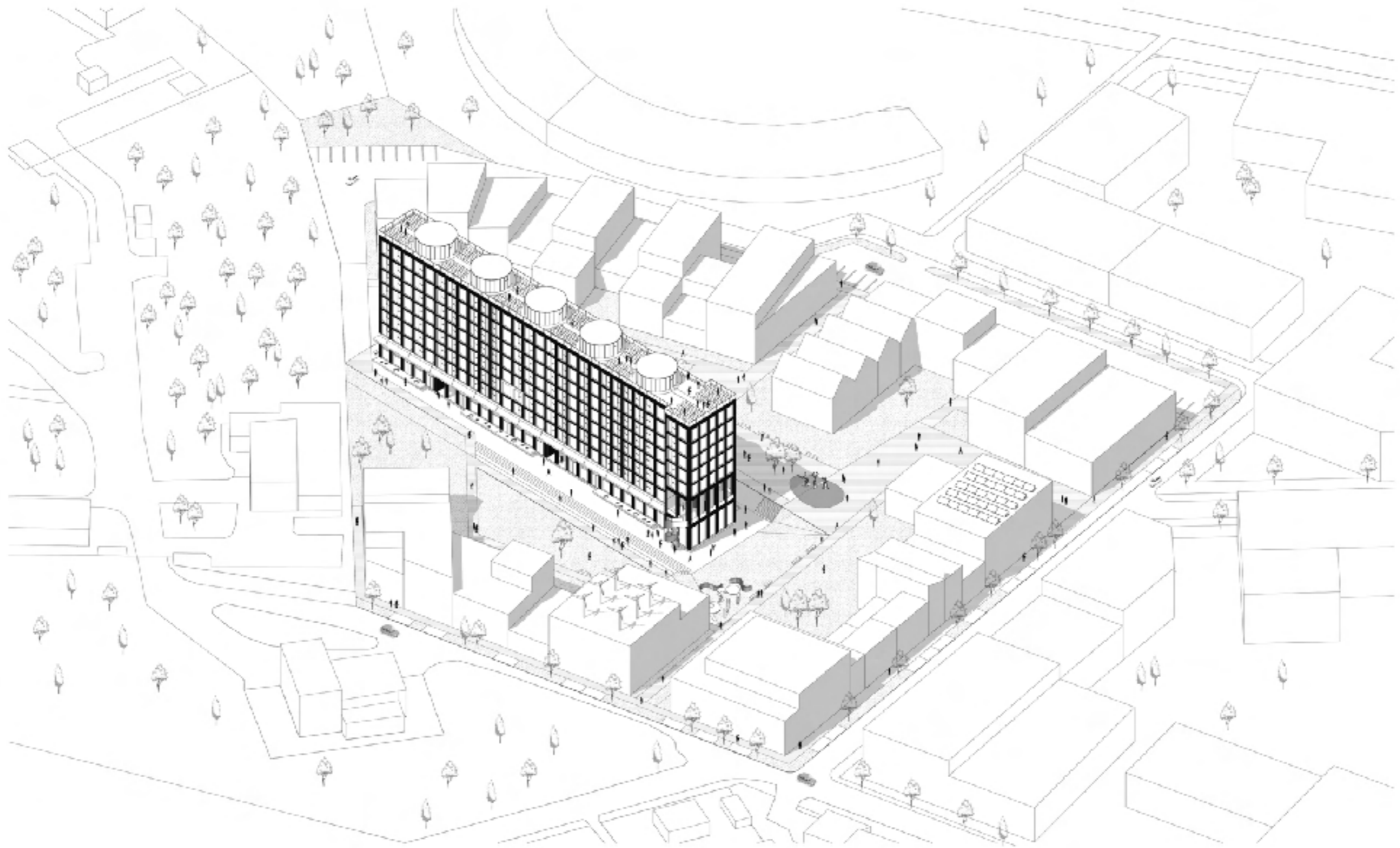
In restructuring the whole industrial park, the project part of this thesis proposes a residential cohousing development in the abandoned grain elevator building. The project aims to be community and pedestrian oriented, as the site is well connected in terms of public transportation. As the existing grain elevator building is located centrally on the plot, it was decided early on, that a design approach characteristic to multi-building cohousing developments was to be considered. The central structure acts as a community building, or hub, while the buildings around it are housing or commercial oriented.

The site is pedestrian focused, with parking spots and building blocks on the perimeter of the site. This allows for a safe and homely environment inside the border of the site for residents and visitors. The densely standing housing blocks are segmented in a way of creating visual divisions of space for more private views, while all buildings open up towards the grain elevator, with the idea of creating a central, lively community space. The design area is accessible from every street with connections to the next residential block. As the silo building sits in a pit of -2,5m, stairs lead down to the community rooms of the building. On the south side of the structure, sitting stairs for events and gatherings are a focus point for meeting.





Site plan, reduced size. Scale on panels 1:500



Axonometric view of the design area proposal

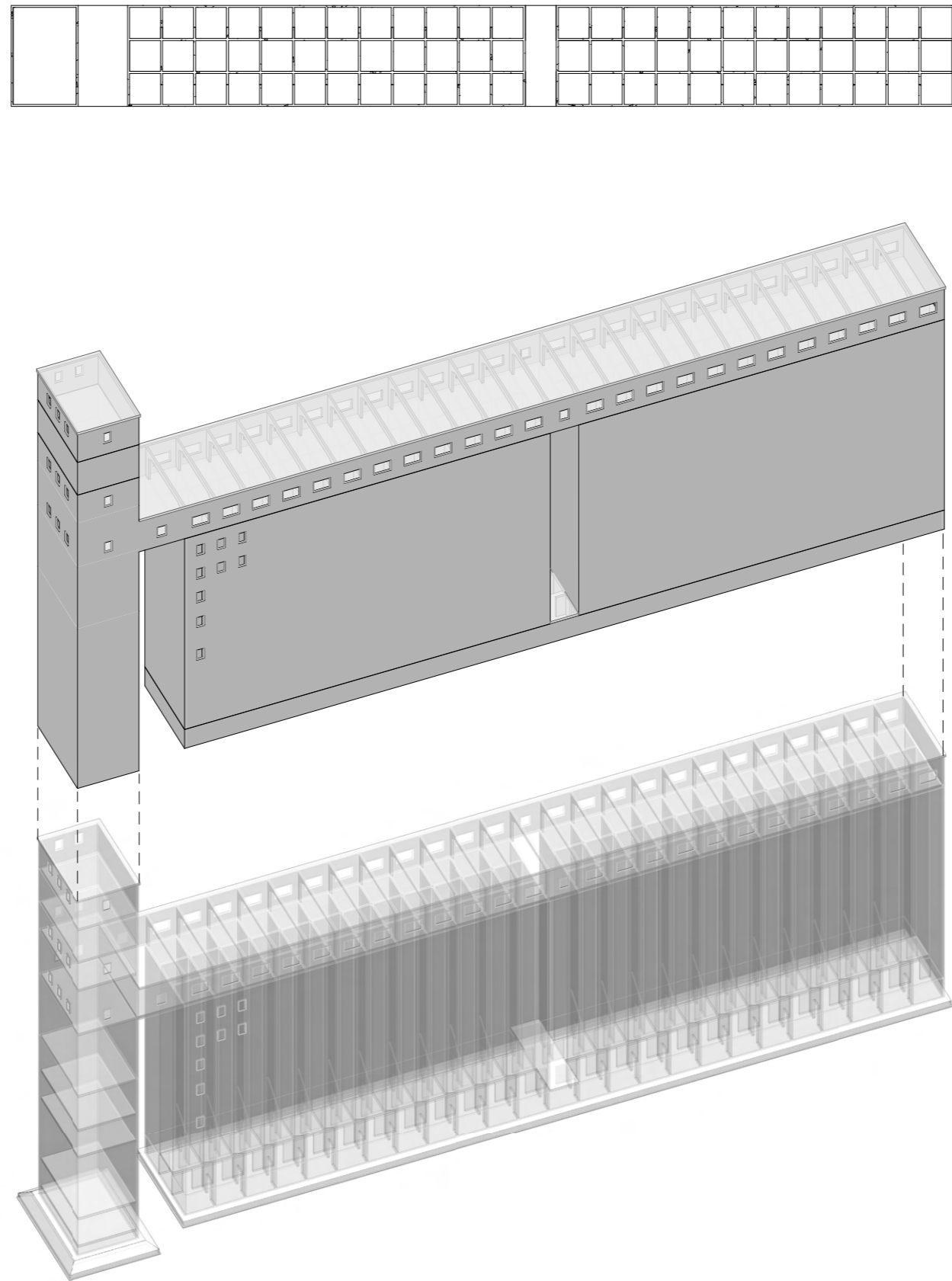
The existing preform

According to archive files, the grain storage building was constructed in 1956 during Soviet Russian occupation times of Estonia. The building was meant to be completed by the anniversary of The Great Socialist October Revolution, on October 25th. It is divided into two separate parts, each holding up to 5500 tonnes of grain. The processes were fully automated, although the systems still needed to be operated by 8 people, during three separate shifts. The reception capacity was 100 tonnes of grain per hour. After receiving the grain, the next processes included cleaning of the grain by four "separators", after which the grain was dried. The grain was transported to the Hiiu storage building from different provinces of the Soviet Union. (Midri, 1956)

The building was still active as a grain storage to the Estonian Grain Tray until 2006. (Peensoo, 2006)



The abandoned grain elevator building has a unique form: the slender building envelope holds inside it a 3,2m x 3,2m honeycomb-like structure of concrete walls, going from the bottom to the top of the building, each square acting as a storage unit to hold grain. With a length of 80m, the whole storage capacity is about 11000 tonnes of grain.



Scheme: existing preform

Design approach

While cohousing is meant to be resident-led, it is not possible to simulate this process for the purpose of this project. The cohousing practices and strategies from literature and the case study analysis are used to make design decisions. The cohousing project aims to offer its residents a broad variety of living possibilities, with the programming allowing for diversity in communities and flexibility when needed.

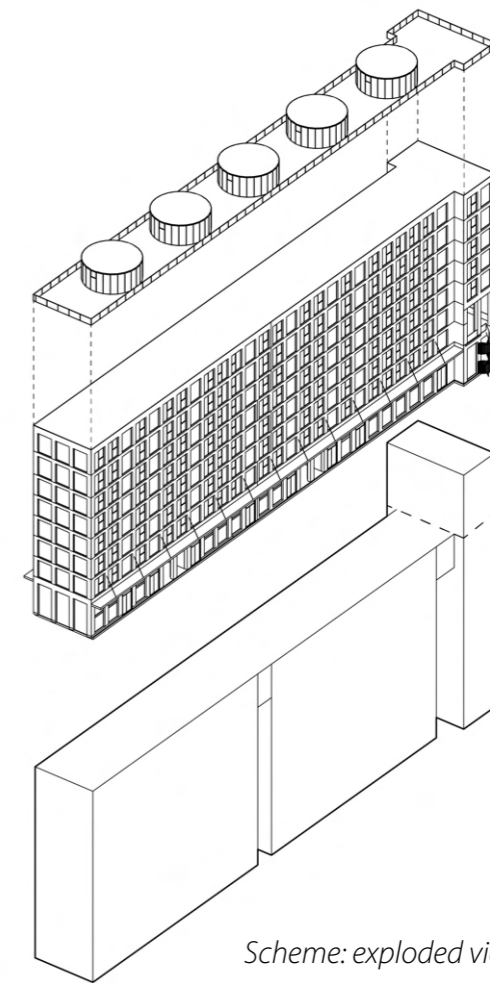
The result is a mixed-use, multi-storey cohousing building, with shared facilities on the ground floor which are extended through a mezzanine floor. Shared facilities are a cafe for events and communal dining, a co-working area and a workshop. The residential part consist of seven floors of different living: regular apartments and cohousing clusters apartments. Each cluster apartment acts as an independent unit, with shared facilities and private units. While the number of residents in a cluster apartment varies, the different typologies of private units are equipped with day- and nighttime furniture. On the roof, there are community terraces to enjoy views, while the space is segregated with circular greenhouses for communal gardening, to which each staircase has their own access. Outdoor activities also extend to the surrounding of the building.



Scheme: functional zoning



Scheme: functional zoning

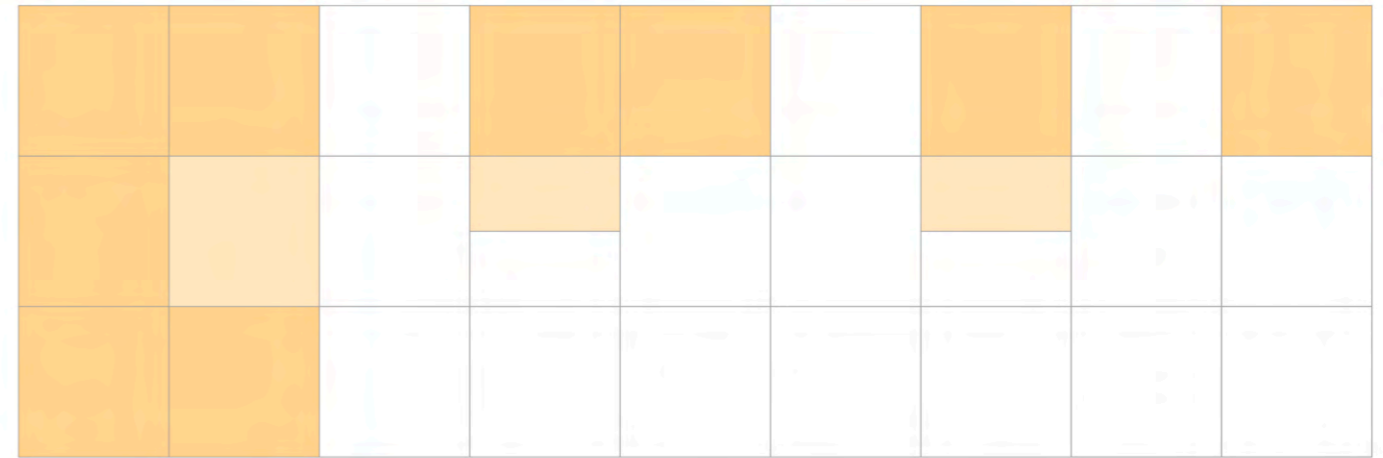


Scheme: exploded view, facade

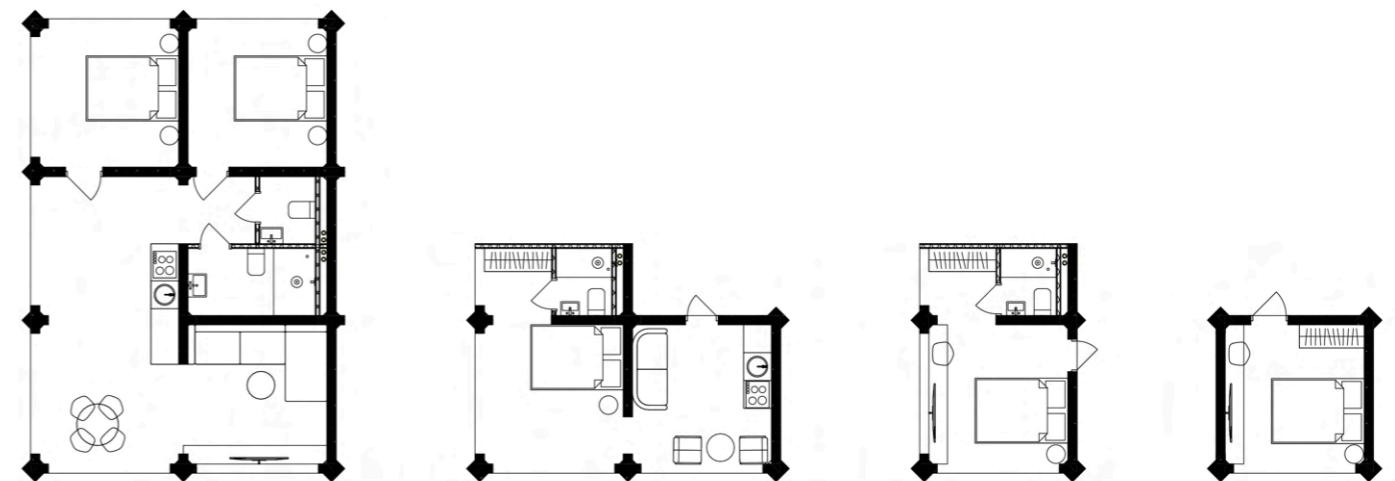
Unit catalogue

As stated, this cohousing project aims to offer its residents a broad variety of living possibilities, with the programming allowing for diversity in communities and flexibility when needed. This was achieved by creating a unit catalogue. The catalogue proposes 4 different types of units for different end-users. Introducing this modular system allows for flexibility in creating the floor plans, while each user could choose the area of private space needed, with shared spaces provided. According to size, these units are categorised as S, M, L, and XL.

With wet-spaces as the only predefined space in the middle of the grid, placing units around the middle square allows for a flexible approach in arranging the private living units.

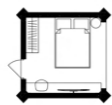


Scheme: private unit arrangement inside the existing structure

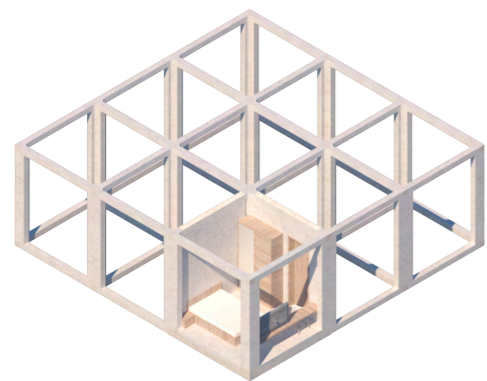


Unit floor plans, reduced size. Scale on panels 1:100

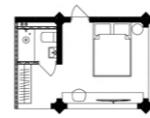
S



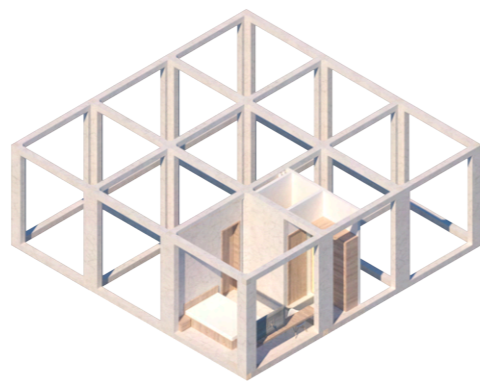
Capacity	1 person
Squares on grid	1
Floor area	9 m ²
Functions	Private room
Furniture	Bed, nightstands, wardrobe, table, TV
Day-night activity separation	no



M



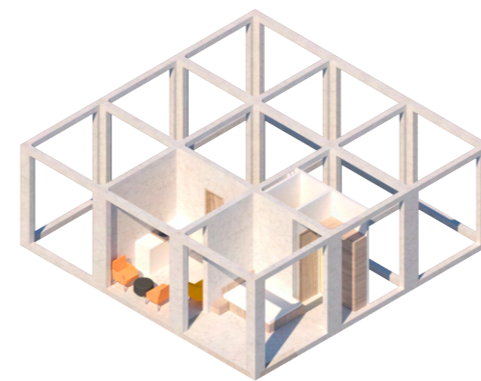
Capacity	1 person
Squares on grid	1,5
Floor area	13,5 m ²
Functions	Private room with bathroom
Furniture	Bed, nightstands, wardrobe, table, TV, bathroom
Day-night activity separation	no



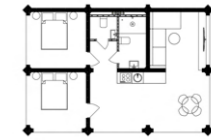
L



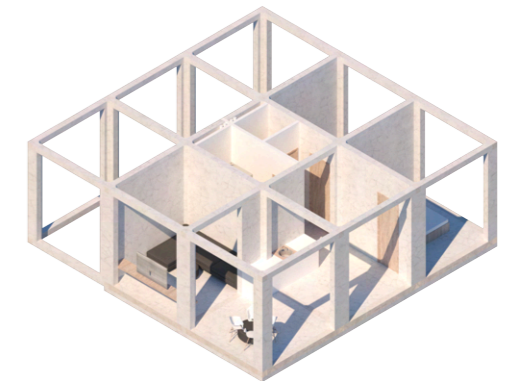
Capacity	1-2 people
Squares on grid	2,5
Floor area	22,5 m ²
Functions	Private room with bathroom+
Furniture	Bed, nightstands, wardrobe, table, TV, bathroom, kitchenette, sofa, lounge chair
Day-night activity separation	yes



XL



Capacity	2-3 people
Squares on grid	6
Floor area	54 m ²
Functions	Apartment with 2 bedrooms
Furniture	2xbed, nightstands, wardrobe, table, TV, 2xbathroom, kitchen, dinner table
Day-night activity separation	yes

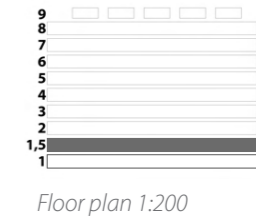
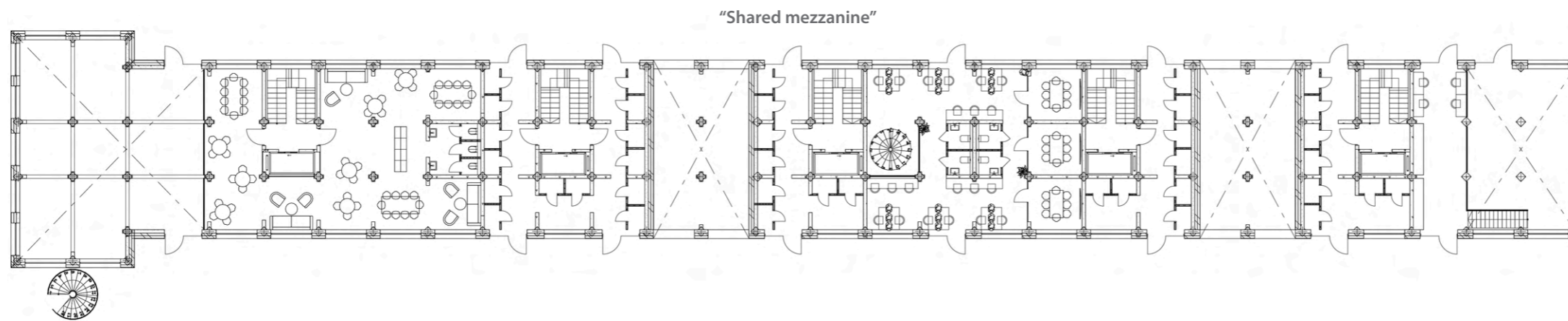
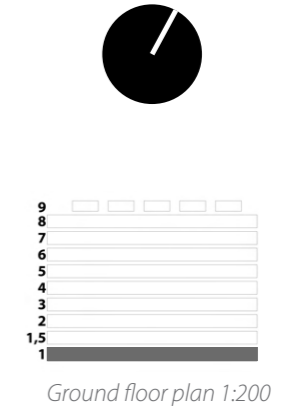
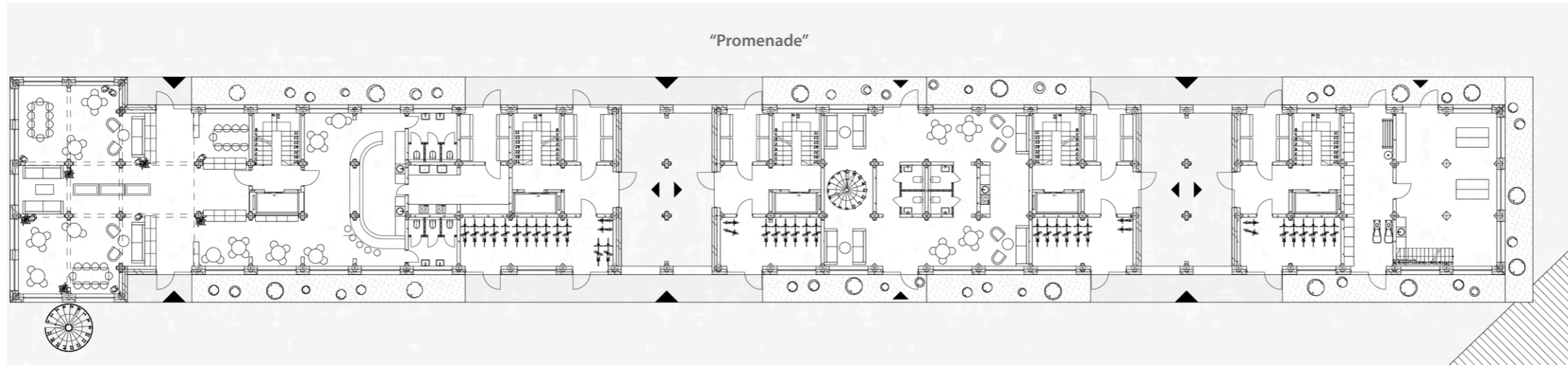


The layouts

To show the different possibilities of unit arrangement and the flexibility of the grid structure, 4 different "potentiality floor plans" are proposed. With shared functions on the ground, mezzanine floor and roof, the housing storeys consist of different types of living arrangements, with different private unit and shared space sizes. The fixed spaces consist of staircases and wet-spaces, while the shared areas and private unites flow around the pre-defined parameters.

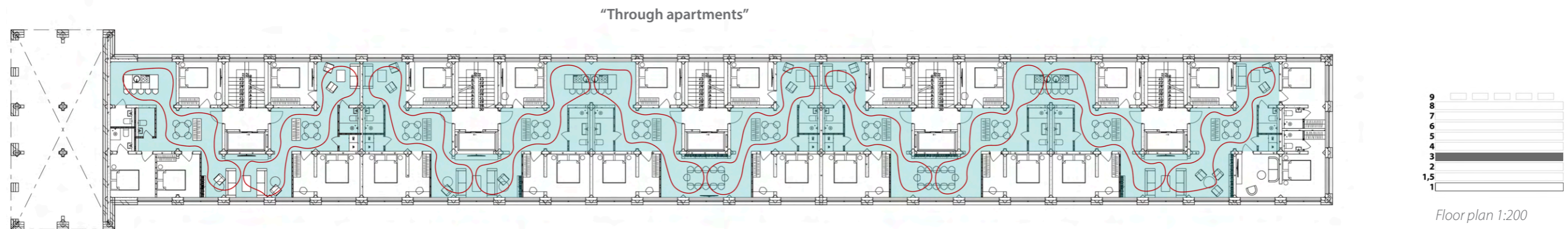
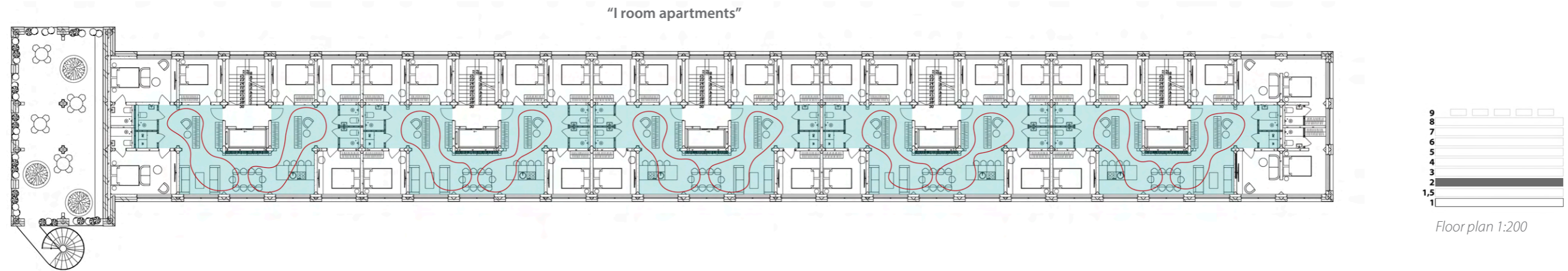
Shared areas are mostly faced towards the south, while private units face the north.

The ground floor holds public functions for the community of the building and neighbourhood, which are separated by the entrances to the apartments. Shared functions are a community cafe for events and shared meals, a co-working space in the middle of the building and a workshop. The ground floor also holds storage areas for residents.



The mezzanine floor acts as an extension of the ground floor functions, with more storage units for residents accessible from the staircase.

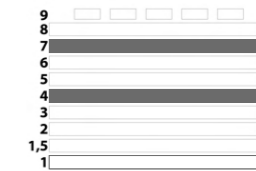
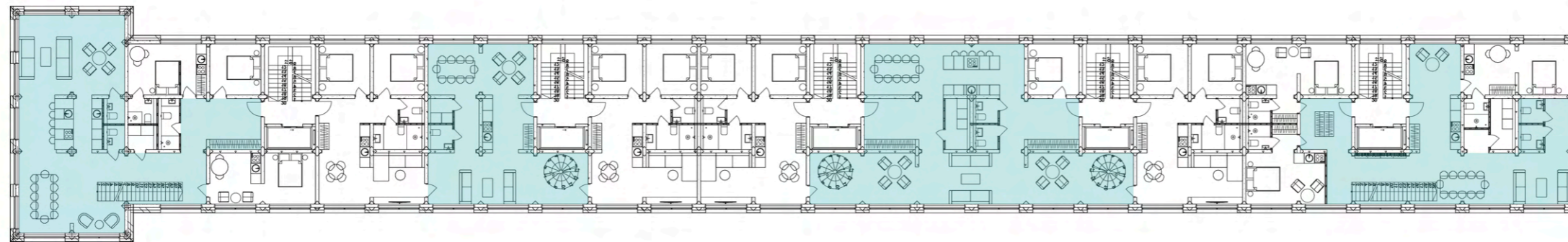
This layout consists of 1 room private units (unit S), with shared spaces providing the basic functionalities: a shared living room, kitchen, dining area and bathrooms. For this approach residents are forced to use shared facilities, as the private units are not equipped to be independent. This approach allows for most private units per staircase, while separation walls could be eliminated according to the needs of the user.



The through apartments allow for a flexible cluster size. The private units are located in a way, that allows for the shared spaces to continuously flow, providing more visual separation and hence, semi private areas. The through apartment consist of 1 room private units (unit S & M) with shared spaces providing the basic functionalities: a shared living room, kitchen, dining area and bathrooms.

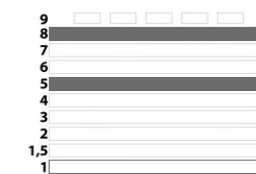
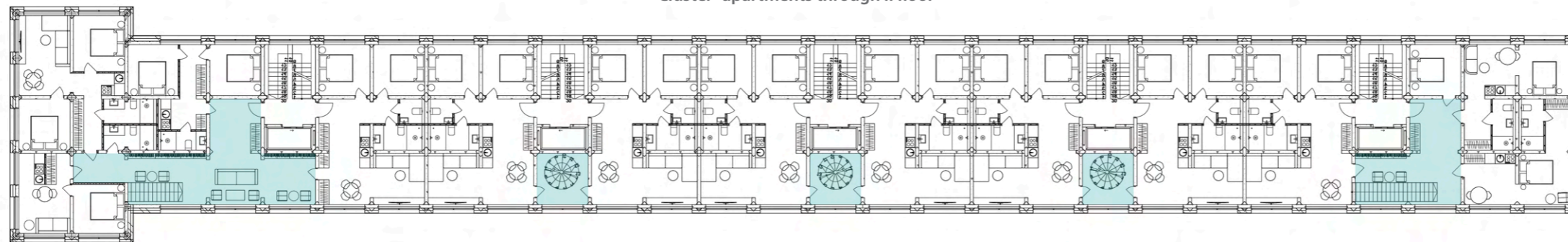
The cluster apartments hold independent apartments with all necessary functions provided, while opening up into communal spaces. The independent apartments are still smaller than “regular”, with the benefit of large community spaces consisting of dining areas, a kitchen and living room. The cluster apartments flow through 2 storeys, with the lower floor holding most shared spaces and the second floor being for private apartments.

“Cluster- apartments through I floor”



Floor plan 1:200

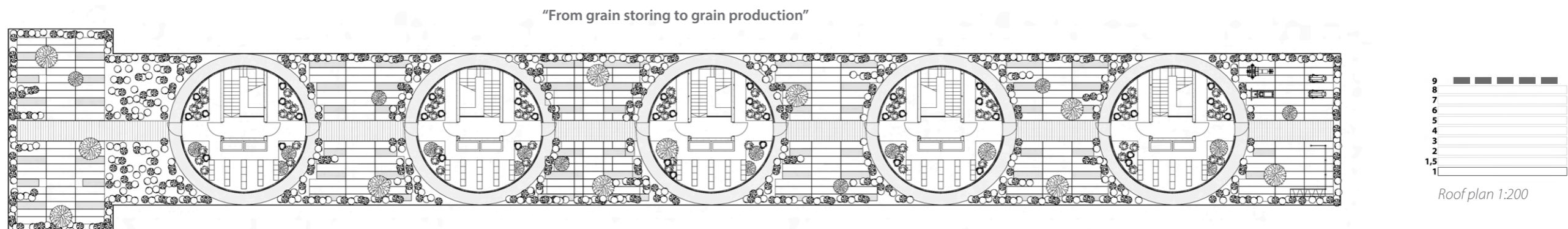
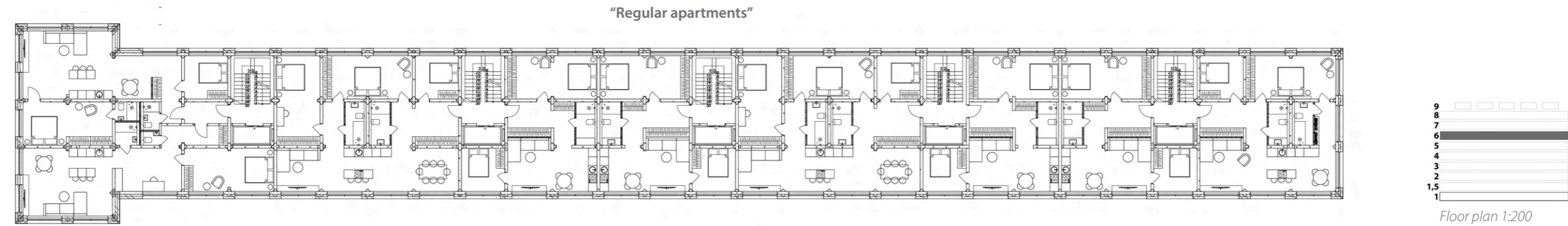
“Cluster- apartments through II floor”



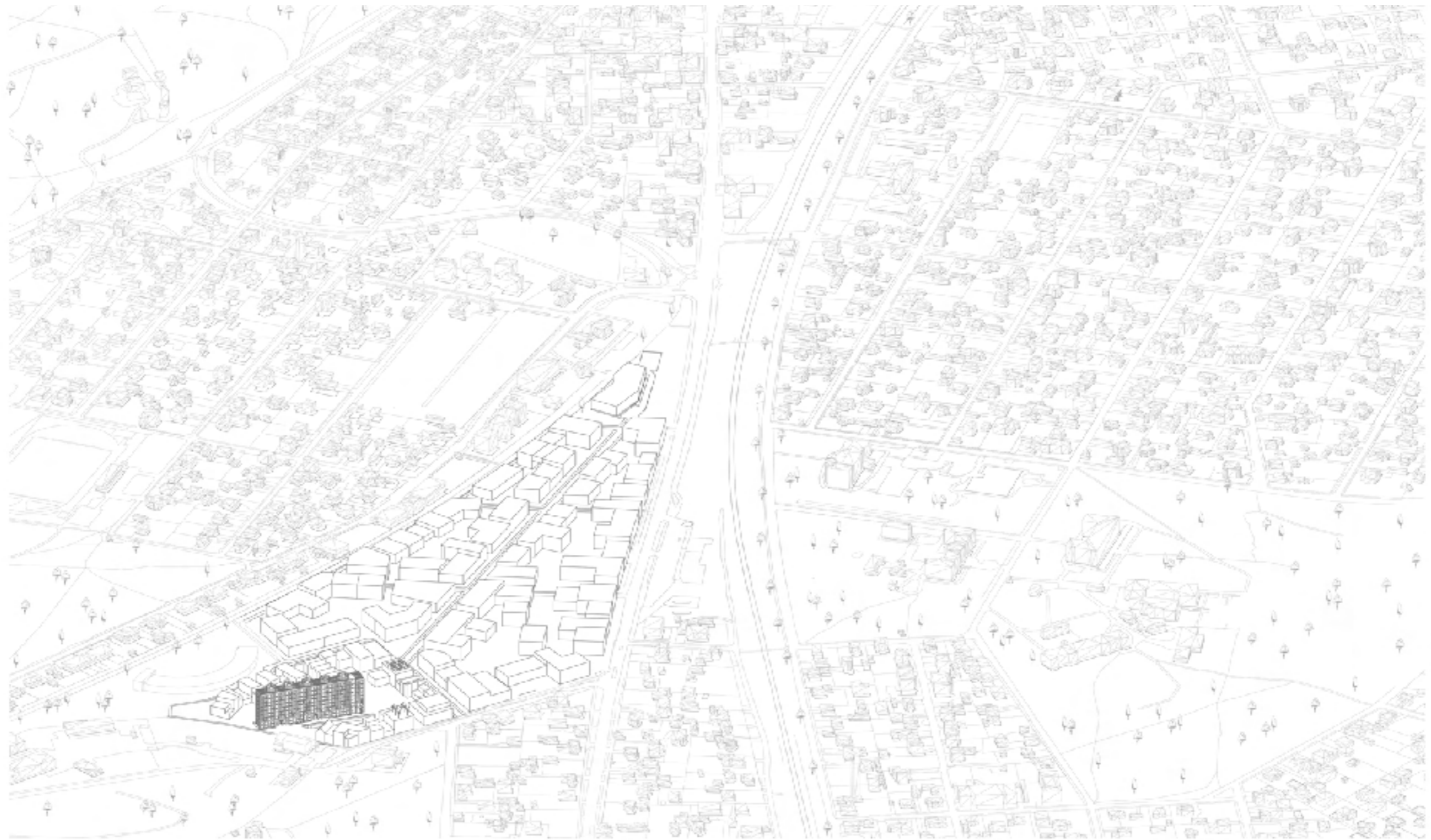
Floor plan 1:200

The second floor of the cluster apartments holds independent apartments with minimal shared areas. All apartments are connected to the shared areas via shared staircases.

To showcase the effectiveness sharing spaces, also a "regular apartment" floor exists on the sixth floor. Each staircase opens up into one or two separate apartments, with sizes varying from 54-108 square metres. This floor holds 9 private apartments.



Each staircase opens up towards the roof with a greenhouse for all-year-round community gardening. From the greenhouses, the rooftop terrace is accessible, with a ground elevation of approximately 30 metres for seamless views.

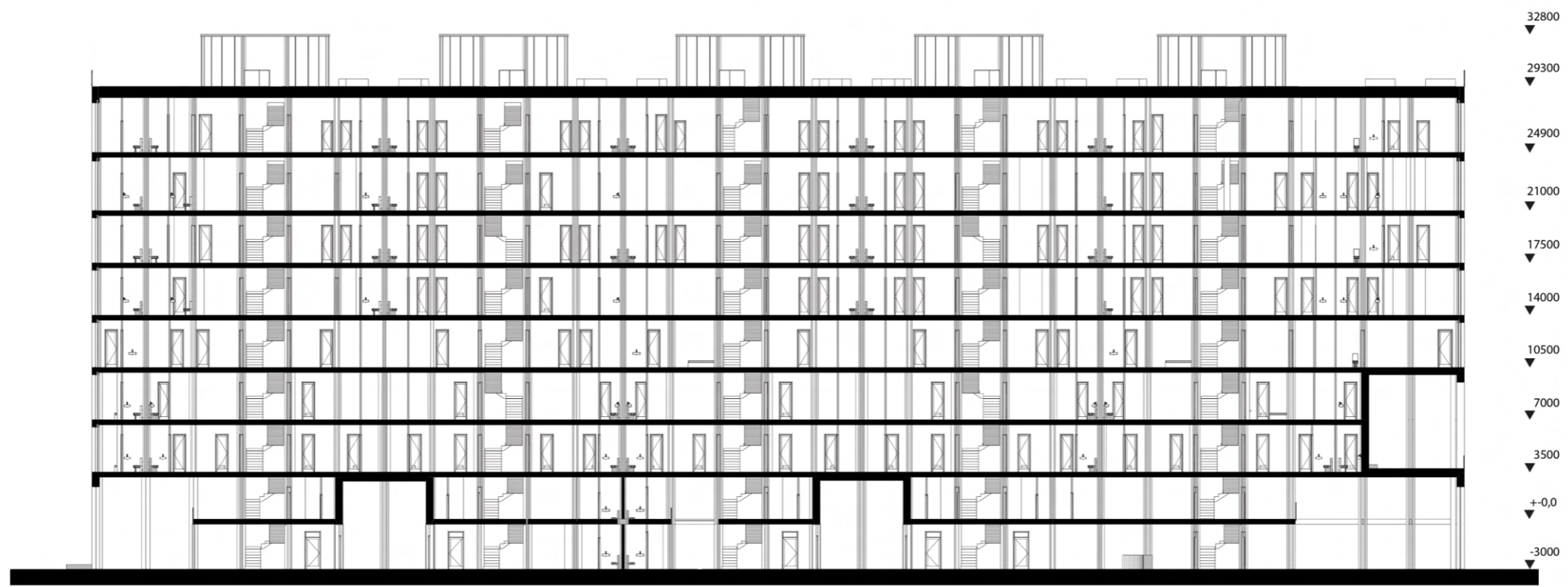


Axonometric view of the design area and its surroundings

Elevations & sections



Section 1 & front elevation



Side elevation & section 2

Visualisations



Exterior: the neighbourhood



Exterior: the facade, elevated views



Exterior: public space next to the building

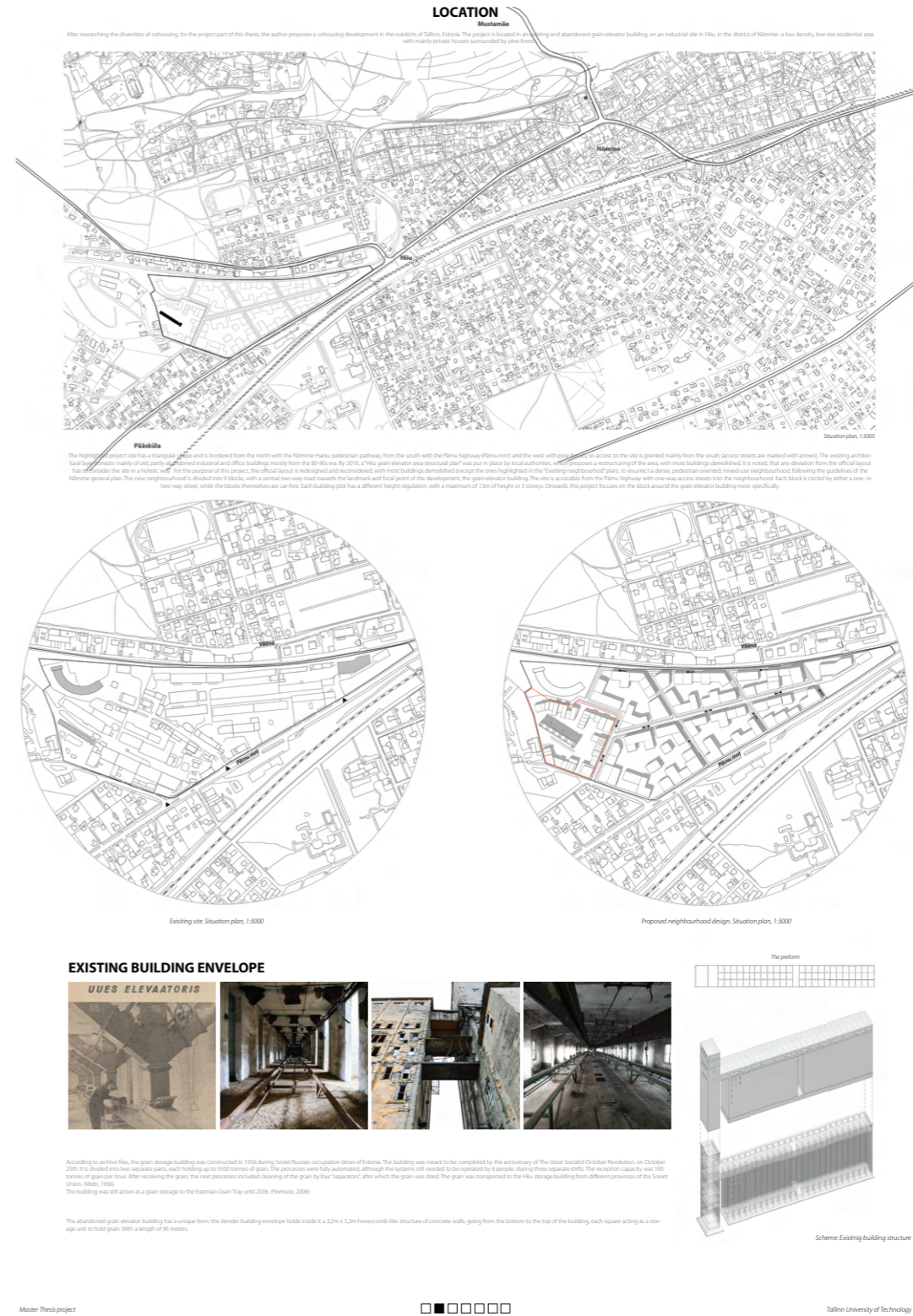


Interior space: shared facilities on the ground floor. A cafe for the public and community



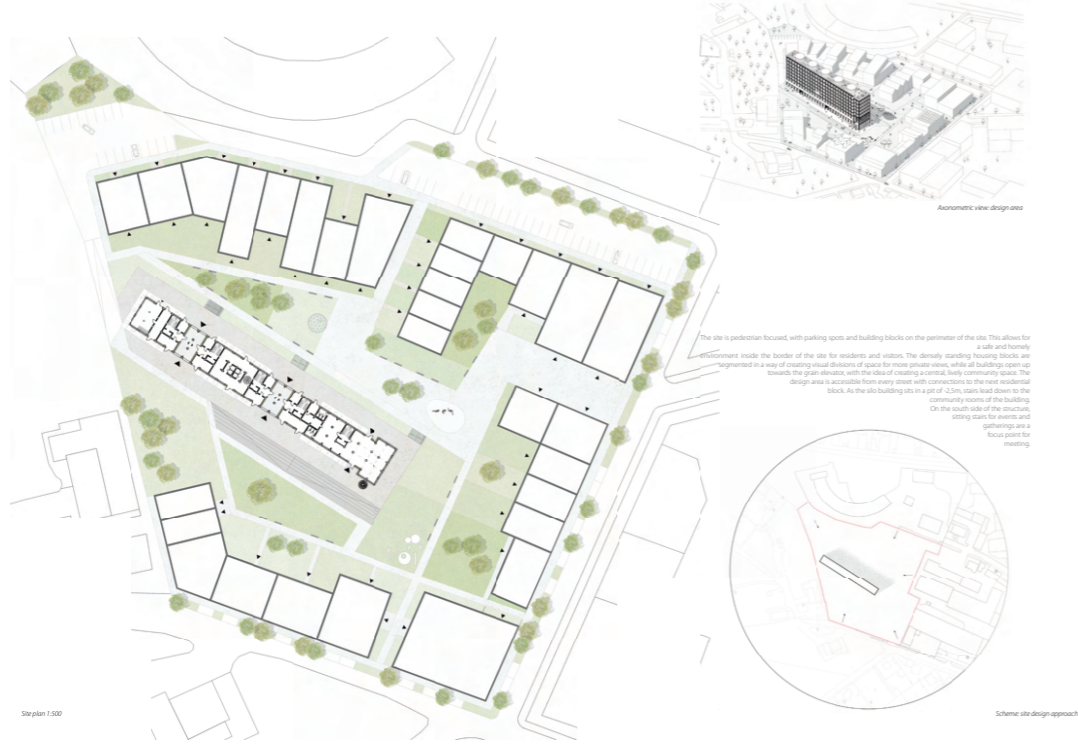
Interior space: shared kitchen and living room of a cluster-apartment on the 7th floor

Panels in reduced size



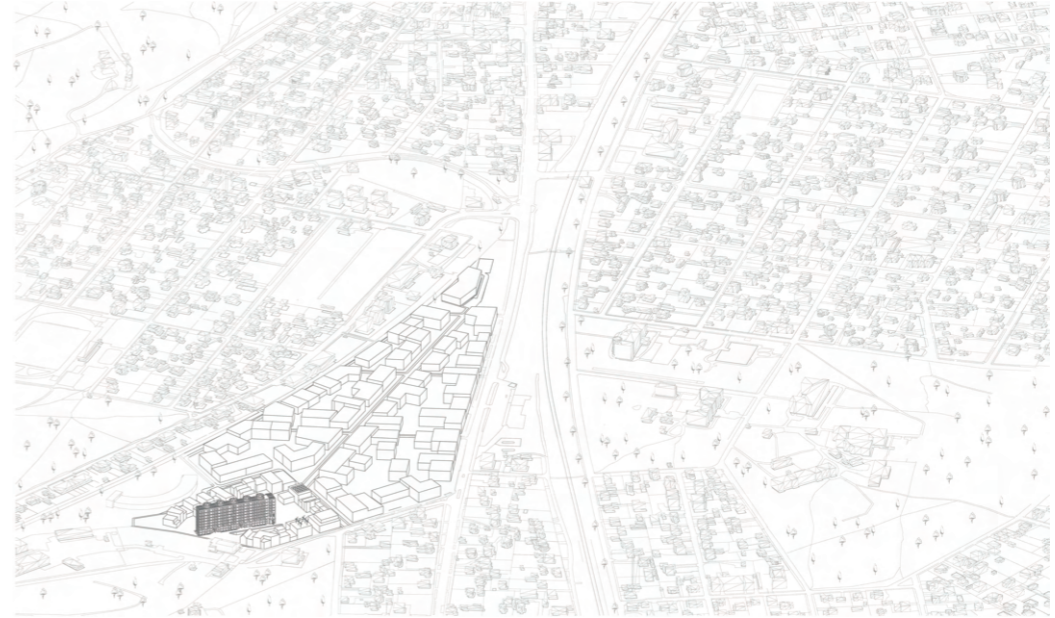
THE SITE

In restructuring the whole industrial park, the project part of this thesis proposes a residential cohousing development in the abandoned grain elevator building. The project aims to be community and pedestrian oriented, as the site is well connected in terms of public transportation. As the existing grain elevator building is located centrally on the plot, it was decided early on, that a design approach characteristic to multi-building cohousing developments was to be considered. The central structure acts as a community building, or hub, while the buildings around it are housing or commercial oriented.



Site plan 1:500

Scheme site design approach



Axonomic view proposed neighbourhood

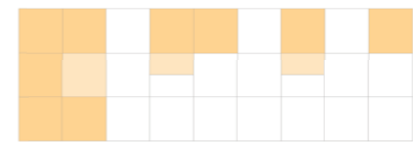
DESIGN APPROACH

While cohousing is meant to be resident led, it is not possible to simulate this process for the purpose of this project. The cohousing practices and strategies from literature and the case study analysis are used to make design decisions. The cohousing project aims to offer its residents a broad variety of living possibilities, with the programming allowing for diversity in communities and flexibility when needed. The result is a mixed-use, multi-story cohousing building, with shared facilities on the ground floor which are extended through a mezzanine floor. Shared facilities are a cafe for events and communal dining, a working area and a workshop. The residential part consists of seven floors of different living regular apartments and cohousing cluster apartments. Each cluster apartment acts as an independent unit, with shared facilities and private units. On the roof, there are community terraces to enjoy views, while the space is segregated with circular greenhouses for communal gardening, in which each terrace has their own access. Outdoor activities are related to the community of the building.

UNIT CATALOGUE

As stated, this cohousing project aims to offer its residents a broad variety of living possibilities, with the programming allowing for diversity in communities and flexibility when needed. This was achieved by creating a unit catalogue. The catalogue provides a different type of units for different end users. Introducing this modular system allows for flexibility in creating the floor plans, while each user could choose the amount of private space needed, with shared spaces provided. According to size, these units are categorized as S, M, L, and XL.

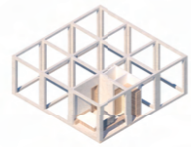
With each space as the only predefined space in the middle of the grid, placing units around the middle square allows for a flexible approach in arranging the private living units.



S	M	L	XL
Capacity	1 person	1 person	2-3 people
Squares on grid	1	1.5	4
Floor area	9 m ²	13.5 m ²	54 m ²
Functions	Private room	Private room with bathroom	Apartment with 2 bedrooms
Furniture	Bed, nightstands, wardrobe, table, TV	Bed, nightstands, wardrobe, table, TV, bathroom	Bed, nightstands, wardrobe, table, TV, 2 bedrooms, kitchen, living area, dining table
Day-night activity separation	no	no	yes

M	L	XL	
Capacity	1 person	1-2 people	2-3 people
Squares on grid	1.5	2.5	4
Floor area	13.5 m ²	22.5 m ²	54 m ²
Functions	Private room with bathroom	Private room with bathroom	Apartment with 2 bedrooms
Furniture	Bed, nightstands, wardrobe, table, TV, bathroom	Bed, nightstands, wardrobe, table, TV, bathroom, kitchenette, sofa, lounge chair	Bed, nightstands, wardrobe, table, TV, 2 bedrooms, kitchen, living area, dining table
Day-night activity separation	no	yes	yes

L	XL	
Capacity	1-2 people	2-3 people
Squares on grid	2.5	4
Floor area	22.5 m ²	54 m ²
Functions	Private room with bathroom	Apartment with 2 bedrooms
Furniture	Bed, nightstands, wardrobe, table, TV, bathroom, kitchenette, sofa, lounge chair	Bed, nightstands, wardrobe, table, TV, 2 bedrooms, kitchen, living area, dining table
Day-night activity separation	yes	yes



Master Thesis project



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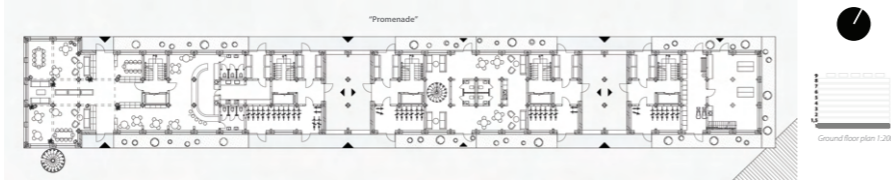
Master Thesis project



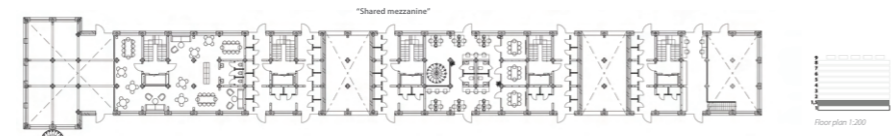
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THE LAYOUT

The ground floor holds public functions for the community of the building and neighborhood, which are separate from the entrance to the apartments. Shared functions are a community hall for events and shared work, a co-working space in the middle of the building and a workshop. The ground floor also holds storage areas for residents.



The mezzanine floor acts as an extension of the ground floor functions, with more storage units for residents accessible from the apartments.



This layout consists of 1 room private units with shared space providing the basic functions of a house: living room, kitchen, dining area and bathroom. For the approach, residents are forced to use shared facilities, as the private units are not equipped to be independent. This approach allows for more private units per apartment, while separation walls could be eliminated according to the needs of the user.



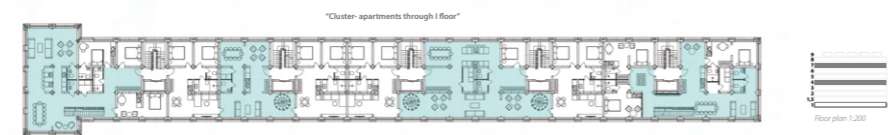
The through apartments allow for a double cluster size. The private units are located in a zone that allows for the shared spaces to be more open, providing more social separation and better views of the area. The through apartment consists of 2 more private units (40 m²) with shared living room, kitchen, dining area and bathroom.



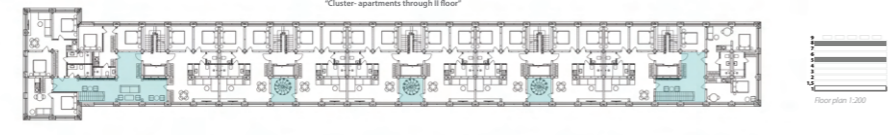
To showcase the effective use of shared space, this 'regular apartment' floor acts on the sixth floor. Each apartment opens up to one of two separate apartments, with one serving from 50-100 square meters. This floor holds 10 regular apartments.



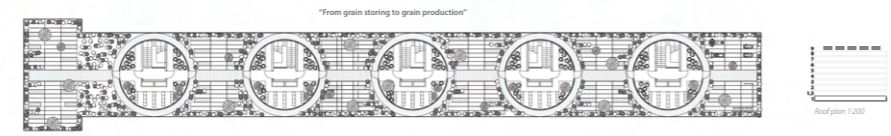
The cluster apartments hold independent apartments with all necessary functions provided, while opening up into communal spaces. The independent apartments are all smaller than 'regular' with the benefit of open community space consisting of dining area, kitchen and living room. The cluster apartments have through 2 stories, with the lower floor holding more shared space and the second floor being for private apartments.



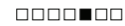
The second floor of the cluster apartments holds independent apartments with minimal shared areas. All apartments are connected to the shared areas via shared staircases.



Each staircase opens up towards the roof with a green terrace for all residents. Community gathering from the greenhouse, the rooftop terrace is accessible with a ground elevation of approximately 10 meters for workshop areas.



Master Thesis project



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Section A 1:100

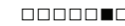
Shared facilities on the ground floor community café & dining area



Stair next to the building a meeting point for events and gatherings



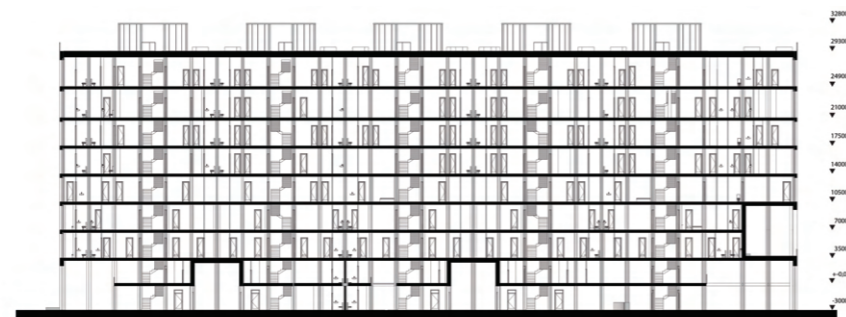
Master Thesis project



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Side elevation 1:200



Section B 1:200

Master Thesis project



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