



ADAPTIVE REUSE FOR SUSTAINABLE STUDENT HOUSING

PRESERVATION AND RESIDENTIAL QUALITY IN THE TRANSFORMATION OF EKLANDAGATAN 86

Master Thesis 2026
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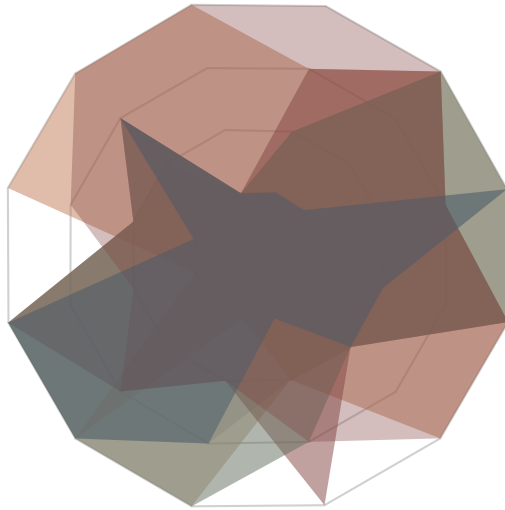
Preservation and Residential Quality in the Transformation of
Eklandagatan 86

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ABSTRACT

In a time of rising greenhouse gas emissions and increasing pressure to reduce the environmental impact of the built environment, together with a housing shortage and a growing student population, adaptive reuse emerges as a strategy capable of responding to several of these challenges simultaneously. This thesis investigates the transformation of Eklandagatan 86, a former institutional and university building in Gothenburg, into sustainable student housing.

The thesis explores how the existing building can be transformed into student housing and how its existing conditions can inform design decisions and spatial possibilities. It also investigates the tension between preservation and residential quality through co-living as a student housing typology.

The work is based on a theoretical framework established through literature research, reference project analysis, focus group insights, and building analysis. From this foundation, a set of design principles is developed and tested through seven design prototypes, evaluated against the principles using a structured evaluation matrix.

The results show that the building rewards co-living as a typology, but does not solve it, since the cluster sizes it accommodates most naturally exceed the scale at which shared living remains socially functional. In this sense, co-living solves the building's logic more than the building solves a qualitative co-living solution.

The tension between preservation and residential quality is not binary, and the strongest outcomes emerge not from optimizing a single typology but from combining them. Preservation functions as a complement, not a constraint, and the right choice is not about the degree of change, but the coherence of decisions.

Key words: Co-living, Building transformation, Gothenburg, Design evaluation

STUDENT BACKGROUND



BACHELORS DEGREE IN ARCHITECTURE

Chalmers University of Technology
Gothenburg, 2023

MASTERS DEGREE IN ARCHITECTURE

Chalmers University of Technology
Architecture and Urban Design
Gothenburg, 2026

COURSES & STUDIOS

ACE515 Building Tectonics
ACE370 Master's thesis preparation
ACE425 Master's thesis preparation
ACE575 Sustainable Building Transformation
ACE405 Design and performance optimization in architecture
ACE350 Building climatology
ACE475 Material & Technique
ACE400 Architecture in the Anthropocene
ACE380 Sustainable development and the design professions

STANDPOINT

This master's thesis originates from three starting points that have shaped both its direction and its approach.

The first is my personal experience as a student who has lived in various types of student housing. Moving between different living situations has given me an understanding and insight into the advantages, challenges, and shifting needs of student life.

The second is a conviction that has quietly guided my thinking since early in my education: that the most sustainable building is the one that is already built, or the one that is never built at all. Rather than treating new construction as the default answer, I find myself drawn to see the potential of what already exists.

The third is an interest in the conceptual and investigative work that precedes any design process. Architecture may often lean against intuition, but there is usually a substantial knowledge and evidence beneath the surface. That process of analysis is, for me, where the most interesting thinking happens.

Together, these three starting points frame the perspective from which this thesis approaches the question of how adaptive reuse can respond to both social and environmental challenges.

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CHAPTER ONE

INTRODUCTION

NOTES & DEFINITIONS

TERMINOLOGY

Studio apartment

A self-contained dwelling for one student, in which the sleeping area, living space, and kitchen are integrated within a single room, with a private bathroom.

Duo apartment

A dwelling for two students, each with a private room, sharing a bathroom and kitchen.

Co-living cluster

A shared dwelling for three or more students who are not family members, where social spaces are shared.

Student housing typology

A type of housing for students, can be Studio apartment, Duo apartments or Co-living cluster

Prototype

In this thesis, a *prototype* refers to a distinct spatial strategy for the transformation of the existing building, each prototype is representing a different conceptual approach to housing typology and degree of preservation. The prototypes are not fully resolved proposals, but exploratory design iterations developed to test and compare the design principles.

IMAGE CREDITS

All figures and photographs are by the author unless otherwise stated.

AIM & APPROACH

PURPOSE & OBJECTIVES

The purpose of this thesis is to explore how an existing building can be transformed into sustainable student housing, with a focus on different housing typologies, from individual student apartments to co-living clusters, and how the conditions of the existing building can inform design decisions and spatial possibilities. Rather than treating the existing structure as a limitation, the project approaches it as a generative constraint that guides spatial organization and transformation.

The objective of this thesis is to explore the tension between preservation and residential quality through co-living as a student housing typology. The project also aims to contribute to the ongoing discussion on adaptive reuse through this case study focusing on student housing and co-living.

THESIS QUESTIONS

What are the key principles for transforming the existing building into student housing?

How can the application of these principles inform the transformation of the existing building into student housing?

What does the exploration of different housing typologies reveal about the tension between preservation and residential quality?

PROCESS

The work process is structured into five phases: theoretical framework, design principles, prototyping, evaluation, and conclusion. Together, these phases form an iterative process where each stage informs and refines the next.

The process begins with establishing a theoretical framework, based on literature, reference projects, user insights, and building analysis. This foundation then shapes a set of design principles that guide the subsequent work. From these principles, prototypes are developed and evaluated.

This process is not strictly linear. As illustrated in figure 1, findings from the evaluation phase feed back into earlier stages, returning to prototyping, revisiting the design principles, or even reconsidering aspects of the theoretical framework itself. This iterative loop ensures that the work remains grounded in theory while staying responsive to new insights that emerge throughout the process. Finally, the conclusion synthesizes the findings.

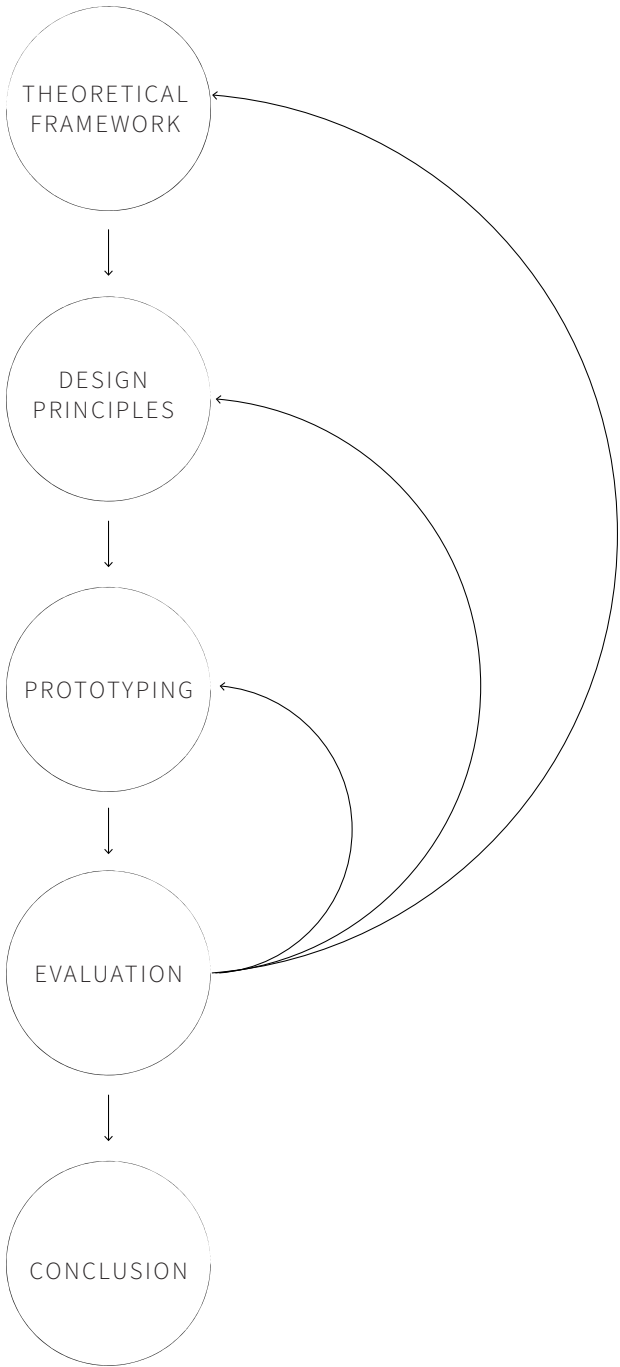


Figure 1: Process diagram.

DELIMITATIONS

Case specificity

This thesis is limited to the existing building at Eklandagatan 86 in Gothenburg. While the strategies and principles developed may offer broader insights for similar building transformations, the analysis, prototypes, and conclusions remain specific to this site and its spatial, structural, and regulatory conditions. The work is conducted over a limited period of time and should be understood as a preliminary study exploring possibilities rather than fully resolved proposals.

Spatial Focus

The work investigates the building's interior spatial configuration, focusing exclusively on existing interior structures and rooms. Any redesign or consideration of the surrounding environment, including courtyards, gardens, and other outdoor spaces, is explicitly excluded from this investigation.

Technical and Structural Boundaries

Acoustic performance, fire safety beyond what directly influences cluster size and compartmentation, and structural engineering considerations are recognized as essential to any realized project but are treated at a conceptual level. The thesis does not extend to technical detailing or full structural analysis.

Wet room installations and kitchen placement

Bathroom placement has been prioritized in relation to existing shaft positions and structural conditions. The existing kitchens in the building were distributed unevenly across floors without spatial continuity, making them impractical to account for in a typical floor plan-based investigation. Kitchen placement in co-living clusters has therefore not been approached with the same level of precision as bathrooms, but have whenever possible, been placed in close relation to each other.

Economic and legal dimensions

Building economics, legal frameworks, and facilitation and operational structures for co-living fall outside the scope of this thesis. While theory confirms that co-living can reduce construction costs through fewer wet room installations and shared functions, no cost analysis has been conducted for the specific prototypes. Economic viability is therefore treated as an indirect consequence of spatial decisions rather than a direct design parameter.

Floor plan generalization

The prototypes are developed from a typical floor plan based on floors 2–4 and should be understood as spatial zoning studies rather than resolved design proposals. Room placements, cluster boundaries, and unit layouts indicate organizational principles and relative relationships between spaces – not finalized dimensions, exact positions, or detailed interior solutions. Applying any prototype to the full building would require floor-by-floor adjustment.

Design principles as evaluative framework

The prototypes are evaluated against a set of design principles developed within this thesis. Different starting points, priorities, or weightings could lead to different conclusions. The results should therefore be understood as outcomes of this specific framework rather than objective rankings of the prototypes.

METHODOLOGY



Research

A literature study was conducted to build a foundation for the project, covering research and perspectives relevant to adaptive reuse, student housing, co-living, and sustainable architecture. The findings inform both the design principles and the decisions made throughout the design process.



Reference Projects

A selection of built projects was studied to ground the research in concrete architectural examples. The reference projects included both adaptive reuse projects transformed to student housing and examples of co-living typologies, providing insight into what has worked and what has not in practice. The findings from the reference projects informed the development of the design principles and were also used as a basis for discussion in the focus groups.



Focus Group

A focus group of six students was conducted in two stages. In the first stage, participants explored different housing concepts and typologies through discussion of reference projects, allowing them to respond to built examples of different living arrangements. The insights informed the development of the design principles. In the second stage, the focus group reconvened to evaluate different design concepts, providing feedback that contributed to further refinement of the prototypes. As the author is part of the target user group, the focus group also served to complement personal observations and reduce subjective bias.



Building Analysis

The existing building at Eklandagatan 86 was analysed through site visits, study of plans and technical documents, and discussions with the property owner. The analysis covers the building's history and current situation, urban context, detailed development plan, and building characteristics. Strengths and weaknesses were identified that guided the design principles and the overall process.



Sketching and Prototyping

The design process followed an iterative cycle of freehand sketching and digital drawing, moving back and forth between the two as ideas were developed and tested against spatial and dimensional constraints. From this process, a selection of prototypes was identified, each representing a distinct conceptual approach to the transformation with a different emphasis in terms of typology and degree of preservation. The prototypes were evaluated against the design principles to assess both the living quality achieved and the degree of preservation maintained.



Design Evaluation

From the theoretical framework – literature research, reference projects, user insights from the focus group, and building analysis – a set of design principles was determined. The principles were organized into two categories: the first defining what key aspects students value in student housing in terms of environmental, spatial, and social qualities; the second defining the degree to which the existing building should be retained during transformation.

Each principle was further divided into three sub-principles, against which each prototype was scored on a scale of 1–4. This evaluation matrix allowed for a structured comparison across prototypes, making both the strengths and weaknesses of each design strategy visible. The evaluation matrix assumes equal weighting between principles in order to enable transparent comparison between proposals. Rather than functioning as absolute requirements, they serve as both a guide for the design process and an evaluative framework to determine which prototype works best in which case.

BACKGROUND

BUILT ENVIRONMENT EMISSIONS

The amount of carbon dioxide and other greenhouse gases in the atmosphere continues to increase. According to Naturvårdsverket (2025), the past decade has likely been the warmest in around 125,000 years. To limit global warming to 1.5°C, global greenhouse gas emissions must rapidly approach zero emissions in the second half of this century. The building and real estate sector is a major contributor to this challenge, with buildings consuming 32% of global energy and contributing 34% of global CO₂ emissions (UNEP, 2025). In Sweden, Boverket (2025a) reports that 22% of total domestic emissions originate from this sector.

Generally, the biggest environmental benefit is achieved when buildings are properly maintained and the need for demolition is avoided (Boverket, 2024). From a lifecycle perspective, a building that has stood for a long time has already paid off a large portion of its climate debt and by reusing buildings, the embodied energy and natural resources consumed during manufacturing can be preserved. Svenska Miljöinstitutet (2025) confirms that reusing buildings through preservation and renovation can result in up to 91% lower climate impact compared to new construction.

HOUSING SHORTAGE

Sweden is currently facing a significant housing shortage. According to Boverket (2025b), 44% of municipalities report a lack of housing, with the situation especially severe in large cities. Gothenburg is expected to experience the largest population growth in Sweden in the coming years, and the city’s attractiveness as an academic destination is closely tied to its ability to provide housing for students and researchers (Västsvenska Handelskammaren, 2024). Yet, Gothenburg remains one of the most difficult cities for new students to find

housing (SFS, 2025), and surveys show that one in four students avoid universities in cities where there is difficult to find housing (Studentbostadsföretagen, 2023). Both Chalmers University of Technology and the University of Gothenburg have struggled to provide housing for exchange students, leading some prospective students to decline study offers in Gothenburg due to difficulties finding accommodation (Inobi, 2024).

The initiative Göteborg7000+ was launched in 2016 with the goal of constructing 7,000 new student apartments by 2026, yet as the target year has now arrived, only around 2,000 have been completed (Gbg7000+, n.d.). Forecasts estimate that by 2035, approximately 16,000 student housing units will be needed, compared with 12,000 available in 2024, implying a need for at least 4,000 additional units (Inobi, 2024).

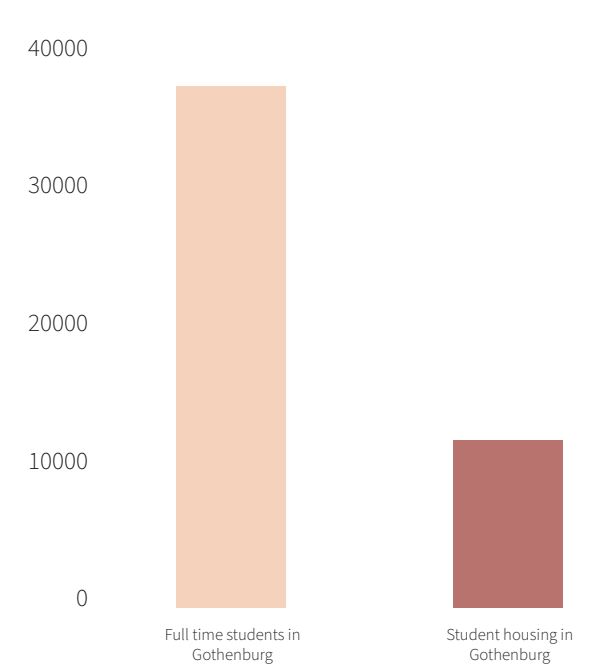


Figure 2 : Relationship between students and student housing in Gothenburg. Inobi. (2024). *Studenter och studentbostäder i Göteborg*. <https://www.inobi.se/>

REGULATORY CHANGES

On 1 June 2025, changes to the Swedish Planning and Building Act came into effect, aiming to reduce construction costs and increase the supply of student housing by easing certain building requirements (Prop. 2024/25:132). The earlier rule that full accessibility must be implemented in all newly built student units was removed, and instead, only 20% must now meet full accessibility standards. However, all units must still be able to host a visitor with reduced mobility or orientation capacity.

As a result, the regulatory change allows for smaller unit sizes, enabling more compact and cost-efficient layouts without necessarily compromising spatial quality (Studentbostadsföretagen, 2025). This master thesis is grounded in the revised 80/20 regulation, which affords greater flexibility in unit design and creates scope for exploring new residential typologies, shifting focus from regulatory compliance toward adapting apartments to the existing structural conditions.

CASE STUDY

The building examined in this study is located at Eklandagatan 86, shown in figure 3, and was originally constructed as an institutional and university facility. It is situated in Johanneberg, with a clear connection to the campus of Chalmers University of Technology. The detailed development plan for the area has already assessed the building's potential and proposes a conversion to residential and commercial functions.

Together, these challenges – the urgent need to reduce the climate impact of construction and the critical shortage of student housing in Gothenburg – together with the new regulatory flexibility introduced in 2025, establish a compelling case for adaptive reuse as both an environmentally responsible and practically viable strategy. The conversion of Eklandagatan 86 thus represents not only a site specific design challenge but a response to broader structural demands facing Swedish cities today.



Figure 3 : Eklandagatan 86

2

CHAPTER TWO

*THEORETICAL
FRAMEWORK*

THEORETICAL FOUNDATION

The transition toward a more sustainable built environment requires not only new construction techniques but a fundamental rethinking of how we use, reuse, and inhabit existing buildings. This thesis situates that challenge within the specific context of student housing: a housing form defined by particular spatial, social, and economic needs. Against that, adaptive reuse and co-living emerge as two complementary strategies with the potential to respond simultaneously to environmental, social, and economic pressures. These three dimensions of sustainability run as a common thread throughout this chapter and into the design proposal.

ADAPTIVE REUSE

Plevoets and Van Cleempoel (2019) define adaptive reuse as being grounded in the two concepts of adaptation and reuse, referring to the modification of a building's physical or functional form. Furthermore, they suggest that adaptive reuse needs to be understood through several complementary perspectives, addressing everything from how a building's spatial logic affects its adaptability, to the formal relationship between old and new, to questions of technical performance. According to Wong (2025), a successful transformation spans through several dimensions: the merits of the new use, the dialogue with the existing structure, the role of economics, the preservation of heritage and memory, and the conservation of materials and energy. Wong further argues that adaptive reuse, in contrast to demolition or preservation, enables growth and change by transforming unused or underused buildings to accommodate new functions and requires making room for something new within the framework of what exists.

The practice of changing a building's function is not a new phenomenon (Plevoets & Van Cleempoel, 2019), buildings have throughout history continuously been repurposed in response to shifting

economic and political circumstances. In recent decades, the concept has expanded to also address climate change – a shift that reflects the building sector's significant contribution to global greenhouse gas emissions. A study of school conversions in Halland (IVL Svenska Miljöinstitutet, 2025) modeled three scenarios of increasing intervention. Preserving the load-bearing structure reduced climate impact by up to 60% compared to new construction, retaining only the foundation reduced it by around 30%, while a light renovation with minimal intervention achieved up to 91% reduction, showing that the level of intervention stands in direct relation to the climate benefit.

Mjörnell & Palmgren (2025) mapped 141 buildings in Sweden that had undergone conversion, finding that office and industrial buildings were the most commonly transformed, with the majority converted to residential use, most frequently student apartments. The study highlights that office buildings are particularly suitable for adaptive reuse due to their similarity in spatial configuration to residential programs and their urban locations. A case study of a Swedish office building converted to residential use (Palmgren & Mjörnell, 2025) found that the degree of intervention is not simply a sliding scale where more is better. Both low and high levels of intervention carry risks: too little fails to sufficiently improve the building's performance, while too much intervention becomes counter-productive where the climate cost of the measures themselves outweighs the gains.

Together, these perspectives illustrate that there is no single correct way to approach a transformation. The appropriate strategy depends on the building, its conditions, and the aim of the project. The dimensions of adaptive reuse are not competing criteria but interconnected ones. A transformation that minimizes physical intervention but produces poor living conditions fails its inhabitants; equally, a spatially successful conversion that disregards

material reuse misses a central opportunity to reduce climate impact. Spatial quality, long-term adaptability, and climate performance must therefore be evaluated together as mutually reinforcing goals.

STUDENT HOUSING

Student housing is designed as a form of transient residence, intended to provide accommodation in the city where one studies, supporting active students and enabling participation in higher education (Studentbostadsföretagen, n.d.).

Who are the students?

The student population is far from homogeneous and can be divided in four distinct groups that bring different needs and living patterns (Akademiska Hus, 2019):

The first group, international students, often need assistance finding accommodation and typically stay for shorter periods. As newcomers to both the university and the country, they tend to have a strong need for social integration and are generally more open to shared living arrangements.

The second group, first-year students, are often living independently for the first time and share a similar desire to establish social connections and become part of the student community.

The third group, more experienced students, having already built social networks in the city and prioritize stability and independence, some may also have partners with whom they prefer to live with.

The fourth and last group is the PhD students that generally require more privacy and space and may have family-related needs that requires them to become more established locality and is in greater



I'm a **first year student** and I want to meet people and feel part of the student community.



I'm an **experienced student** and I want somewhere to live with my partner.



I'm an **international student** and I need short term housing and a social living environment.



I'm a **PhD student** and I need a quiet and private place where I can really focus.

Figure 4: The four different student groups, defined by Akademiska Hus. (2019). Riktlinjer för student- och forskarbostäder. <https://www.akademiskahus.se/>

need of proximity to services and community functions, such as preschool.

This thesis will primarily focus on the first three student groups – international students, first-year students and experienced students – in the design of student housing.

Living typologies

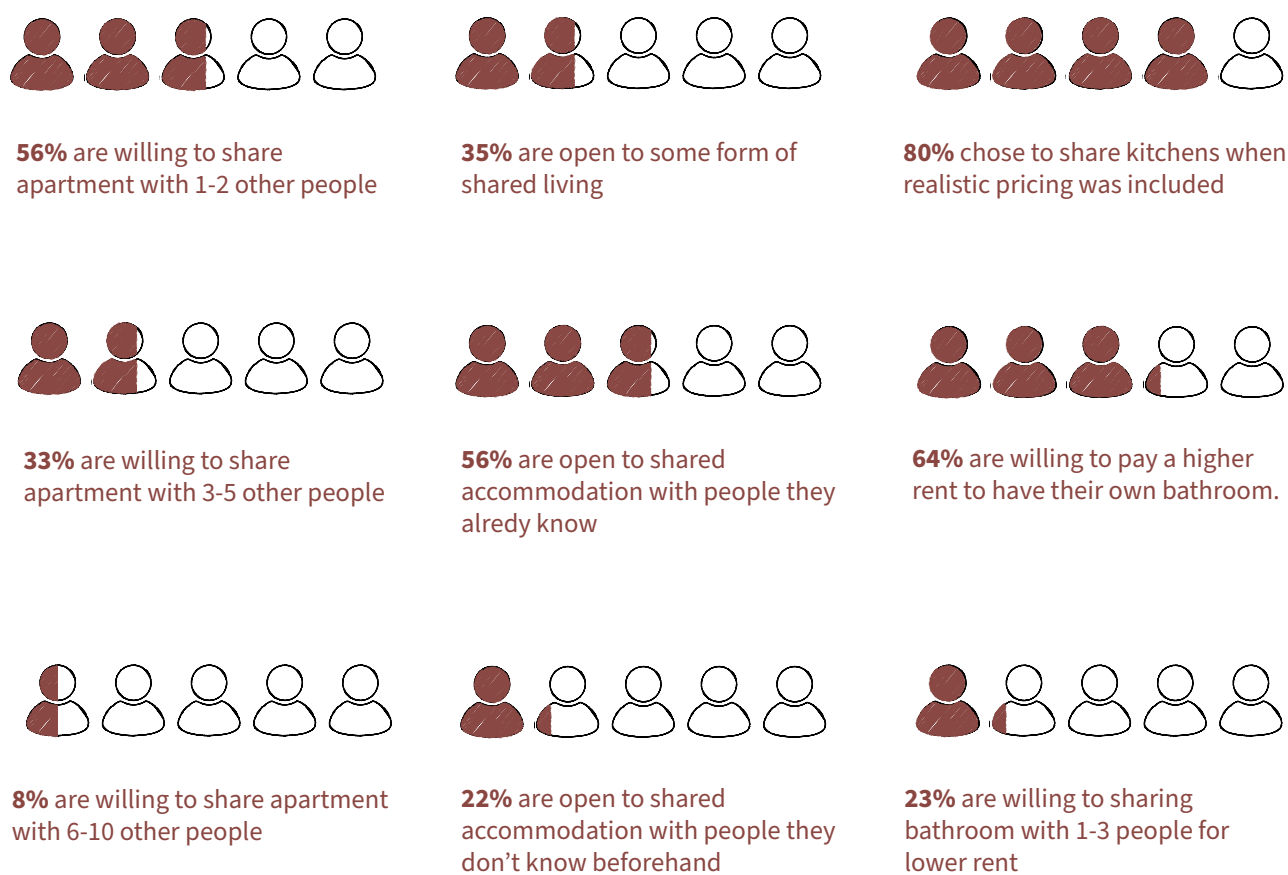
Despite these differences, certain qualities are consistently valued across groups. Low rent is the single most important factor for the majority of students, followed by safety, sufficient space, and proximity to campus and public transport (Studentbostadsföretagen, 2021). Private hygiene facilities are considered essential, own shower, toilet, and access to a complete kitchen are important qualities for all student groups and 64% are willing to pay a higher rent to have their own bathroom. At the same time, a pleasant and well-maintained indoor and outdoor environment is central to students' sense of safety and well-being, with green spaces and outdoor areas particularly valued.

When it comes to living arrangements, the private one-room apartment, the studio apartment, is the most attractive option for the majority of students, as having one's own home is seen as an important step into adulthood and personal development (Studentbostadsföretagen, 2024). Approximately 45% of students prefer to live alone, while around 35% are open to some form of shared living (Akademiska Hus, 2019). CoKitchen, a comprehensive three-year research project at KTH investigating future sustainable shared housing for students, state that even if the studio apartment is appreciated for its privacy and the freedom to furnish and decorate one's own space, students also indicate a lack of space for social interaction and a concern about isolation as negative aspects. When students were given the opportunity to design their own ideal housing using realistically priced options, none chose to live in a

fully private one-room apartment, and 80% were open for a shared kitchen (Ilstedt, 2023). Shared living is most acceptable when it involves people one already knows, three out of five students are open to share with friend or partner, while only one in five can imagine sharing with strangers (Studentbostadsföretagen, 2021). International students are a notable exception, with 43% open to shared accommodation with people they do not know in advance.

The corridor, or traditional student dorm, is generally viewed as a transitional form of accommodation, more appealing to new and socially oriented students (Studentbostadsföretagen, 2024). Those who are sceptical tend to focus on concerns about disorder in shared spaces and a lack of control over who they live with. The optimal number of residents in a shared living arrangement remains unresolved. When students were asked about their preferences, the majority stated that they would prefer to live with one to two other people (Studentbostadsföretagen, 2021), while case studies of co-living apartments for students suggest that four to six residents is an optimal number (Ilstedt, 2023). Across all shared living forms, living with the right people is considered crucial and privacy remains central even in shared arrangements, with students more willing to share living rooms, kitchens, and study spaces than bathrooms and bedrooms (Studentbostadsföretagen, 2021).

These insights point toward a housing model that balances private space with opportunities for social interaction. Individual rooms are consistently prioritized, and private hygiene facilities are strongly preferred while shared kitchens and communal areas are accepted as spaces that can encourage community in a positive manner.



Figur 5-10: Statistics compiled from: Studentbostadsföretagen. (2021). Hur vill studenter bo? <https://studentbostadsforetagen.se/>; Akademiska Hus. (2019). Riktlinjer för student- och forskarbostäder; <https://www.akademiskahus.se/> Ilstedt, S. (2023). Co-Kitchen Framtidens hållbara delningsbostad för studenter. KTH Live-In Lab

CO-LIVING

Co-living is defined by Cambridge Dictionary as “the practice of living with other people in a group of homes that include some shared facilities” (Cambridge Dictionary, n.d.). Beyond this definition, co-living is characterized by a deliberate focus on community and a voluntary choice to share everyday life with others (Perdrix, cited in Conscious Coliving, 2022). Unlike traditional student dormitories, co-living emphasizes well-designed communal spaces and intentional social interaction (Svenska Colivingförbundet, n.d.). The concept has gained relevance in recent years as a response to three converging challenges: a housing crisis marked by both shortage and high costs, a crisis of loneliness and mental health and growing environmental pressures (Penny, cited in Conscious Coliving, 2022).

Economic dimensions

One of the most immediate advantages of co-living is its potential to reduce housing costs. By sharing functions such as kitchens and bathrooms, the total installation area per person is significantly reduced and studies show that shared housing can have up to 42% less installation area compared to individual apartments (Akademiska Hus, 2020). This reduction in fixed infrastructure directly lowers construction and maintenance costs, which can translate into more affordable rents. A cost analysis conducted within CoKitchen confirms this potential, finding that shared housing can be 26% cheaper to build per square meter of living area compared to individual studio apartments (Ilstedt, 2023). For students, where low rent is consistently identified as one of the most important factors when choosing housing (Studentbostadsföretagen, 2021), this is a significant advantage among those who are open to shared living. Economic insecurity and unstable housing conditions are also among the factors that can contribute to reduced student well-being (SFS,

2021) which underlines that the need for affordable housing is not only economic, but also social.

Social dimensions

Individuals aged 16 to 29 are among the groups that report the highest levels of loneliness (Folkhälsomyndigheten, 2024), and major life transitions such as beginning university studies may contribute to this. Co-living, by its nature, creates conditions for everyday social interaction through shared spaces and everyday life (Akademiska Hus, 2020). Research suggests that shared living communities tend to support individual growth and increase self-confidence, encouraging collaboration and the exchange of knowledge and experience. Residents in well-designed co-living environments generally report a stronger sense of community and lower levels of loneliness compared to those living in more conventional housing (AART Architects, 2019).

However, the social benefits of co-living are not guaranteed. The most important practical factors for successful shared living are logistical: sufficient storage, the possibility of privacy, and functioning cleaning arrangements (Perdrix, cited in Conscious Coliving, 2022). Living with the right people is considered crucial across all shared living forms (Studentbostadsföretagen, 2024), and poorly managed group compositions can lead to discomfort and social exhaustion rather than community. Privacy remains essential and if residents cannot satisfy their need for personal space, the shared environment can become a source of stress rather than support (Akademiska Hus, 2020). Concerns about different hygiene standards and different routines were among the raised anxieties in shared living arrangements (Ilstedt, 2023). CoKitchen offers a spatial framework for understanding these boundaries, organizing the shared home into three scales: the entirely private zone for rest and personal time; the semi-private zone shared between a small number of people; and the completely shared zone

shared between everyone in the apartment.

Environmental dimensions

From an environmental perspective, co-living offers advantages at different scales. At the level of daily life, shared consumption generally leads to reduced resource use, similarly larger shared spaces at home mean residents are more likely to gather there rather than at commercial venues, contributing to lower overall consumption (Akademiska Hus, 2020). At a broader scale, a third of students report being motivated to share housing if it means a reduced climate footprint (Studentbostadsföretagen, 2021), suggesting an alignment between student values and the environmental logic of co-living.

It can be argued that the reduction in installation areas, fewer kitchens and fewer bathrooms, also means less material consumption during the building process itself build (Akademiska Hus, 2020). Fewer wet room installations require less piping, fewer materials, and generate less construction waste, lowering the climate impact of the construction as a whole. It is worth noting, however, that co-living does not necessarily reduce total floor area per person since residents still require roughly the same amount of space overall. The environmental gain lies specifically in the reduction of installation-heavy areas, which are disproportionately costly and carbon intensive to build.

Design strategies and limitations

Current regulations are not designed with co-living in mind (Svenska arkitekturinstitutet, 2025). Fire safety and legal requirements limit both the number of people who can reside in a shared living arrangement and limit that only one person can occupy an individual room or unit. The applicable rule sets a maximum of 6 persons per fire cell, meaning that if a co-living cluster contains more than 6 residential units, the apartment or dwelling

must be divided into separate fire cells (Boverket, 2025d) — a requirement that directly affects both spatial design and project economics. Regulations also limit the maximum of three people may share a single bathroom in shared living arrangements (Boverket, 2025e).

As part of the Co-kitchen project, key figures for a well-designed co-living kitchen were compiled. These are as follows (Ilstedt, 2023):

ELEMENT	SPECIFICATION
Total kitchen length	7200 mm
Counter space	6000 mm
Kitchen cabinet	1200 mm
Fridge/Freezer	2 units
Stove	2 units
Dishwasher	1 unit
Sink	2 units

Table 1: Key figures over co-living kitchen from CoKitchen: Framtidens hållbara delningsbostad för studenter.

Co-living and sustainability

Co-living addresses three major contemporary crises in an integrated way. Regarding the housing crisis, it enables more affordable housing by reducing construction and living costs through shared spaces and collective consumption. In terms of loneliness and mental health, co-living supports community and social interaction, creating a stronger sense of belonging for residents and may be particularly valuable as a way of reducing the risk of isolation at the start of student life, even if it does

not necessarily lead to long-term friendships. From an environmental perspective, co-living supports a more sustainable lifestyle by reducing resource use, material consumption, and the climate impact of construction. Co-living can therefore be seen as a combined response to the three dimensions of sustainability: economic, social, and environmental. In the context of adaptive reuse, where minimizing intervention is already a central ambition, this makes co-living not only a sustainable way to live, but a sustainable way to build.

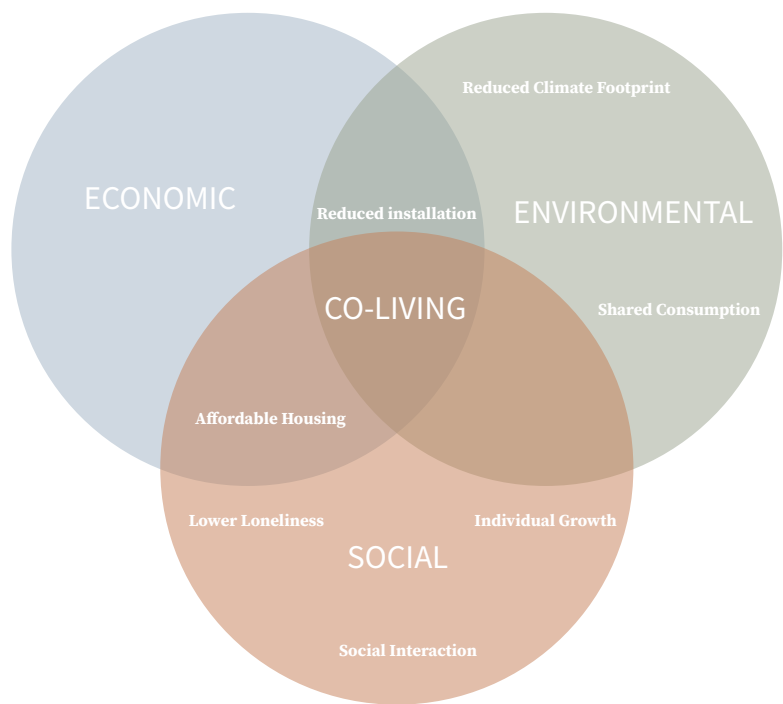


Figure 11: Co-living as a sustainable framework

SUSTAINABILITY

Sustainability, as defined by the *Brundtland Report* (Our Common Future; WCED, 1987), involves social justice, economic development, and ecological limits within an integrated system. It focuses on the present by meeting people's fundamental needs, while also ensuring opportunities for future generations. Guy and Farmer (2001) argue that sustainable architecture cannot be reduced to a single aspect alone but must be understood as an integrated relationship among environmental, social, and cultural dimensions. For this thesis, three of their perspectives, presented as logics, are particularly relevant.

The first is the eco-technic logic, which emphasizes technological innovation, efficiency, and life-cycle thinking to balance environmental protection with ongoing modernization. In the context of this thesis, it connects directly to adaptive reuse as a contemporary climate strategy that extends the life of existing structures rather than replacing them, and where the degree of intervention directly determines the magnitude of the climate benefit.

The second is the eco-medical logic, which connects sustainability to human health and well-being, emphasizing natural materials, light, and ventilation to create restorative and non-toxic environments. This is directly relevant to the design ambition of creating student housing with strong connections to nature, good daylighting and a healthy indoor environment. All qualities that the student housing research identifies as central to well-being.

The last is the eco-social logic, which frames sustainability as a matter of social justice, highlighting community participation, equity, and local self-sufficiency as essential components of an environmentally responsible society. This logic finds its clearest expression in co-living as a housing

model since shared spaces and collective consumption not only reduce resource use and construction costs but strengthen social bonds and counteract the loneliness that disproportionately affects young people.

Taken together, these three logics mirror what both the Brundtland Report and the previous theory sections make clear: that sustainability is inherently multidimensional, and that its dimensions reinforce rather than compete with one another. This principle underlay the approach taken throughout this thesis and points toward adaptive reuse into co-living student housing as a response that operates across all three dimensions at once. While economic sustainability is not a direct driver of the architectural decisions in this thesis, it surfaces throughout the theory as an indirect consequence since co-living's reduction of installation-heavy areas lowers both construction costs and rents, making affordability an emergent benefit of the spatial and environmental choices made.

REFERENCE PROJECTS

Five reference projects have been examined in this thesis: *Gibraltar*, the building neighboring the case study building; *Skrapan*, a transformation project in Stockholm; *Bikuben Kollegiet*, a co-living complex in Copenhagen; *CASEUS*, a newly built co-living cluster in Gothenburg; and *Språkskrapan*, a recently transformed building accommodating a range of housing typologies in Gothenburg. These reference projects represent a spectrum of approaches to student and co-living housing, from large-scale adaptive reuse with mixed programs to purpose-built co-living developments, and together they highlight several recurring aspects relevant to this thesis: between transformation strategy and spatial quality, between shared ambitions and individual privacy, and between design intention and lived experience.

TRANSFORMATION STRATEGY

Three of the five projects involve the conversion of existing buildings, each navigating the relationship between the original structure and the new residential program in different ways. In *Skrapan*, the load-bearing concrete structure was retained while most non-structural elements were rebuilt (personal communication, B. Ericson). The transformation resulted in a large mixed-use building in central Stockholm (Ahrbom & Partner, n.d.) The scale of the intervention allowed for considerable programmatic flexibility, but the building's existing logic set clear limits on what was spatially possible. *Gibraltar*, also an adaptive reuse project but in Gothenburg, followed a similar approach where the facade expression and window rhythm were preserved, and the existing window placement directly shaped the residential layout (personal communication, T. Jaxing). At the same time, the intervention was substantial: the interior was largely cleared and rebuilt to accommodate one-room studios and larger corner apartments, and additional floors were added to the existing building

volume. *Språkskrapan* represents a more restrained approach where the transformation reused existing building elements such as windowsills, doors, and lighting fixtures, treating the original fabric as a material resource rather than simply a structural framework (Akademiska Hus. n.d.a)

SHARED SPACE AND CO-LIVING

Across several of the reference projects, shared spaces emerge as both the greatest design opportunity and the most challenging aspect to realize in practice. In *Skrapan*, shared spaces were provided on every floor and in the basement, but these spaces are currently closed or underused (Ahrbom & Partner, 2025), a pattern that may reflect the difficulty of sustaining collective responsibility across a large amount of households. *Språkskrapan* reveal a similar dynamic at a smaller scale: shared spaces were generally valued for the social interaction they enabled, and many residents appreciated the opportunity to meet fellow students, particularly international ones (Akademiska Hus, n.d.b). However, recurring issues around cleaning, unclear responsibilities, and communication created friction, and residents noted that maintaining a consistent sense of community required common activities and clear structures for collective responsibility.

Bikuben Kollegiet shows that the challenge lies not simply in providing shared spaces, but in how they are used and connected to daily life. Informal meeting points distributed throughout the building saw limited use, and a living room separated from the shared kitchen was largely bypassed in favor of the kitchen itself (AART Architects, 2019). A smaller lounge was well received and preferred over a dedicated party room at ground level, which felt too exposed to outsiders. The inclusion of small kitchenettes in private rooms, intended to give residents flexibility, had the unintended consequence of reducing participation in shared cooking

and dining, suggesting that optional sharing can quietly become no sharing at all.

The success of shared living depends less on the design itself than on the motivations of the people who inhabit it. Colive CASEUS in Gothenburg operates on the premise that its residents have actively chosen collective living as a preferred lifestyle, not as a compromise. Private rooms are compact, providing space for sleeping, storage, and personal hygiene, while cooking, socialising, and daily life are oriented toward shared spaces (Colive, n.d.). This model functions because it attracts residents with aligned expectations. Suggest that when those expectations diverge, between those who sought out shared living for its social qualities and those who saw it as their only option, willingness to engage in the everyday compromises that co-living requires tends to follow (Akademiska Hus, n.d.b). For a broader student population, a housing model that assumes aligned values risks feeling constraining rather than enabling. Further suggestions is that sharing a bathroom with one other person was generally manageable in Språkskrapan, but not preferable, particularly when living with someone previously unknown, where differing standards of cleanliness easily became a source of tension.

These observations point toward a consistent principle: shared spaces function best when the group sharing them is small enough to maintain social legibility, when ownership and responsibility are clearly defined, and when the design makes participation feel natural.

OTHER OBSERVATIONS

Språkskrapan, and partly Skrapan, demonstrate the value of offering a range of apartment types within a single building. Skrapan combines studio apartments and duo apartments, while Språkskra-

pan offers a mix of private one-room studio apartments and shared duo apartments alongside larger co-living clusters. This mix serves a practical function: different students have different needs at different stages. But it also has a social dimension: a varied program creates a more heterogeneous community, which may in itself support the kind of informal social interaction that purely homogeneous co-living buildings can struggle to generate.

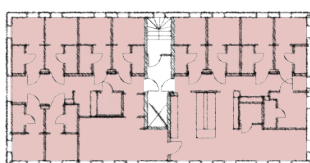
Taken together, the reference projects resist any single conclusion about what student housing should look like. There is no universal model because students differ in their needs, their willingness to share, and the life stage they find themselves in. Yet certain conditions emerge as consistently important regardless of typology or scale. Community must remain voluntary, imposed togetherness tends to produce friction rather than belonging, while making sharing entirely optional risks producing no sharing at all. Shared spaces function best when they serve a group small enough to maintain a sense of mutual familiarity and collective responsibility. Similarly, the reference projects show that transformation strategy does not determine outcome alone, what matters is not the degree of change, but the coherence of the decisions made.



REFERENCE PROJECTS	GIBRALTAR	SKRAPAN
LOCATION	Gothenburg	Stockholm
TYPE	Transformation	Transformation
ORIGINAL ARCHITECT	White Arkitekter	Paul Hedqvist
CONVERSION ARCHITECT	Sweco	Ahrbom & Partner
BUILT	1993	1959
CONVERTED	2013	2007
HOUSING UNITS*	29	24
TARGET GROUP	Students	Students (mixed use bulding)
TPOLOGY	Studio, Duo apartment	Studio, Duo apartments

**Based on one generic floor*

- STUDIO APARTMENT
- DUO APARTMENT 2 RESIDENTS
- CO-LIVING CLUSTER 5-6 RESIDENTS
- CO-LIVING CLUSTER 7 OR MORE RESIDENTS



BIKUBEN KOLLEGIET	COLIVE CASEUS	SPRÅKSKRAPAN
Copenhagen	Gothenburg	Gothenburg
New construction	New construction	Transformation
AART Architects	Liljewall Arkitekter AB	Jaan Allpere o Claes Mellin - Ragnar Uppman o Mart.
—	—	Arkitema Arkitekter
2007	2022	1966
—	—	2023
17	11	21
Students	Students and young adults	International students + PhD researchers
Co-living clusters	Co-living clusters	Studio, Duo apartments, Co-living clusters

Table 2: Floor plans and project information for Gibraltar, Bikuben, Colive CASEUS, and Språkskrapan. Information compiled from SGS Studentbostäder (n.d.); internal building permit documents provided by SGS; Ahrbom & Partner (n.d.); internal building permit documents provided by Ahrbom & Partner; AART Architects (n.d.); Colive (n.d.); and Akademiska Hus (n.d.). The floor plans for Gibraltar, Bikuben, and Colive Caseus were redrawn and simplified by the author based on original drawings and available project documentation.

USER INSIGHTS

The focus group consisted of six students from different educational programs, all belonging to the category of experienced students but with varied life situations. Some lived alone, others with a partner, with family, or in shared housing. The session was structured in two parts: the first aimed to identify spatial and social qualities that students value in housing, and the second invited participants to reflect on the reference projects presented in the previous chapter. Rather than approaching the workshop as an open exploration, it was also designed to test and refine design strategies in relation to theoretical frameworks and observations already drawn from the reference projects.

IDENTIFIED QUALITIES

The first part of the workshop asked participants to reflect on positive and negative aspects of their current or previous housing, which were then reformulated into qualities. These were divided into functional, spatial, social, and environmental qualities, and further distinguished between

explicit qualities, those directly stated by participants, and implicit qualities inferred from the problems and frustrations they described.

Functional and spatial qualities centered around efficiency, flexibility, and clearly defined zones. Participants valued storage solutions that did not occupy floor space, such as overhead cabinets, and appreciated layouts with clearly separated functional areas, particularly the separation of kitchen and living room and the ability to screen off a sleeping alcove from the main living area. A kitchen island was mentioned as a desirable feature. Underutilized areas within apartments were consistently identified as a frustration, pointing to a preference for compact but purposeful layouts over larger spaces with undefined zones.

Social qualities revealed a nuanced relationship between privacy and community. Participants expressed a clear preference for private bathroom facilities, at minimum a private toilet with more flexibility around shared shower arrangements. In co-living contexts, the presence of a small private



Figure 12: Workshop participants discuss reference projects

kitchenette alongside a larger shared kitchen was appreciated for the independence it offered. Several participants noted the value of clearly defined thresholds between private and communal spaces, allowing residents to choose their level of participation without social pressure.

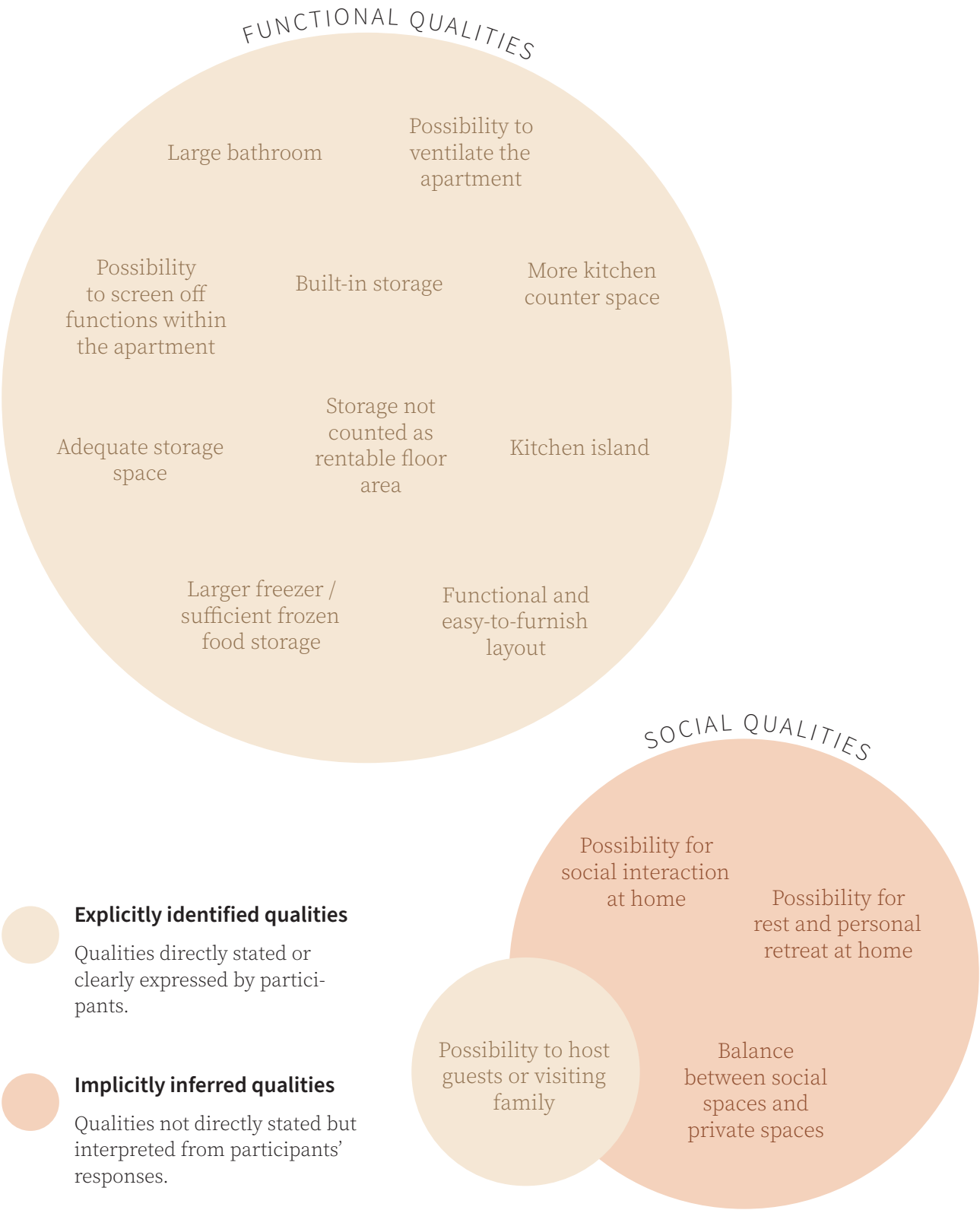
Environmental qualities included proximity to nature, good natural light, access to a balcony, courtyard or patio, and a visual connection to the outdoor environment. High perceived housing quality was the ability to cross-ventilate and modern interior finishes.

HOUSING TYPOLOGIES

The second part of the workshop invited participants to reflect on the reference projects and broadly confirmed observations already drawn from them. Shared and co-living arrangements were generally considered more suited to exchange students than to experienced students. Smaller co-living clusters were preferred over larger arrangements. Aspects that generated broad agreement included the attractiveness of balconies, the preference for private bathroom facilities, and the value of separating sleeping and social areas. Opinions diverged on whether co-living apartments should be prefurnished and on the question of personal storage adequacy — reflecting the varied life situations within the group.



Figure 13: Workshop material



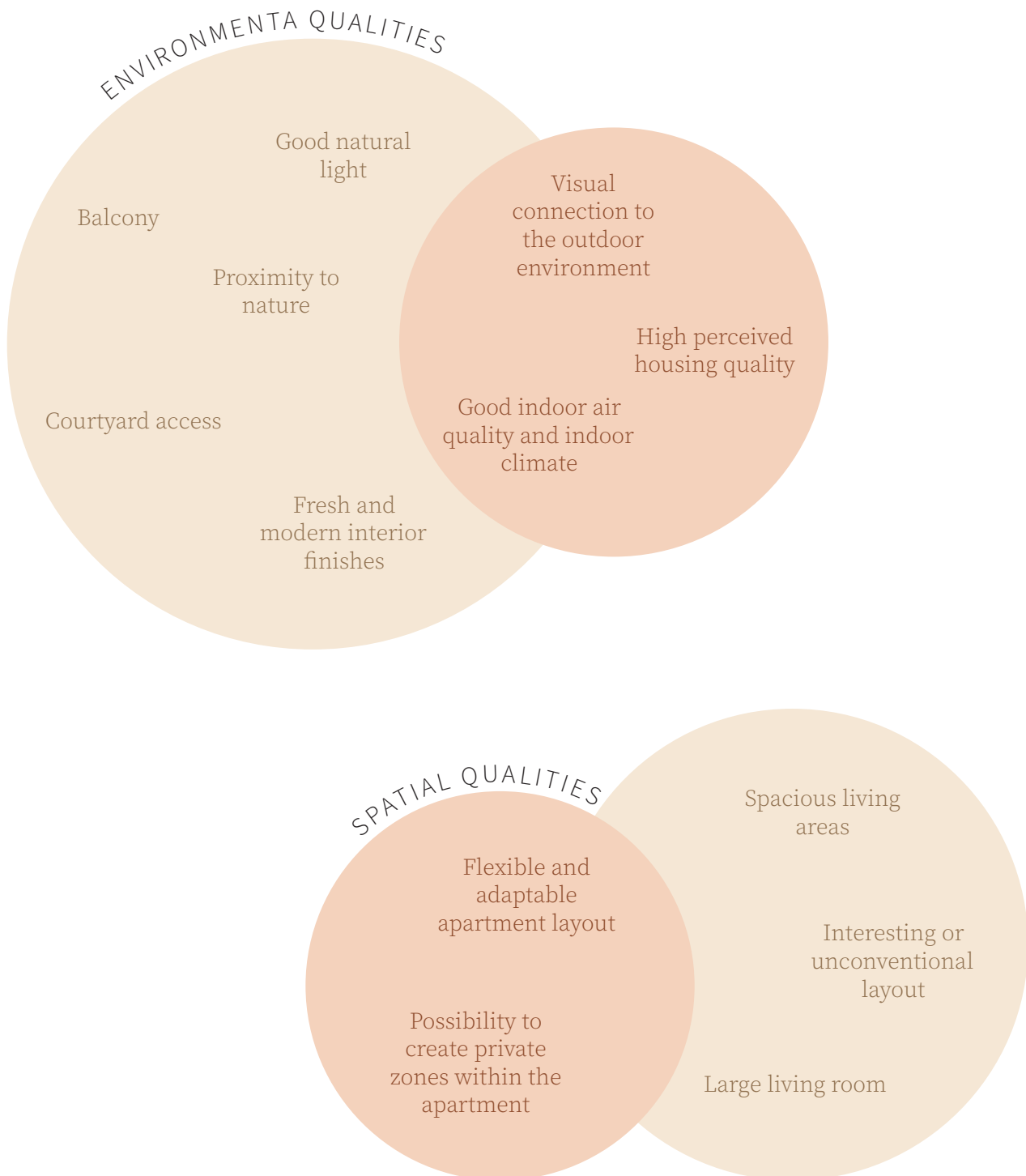


Figure 14: Visualization diagram of identified qualities from workshop

BUILDING ANALYSIS



Figure 15: Areal photo of Krokslätt. (Min karta ©Lantmäteriet 2026). CC BY 4.0

HISTORY

As shown in figure 16, the building was constructed in 1993 as *Matematiska centrum*. The building was included in the detailed plan where it could be transformed into student housing, but Eklandagatan 86 was retained as an evacuation building and only the neighboring building was transformed into student housing. The building was later renovated to serve as temporary premises of the School of Performing Arts and Music. When they move out, the building will once again be empty and there is the possibility once again of transforming it into student housing.

URBAN CONTEXT

The building, Eklandagatan 86, is located in the area of Johanneberg in Gothenburg. The site lies within walking distance to the campus of Chalmers University of Technology and is situated in an area characterized by a high level of student activity. The surrounding urban environment includes a range of service functions, such as grocery stores, opticians, gyms, sports facilities, preschools, and nature, all within close proximity. In addition, the area is well served by public transportation, providing connections to both Korsvägen and central Gothenburg within approximately ten minutes. Together with the presence of numerous existing residential buildings in the surrounding neighborhood, these conditions create favorable circumstances for the development of student housing at this location.

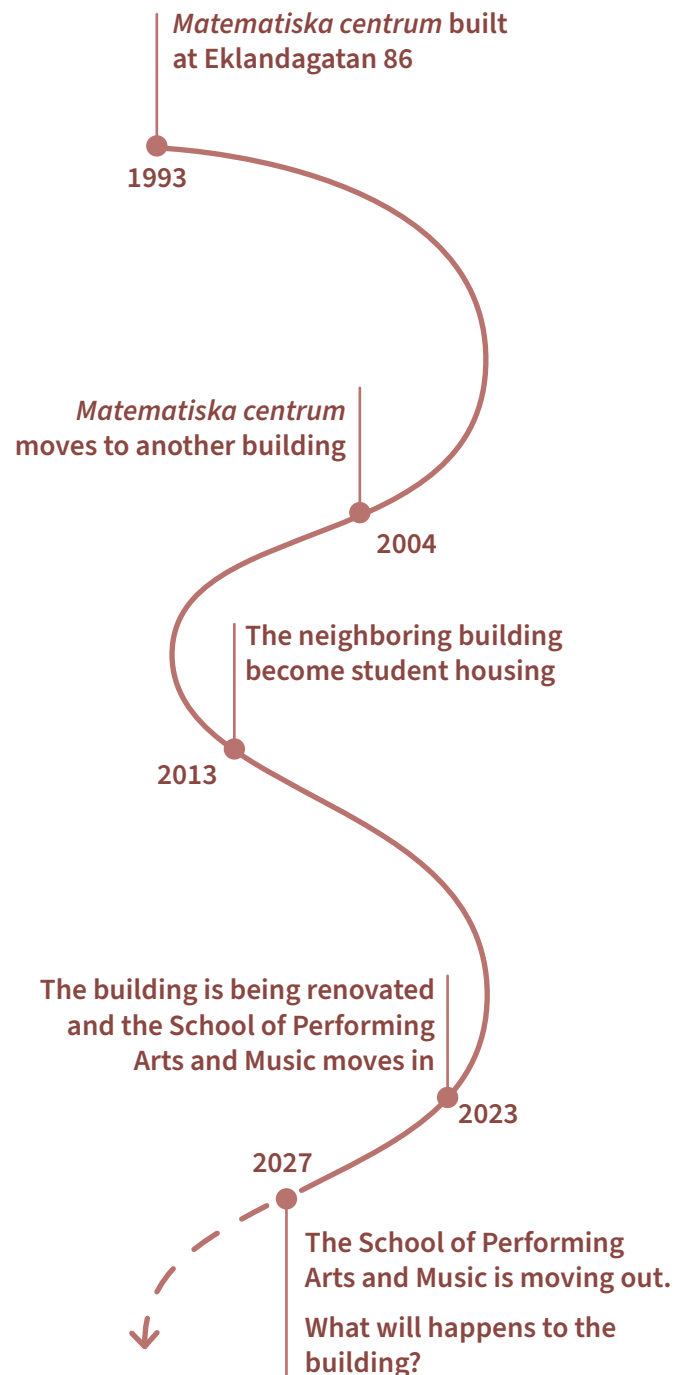


Figure 16: Timeline of the building's history. Compiled from Akademiska Hus (2024); Göteborgs universitet (2026); Göteborgs Stad, Stadsbyggnadskontoret (2008).

DETAILED DEVELOPMENT PLAN

The detailed development plan provides insight in the transformation of the site from institutional and university use to residential and mixed-use functions (Göteborgs Stad, Stadsbyggnadskontoret, 2008). The plan includes both Eklandagatan 86 and the neighboring building Gibraltargatan 25-27. Since then, Gibraltargatan 25-27 has been transformed into residential use, while Eklandagatan 86 was retained primarily to function as an evacuation facility for ongoing university operations. With this function no longer required, the transformation of the remaining building is once again reconsidered to be transformed to housing. Within this updated context, the plan explicitly allows the conversion of

the existing institutional buildings into housing, recognizing their suitability for adaptive reuse. It also permits vertical extensions of up to two additional storeys, enabling increased density while maintaining continuity with the existing built form. A key requirement in the plan is contextual integration, where new additions must align with the existing yellow brick architecture in terms of material and color. This reinforces a strategy based on adaptation rather than contrast. The plan also addresses spatial constraints related to residential conversion, particularly north-facing apartments with limited direct sunlight. To mitigate this, the inclusion of balconies, shared outdoor spaces, or sun-accessible terraces is required.



Figure 17: Eklandagatan 86, entrance from the north side, main entrance (2nd floor)



Figure 18: Eklandagatan 86, connection between street and entrance level (2nd floor)



Figure 19: Eklandagatan 86 left, Gibraltargatan 25-27 right



Figure 20: Gibraltargatan 25-27 left, Eklandagatan 86 right,

BUILDING CHARACTERISTICS

The following analysis is based on floor plan review, a site visit, consultation with the property owner.

Typology and Entrances

The building sits on a sloping site, resulting in three storeys facing the street and four storeys facing the park and courtyards. This difference in ground level creates a varied relationship between the building and its surroundings depending on orientation and is a key condition for understanding both the basement level and the potential for new entrances.

Vertical Circulation

The building has one main staircase and four fire escape stairs, all of which have potential to function as additional staircases in a residential program. There is also an additional lift without an accompanying staircase, which could similarly be developed into a new vertical circulation core. The existing main lift is small and may be insufficient if the primary flow of residents continues to be concentrated at the main entrance. However, if new additional entrances are introduced, the existing lift capacity may prove adequate.

Spatial Logic and Corridors

While the first floor is embedded into the ground with civil defense shelters on one side, the opposite side benefits from the slope, opening toward the park and south. Floors 2–4 share a consistent spatial organisation: rooms are placed along the facades, while circulation runs through a darker, more enclosed central zone. This clear organisational principle creates a rational plan, yet site observations reveal challenges in orientation. The repetition of similar layouts and the limited visual connections outward can make it difficult to dis-

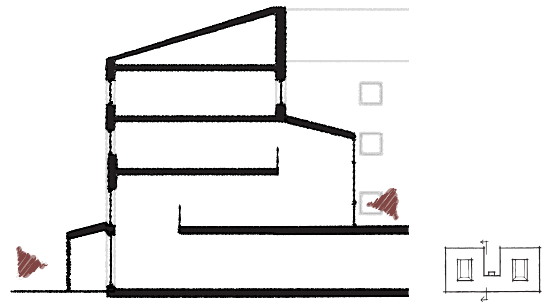


Figure 21: Section showing entrances.



Figure 22: Floor plan showing vertical communication. Akademiska hus. Modified by the author, published with permission.



Figure 23: Floor plan showing horizontal communication. Akademiska hus. Modified by the author, published with permission.

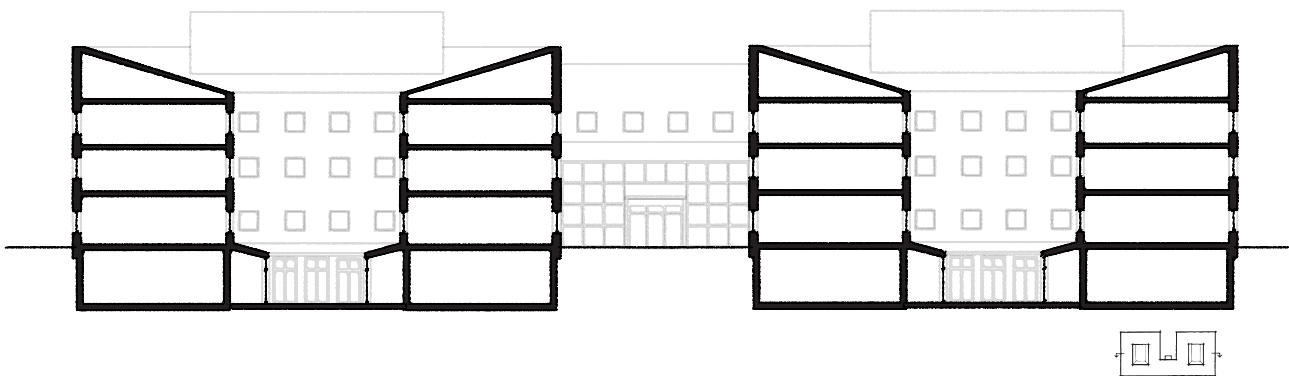


Figure 24: Section through the building showing the courtyards. Göteborgs Stad, Stadsbyggnadskontoret. (2008). Modified by the author

tinguish one part of the building from another. Strengthening legibility can therefore be important in the transformation, potentially through differentiated zones, new openings, or stronger spatial directions.

Courtyards

The courtyards function as key organising elements, structuring the building's spatial logic while bringing light into the deeper parts of the plan. They also act as reference points that help guide movement through the building. However, their relatively small scale introduces certain limitations. If apartments are facing the courtyards they are likely to experience overlooking issues, which is not a problem if the building serves a public function, but when converting it into residential use this is something that should be considered. Balancing the courtyards' role as light sources and orientation devices with issues of privacy will be an important aspect of the design.



Figure 25: Floor plan showing courtyards. Akademiska hus. Modified by the author, published with permission.

Structure

The load-bearing structure consists of prefabricated concrete elements in the facade and cast-in-place concrete slab in the basement, with hollow-core slabs on the remaining floors. This structural logic is relevant for the transformation, as new wet rooms cannot be routed through the basement's civil defense shelters. Pipe runs must instead be directed horizontally through the floor to the corridor zone, which influences where new bathrooms can be placed.

Civil Defense Shelters

Floor 1, the basement level, is largely occupied by civil defense shelters. Because these must remain functional as shelters, their contents need to be cleared within 48 hours, making them suitable for uses that do not require permanent fixtures, such as storage room, bicycle storage, club room or community activities such as billiard or ping pong. The basement's connection to the courtyards presents an opportunity to link indoor and outdoor shared functions at this level.

Solar Study

The south and west facing facades receive the most direct sunlight and offer the best conditions for residential use across all floors. The lower levels of the courtyards, the northern facade receive very little direct sun, as do the east part of the building due to the neighboring building. There is a risk of glare along the south facade, particularly on the second floor where windows are bigger, which is worth considering in the layout of rooms. These findings suggest that areas with limited daylight, particularly the lower courtyard levels, are better suited to shared functions with lower daylight requirements.

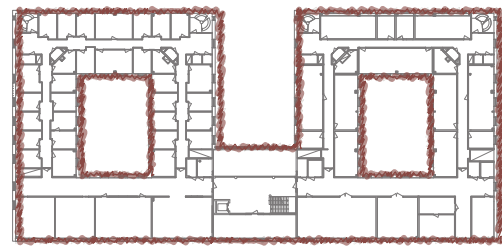


Figure 26: Floor plan showing load-bearing structures. Akademiska hus. Modified by the author, published with permission.

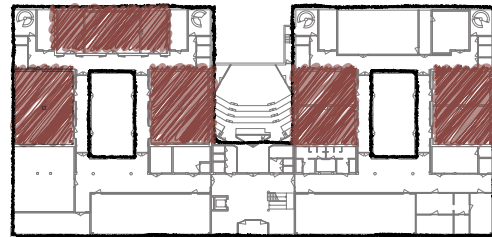


Figure 27: Floor plan showing civil defense shelters. Akademiska hus. Modified by the author, published with permission.

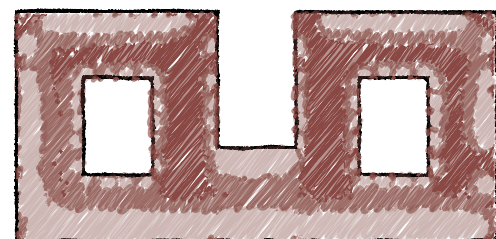
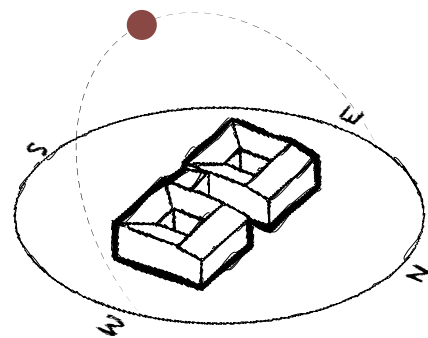


Figure 28-29: Solar Study. Made with Grasshopper with the Honeybee plugin.

Attic and Ventilation

The building's existing structure and the detailed development plan both permit vertical extensions of up to two additional storeys. This presents an opportunity to increase the total residential area while also motivating the introduction of new entrance points with dedicated lift access. Right now, the ventilation space is in the attic, but the need for ventilation will decrease when the building changes function from public to residential, which means that the ventilation system will take up less space, which also motivates using the attic for something else, such as increased number of apartments.

Floor Heights

The building's floor heights vary across storeys, with the basement at 3.50 metres, floor 2 at 3.19 metres, and floors 3-4 at 2.74 metres. All floors currently have suspended ceilings to accommodate technical installations, reducing the perceived height throughout. The courtyards sit at the same level as floor 1 (see figure 24), reinforcing the potential for an active indoor-outdoor relationship at basement level. The generous height on floor 1 also opens up the possibility of introducing a small loft in selected units.

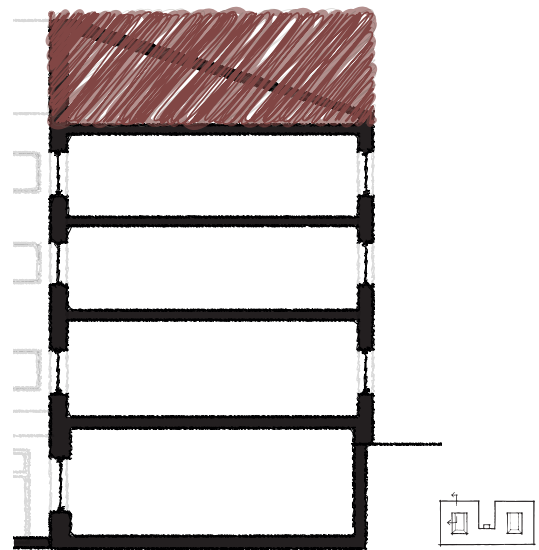


Figure 30: Schematic showing how another storey can be added to the current attic floor. Göteborgs Stad, Stadsbyggnadskontoret. (2008). Modified by the author.

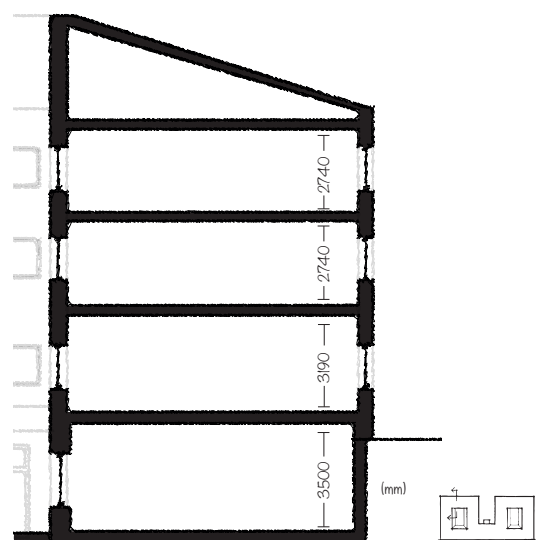


Figure 31: Storey heights. Göteborgs Stad, Stadsbyggnadskontoret. (2008). Modified by the author.

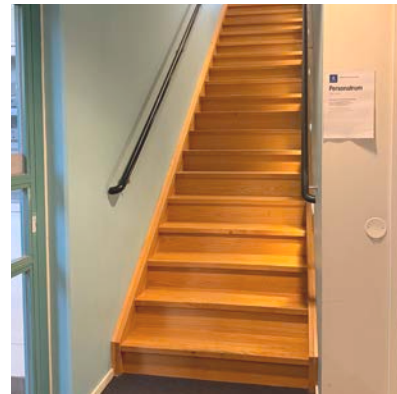
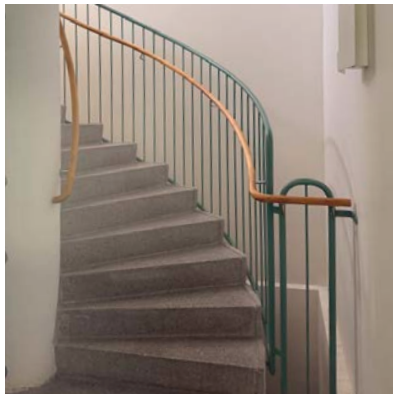
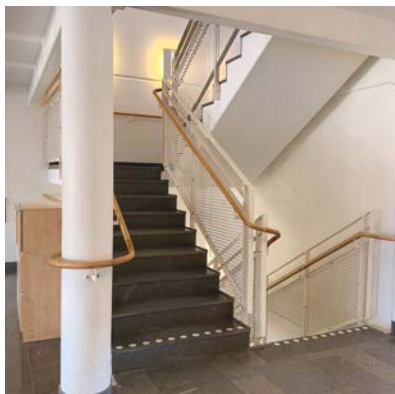


Figure 32-34: Left: main staircase in the entrance. Middle: Escape staircase. Right: Internal communication between floors 2-3.

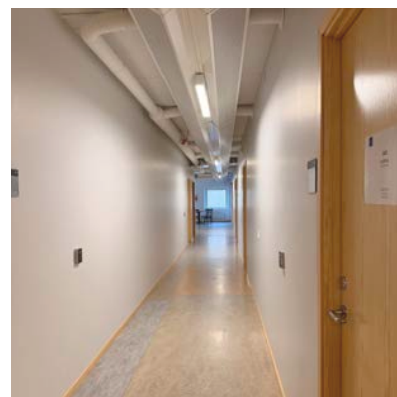
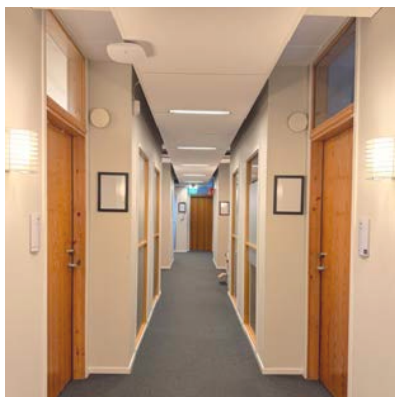


Figure 35-37: Left: Corridor original design Middle: Wider corridor. Left: New corridor

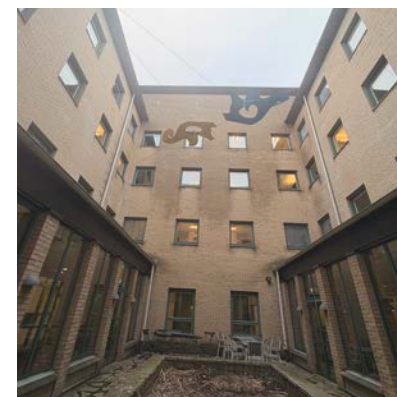
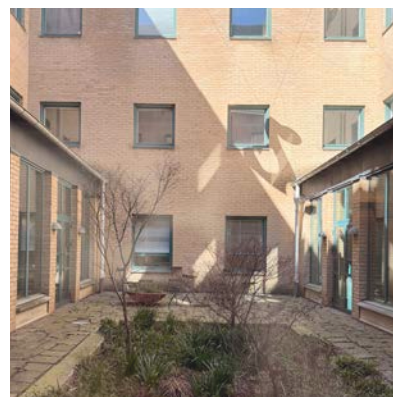
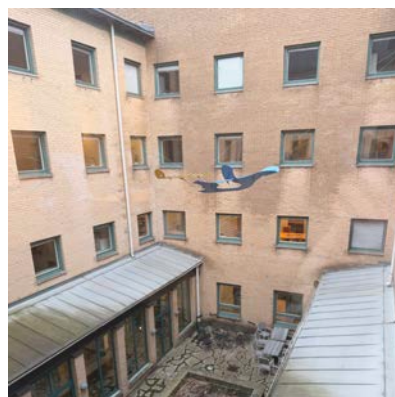


Figure 38-40: Courtyard



Figure 41-43: Left: Civil defence shelter door Middle and right: different usage inside the civil defence shelters

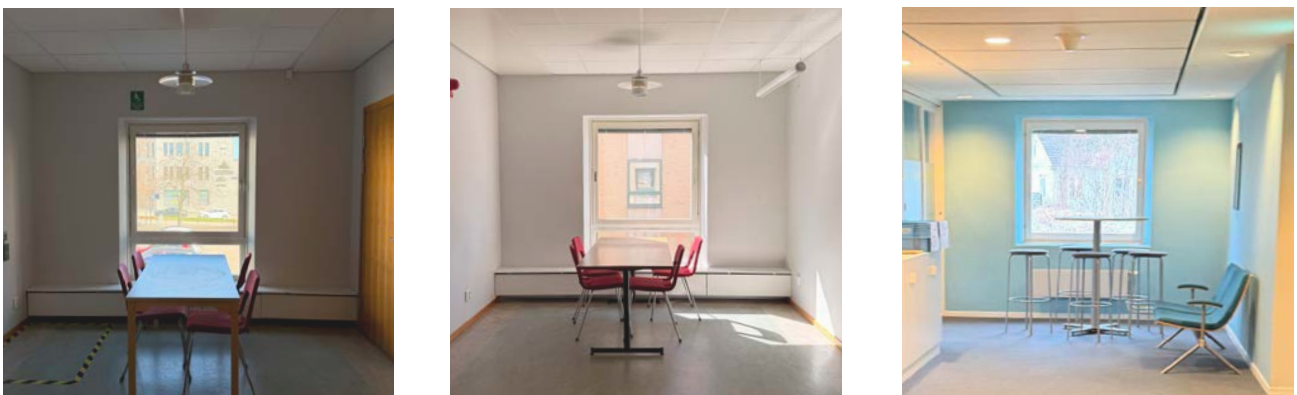


Figure 44-46: Standard Windows from various places in the building

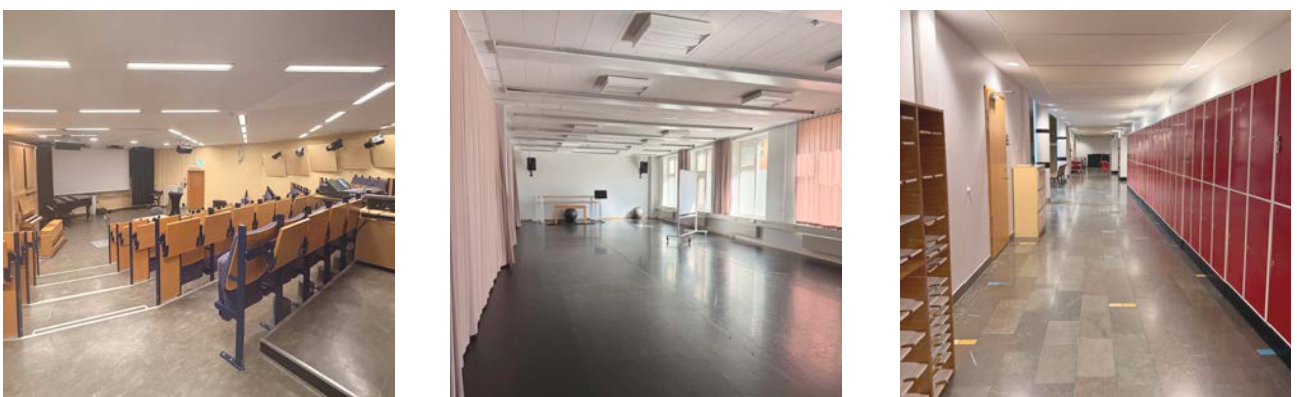


Figure 47-49: Left: lecture hall Middle: dance hall Right: Corridor, floor 1

3

CHAPTER THREE

*DESIGN &
EVALUATION*

DESIGN PRINCIPLES

The design principles *environmental context (EC)*, *spatial quality (SQ)*, *social and shared living (SSL)*, and *transformation within the existing (TWE)* presented in this chapter are grounded in the conclusions from the theoretical framework chapter. Rather than functioning as absolute requirements, the principles serve as an evaluative framework and a set of ambitions against which the different prototypes can be tested and compared. The design principles are explained in more detail on the next pages.

The principles are organized into two distinct categories that reflect the dual ambition of the thesis and are visualized in figure 50, the concept diagram. The first category (displayed in orange as the inner line) represents key aspects students value in student housing in terms of environmental, spatial, and social qualities. The second category (displayed in green as the outer line) defines the degree to which the existing building should be retained during transformation.



Figure 50: Concept diagram



Figure 51: Design Principles diagram



TRANSFORMATION WITHIN THE EXISTING

Selective Intervention: Avoid removing existing elements solely to introduce new ones. Existing structures should either remain and be complemented through additions, or be transformed only when this creates clearly improved qualities.

Vertical Continuity: Reuse existing shafts, staircases, and lifts where possible; new vertical elements should be motivated by clear spatial or functional improvement.

Structural Constraints: Routing new shafts or vertical penetrations through the basement civil defence rooms requires greater intervention; placing these elements elsewhere in the plan is therefore preferred.



SOCIAL AND SHARED LIVING

Sense of Belonging: Design shared living at a scale where residents feel familiarity and responsibility.

Spatial Thresholds: Design clear thresholds between private, semi-private, and shared zones.

Private Hygiene: Provide each resident with access to bathroom which is shared with as few other people as possible.



ENVIRONMENTAL CONTEXT

Daylight Distribution: Adapt unit size to solar orientation by placing smaller units where daylight access is greatest and larger units where it is more limited.

Indoor Climate: Enable natural ventilation and separate cooking areas from sleeping space to limit cooking smells and maintain air quality.

Spatial Legibility: Avoid long, enclosed corridors and create visual reference points outward, to increase spatial readability and nature connection



SPATIAL QUALITY

Functional Zoning: Ensure that functional areas – sleeping, cooking, and social space – do not overlap or interfere with one another.

Flexible Layout: Prioritize flexibility through open floor areas and wall-mounted storage that does not consume floor space.

Unit Mix: Offer a mix of unit types to accommodate students at different life stages and with different needs and preferences

EVALUATION

The rest of this chapter presents seven design prototypes for the transformation of Eklandagatan 86 into student housing, each testing different spatial strategies in relation to the existing building. The prototypes are evaluated against the design principles outlined in the previous chapter and scored 1–4 on each sub-principle, where 1 indicates that the principle is poorly met and 4 that it is well met. The scores are intended as a comparative tool rather than absolute judgements. The prototypes are developed from a generic floor plan based on floors 2–4, which have a ceiling height of 2.74 m, and would require minor adjustments per floor to be fully realized.

The evaluation is primarily based on the overall floor plan layout, but may vary between different apartments within the proposed plan. When different apartments meet different requirements, it is measured either based on the type that is in the significant majority, or as an average if they represent an equal part of the plan.

REGULATIONS

All prototypes meet the accessibility requirement of a minimum 20% fully accessible units. Though the strategies differ and relevant limitations are noted where relevant.

Co-living clusters may consist of a maximum of six dwelling units within a single fire compartment, including shared spaces. Larger clusters therefore need to be subdivided into separate fire compartments, which has significant spatial and economic implications. This regulation has directly influenced the cluster sizes and spatial organization of the co-living prototypes and is noted where relevant.

FOCUS GROUP

For the final evaluation, the focus group reconvened to express their thoughts on the different prototypes and versions of solutions. Their feedback is summarized under each prototype where relevant.

RESULT AND VISUALIZATION

The results are visualized through a radar diagram for each prototype corresponding to the design principle diagram (figure 51) and summarized in a table at the end of this chapter.

EXPLORATION

The design exploration is structured through a series of seven main prototypes, each representing a distinct strategy for transforming the existing building into student housing.

Several prototypes are further developed through sub-prototypes (e.g. 3.1–3.2 and 4.1–4.4). These should not be understood as separate design proposals, but as alternative variations within the same overall strategy. The sub-prototypes primarily explore different degrees of preservation, bathroom configurations, and spatial organization while maintaining the same underlying concept.

In addition, selected prototypes are examined through alternative furnishing layouts and spatial sections. These studies are not evaluated as separate proposals, but serve to investigate flexibility, room usability, and spatial quality in greater depth.

The purpose of this structure is therefore twofold: first, to compare fundamentally different transformation strategies through the main prototypes, and second, to investigate critical design questions in greater detail through targeted variations and spatial studies.

Prototypes 3 and 4 were selected for further development as they represent the two most distinct co-living strategies and revealed unresolved spatial questions during the initial evaluation.

PROTOTYPE	MAIN IDEA
1	Studio apartments
2	Studios with corner duo units
3	Co-living with minimal intervention
4	Co-living prioritizing residential quality
5	Mixed typology with large clusters
6	Mixed typology with smaller clusters
7	Mixed typology with minimized intervention

PROTOTYPE 1: STUDIO APARTMENT

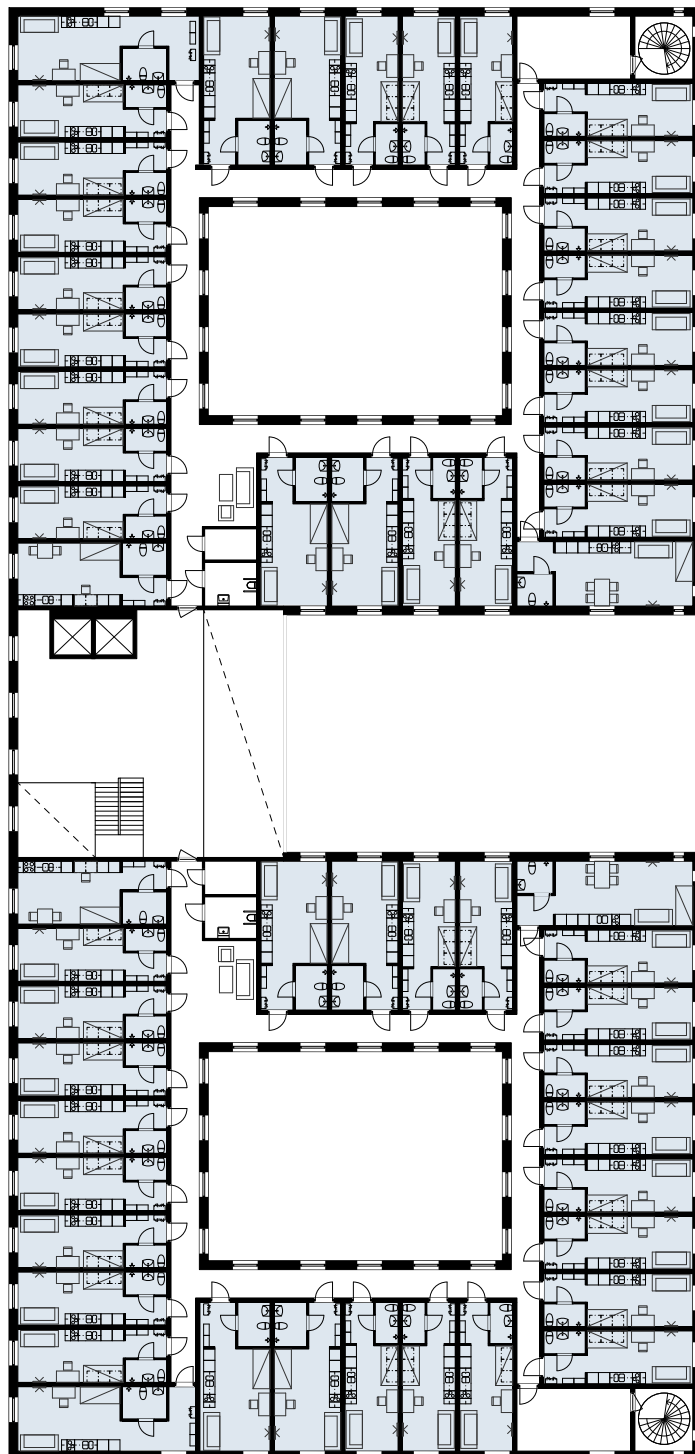
The studio apartment is in some sense the most expected outcome to this kind of transformation, as it is what has been done to the neighboring building. With a rational grid of single units organized around the courtyard it creates a visual connection. The unit dimensions are slightly narrower and deeper than standard, adjusted to align with the existing window rhythm. This is a constraint that is technically allowed under new accessibility requirements. Of all the prototypes, prototype 1 has the greatest impact on the interior structure, as it does not attempt to follow the existing spatial logic and instead introduces an entirely new layout from scratch.

The units are approximately 22 sqm and, for the purposes of this prototype, based on a floor-to-ceiling height of 2.7 m, it does allow for full-height cabinetry which is something the unit, given its limited floor area, should take active advantage of to compensate for the lack of storage elsewhere in the plan.

The consequences of the narrow unit size are most apparent in the relationship between hall, kitchen, and social space. Because the hall is too narrow to accommodate storage, the kitchen is pushed toward the window, which leaves little room for a flexible zone at the window end. The unit offers limited zoning but performs well on clarity: what



Figure 52: Radar diagram prototype 1



RESIDENTS/FLOOR: 56
FLOOR AREA EFFICIENCY: 70%
APARTMENT SIZE: 22 SQM

SCORE

EC: 6
SQ: 5
SSL: 11
TWE: 5
TOTAL SCORE: 27

- STUDIO APARTMENT
- DUO APARTMENT 2 RESIDENTS
- CO-LIVING CLUSTER 3-4 RESIDENTS
- CO-LIVING CLUSTER 5-6 RESIDENTS
- CO-LIVING CLUSTER 7 OR MORE RESIDENTS

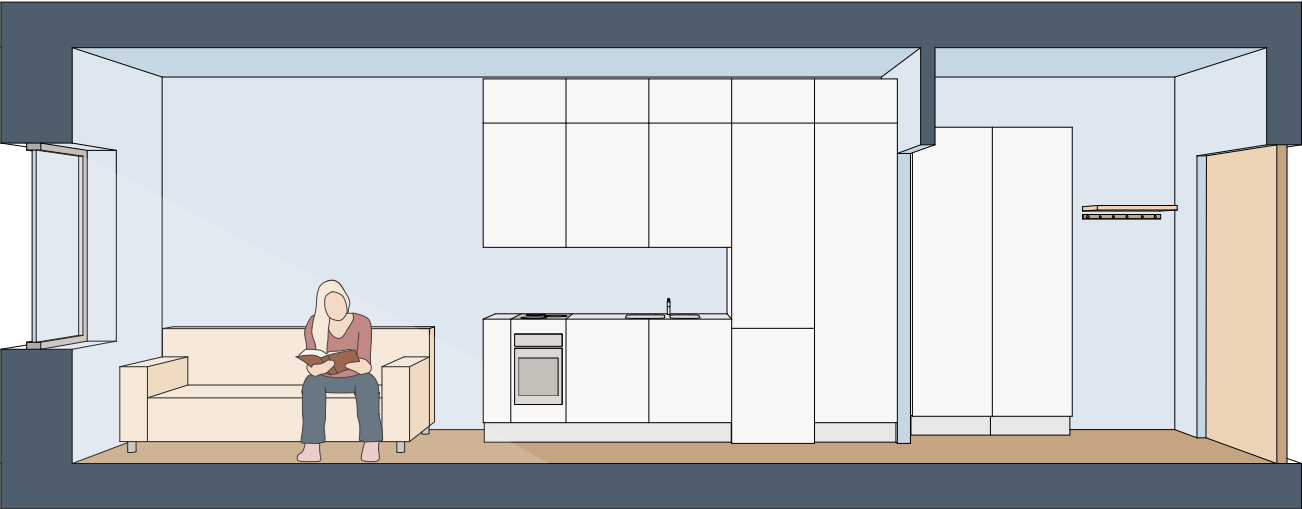
1:400

0 5 20 M

Figure 53: Plan prototype 1

is private is entirely private, and shared functions are confined to the stairwell and communication including a small lounge near the public WC. This sharpness of boundary is a strength, but it also risks replicating the dynamic observed at Skrapan, where shared spaces went unused precisely because they lacked a sense of belonging to any particular group

The units are served by a single window on one facade, which given the narrow and deep plan geometry results in limited daylight penetration toward the rear of the unit. South-facing units risk overheating, while north-facing units and those on lower floors, particularly where shaded by the courtyard and surrounding buildings, may receive insufficient natural light.



A-A

Figure 54: Studio apartment section

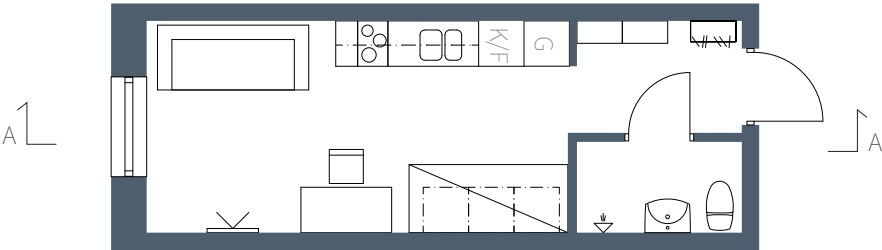


Figure 55: Studio apartment floor plan



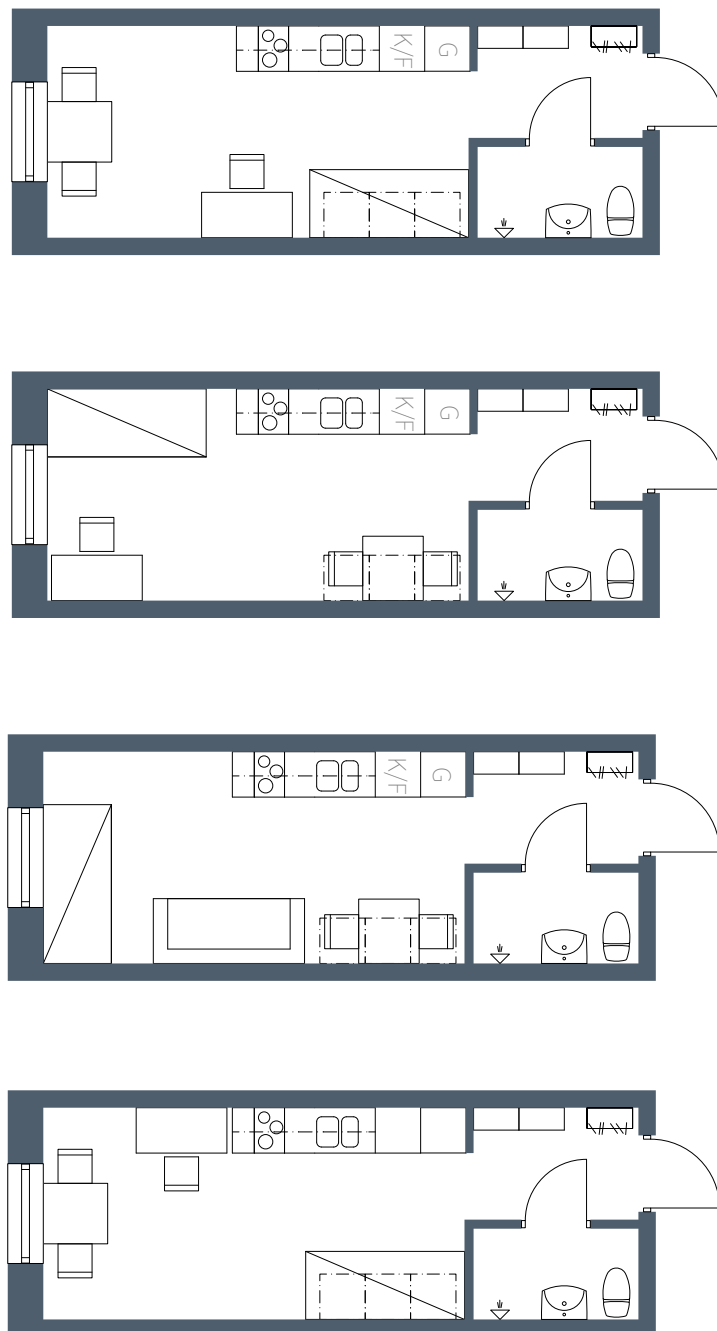


Figure 56-59: Studio apartment floor plan, alternative furnishing.

1:100 0 1 5 M

**PROTOTYPE 2: STUDIO APARTMENT
WITH CORNER DUO UNITS**

Prototype 2 builds directly on prototype 1, introducing duo units in the corners with minimal additional intervention. The adjustment is small but meaningful since it creates a more varied unit mix without altering the structural approach, and the corner units can accommodate either two friends or a couple. The social logic remains the same as in prototype 1, private-focused with limited shared space, but the mix begins to reflect the range of students the building might attract.

Each private room is 11 sqm, with a shared area of 38 sqm, giving each resident access to a total of 41 sqm. The shared area also includes dedicated storage, complementing the limited storage

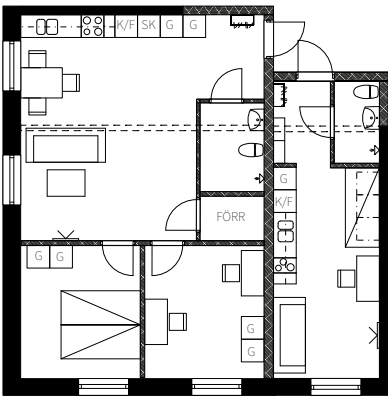


Figure 60: Duo apartment and studioapartment

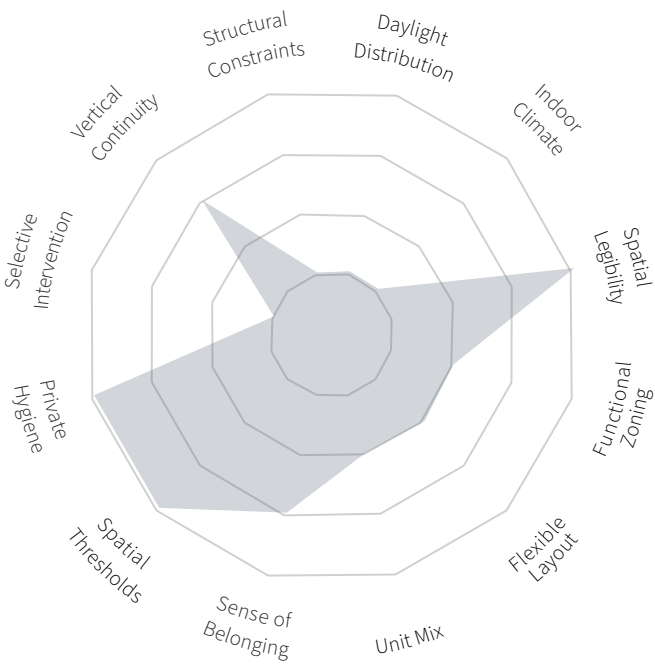
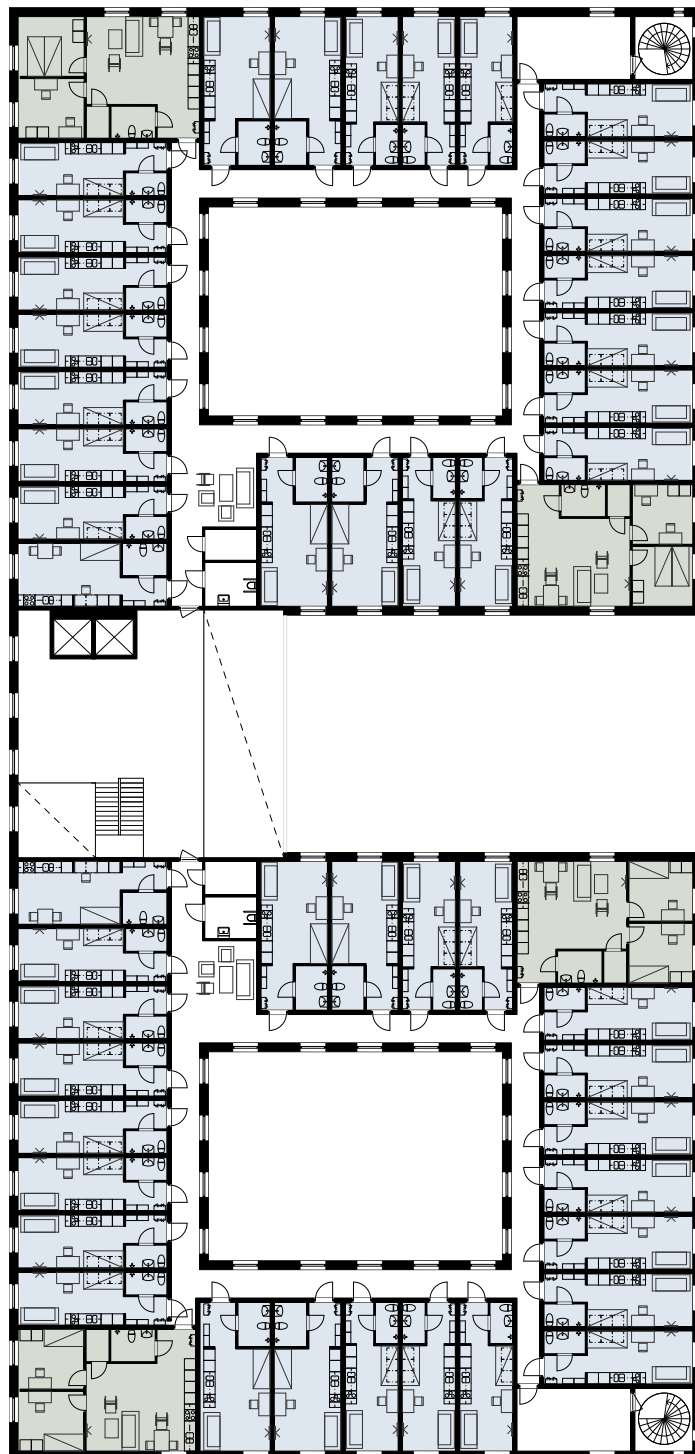


Figure 61: Radar diagram prototype 2



RESIDENTS/FLOOR: 56
 FLOOR AREA EFFICIENCY: 71%
 APARTMENT SIZE: 22-60 SQM

SCORE

EC: 6
 SQ: 6
 SSL: 11
 TWE: 5
 TOTAL SCORE: 28

- STUDIO APARTMENT
- DUO APARTMENT 2 RESIDENTS
- CO-LIVING CLUSTER 3-4 RESIDENTS
- CO-LIVING CLUSTER 5-6 RESIDENTS
- CO-LIVING CLUSTER 7 OR MORE RESIDENTS

1:400

0 5 20 M

Figure 62: Plan prototype 2



B-B

Figure 63: Duo apartment section

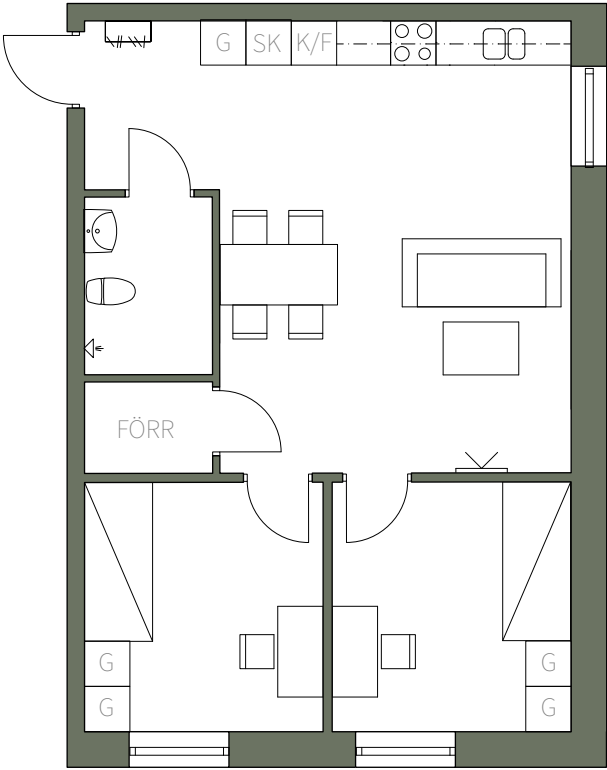


Figure 64: Duo apartment floor plan



capacity of the individual rooms. Each private room is served by its own window; since the same window area now lights a smaller floor area than in the studio units, daylight conditions within the private rooms are proportionally better. The shared spaces are served by one to two windows depending on position in the building. However, some corner positions have limited existing window openings, and achieving adequate daylight in the shared area may require enlarging or introducing new facade openings.

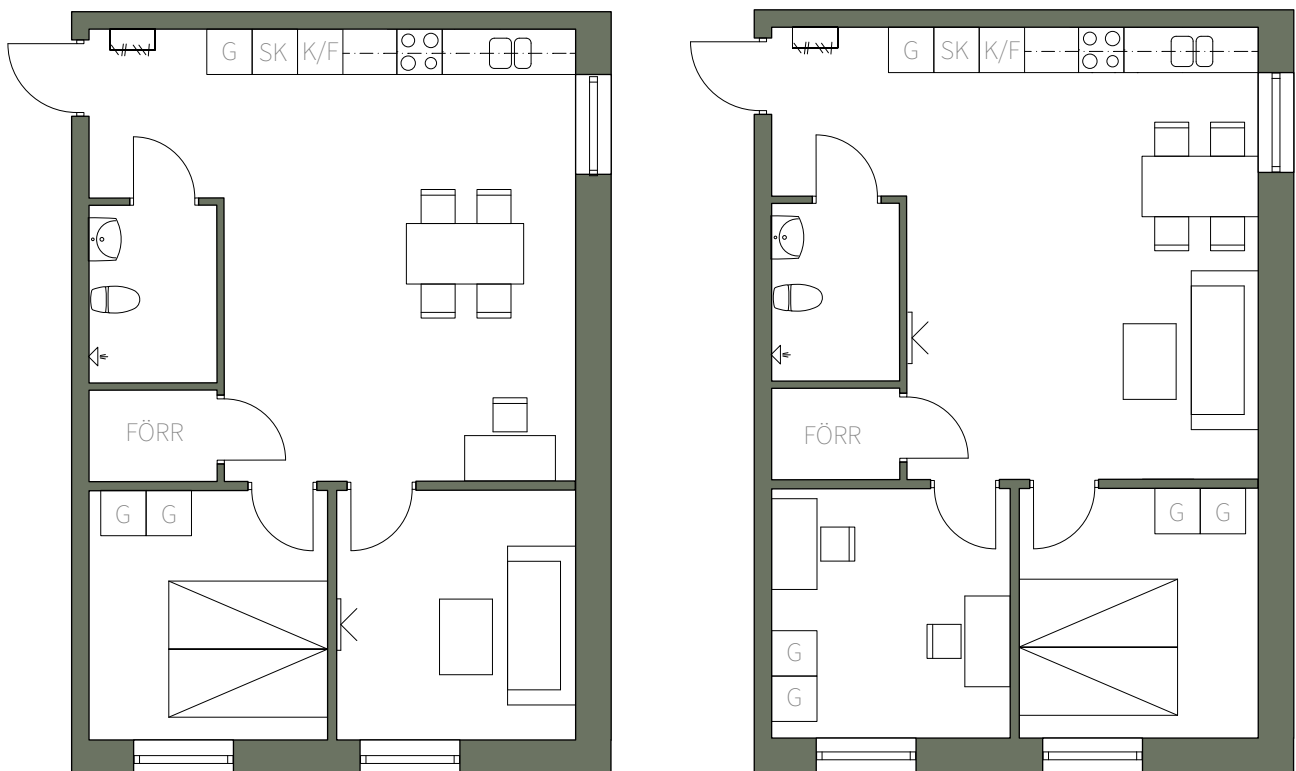


Figure 65-66: Duo apartment floor plan alternative furnishing.

1:100 0 1 5 M

PROTOTYPE 3: CO-LIVING WITH MINIMAL INTERVENTION

Of all the prototypes, prototype 3 makes the strongest argument for working within the existing building. Bathrooms are retained or relocated only to existing shaft positions and kitchens have been concentrated to a limited extent without restricting the function of a shared kitchen. The vertical circulation is supplemented by externally added staircases and lifts rather than carved out from within to avoid demolition purely for the sake of new construction. The result is a prototype that scores well on preservation with a big focus on shared functions. From what might have been 49 individual kitchen installations and bathrooms,

to 12 shared kitchen zones and 12 bathrooms zones. But this with significant consequences on the social aspects.

Each private room is 11 sqm, with a shared area of 145 sqm, giving each resident access to a total of 153 sqm. Since the bathrooms are located outside the private room, the room itself gains considerable flexibility were the floor area can be arranged freely because of the wall-hung overhead cabinets. The shared spaces face the courtyard, which means any activity there engages the social areas rather than the private rooms, a quality that supports both community and privacy simultaneously. The private rooms face outward, reinforcing their character as quieter, more personal spaces.

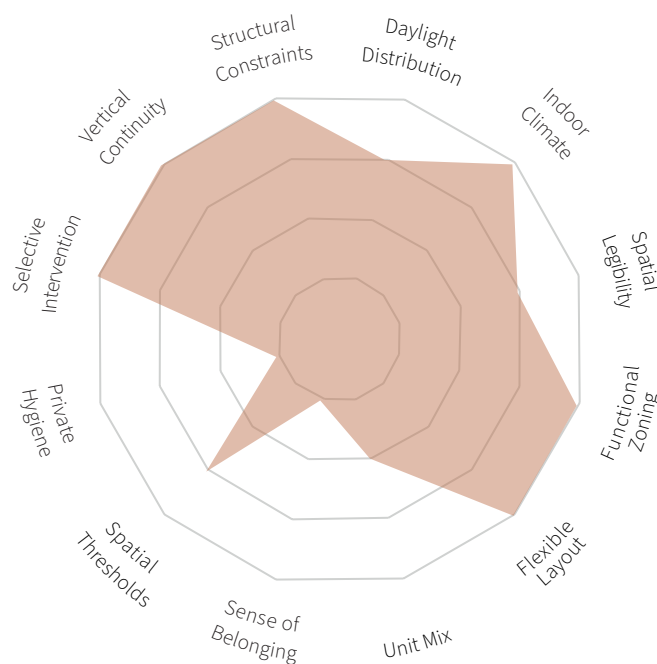


Figure 57: Radar diagram prototype 3.1



Figure 68: Plan prototype 3

RESIDENTS/FLOOR: 49
 FLOOR AREA EFFICIENCY: 83%
 CO-LIVING CLUSTER: 5-8 RESIDENT
 APARTMENT SIZE: 160-275 SQM

SCORE

EC: 10
 SQ: 10
 SSL: 6
 TWE: 12
 TOTAL SCORE: 38

- STUDIO APARTMENT
- DUO APARTMENT 2 RESIDENTS
- CO-LIVING CLUSTER 3-4 RESIDENTS
- CO-LIVING CLUSTER 5-6 RESIDENTS
- CO-LIVING CLUSTER 7 OR MORE RESIDENTS

1:400
 0 5 20 M

The north-facing clusters benefit from daylight on two sides with visual connections between them, creating a brighter and more spatially generous social zone. The south-facing clusters, however, receive daylight only from the north, facing the courtyard, leaving the shared area darker and less inviting. Meanwhile, the private rooms in these clusters face south, where they risk overheating. This creates an imbalance where the social spaces are dim and the private rooms potentially too warm. Reversing the arrangement would have solved the light quality issue, but the fewer windows on the north facade would not have provided sufficient openings for the required number of private rooms.

The clusters are large – larger than research suggests is ideal for shared living – and must be divided into two fire compartments, (a division made visible in the floor plan as a thickened wall running through the shared space). The bathroom-to-resident ratio of one per three people sits at the recommended maximum, but over the threshold where comfort begins to break down. The prototype thus reveals a fundamental tension: the most structurally respectful approach produces the least socially optimal conditions. Which aspect weighs the most depends on how much importance is placed on the building versus the quality of life within it.

The selected apartment shown in prototypes 3.1 and 3.2 is almost identical, but with a difference in the renovation of the bathroom. A change that can be considered both essential for better spatiality, or unnecessary for the little it does.

PROTOTYPE 3.1

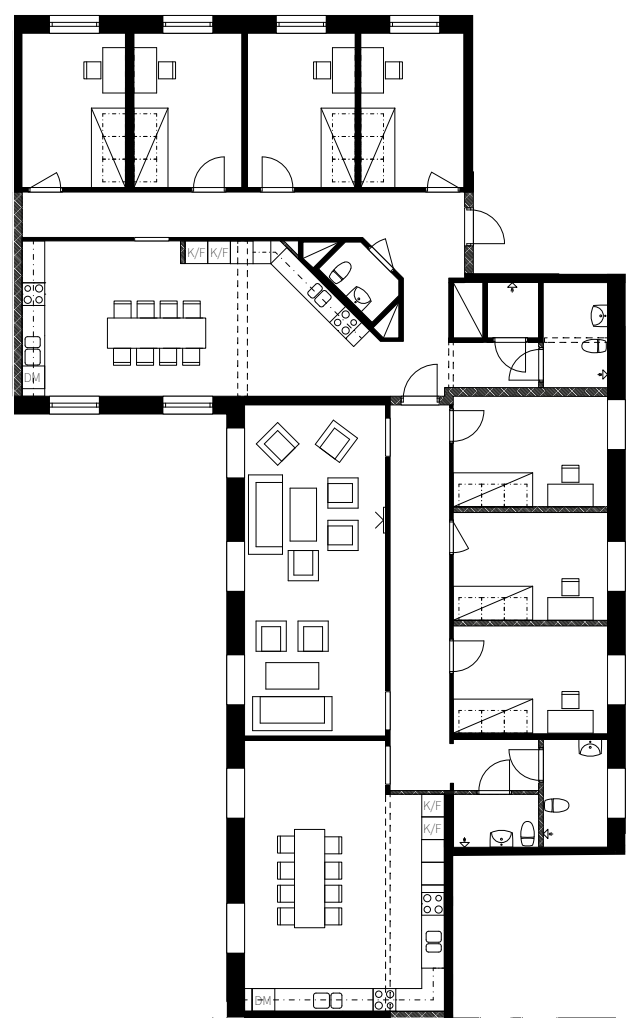


Figure 69: Plan prototype 3.1

- EXISTING WALLS
- NEW WALLS
- WALLS TO BE REMOVED

PROTOTYPE 3.2

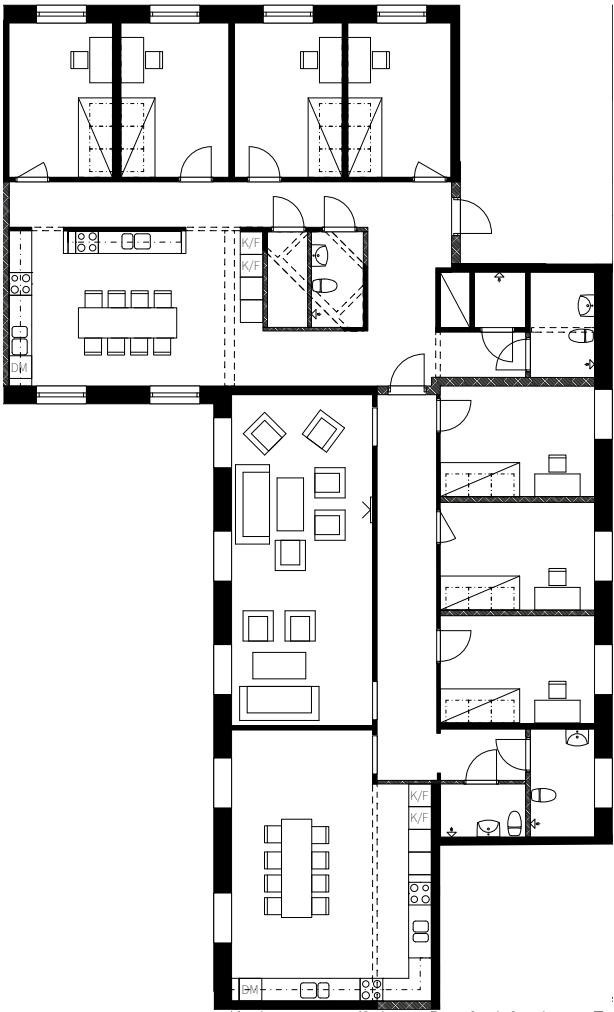


Figure 70: Plan prototype 3.2

SCORE
EC: 10
SQ: 10
SSL: 6
TWE: 11
TOTAL SCORE: 37

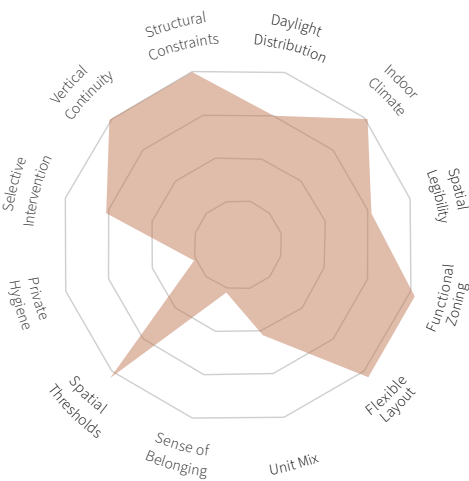


Figure 71: Radar diagram prototype 3.2

PROTOTYPE 4: CO-LIVING PRIORITIZING RESIDENTIAL QUALITY

Prototype 4 addresses the social shortcomings of Prototype 3 by bringing bathrooms closer to the individual and limiting the amount of people sharing an apartment to 4-5 people. Compared to Prototype 3, this prototype represents a shift in priority and accepts greater structural impact in exchange for more clearly defined and livable shared clusters. The scale of co-living clusters and their placement can however be questionable, as some are smaller with fewer windows and others significantly larger – making a significant difference between different shared co-living clusters.

PROTOTYPE 4.1

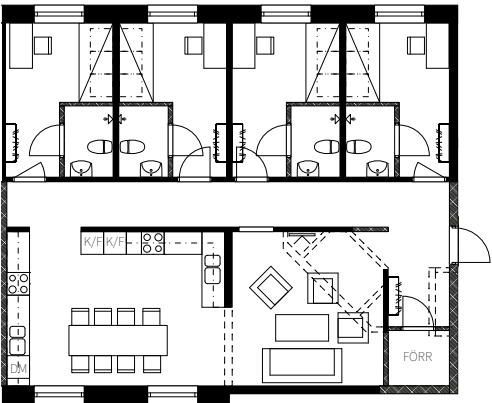


Figure 72: Plan prototype 4.1

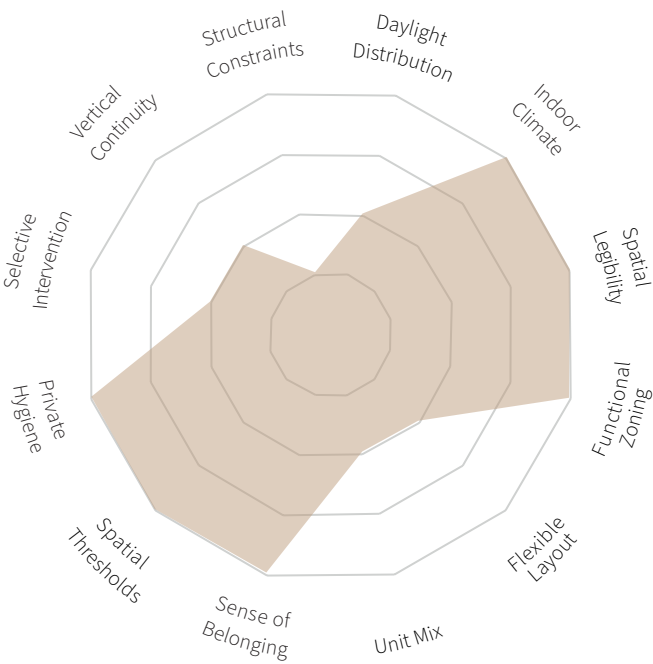
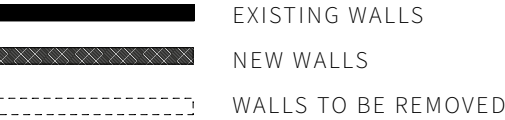
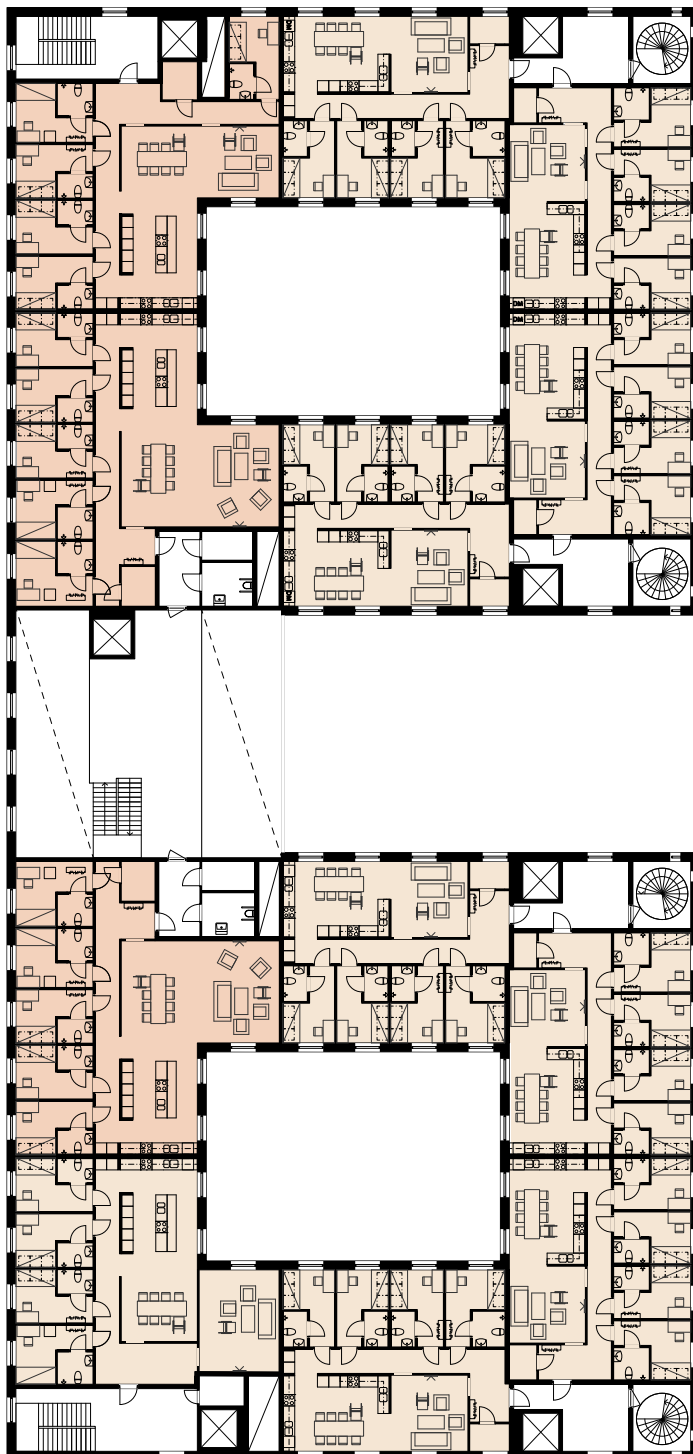


Figure 73: Radar diagram prototype 4.1



RESIDENTS/FLOOR: 51
 FLOOR AREA EFFICIENCY: 78%
 CO-LIVING CLUSTER: 4-5 RESIDENT
 APARTMENT SIZE: 100-150 SQM

SCORE

EC: 10
 SQ: 8
 SSL: 12
 TWE: 5
 TOTAL SCORE: 35

- STUDIO APARTMENT
- DUO APARTMENT 2 RESIDENTS
- CO-LIVING CLUSTER 3-4 RESIDENTS
- CO-LIVING CLUSTER 5-6 RESIDENTS
- CO-LIVING CLUSTER 7 OR MORE RESIDENTS

1:400
 0 5 20 M

Figure 74: Plan prototype 4

Each private room is 11 sqm, with a shared area of 62 sqm, giving each resident access to a total of 73 sqm. Each private room includes its own bathroom, which while improving privacy, significantly limits furniture arrangement – the bed has one obvious position, leaving room for little more than a desk. This is, however, arguably appropriate for a co-living unit, where the expectation is that residents spend time in the shared areas outside the room, and where the kitchen table offers an alternative space for studying or working.

The major shortcoming of prototype 4 is the addition of many new fragmented entrances and interventions in the building. Perhaps these can be justified by applying the Prototype 3 strategy of external addition of vertical communication.

One of the co-living clusters has been analyzed further in different versions: Version 4.1 gives each room its own bathroom; versions 4.2, 4.3 and 4.4 introduce paired bathrooms shared between two residents. In the current layout shared bathrooms are accessible – the focus group suggested splitting the shower from the toilet and sink, which would compromise this, though it could be argued that only one bathroom per cluster could be configured to meet both goals. All different versions have, however, their different shortfalls: in 4.1 the shared accessible WC for visitors can only be reached via the main entrance, which does not meet the requirement that it should be accessible near the dwelling unit itself. Both in 4.1 and 4.2, the WC takes up a big share of the private room, giving the corridor more space. In 4.3, bathrooms are accessible but smaller, and the circulation possibility to move between private, semi-private, and shared zones is more limited. Prototype 4.4 works within the existing structure the most, but the living room is clearly compressed.

PROTOTYPE 4.2

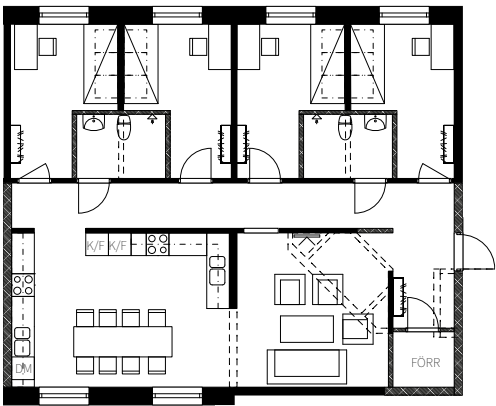


Figure 75: Plan prototype 4.2

SCORE

- EC: 10
- SQ: 8
- SSL: 10
- TWE: 6
- TOTAL SCORE: 35

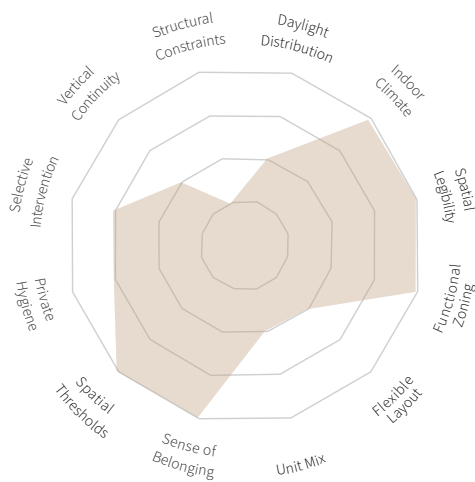


Figure 76: Radar diagram prototype 4.2

PROTOTYPE 4.3

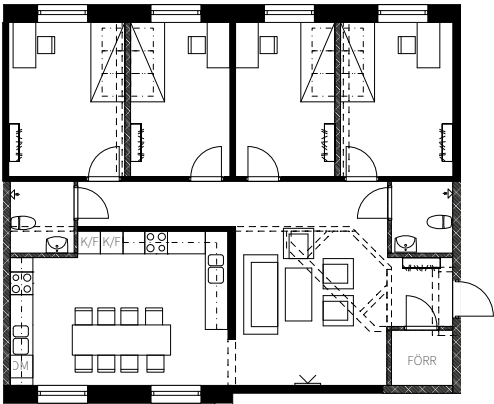


Figure 77: Plan prototype 4.3

SCORE

EC: 10
SQ: 9
SSL: 9
TWE: 6
TOTAL SCORE: 35

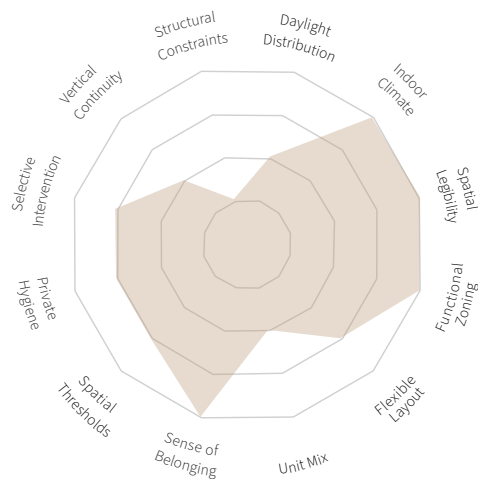


Figure 78: Radar diagram prototype 4.3

PROTOTYPE 4.4

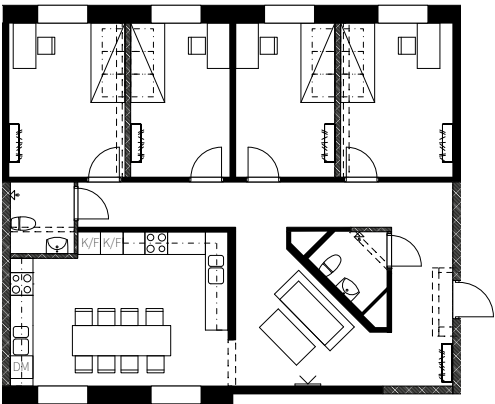


Figure 79: Plan prototype 4.4

SCORE

EC: 10
SQ: 9
SSL: 10
TWE: 8
TOTAL SCORE: 37

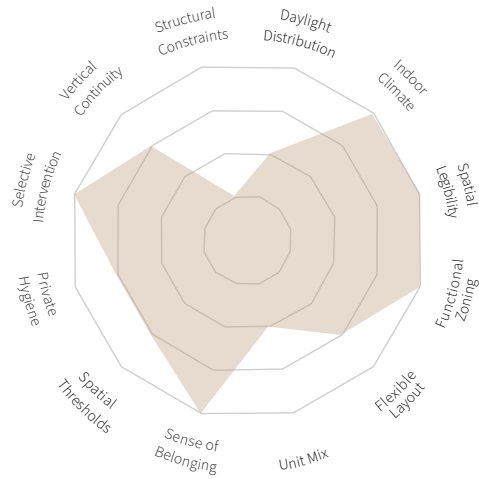


Figure 80: Radar diagram prototype 4.4



C-C

Figure 81: Co living cluster section



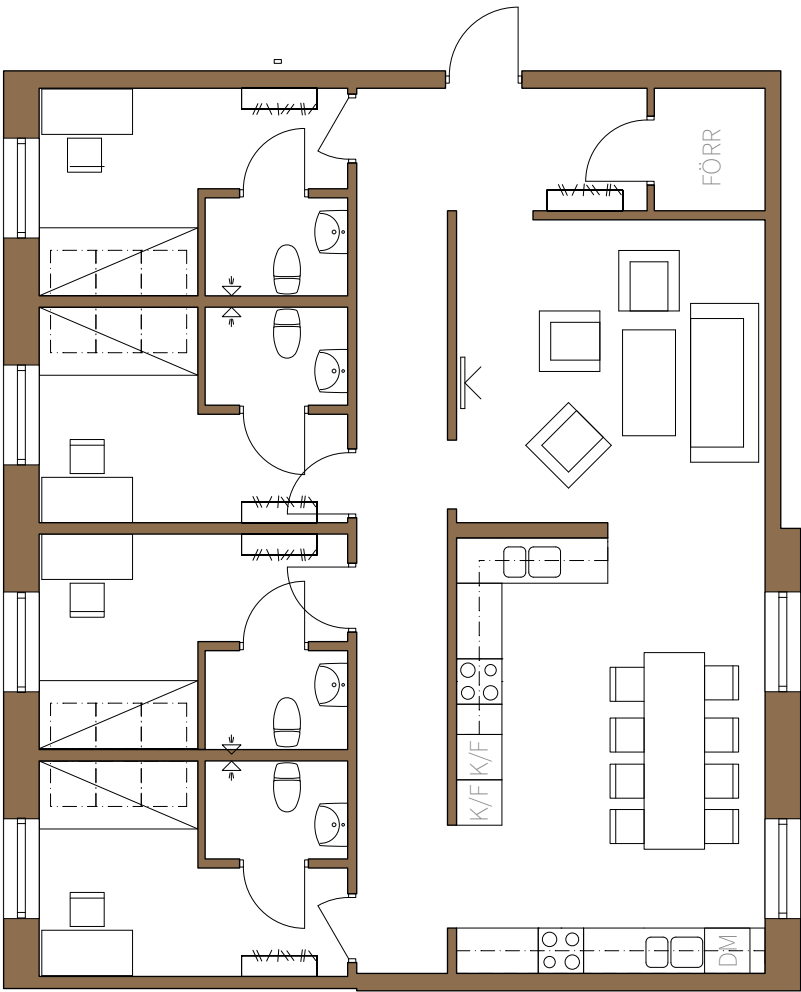


Figure 82: Co living cluster floor plan



PROTOTYPE 5: MIXED TYPOLOGY WITH LARGE CLUSTERS

Prototype 5 introduces a mixed typology, placing narrow studio apartments along the south facade, where no civil defense rooms lie beneath and new shafts can be added without conflict, and co-living clusters to the north. Concentrating the studio apartments along a single facade also generates a more efficient circulation strategy, rather than a corridor running the full perimeter, access can be organised from a short shared corridor at the main entrance, with co-living clusters reached either from the same corridor or through dedicated new entrances. Adding two new entrances with lifts in close proximity to the existing main entrance also reinforces a clear point of arrival.

However, the narrow and deep plan of the studio apartments means they face directly south, exposing them to significant solar heat gain without the possibility of cross-ventilation or shading. These units risk overheating and poor thermal comfort. A buffer element such as adding a balcony could help mediate this, providing shade while also enriching the spatial quality of what are otherwise compact units.

The division of the co-living clusters also means that those towards the north have a smaller proportion of windows and darker social areas, so the arrangement does not work equally well across all clusters. The eight-person clusters introduced in this prototype were a response to the building geometry and to minimise new entrances, but the focus group expressed that eight people sharing feels more like a dormitory than a home.

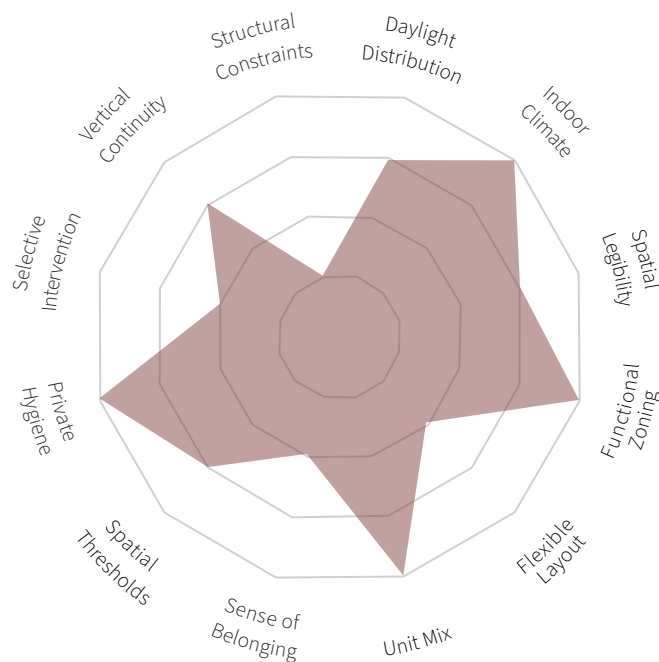
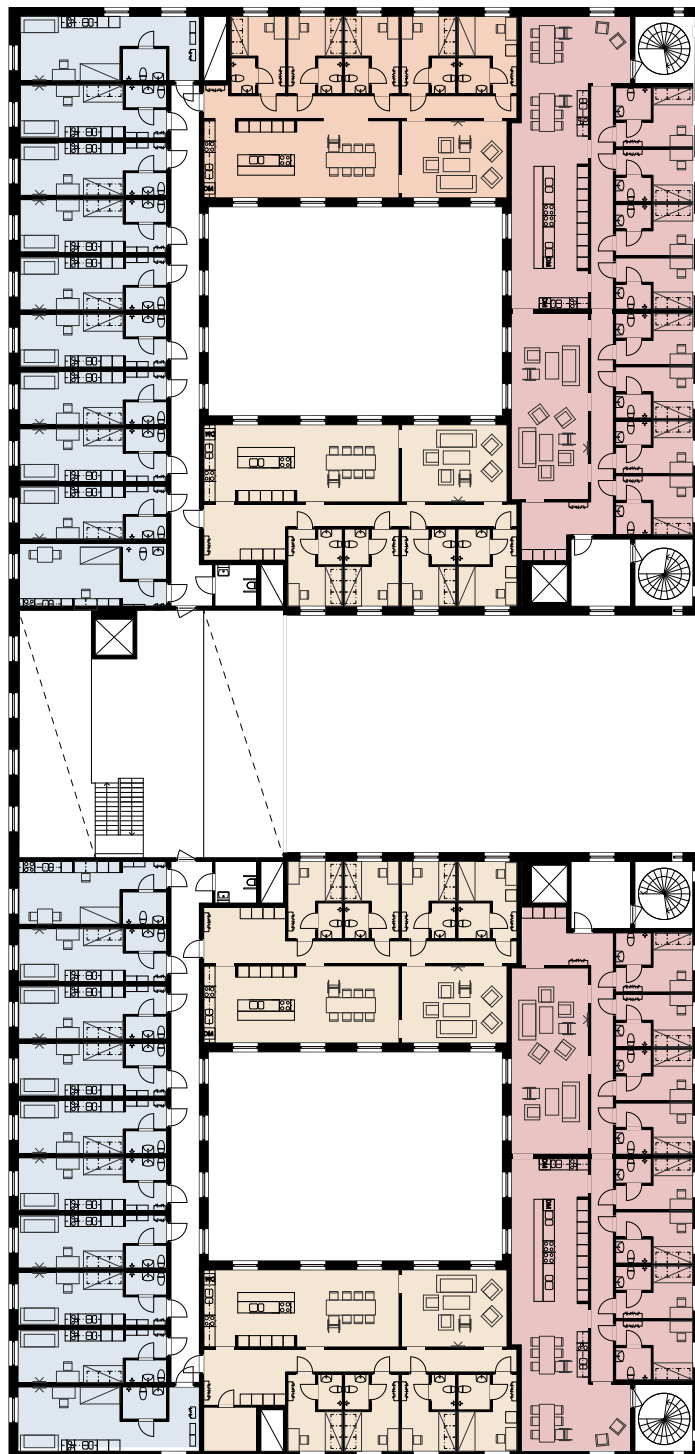


Figure 83: Radar diagram prototype 5



RESIDENTS/FLOOR: 53
 FLOOR AREA EFFICIENCY: 80%
 CO-LIVING CLUSTER: 4-8 RESIDENT
 APARTMENT SIZE: 145-245 SQM

SCORE

EC: 10
 SQ: 10
 SSL: 9
 TWE: 6
 TOTAL SCORE: 36

- STUDIO APARTMENT
- DUO APARTMENT 2 RESIDENTS
- CO-LIVING CLUSTER 3-4 RESIDENTS
- CO-LIVING CLUSTER 5-6 RESIDENTS
- CO-LIVING CLUSTER 7 OR MORE RESIDENTS

1:400

0 5 20 M

Figure 84: Plan prototype 5

PROTOTYPE 6: MIXED TYPOLOGY WITH SMALLER CLUSTERS

Prototype 6 follows the same spatial logic as Prototype 5 but subdivides the eight-person co-living clusters into smaller units. The benefit is a more appropriately scaled shared living situation; the cost is a more fragmented circulation strategy. Where Prototype 5 can combine the entrance zones, prototype 6 requires a total of four new lifts distributed across the plan. This is a significantly greater intervention that also weakens the legibility of arrival. It is a meaningful variant, but one that trades one problem for another.

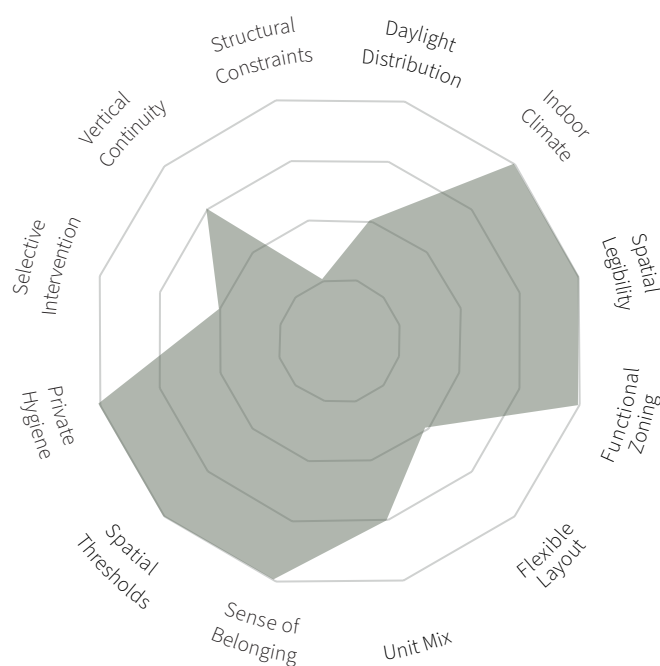
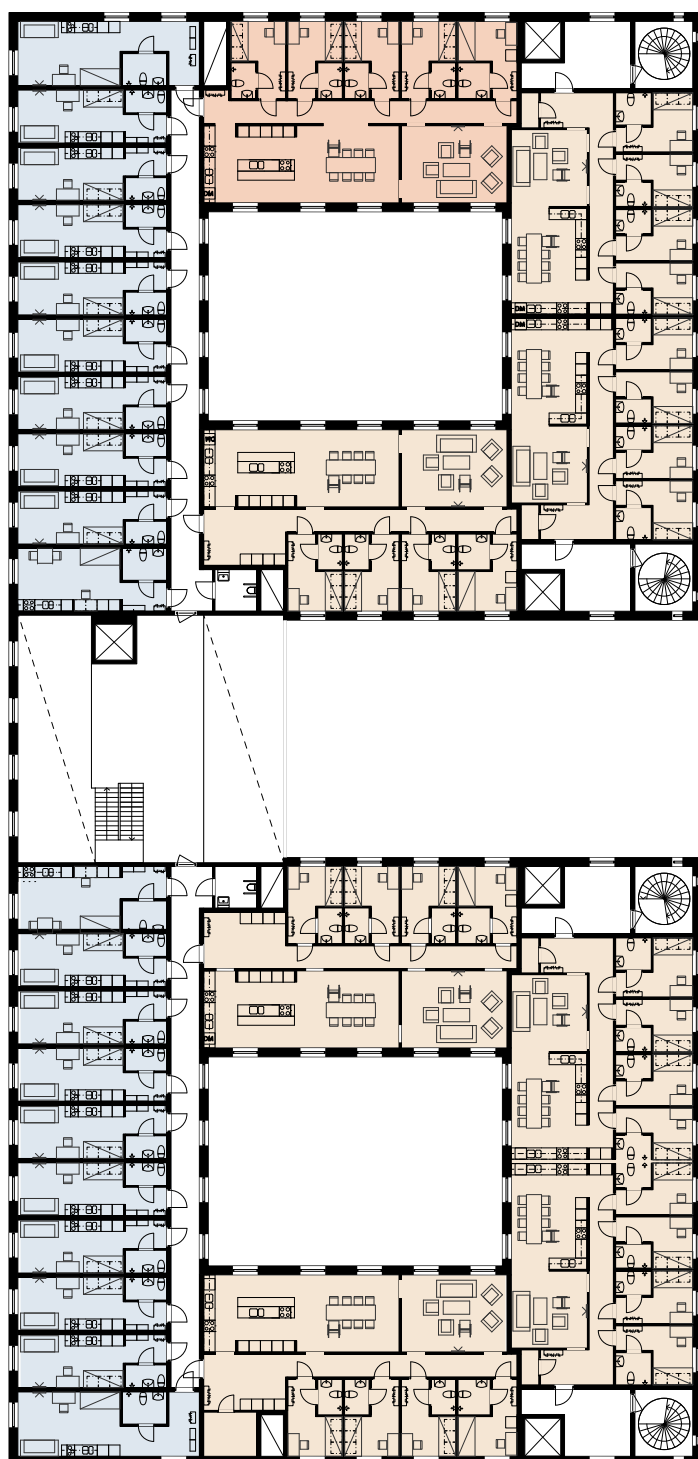


Figure 85: Radar diagram prototype 6



RESIDENTS/FLOOR: 53
 FLOOR AREA EFFICIENCY: 78%
 CO-LIVING CLUSTER: 4-5 RESIDENT
 APARTMENT SIZE: 145-150 SQM

SCORE

EC: 10
 SQ: 9
 SSL: 12
 TWE: 6
 TOTAL SCORE: 37

- STUDIO APARTMENT
- DUO APARTMENT 2 RESIDENTS
- CO-LIVING CLUSTER 3-4 RESIDENTS
- CO-LIVING CLUSTER 5-6 RESIDENTS
- CO-LIVING CLUSTER 7 OR MORE RESIDENTS

1:400

0 5 20 M

Figure 86: Plan prototype 6

PROTOTYPE 7: MIXED TYPOLOGY WITH MINIMIZED INTERVENTION

Prototype 7 shares a mixed typology combining prototype 2 and 3 together with the application from prototype 5 and 6. Studio apartments are placed to the south and, as in Prototype 5, remain exposed to solar heat gain without shading or ventilation buffers. The larger co-living clusters to the north are organized so that bathrooms align with existing shafts, reducing new penetrations significantly.

The clusters are large, and like Prototype 3, they require fire compartment division where the main

weakness is entry and spatial connection inside the cluster: residents in one fire compartment effectively pass through the edge of the other to reach their own, which subtly erodes the sense of spatial ownership. The prototype performs strongly on preservation and infrastructure efficiency, but the social consequences of its scale remain the hardest problem to solve and the one most consistent across all co-living variants.

A note on this prototype is that one elevator has been removed, on the grounds that it is not needed for the prototype's circulation and an additional apartment unit can be added thanks to this intervention.

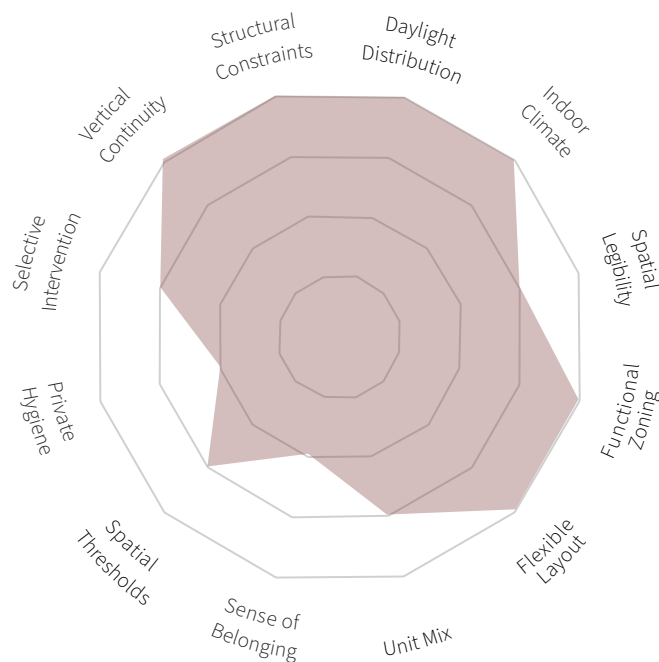
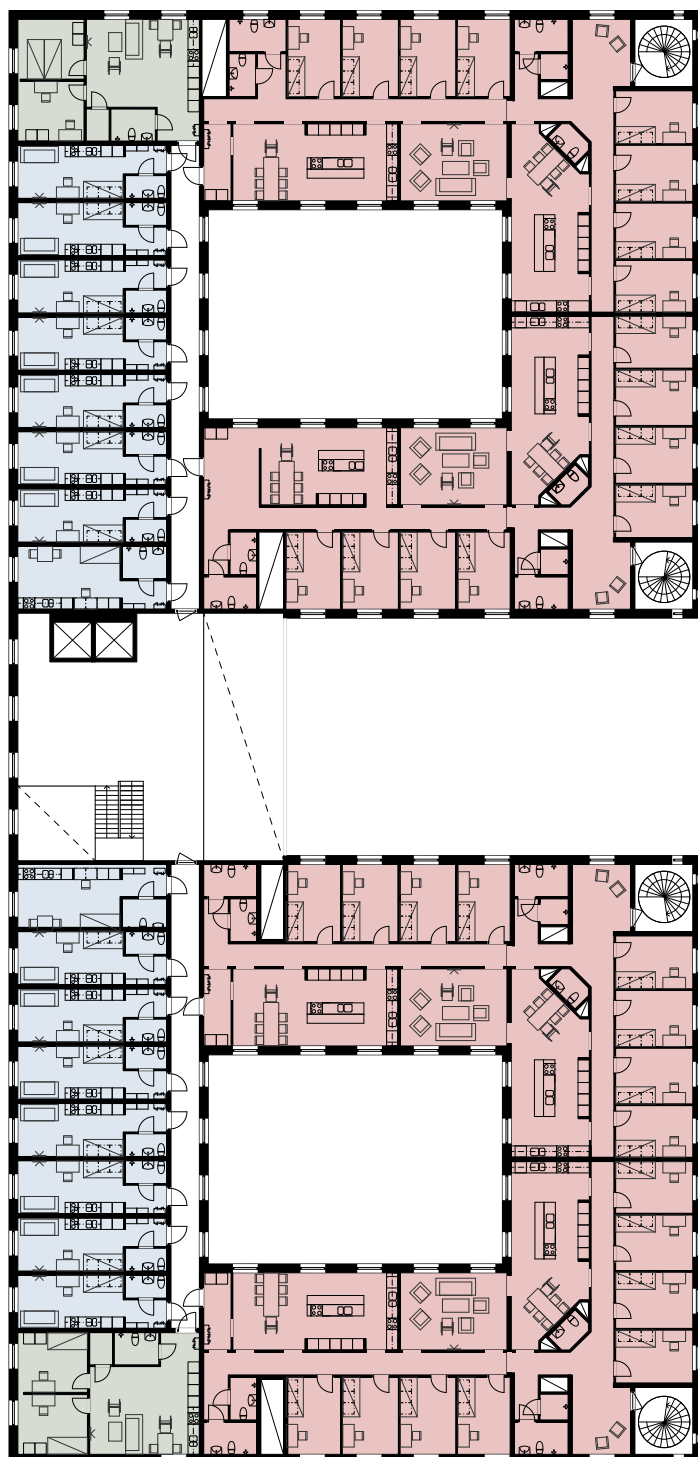


Figure 87: Radar diagram prototype 7



RESIDENTS/FLOOR: 51
 FLOOR AREA EFFICIENCY: 82%
 CO-LIVING CLUSTER: 4-8 RESIDENT
 APARTMENT SIZE: 145-245 SQM

SCORE

EC: 11
 SQ: 11
 SSL: 7
 TWE: 11
 TOTAL SCORE: 40

- STUDIO APARTMENT
- DUO APARTMENT 2 RESIDENTS
- CO-LIVING CLUSTER 3-4 RESIDENTS
- CO-LIVING CLUSTER 5-6 RESIDENTS
- CO-LIVING CLUSTER 7 OR MORE RESIDENTS

1:400

0 5 20 M

Figure 88: Plan prototype 7

EVALUATION MATRIX & COMPARISON

PROTOTYP	1	2	3	4	5	6	7
ENVIRONMENTAL CONTEXT	6	6	10	10	9	10	11
SPATIAL QUALITY	6	7	10	8	10	9	11
SOCIAL AND SHARED LIVING	9	10	6	12	9	12	7
TRANSFORMATION WITHIN THE EXISTING	5	5	12	5	6	6	11
TOTAL MATRIX SCORE	26	28	38	35	34	37	40
RESIDENTS	56	56	49	51	53	53	51
FLOOR AREA EFFINCENCY	70%	71%	83%	78%	80%	78%	82%
RESIDENTS/ APARTMENT APARTMENT(RESIDENT)	1	1-2	5-8	4-5	1-8	1-5	1-8
APARTMENT SIZE (SQM)	22	22-60	160-275	100-150	145-245	145-150	145-245

Table 3: Compilation and comparison of all prototypes

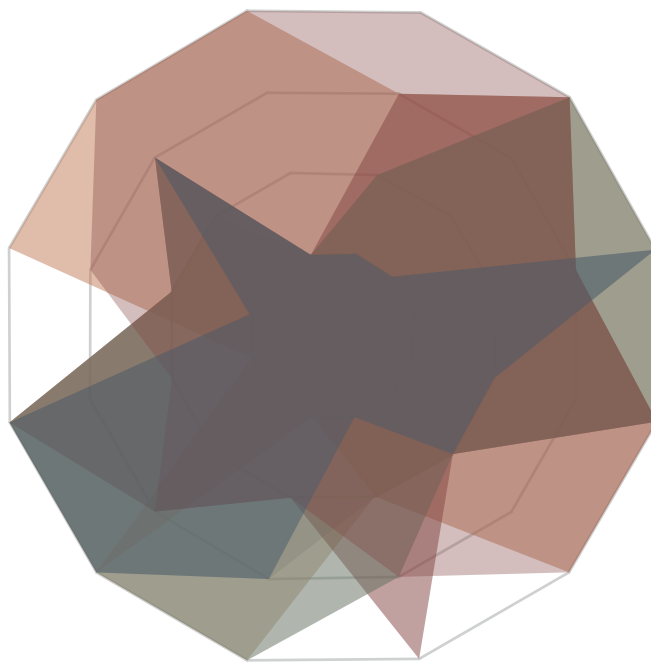


Figure 89: Visual merging of all prototypes

RESULT

Prototypes 1 and 2, which introduce a new spatial logic and more private units, generally perform worst based on the set design principles. Of the co-living variants, Prototype 3 with shared bathrooms and lower intervention performs better than Prototype 4. The mixed typologies perform better still, with Prototype 7, which combines studio apartments, duo apartments, and larger co-living clusters with low intervention, scoring highest overall.

The evaluation reveals a consistent pattern: co-living prototypes perform well across preservation principles and many spatial qualities, but score lower on the aspects students value most: private bathroom access and small group size. This did, however, not have a decisive impact on the result.

The strength of Prototype 7, which scores highest overall, comes primarily from the fact that it does not generally compromise on the qualities that other prototypes can handle well. The co-living clusters in Prototype 7 share the same characteristics as those in Prototype 3, and it is the addition of studio apartments and duo units that provides the meaningful margin of mixed typology. This suggests that a mixed typology is not only spatially justified by the building's logic, but also produces a more balanced result across the full range of evaluated qualities.

DUO APARTMENTS

The seven prototypes together demonstrate that the existing building has a clear spatial logic that fits certain typologies better than others. Studio apartments and co-living clusters each fit the building's structure in different ways, while duo apartments, which was tested but excluded from the final evaluation, proved difficult to accommodate: placing them along one side of the building resulted in units too small to be viable, while spanning both sides required too many additional staircases to be justifiable. Duo apartments appear in the final prototypes only in corner positions, where windows on two facades make them more spatially feasible.

CAPACITY AND DENSITY

The evaluation does not capture one significant dimension of the comparison: the relationship between typology and residential capacity. Prototypes 1 and 2, which score lowest overall, accommodate the highest number of residents, 56 each. This is made possible by the introduction of new facade openings, allowing additional units to be placed where the existing window structure would otherwise prevent it. While this intervention scores lower in the matrix, it produces a measurably higher density.

The co-living prototypes, in contrast, accommodate fewer residents despite their higher matrix scores. One reason for this is that the placement of shared bathrooms close to existing shafts, which was the arrangement that best respects the structure of the building, occupies floor area that would otherwise accommodate additional units. This may not be a flaw in the co-living concept, but it is a concrete consequence visible in the drawn floor plans, and one worth acknowledging when comparing prototypes across both qualitative and quantitative dimensions.

DAYLIGHT AND ORIENTATION

Daylight distribution is included in the evaluation matrix as a criterion under Environmental Context, and the prototypes are compared against each other on this basis. The matrix does not, however, resolve the underlying challenge, it reflects how well each prototype responds to the building's daylight conditions relative to the others, not whether those conditions are adequate in absolute terms.

The building has a structurally complex relationship with daylight. Several spaces receive light only from the inner courtyard, and others are partially shaded by the building's own volume or by the neighbouring building to the southeast. These conditions are not evenly distributed across the facades.

The mixed typologies address this in part by placing studio apartments along the south facade and co-living clusters to the north, an arrangement that aligns with the constraints of the building's civil defence shelters and allows the corridor space to be significantly reduced. One could argue that small, deep apartments need a lot of light but placing small units along the south facade does, however, raise questions about residential quality: strong solar exposure without adequate cross-ventilation is not straightforwardly a benefit.

Considered across all orientations, the building offers few positions that are well suited for housing without qualification. The north facade lacks direct sunlight and faces a street that may carry more traffic in the future. The east side is blocked by the neighbouring building. The south receives strong light but ventilation is constrained. Facades facing the courtyard or entrance risk limited sunlight and overlooking. This leaves the west facade as the orientation with the most favourable conditions, but it represents only a small part of the total building perimeter.

This is not a problem any of the seven prototypes resolves. It is an observation about the building's inherent constraints and one that should inform any further development, where optimising unit placement in relation to orientation and daylight would be a meaningful focus.

4

CHAPTER FOUR

*DISCUSSION &
REFLECTION*

CONCLUSION

This thesis has investigated how the spatial and structural logic of an existing building can inform the design of student housing through adaptive reuse, with a particular focus on co-living and the tension between preservation and residential quality. The conclusions are drawn from the application of design principles across seven prototypes developed for Eklandagatan 86.

What are the key principles for transforming the existing building into student housing?

The key design principles developed in this thesis are organized around four dimensions: Transformation within the existing, Environmental context, Social and shared living and Spatial quality. Together they establish that a successful transformation is not only a question of fitting new functions into an old structure, but of understanding and respecting the building's spatial logic while creating housing that is environmentally considered, functionally clear, and socially sustainable. The principles do not prescribe a single typology, but they provide a framework for evaluating which typological choices are appropriate for a given building and context.

How can the application of these principles inform the transformation of the existing building into student housing?

Applied as an evaluation tool, the design principles make it possible to compare prototypes across a consistent set of criteria and identify where each concept performs well and where it falls short. The evaluation reveals that no single prototype stands out across all dimensions, but that the strongest results come from prototypes that make selective and motivated choices about where to retain and where to transform. Prototype 7, which combines studio apartments, duo units in corner positions, and larger co-living clusters with low structural intervention, scores highest overall. This is not done by eliminating compromises, but by achieving a medium or higher score across most principles.

The application of the principles thus answers not only which prototype performs best, but why: a mixed typology that respects the building's structural rhythm while offering a range of unit types produces the most balanced result.

What does the exploration of different housing typologies reveal about the tension between preservation and residential quality?

The application of the design principles to the existing building revealed that the building has a clear spatial logic that rewards certain typologies and resists others. The central question is not whether to intervene, but where intervention is justified. Co-living partially resolves the tension between preservation and residential quality because it reduces wet room installations and aligns with the building's structural rhythm, but co-living solves the building's logic more than the building solves co-living. The bathroom arrangements that preservation favors are precisely those students are least willing to accept, and the cluster sizes the building accommodates most naturally exceed the scale at which shared living feels like a home. The duo unit, a promising intermediate typology combining the privacy of a studio with the benefits of sharing, proved structurally difficult to accommodate and remains an open question for future investigation.

The tension between preservation and residential quality does not resolve neatly in either direction. The strongest prototypes were neither those with the most preservation nor the most intervention, but those that made selective and motivated choices about where to retain and where to transform. Where exactly those boundaries lie is a question this thesis has begun to map, but not fully answered, and one that becomes particularly meaningful only when tested against a specific building – as it has been here.

DISCUSSION

PRESERVATION AND HOUSING QUALITY

The evaluation produced a result that was not straightforwardly predictable. With nine principles related to housing quality against three related to preservation, one might expect the prototypes that prioritized residential quality to dominate. They did not. The prototypes that also worked within the building's constraints gained an additional dimension of performance and scored higher as a result. This suggests that preservation does not need to stand in contrast to housing quality. When approached selectively and with motivation, it can function as a complementary set of qualities rather than a competing ambition.

ECONOMIC FEASIBILITY AND RESIDENTIAL CAPACITY

Co-living clusters require fewer wet room installations and less structural intervention, and shared functions reduce material expenditure. Theory confirms that this has a positive economic impact and can lower housing costs. However, the evaluation also reveals a tension that this framing does not fully address. The typologies with the least intervention and are least costly to build are also the ones that house the fewest people, which has direct implications for long-term economic viability because fewer residents means fewer rental incomes.

This does not invalidate the co-living approach, but it suggests that the current prototypes may not yet represent an optimised version of the concept. A more economically resolved co-living proposal would need to investigate whether higher density is achievable within the same structural constraints, for instance through smaller cluster sizes, more efficient corridor integration, or alternative bathroom configurations. The environmental, social, and economic dimensions of the transformation may align more than the evaluation matrix

currently reflects, but the relationship is not straightforward. A cost-weighted evaluation would be a meaningful next step.

BROADER IMPLICATIONS

Beyond the specific question of student housing, the study demonstrates how adaptive reuse can function as a method for revealing the spatial opportunities and constraints embedded within an existing building. The design process does not only evaluate housing solutions but also exposes where the building itself supports or resists change. In this sense, the findings may be relevant beyond the proposed programme, providing insights into the long-term adaptability of the building as a resource.

While the study is grounded in a specific building, its findings extend beyond the case itself. The work demonstrates how existing spatial structures actively shape the range of viable transformation strategies, rather than functioning as neutral containers for new programmes. It further suggests that the relationship between preservation and residential quality is not inherently oppositional, but dependent on the coherence between existing conditions and design decisions. Finally, the study illustrates how iterative prototyping and principle-based evaluation can be used as a method for investigating adaptive reuse projects where multiple and sometimes conflicting objectives must be balanced.

METHOD DISCUSSION

The focus group consisted entirely of experienced Swedish students, which introduced a risk of social bias. The perspectives of international and first-year students, who tend to be more open to shared living, were therefore not captured. The group was also selected by the author on a personal basis, which adds a further risk of bias, and only four

of six participants attended the second session, reducing variation further.

The evaluation made in this thesis weighted all principles equally, which does not fully reflect how students actually prioritize. Private bathroom access in particular emerged as a quality students value highly, but this is not reflected in the matrix's structure. Applying identical criteria across studio apartments and co-living clusters also does not account for the different expectations these typologies carry. What constitutes a good studio apartment and what constitutes a good co-living cluster are not the same question. The absence of economic considerations leaves an additional variable unaccounted for.

FURTHER DEVELOPMENT

Applying any prototype to the full building would require floor-by-floor adjustment, deeper investigation of shaft routing including other structural constraints, and engagement with the economic and legal dimensions of the transformation and co-living concept.

Research and user preferences point toward the duo apartment as promising, but it was the typology most resistant to the building's spatial logic. Whether this resistance is a consequence of this building's specific geometry or a more general characteristic of the typology remains undetermined and needs further investigation.

Balconies were identified as a highly desirable quality by the focus group. As the building offered limited potential for balconies in its existing state, this quality was not included in the design principles. Further development could instead explore the potential of outdoor terraces and courtyards as compensation.

Vertical extensions, permitted by the detailed development plan, were not explored as the investigation was based on a typical floor plan. This represents an opportunity for further development, offering potential for both shared and private terraces while also motivating the introduction of additional staircases and lifts.

More broadly, this work raises the question of whether the design approach should shift from creating something new inside the existing building to creating something new from it and to treat transformation not as a constraint to be managed but as a generative act. That shift, combined with the evaluative framework developed in this thesis, could form the basis for a more resolved proposal in a subsequent phase of this work, whether at Eklandagatan 86 or at other buildings facing similar investigation needs.

**DECLARATION OF AI-ASSISTED
TECHNOLOGIES IN THE WRITING
PROCESS**

During the writing process of this work, the author used Claude (Anthropic) for language assistance, including translation, grammar checking, and improving the clarity and readability of the author's own written text. All ideas, interpretations, and conclusions are entirely the author's own. After using this tool, the author reviewed and edited all text and takes full responsibility for the content of the publication.

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CHALMERS
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ADAPTIVE REUSE FOR SUSTAINABLE STUDENT HOUSING

PRESERVATION AND RESIDENTIAL QUALITY IN THE TRANSFORMATION OF EKLANDAGATAN 86

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