

a space of one's own



recreating educational environments based on student
opinions at Angeredsgymnasiet

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abstract

As the climate crisis worsens, the need to transition towards a more sustainable society has never been more evident or more urgent. In a suburb of Gothenburg, Sweden, the secondary school Angeredsgymnasiet faces demolition as the building is nearing the end of its life span. This demolition, however, can not be considered a sustainable choice, neither from a social, ecological or economic perspective.

This thesis aimed to show how participatory work can be used in transformative design processes to identify challenges and motivate design which was done through the example of Angeredsgymnasiet. The thesis analyzed four participatory reference projects previously conducted in cooperation with students at Angeredsgymnasiet. Literary analysis and case studies were used as complimentary sources. The research found that although the building faces some technical challenges the main concerns were the experience of safety, the lack of high quality spaces for breaks, and a lack of identity and creativity in the design.

The identified challenges were addressed in a transformative design proposal in which functions were redistributed to activate the whole building and create natural meeting places. Some of the courtyards were transformed to interior boulevards, creating a dynamic space for social interaction, while existing corridors were widened to create calm streets. The learning spaces were placed in modules framed by the streets and boulevards, providing flexible environments for all kinds of students. Finally, identity was created through the addition of new materials, furniture, and light fixtures. The result is a school where students are free to relax and be themselves - a space of their own.

Keywords: secondary school design, transformation, participation, education

acknowledgements

A great number of people have been involved in this thesis, directly or indirectly, and it's thanks to them that this work exists. Some special mentions are...

... the staff at Angeredsgymnasiet for inviting me into their workplace and showing me its value. I especially want to thank Torbjörn Johansson, the initiator of the Chalmers-Angeredsgymnasiet cooperation, for always making time for me and my endless questions. This project would not have been possible without you.

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... my examiner, Paula Femenias, for her guidance throughout the journey and making sure that I ask the right questions.

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student background

introduction

Astrid Nathorst Westfelt was born 1997 in Stockholm, Sweden. Old childhood drawings are proof of an early interest in architecture, but always with people at the center. After secondary school she chose to pursue studies in architecture and structural engineering following an internship with the construction company Skanska. As an architect she strives to build a better society for its people.



experiences

Chalmers University of Technology
Master Studies 2022-2024

*Architecture and Planning Beyond
Sustainability*

Exchange Spring 2023
Bachelor Studies 2018-2021

*Czech Technical University of Prague (CZ)
Architecture and Technology*

Internships

Struct. Engineering Fall 2021
Architecture Spring 2022

*Sclaich Bergemann und Partner (DE)
Behnisch Architekten (DE)*

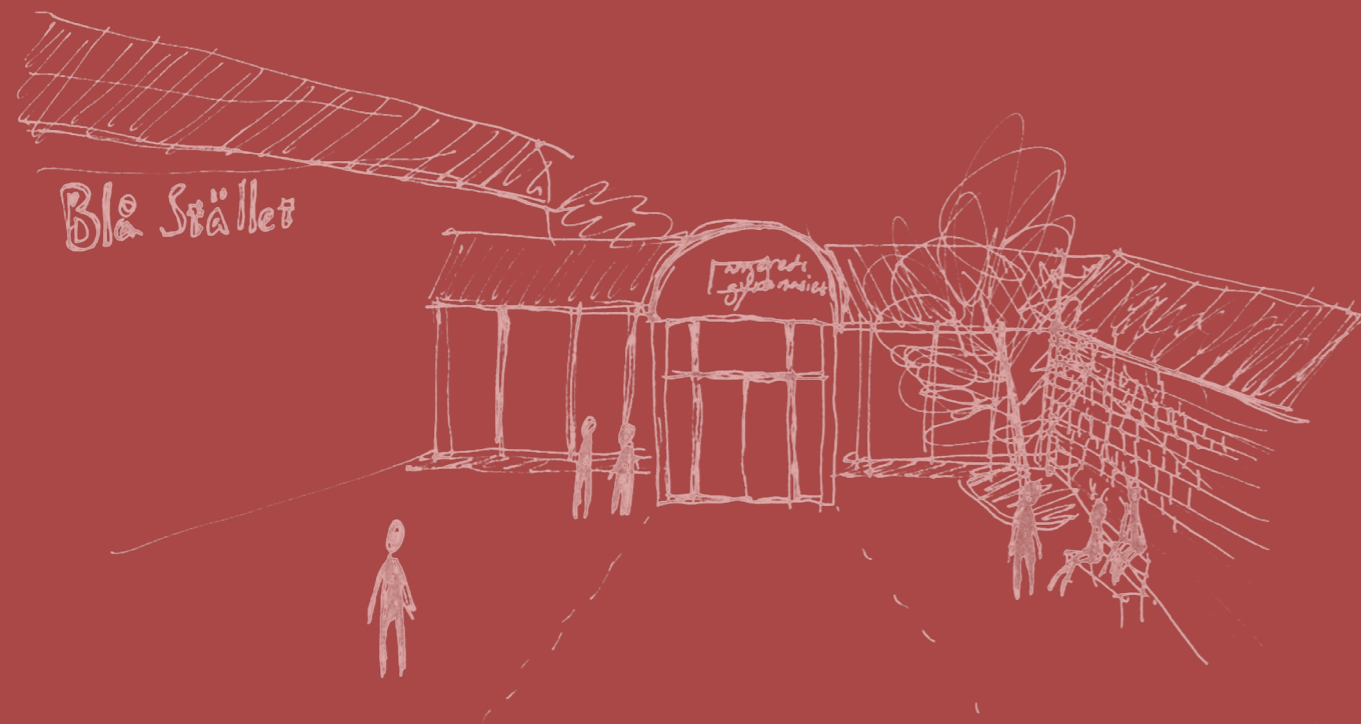
Other

Internship 2017-2018

Skanska AB (SE)

introduction

Defining the boundaries of the thesis by establishing the project background, its aim and purpose, the chosen research questions, the scope, and the delimitations.



background

ecological sustainability

The world is facing a climate crisis which can no longer be ignored. In the latest Global Sustainable Development Report (GSDR) it is stated that we are not progressing at the necessary pace to achieve the United Nations' Sustainable Development Goals by 2030 (United Nations, 2023). A failure to meet the goals could have dire consequences for our world as we know it. The construction industry has a huge impact on our environment, accounting for almost 40% of global emissions (RIBA, 2021). To meet the goals, the industry must transition to circular building, where renovating, upgrading, and transforming existing buildings is key to success (RIBA, 2021) (Ellen MacArthur Foundation, 2020).



economic sustainability

Our society's consumption-based capitalist lifestyle contributes significantly to the climate crisis. As of today, our society follows a model of linear economy where materials are extracted, transformed into a product, used for a certain period of time, and then discarded (Leonard et. al., 2007). Often, products are designed for a short lifespan as it is cheaper and ensures more sales as products need to be replaced. However, this model builds on the assumption of an infinite supply of materials and is therefore not sustainable. A preferable alternative is circular economy where products are made to last and reused for as long as possible. Within the construction industry, this means the transformation and reuse of existing buildings rather than new construction. Sadly, there are still significant issues in implementing circular economy on a larger scale, mainly as a major shift in economical and political priorities is needed to motivate the construction of the necessary infrastructure (Leonard et. al., 2007).

social sustainability

It is not enough, however, to only consider the environmental and economic aspects of sustainability; it is also crucial to consider the social issues we face (United Nations, 2015). In Sweden, we struggle with socioeconomic inequalities which take on spatial properties in the shape of segregated housing areas (Boverket, 2023). These areas are usually disconnected from the city fabric and contain buildings that tend to be considered unattractive in public opinion (Legeby et al., 2015)(Mack, 2021). These areas are also the most affected by the increase in gang violence and shootings in Sweden, often overlapping with the police list of exposed areas (*utsatta områden* in Swedish). Just in Gothenburg there are eight such areas, all located on the outskirts of the city and facing significant socioeconomic challenges (Polismyndigheten, 2023). The municipality of Gothenburg, Göteborg stad, now faces the task of trying to bridge the physical, social and economic gaps created between neighborhoods.

education

One of the factors considered when tracking segregation is degree of education, suggesting that it has an impact on an individual's socioeconomic success and future as a member of society (Boverket, 2023). The Swedish school authority Skolverket acknowledges this in their national learning plan by listing equal education, no matter background or location, as one of their goals (Skolverket, 2023). However, segregation very much exists in the Swedish school system. Schools in areas with a more educated population and higher socioeconomic standards get more critical feedback from the parents of their students, pressuring the school to perform better; the opposite happens in more segregated areas (de Laval et. al., 2017, p25-26). Therefore, students with a more challenged background tend to fall behind more easily in school, depriving them of access to higher education and well-paid jobs in the future.

angeredsgymnasiet

Angered, an area in the north-east of Gothenburg, contains three of the city's vulnerable areas (Polismyndigheten, 2023). Within Angered there is only one secondary school, Angeredsgymnasiet; a school built in the early 1980s that has received quite a bad reputation and is regularly discussed in local media. Consequently, the school receives few applicants, most of whom already live in the area, contributing to further segregation. As the school approaches the end of its technical life span, its future remains unclear, and options such as renovation, demolition, and relocation are all within the realm of possibility. Each option presents opportunities as well as challenges and the choice is neither obvious nor easy.



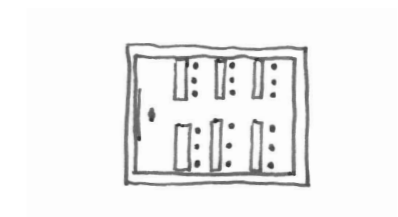
aim and purpose

this thesis aims to...

... explore how outcomes from previously conducted participatory work can be used in a design process to create qualities in the educational environment.



... investigate how architectural aspects influence the educational environment and how design interventions can be used to create good learning spaces.



... apply the findings in a design proposal for the transformation of Angeredsgymnasiet.

thesis questions

main question

How can an architectural transformation of the physical environment at the secondary school Angeredsgymnasiet improve the existing situation as described by its students?

sub questions

What are the challenges and possibilities that Angeredsgymnasiet face today according to its students?

How can the physical qualities of a building create and support a stimulating learning environment and social interaction?



scope

this thesis will...

... focus on developing one possible solution in the form of a design proposal that would improve the educational and social environment of Angeredsgymnasiet through architectural interventions.

... build on the opinions expressed by social science students at Angeredsgymnasiet during previously conducted participatory projects in cooperation with Chalmers students. The students consulted were in their third and final year of secondary school, aged roughly 17-20 years, and of varying background.

... prioritize issues and aspects raised by students in these participatory reference projects over those raised by other users.

... aim to utilize the existing building to the greatest possible extent, changing only that which is deemed necessary to achieve the desired social and educational qualities.

delimitations

this thesis will not...

... conduct any new participatory or co-design work, but solely rely on the outcomes of the previously conducted participatory projects. However, complementary research will be conducted.

... suggest any interventions specifically targeting ecological sustainability; instead, the transformation itself is considered as the main contribution towards ecological sustainability

... go into detailed design; rather, it will focus on more general aspects such as function and flow.

... do any cost calculations or estimations with the aim of proving the affordability of the project.

... contain any calculations regarding energy usage, energy efficiency, life cycle assessment, etc.

diagram

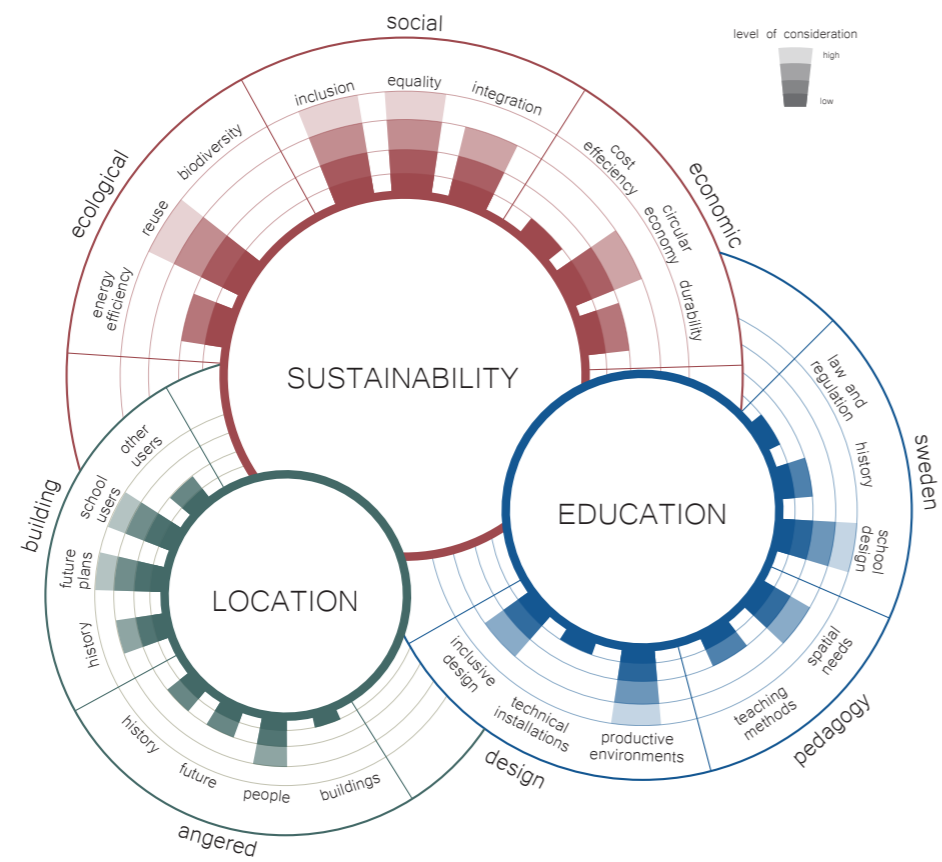
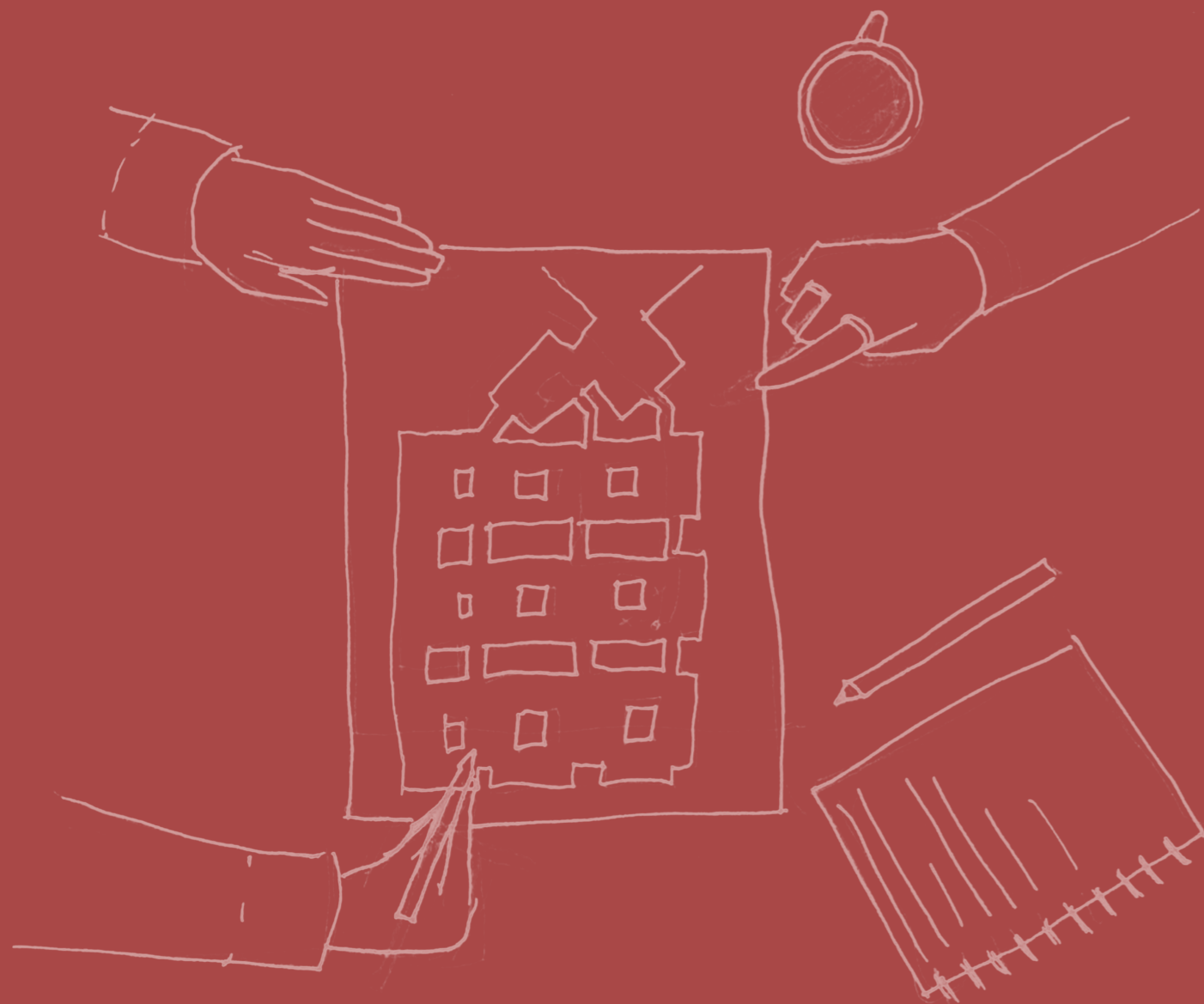


Figure 1. Delimitation diagram depicting some of the thesis topics as well as the degree of consideration in the project. The three main themes - sustainability, education, and location - have been chosen as they create the framework of the thesis. Ideas of sustainability provide the foundation, the location the relevant context, and education the program.

method

A summary of the process, the chosen research approaches, and a description of some of the main methods used in this thesis.



process

general methodology

This project combines research methodologies, which focus on the compilation and analysis of existing data, and design methodologies, where new data is created. These have been used simultaneously throughout the project, creating a dialogue where the outcomes of each influence the other. The research has mainly been of qualitative character, relying on a mix of primary and secondary data, including interviews, observations, literature analysis, case studies and participatory reference projects. The approach was chosen based on the aims of the project and mainly aligns with constructivist and pragmatist world-views as the focus is on understanding the problem, the context, and the people (Creswell, 2009). The design approach was similarly chosen in accordance with the aim of the project resulting in a reliance on evidence-based design (Hanington & Martin, 2012). Some methods used during the analysis and design process were mapping, prototyping, collaging, and storytelling.

project stages

The process was divided into six stages. For further details, see figure 2.

Orientation. Understanding the local context and identifying needs of users.

Connection. Putting the project in a bigger context by connecting it to existing knowledge and research.

Exploration. Applying the gathered knowledge through explorative and iterative design trials.

Specification. Increasing the level of detail based on the outcomes of the previous stages.

Finalization. Developing a final proposal based on the previous stages and producing material to communicate the design.

Reflection. Critically analyzing the outcomes and process of each stage as well as the implications and development of the project as a whole.

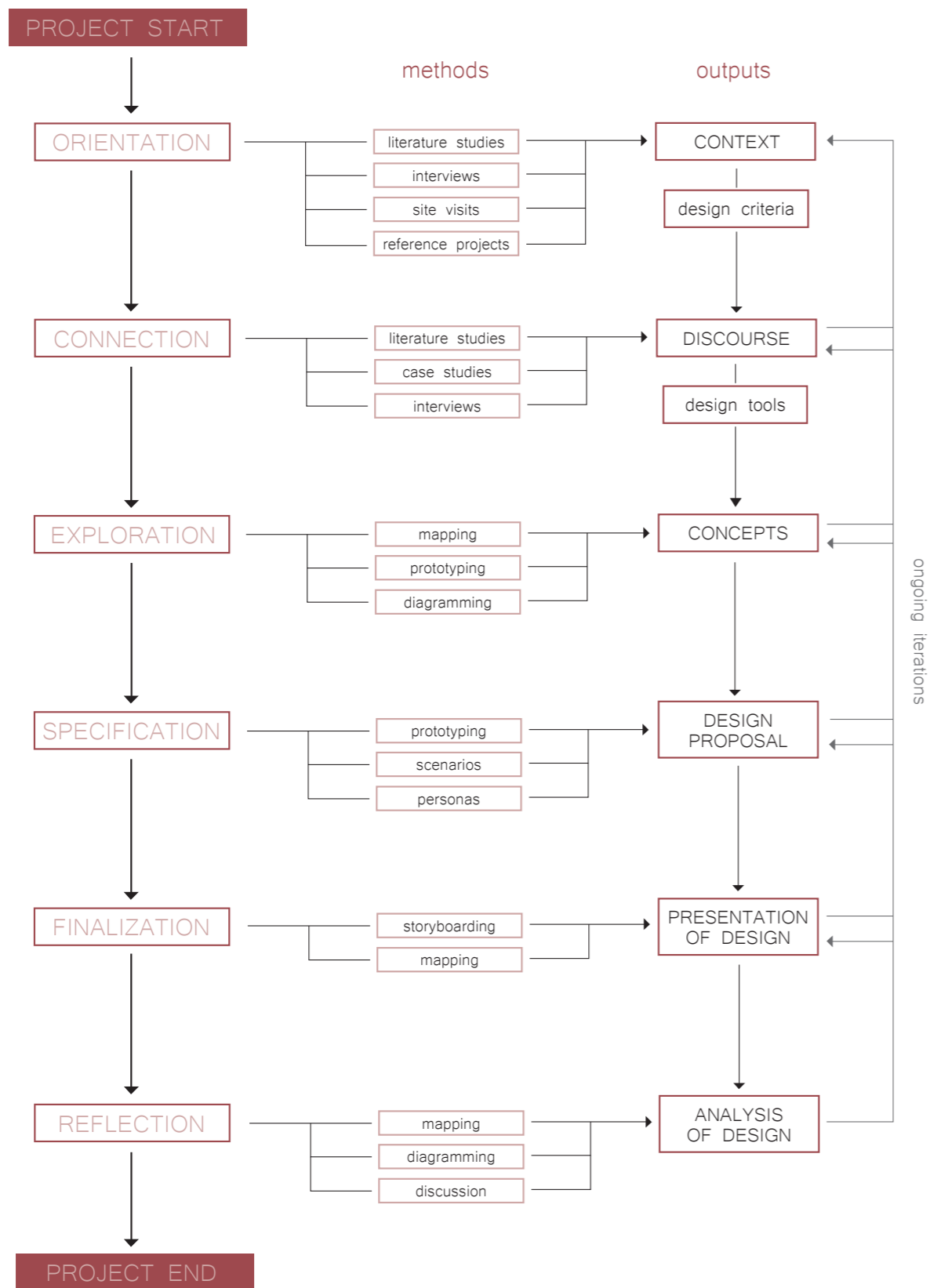


Figure 2. A process diagram showing the different stages, their main methods, and the expected output. The process is not linear but consists of iterative loops where the different stages interact with and shape each other.

methods

literature studies

Literature studies was one of the main methods during the orientation and connection stages. The method mainly had two purposes: to understand the local context and framework which Angeredsgymnasiet exists in, and to explore different design options to address the challenges the school currently faces. While reading, the author reflected on the material in writing and sketches.

Some of the main sources were...

- ... official documents and statistics published by the municipality Göteborg stad
- ... the Swedish national learning plan for secondary school
- ... the book *Skolarkitektur – Formar den oss?* by Jadwiga Krupinska (2022)
- ... the anthology *Skolans nya rum* edited by Suzanne de Laval (2017)
- ... the pre-study *Verktyg för utformning av framtidens skolmiljöer* by Nilsson and Nordenknekt at Liljewalls Architects

participation

This thesis relies on the analysis of previous participatory projects conducted by Chalmers students in cooperation with students at Angeredsgymnasiet over the past five years. These projects conducted generative research using different co-creative techniques during a series of workshops with the aim to extract information about the students and their view of the school environment. Some methods used include various types of mapping, guided tours, collaging, prototyping, and game play. The projects and their outcomes are described in more detail in chapter 4, The Users.

While this project did not use any participatory or co-creative methods to generate new data, the author did conduct a few casual interviews with teachers and staff during site visits. These visits also involved guided tours and co-mapping.

case studies

In order to further the understanding of educational design and how it impacts its users, a selection of case studies were carried out. Most were schools designed in Scandinavia which addressed similar challenges as those that face Angeredsgymnasiet. Some examples are Maja Beskowskolan in Umeå, Munkegaardskole in Aarhus, and Lindholmens tekniska gymnasium in Gothenburg. A few non-school projects were studied as well since they showcased characteristics relevant to the concepts and design. Some of these were the art space Centquatre in Paris, the participatory project Rosens Röda Matta in Malmö, and the local culture house Blå Stället. Not all cases are included in the final booklet as some proved more relevant to the project than others.

complimentary methods

In order to confirm and/or question the information retrieved from the participatory reference projects, the literary analysis, and the case studies, additional methods were applied. Especially interviews with school staff, municipality employees, and professional architects proved useful to the project. The main contributors were:

Anders Hall, municipality project leader
Torbjörn Johansson, teacher
Aase Maria Qvist, headmaster
Madeleine Nordenknekt, architect
Alexandra Karlsson, coordinator Atom-Studios

Other methods worth mentioning are site visits, various types of mapping, prototyping, and storytelling.



Figure 3. Illustrations showing some of the main methods used. Left to right: interviews, site visits, case studies, mapping, literature analysis, and prototyping.

the building

A description and analysis of the school building as well as its surroundings, including a site analysis, functional analysis, and a mapping of the current challenges.



local context

angered

Angered is a Million Home Program-area located in north-eastern Gothenburg. It includes many smaller localities out of which Angered Centrum is the most relevant for this study. Built in the years around 1970, Angered was intended to fill the growing need of housing created by the booming industry in Gothenburg (Hansson et al., 2005). Previously sparsely populated countryside, Angered was re-planned to include housing for 130 000 people and jobs for 70 000 (Hansson et al., 2005). However, economic downturns and cultural preferences contributed to a low interest from Swedish citizens, resulting in a main population of work immigrants and refugees (Hansson et al., 2005). This remains the case, with 69.9 % of Angered's 108 552 inhabitants having an international background (Göteborgs stad, 2023). Angered is generally considered a segregated area with socioeconomic challenges (Boverket, 2023)(Göteborgs stad, 2023).

angered centrum

Angered Centrum is quite different in character compared to the other localities of Angered. Although the original plan contained the pre-fabricated concrete high-rises typically associated with the Million Homes Programme, the plans changed in 1972 to instead focus on developing Angered into a functioning neighborhood center (Hansson et al., 2005). They aimed to introduce not only commercial functions but also health care, schools, sports, and culture. The new center was finished in 1978 and consisted of a small-scale block structure with brick facades (Hansson et al., 2005).

angeredsgymnasiet

history

In the middle of Angered centrum, physically joint with the culture center Blå stället, is the secondary school Angeredsgymnasiet. Built in the early 1980s, the school originally hosted typical academic programs such as languages, natural sciences, and social sciences, but also more practical ones within electronics, machinery, automechanics, economics, and home studies. However, the school eventually became famous for its musical and cultural profile, which was not part of the original design but introduced later. This focus on the arts, closely connected to the proximity of Blå Stället, attracted students from all over Gothenburg (Hansson et. al., 2005). However, the artistic program was relocated in the years around 2014 as part of a reorganization of the local school system. This change caused the student body to become more homogenous, switching from a mix of students with Swedish and immigrant backgrounds to consisting of a vast majority of students with immigrant backgrounds (Qvist, 2024).

surroundings

Angeredsgymnasiet has a central location in Angered centrum, placed just a five minute walk from the local tram stop, see figure 4. It is well connected to bike paths as well as major roads, and is physically joint to the culture house Blå Stället, one of the main attractors of the area. Still, the building fails to integrate with its surroundings; instead it feels weirdly disconnected and almost hidden. The long linear volume of the local mall creates a barrier between the school and the public transport hub, forcing visitors to walk through or around the building. The main entrance is hidden in a niche created by the intersection of the school and Blå Stället, which makes it difficult to find and identify from afar. While surrounded by high quality public functions, such as the city park, the Angered arena sports centre, and the nature reserve around Lärjeån, the design of the adjacent landscape separates the school from these environments. The building is reduced to an isolated and closed volume, hard to identify and connect to.

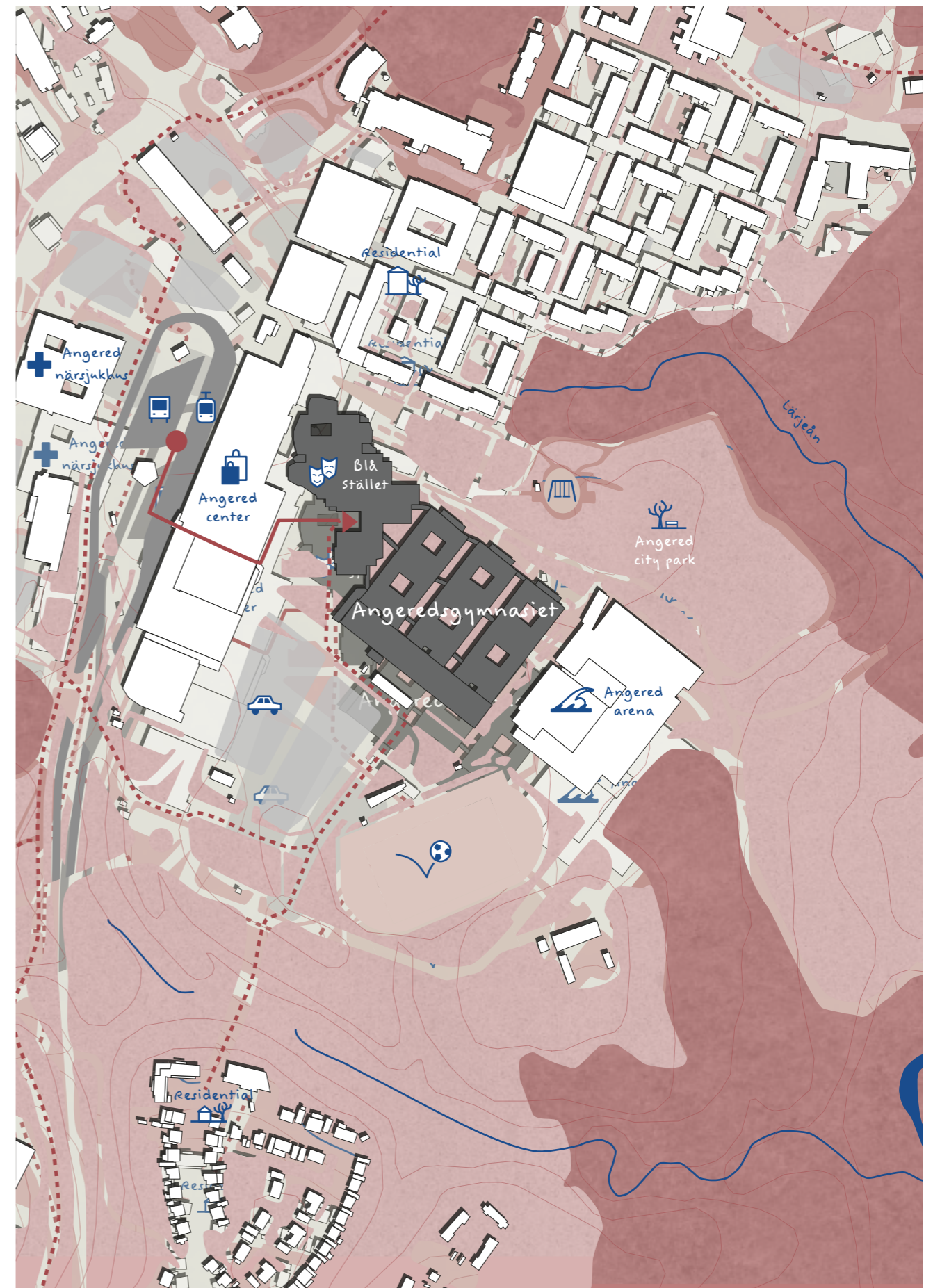


Figure 4. A map of Angered centrum, scale 1:4000, showing the location of Angeredsgymnasiet and other important functions. Despite its good location close to public transport, a variety of facilities, and nature, the placement of the building makes it feel disconnected from its surroundings.

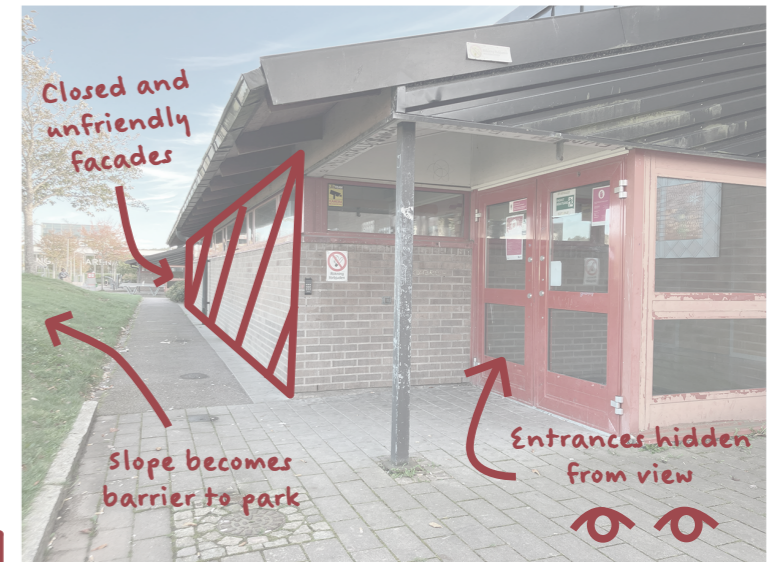
appearance

The school building consists of two main parts: the *low part* and the *high part*. The low part is the main part of the building and consists of a big one-floor structure, see figure 6. It's structured in a grid pattern, creating a network of corridors and courtyards that connect classrooms and bring light into the building. The exterior walls consist of a steel structure covered in red-brown brick at the bottom and black corrugated metal at the top. Time-typical ribbon windows framed in red offer daylight and views; however, their low height contributes to a heaviness in the facade, only broken by the glazed walkways crossing the courtyards. The building is covered with a gable roof covered in black metal sheets. While the one-floor structure has certain advantages, mainly the improved accessibility within the school, it also presents many challenges, such as the creation of long and dark corridors, low ceiling heights, and difficulty navigating the building. In general, the building and its facade is badly maintained, resulting in water leakage, bad air quality, and rusting columns.

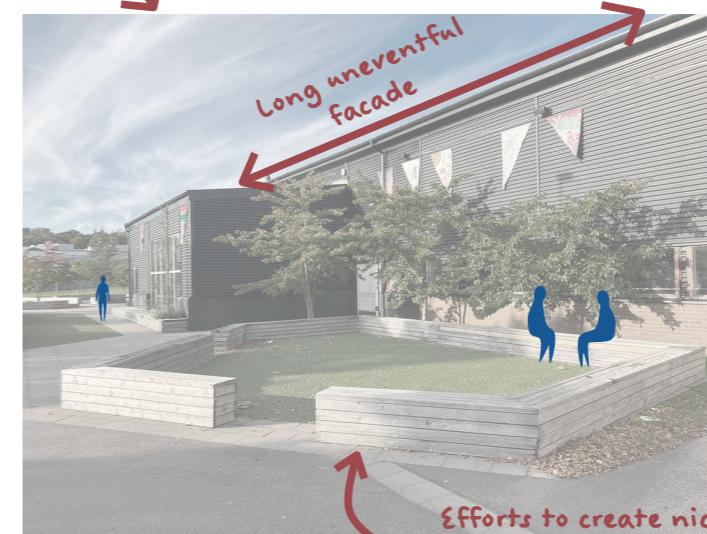
The high part is a two-floor linear structure located in the south-western part of the building. It originally housed the mechanical programs and therefore has a more industrial character with exposed load-bearing beams and columns painted in red. When the artistic programs were introduced at Angeredsgymnasiet the high part was rebuilt and the space was divided into smaller parts. While the bottom part of the facade is similar to the low part, sporting brick walls and ribbon windows, the top part is clad in black and white metal sheets. At certain parts recent renovation can be seen, mainly consisting of the additions of new windows. While this part of the building also lacks maintenance it has certain qualities, mainly the high ceilings, the industrial beams carrying the roof, and the wide spaces

The following pages contain annotated plan drawings, sections, and photos that describe the building and my analysis of it. To see the material without annotations as well as additional photos, please consult the appendix.

Entrance



Facade facing city park



Facade facing parking lot



Street between the school and Angered arena

Figure 5. The photos presented above show the exterior of Angeredsgymnasiet with the author's reflections displayed as annotations in red. Some noteworthy aspects are the closed facades, the landscaping that creates a barrier, the hidden entrance, and the lack of activities.



Figure 6. Ground floor of Angeredsgymnasiet, scale 1:600. The blue annotations on the plan show the different functions while the red annotations show my analysis of the building based on site visits, interviews, and mappings. The main noteworthy aspects are the long and dark corridors that feel cramped and unpleasant, as well as the lack of common spaces where the students can spend their breaks.

The placement of the functions result in a lot of "dead" spaces which feels unsafe as there are low rates of movement and presence. Furthermore, the worry of disturbances during lectures or students partaking in undesired activities (bullying, vandalism, drug dealing, drug use, etc.) has resulted in many spaces being locked or unused, including the courtyards and most group rooms.

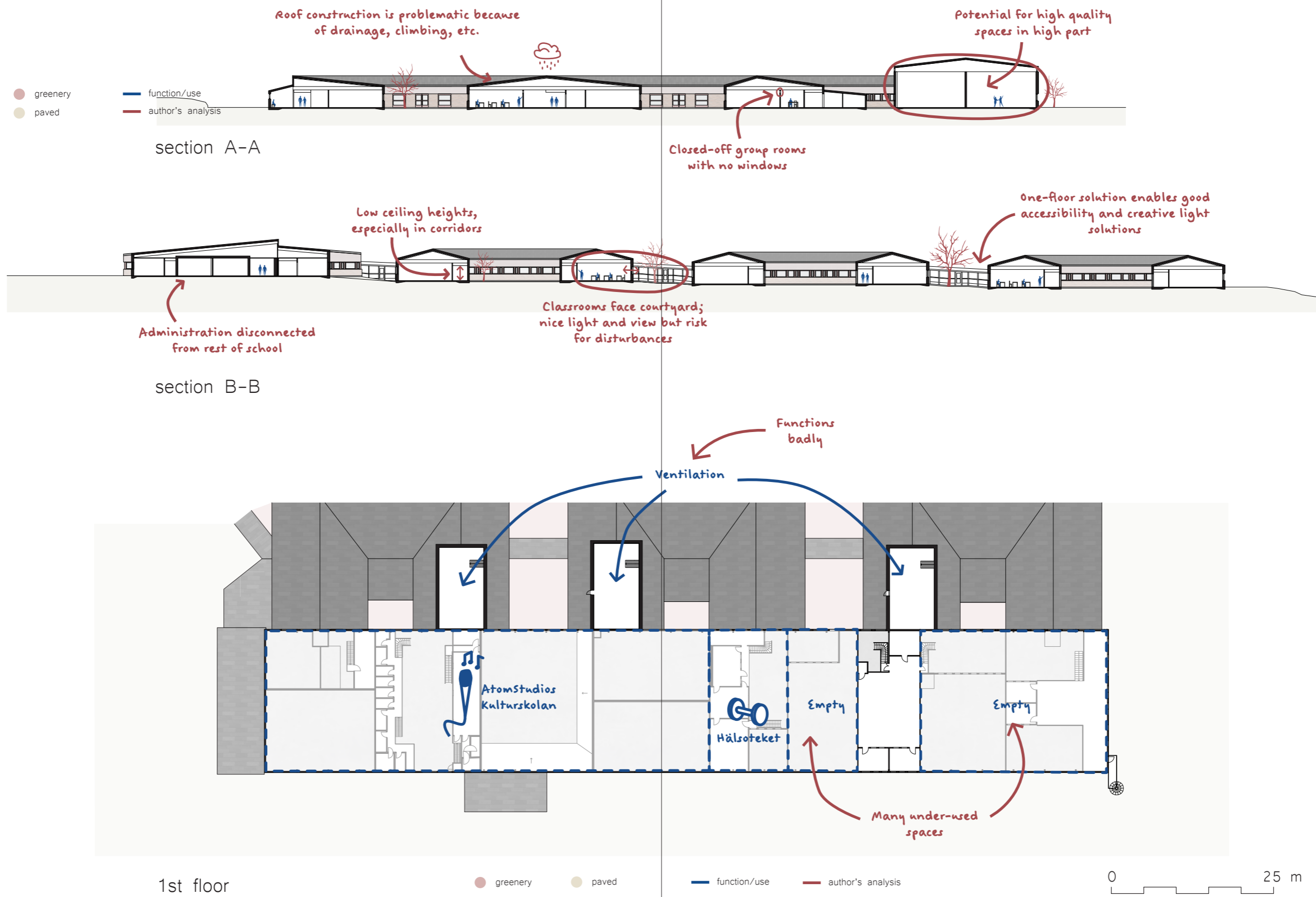
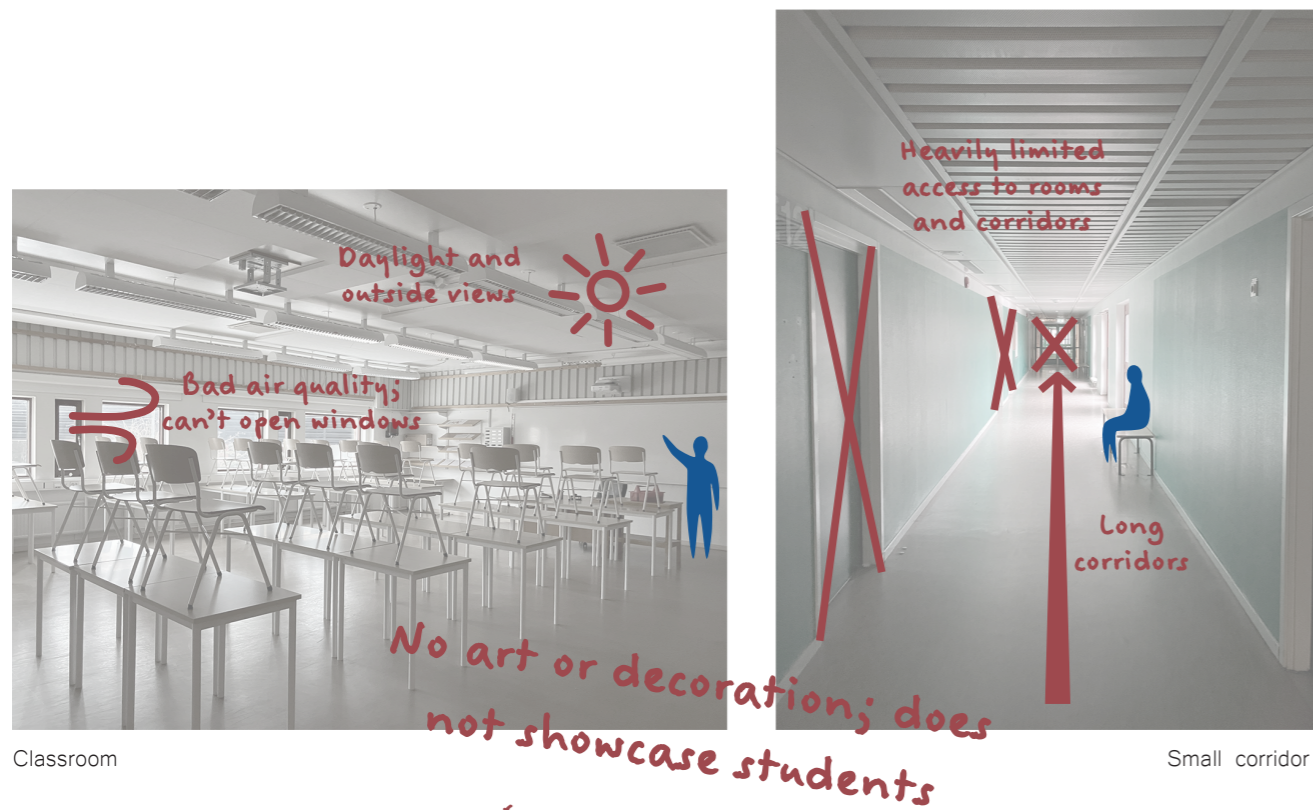


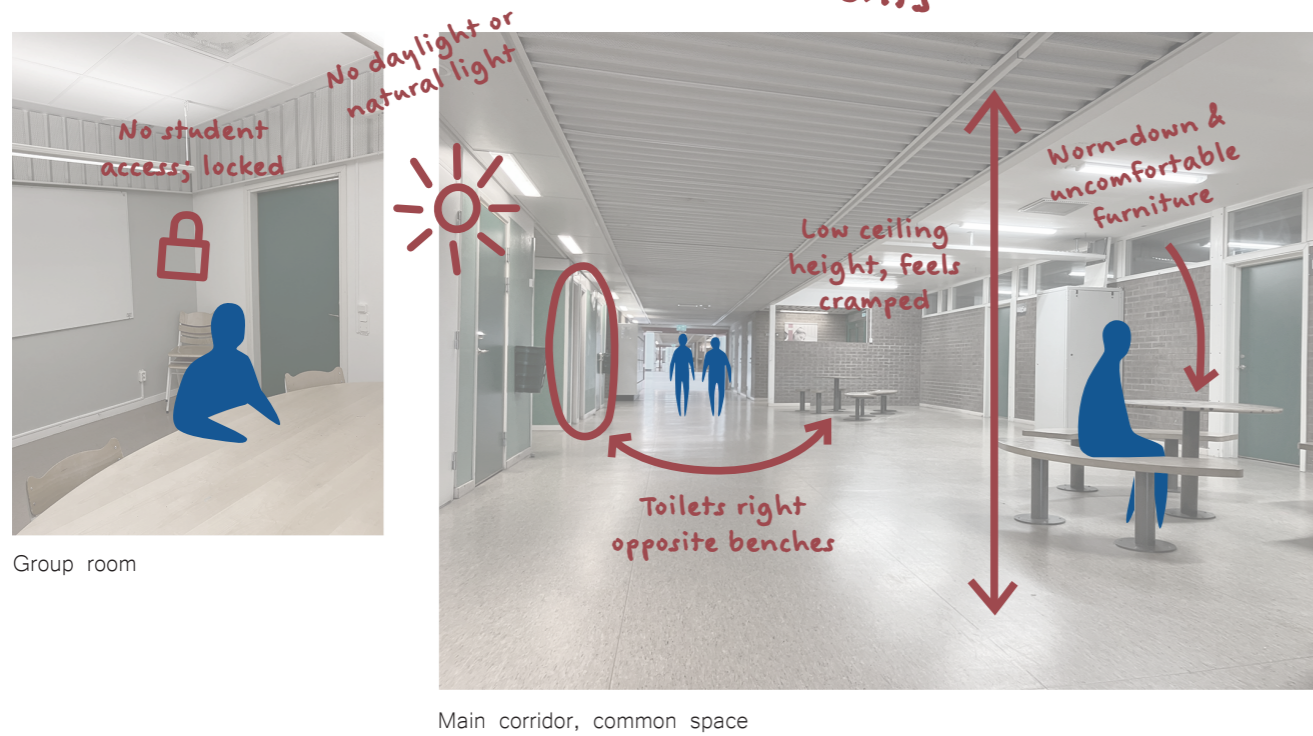
Figure 7. Section A-A and B-B of Angeredsgymnasiet, as well as the first floor, all in scale 1:600. Similarly to the ground floor plan, blue annotations show functions while red annotations show the analysis of the building. The sections show the relatively low ceiling height compared to the

wide spread of the building in plan. It also shows how the ramps connect the buildings at different height levels. The first floor, which only exists in the south-eastern part of the building (the former machine hall), is mainly used by other functions.



Classroom

Small corridor



Group room

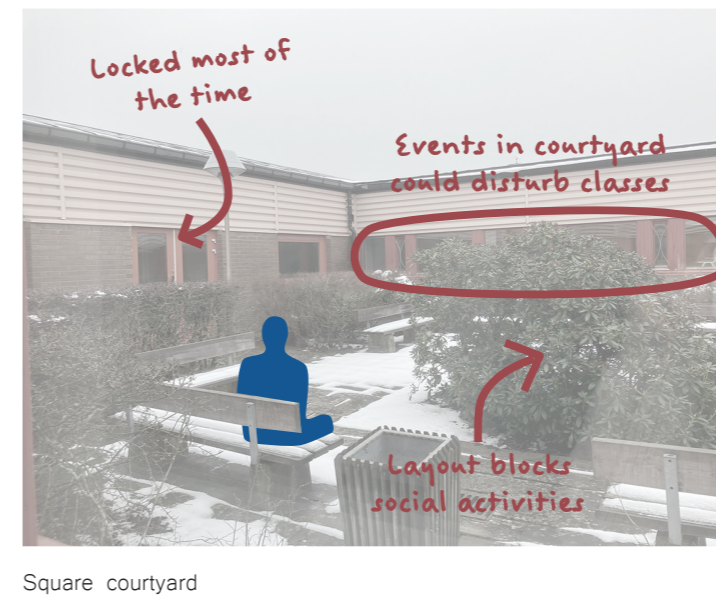
Main corridor, common space

Figure 8. Annotated photos from inside the school building. Some noteworthy aspects are the low ceiling heights, the long corridors, the lack of daylight in the common spaces, the uninspired interiors, and the limited access to parts of the building.

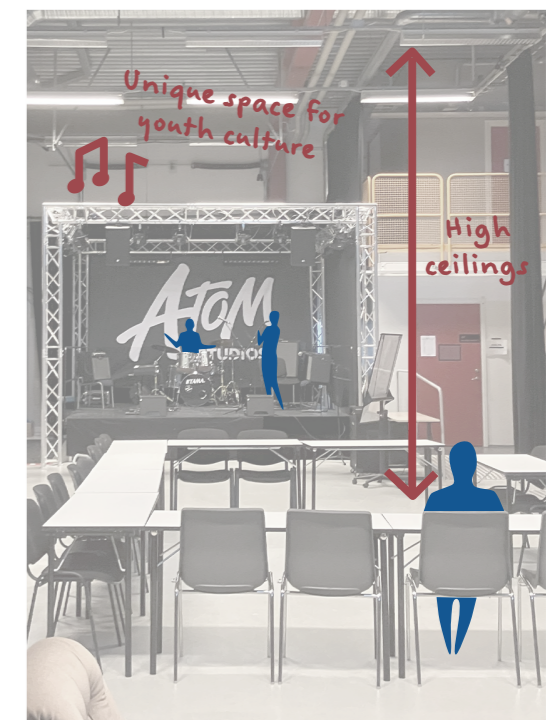


Linear courtyard

Entrance



Square courtyard



"Black box" in Atom Studios

Figure 9. Annotated photos from inside the school building. Some noteworthy aspects are the locked courtyards, the badly planned layout of the outdoor spaces, and the nice high ceilings in the high part.

function

Today, Angeredsgymnasiet is the only secondary school located in north-eastern Gothenburg, excluding the private sports school Aspero Idrottsgymnasium in Utby, south of Angered. The programs offered are academic programs within economics, natural sciences, and social sciences, as well as the practical programs sales and services, and health- and child care (Angeredsgymnasiet, 2024). The school also hosts one of Sweden's four secondary schools for children with physical disabilities, Riksgymnasiet, as well as complimentary courses for those without a complete primary education (Angeredsgymnasiet, 2024). The school is open each day between 7 am and 8 pm for teachers, while students have access from 8 am to 4.30 pm (Qvist, 2024). During all hours an access tag is necessary to enter the building.

As the school function no longer occupies the whole space other functions, mainly municipality-related ones, operate within the building. These include:

- (1) *GUTS*, a youth center for girls ages 13–18
- (2) *Kulturskolan* and *AtomStudios*, cultural centers for children and youth
- (3) *Hälsoteket*, a centre providing free access to exercise and health classes during daytime hours

These functions, except for GUTS, are all located in the high part, see Figure 6. Despite their proximity to each other there is little to no cooperation with the school functions, even though many of the functions work with youth (Qvist, 2024). Additional parts of the building are empty and currently not used.

challenges

Angeredsgymnasiet currently suffers from a bad reputation. It is often talked about as a place that struggle with issues such as low attendance, drug crimes, and violence (Björk, 2021) (Ekström, 2020) (Namazi, 2022). The staff confirms that they face certain issues with crime and drug dealing in the vicinity of the building, especially along the northern part that faces the city park (Qvist, 2024). Furthermore, the building also faces a lot of technical issues, mainly the maintenance of the large and complicated roof structure, as well as the high energy demand of the building (Hall, 2024). The staff expresses a general frustration with the building, mainly the bad indoor climate created by malfunctioning mechanical ventilation and locked windows, but also in relation to the cramped corridors and the lack of social spaces for the youth (Qvist, 2024).

future

In 2017 Stadsfastighetsförvaltningen, the city facility management, initiated a pre-study into Angeredsgymnasiet as the end of its technical lifespan was approaching. Recently, the early stages of the study were completed, concluding that the low part of the building should be demolished. This recommendation was based on the estimation that future maintenance costs would lead to a significant rent increase, which in turn would lead to decreases in teacher pay. The high part is considered to be in better condition and could potentially remain (Hall, 2024). A volume pre-study suggests a couple of new design proposals for the site, confining the high school to a smaller triangular building with 2.5 – 3 floors, giving space to the east for new buildings (White architects, 2023). Blå stället remains in all proposals as it is considered culturally and historically valuable (Hall, 2024). However, nothing is decided yet, and other potential options include renovation or relocation.

summary

analysis of building

Based on the information and analysis described in this chapter, especially the interviews with headmaster Aase Maria Qvist, teacher Torbjörn Johansson, and municipality project leader Anders Hall, the following conclusions have been made:



The spatial layout creates a disconnected whole with remote and secluded spaces that feel unsafe



The building lacks pleasant and stimulating common spaces where students can spend their breaks



Many spaces in the school are used inefficiently or not at all due to safety and disturbance concerns



The current roof needs to be replaced as the structure is too complicated and hard to maintain



The interior and exterior looks worn down and life-less; it does not inspire feelings of pride or ownership

the students

A description and analysis of the four participatory reference projects and their outcomes, as well as a conclusion summarizing the relevant information.

co-creation at angeredsgymnasiet

project introductions

Between the years 2019 and 2023 four participatory design projects have been conducted at Angeredsgymnasiet within the course Design and Planning for Social Inclusion at Chalmers. During each project architecture students cooperated with the social science teacher Torbjörn Johansson and his current students. The projects are described in short below, followed by outcome collages and analysis on the next four pages.

Architecture of Young Creators took place in 2019 and was the first iteration of the project. It was led by five Chalmers students: Sofia Anderson, Rivka Eikelboom, Mumtaheena Rafit, Maëlie Kestelyn, and Markus Zorn. They cooperated with the class SA17 aiming to design a co-learning process. The project addressed the school surroundings, resulting in proposed design interventions in the area.

Collaboration of Dreams was the second iteration and took place in 2020. It was led by the three Chalmers students Johanna Asplund, Maria Oxelman, and Elisabeth Peeters, with the class SA18 as the main participants. This iteration focused on dreams, both concerning life in general and school specifically. The final outcome was some conceptual interventions within the school.

MADE WITH CARE was the third iteration of the project. It took place in 2022 and was led by Charlotta Blom, Chiara Lancelotti, Astrid Nathorst Westfelt (the author of this thesis) and Sadia Sharmin. The main participants were the senior class SA20. This project focused on creating “acupunctural” interventions within the school based on principles of transformation.

A Portable Future was the fourth and latest iteration of the project, taking place in 2023. The process was lead by Moustafa Alchaban, Clara Fraule, Anjuli Grüschow, and My Hallgren Berg, and the participants were the class SA21. The project focused on the potential transition from Angeredsgymnasiet to another school through the creation of a portable prototype that could be brought to a new school environment.



Figure 10. Some materials produced in *Architecture of Young Creators*, quotes from the participants, and my own illustrations representing some of the frequently recurring topics and interventions. The produced materials include collages, models, and the game *Mixity*. The black and white images as well as the quotes are from the project logbook and posters (Anderson et. al., 2019).

architecture of young creators

Proposed interventions: a café in the city park, improved lighting around the school, more flowers, benches, and paths in the park, public spaces for cost-free sports and activities, better playgrounds, an animal park, a fountain in the park, more art.

Reflection: The students express a great interest in their surroundings and a wish to make them more accessible and inclusive. They especially want more affordable activities, meeting places for the locals, and a decorated public space.

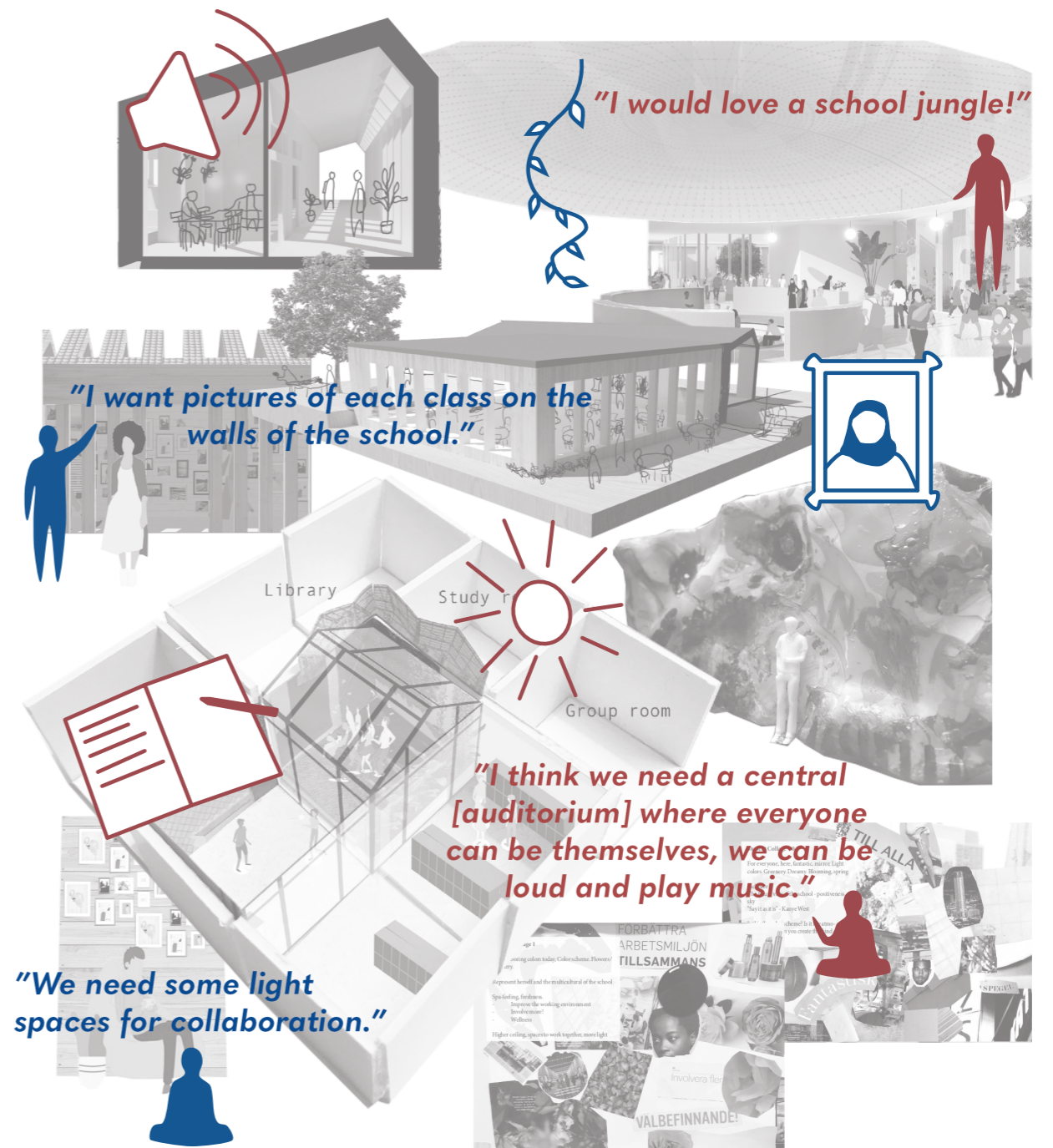


Figure 11. A selection of materials and quotes from *Collaboration of Dreams*, as well as my own illustrations representing some of the most frequently recurring topics and interventions. The black and white images as well as the quotes are taken from project logbook and include collages, illustrations, digital and physical models (Asplund et. al., 2020).

collaboration of dreams

Proposed interventions: an atrium in the center of the school, skylights in the corridors, a "jungle" in connection to the atrium, glazed study rooms next to corridors, more spaces for assembly, photos of students on walls, an interactive wall.

Reflection: The students emphasize that they do not feel represented in their school environment, that it is boring and lacks decoration. They express a great interest in greenery, daylight, and more meeting places.

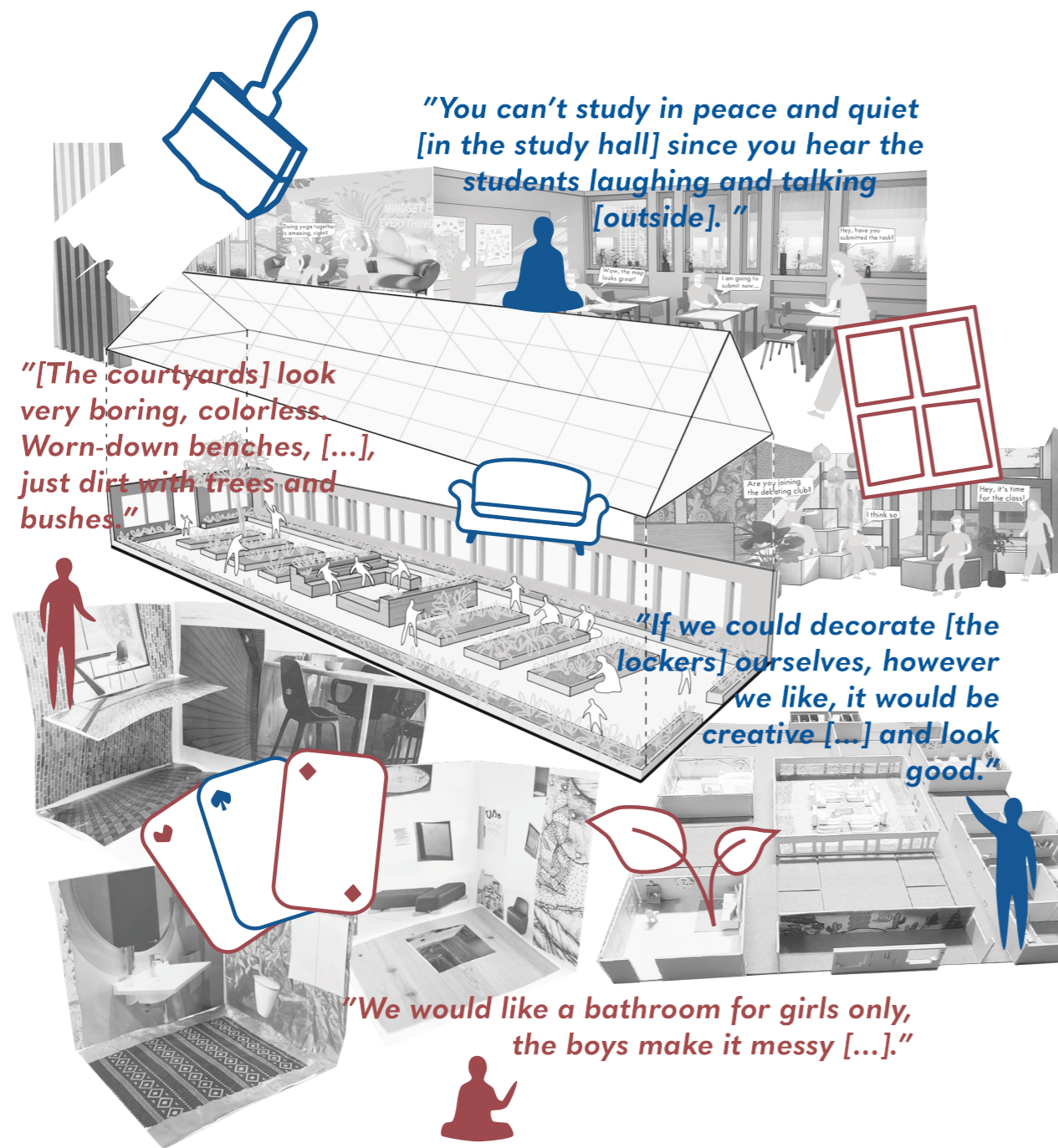


Figure 12. Materials produced in *Made with Care*, quotes from the participants, and illustrations that highlight certain aspects. The produced materials include collages, models, and illustrations. The black and white images as well as the quotes are from the project logbook and posters (Blom et. al., 2022).

made with care

Proposed interventions: gender separated bathrooms, courtyards with glass ceilings for gardening, lockers with integrated seating that divide space in corridors, a mezzanine floor in the study hall, cozier group rooms and classrooms.

Reflection: The students want spaces that are more interesting, fun, and colorful. They also desire more activities in the school environment and complain about being bored during breaks. Many want a separation between calm and loud spaces.

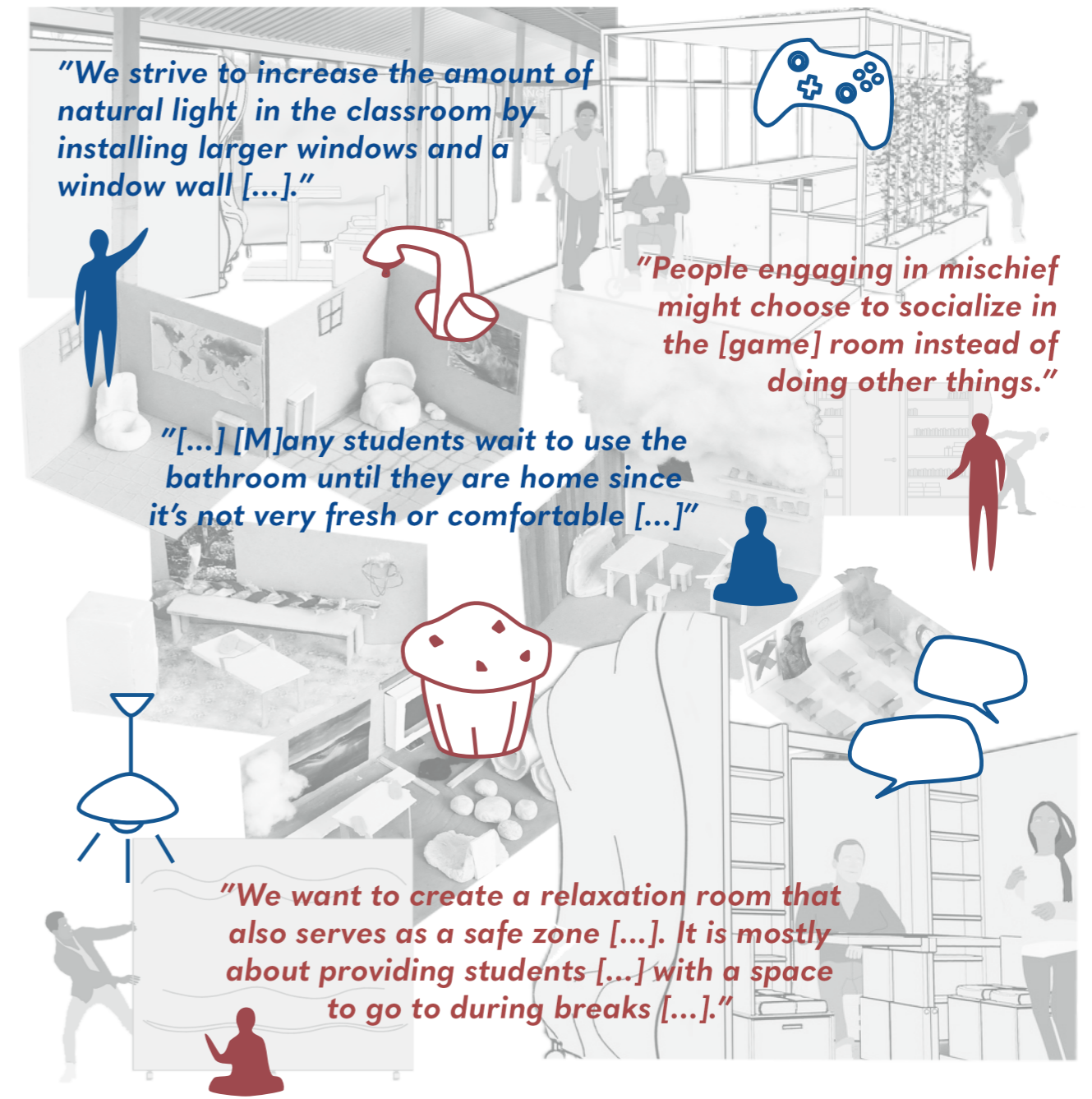


Figure 13. A selection of materials produced in *A Portable Future*, quotes from the participants, and illustrations that highlight certain themes and interventions. The black and white images as well as the quotes are from the project logbook and include models and illustrations (Alchaban et. al., 2023).

a portable future

Proposed interventions: portable elements that can be put together in a variety of ways to create different kind of spaces, both inside and outside. Based on student proposals that heavily focused on spaces for relaxation and social interaction.

Reflection: Similarly to the former projects, the students wish for spaces to visit during breaks where they can interact, play games, and relax. They also speak of safety and the need to have a space of their own.

summary

analysis of student opinion

After studying the four projects certain themes are revealed, some concerning physical aspects of the building while other concern more social and emotional aspects. Listed below are the aspects I consider the most important and intend to address in this thesis.



The students find the building boring and do not feel represented in its design, resulting in a lack of ownership



The students do not feel that they have nice spaces to relax in or spend time with each other between classes



The students lack calm and quiet spaces to study outside of class time



The students find the indoor climate insufficient, especially daylight access



The theoretical framework relevant to this thesis created through literary analysis and case studies, summarized in a conclusion containing relevant tools.



swedish education

history of school architecture

Historically, Swedish schools were small-scale buildings designed according to official regulations issued by the state (Krupinska, 2022). In the 1960s, however, changes in school law lead to an escalation of school planning and building where cost efficiency and speed was prioritized. The result was a collection of one-floor structures with long corridors, a disorienting spatial organization, and a dependence on mechanical ventilation (Krupinska, 2022), much like Angeredsgymnasiet. These schools have been difficult to adapt to modern pedagogical ideas and today many of them face technical as well as functional issues (Krupinska, 2022).

school architecture today

The current edition of the Swedish learning plan for secondary school, Gy11, states that the outcome of education should be responsible individuals that are active participants in society (Skolverket, 2023). What that means for school architecture, however, remains unclear. Since the removal of the Swedish school board (Skolöverstyrelsen) in 1992 all responsibility for school building lies on the local municipalities. Consequently, there are no nation-wide guidelines or norms for school design (Krupinska, 2022). There is also no efficient system for knowledge sharing among the municipalities, neither is there enough research in the field (de Laval, 2017, p32). Therefore, there is a tendency to fall back on conventional and traditional designs which do not consider the more specific requirements of the learning plan, nor the challenging future these students face (de Laval, 2017, p37). However, there are a few exceptions, where designers, planners and teachers have made a common effort to challenge the typical solution.

reference projects

lindholmens tekniska gymnasium

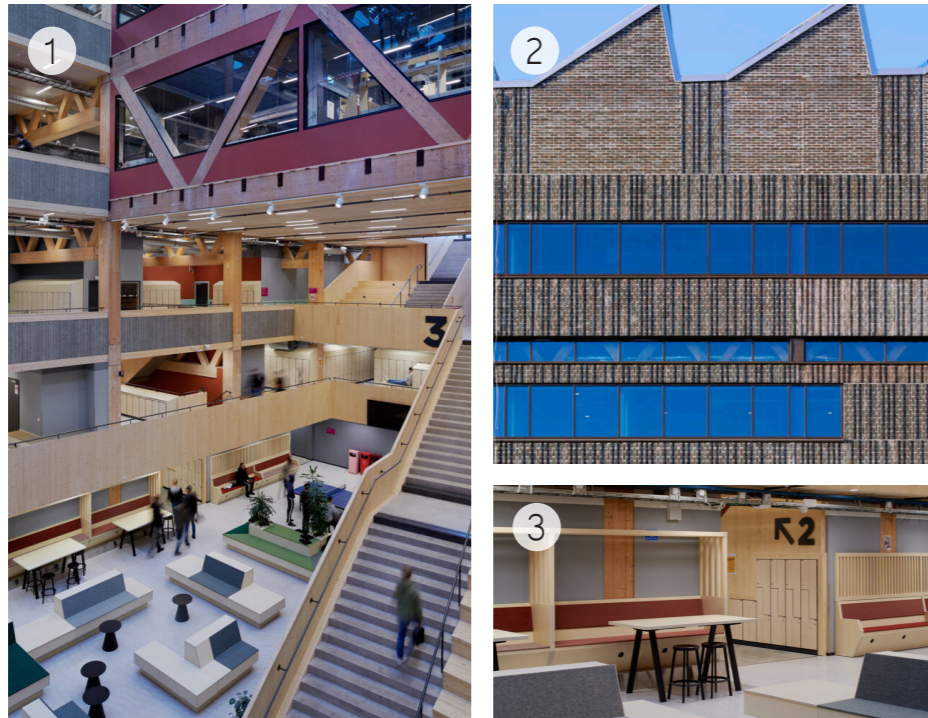


Figure 14. Photos of Lindholmens tekniska gymnasium. Image (1) shows the central atrium, (2) shows part of the facade, and (3) shows the interior design and furniture. All photos by Bert Leandersson (Arkitema, 2024).

Lindholmens tekniska gymnasium, a secondary school with a focus on technical programs, was at its finish date in 2020 the first public secondary school to be built in Gothenburg in more than 20 years (Arkitema, 2024). The design aimed to create a safe environment while also promoting a sense of identity and pride among the students. An integral part is the central atrium which connects the school vertically and creates an arena where students can socialize, study, see and be seen. The exterior was designed in reference to the industrial location, resulting in a saw-tooth roof and brick facade. Big windows are used to display the workshops on the ground floor. Materials and furniture were chosen with quality and durability in mind, and technical installations are exposed for educational purposes (Arkitema, 2024). The school is a great example of identity and creativity in educational design, even for older students.

munkegaard school



Figure 15. The Munkegaard school in Denmark. Image (1) shows the school building from above, (2) shows a classroom interior, and (3) depicts the underground spaces designed by Dorte Mandrup. Photos (1) and (2) were taken by Aage Strüwing, copyright Jørgen Strüwing; (3) was taken by Dorte Mandrup.

The Munkegaard school in Denmark was designed by Arne Jacobsen in 1957 and is a one-floor primary school (Arne Jacobsen, 2023). The rooms are connected through corridors in a grid-like structure, framing peaceful courtyards created in the negative space, one per classroom. For the interior, Jacobsen plays with volume and light to create bright and spacious learning spaces while also creating a good indoor climate. The design was so well-liked that when the need for expansion of the school grew dire the original proposal, suggesting a more radical approach, was protested and eventually rejected. Instead Dorte Mandrup was given the project with a less invasive proposal suggesting an underground expansion where the courtyards are transformed into big skylights (Krupinska, 2022). The design shows how a one-floor structure can be optimally utilized to create high-quality spaces.

centquatre-paris

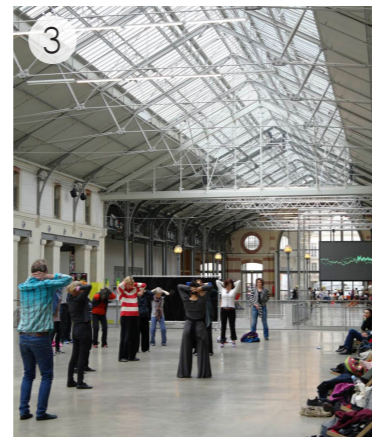
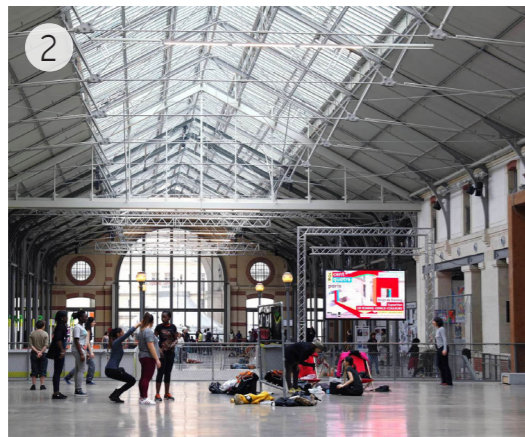


Figure 16. Images from CentQuatre in Paris. Photo (1) shows part of the building in section, (2) and (3) show some possible usages of the space. All photos are from Atelier Novembre (Atelier Novembre, 2024).

CentQuatre in Paris is a former storage hall for funeral carriages which has been transformed into a culture center. Its wide open halls are now used for a range of activities, including art exhibitions, dance classes, concerts and theatre performances (Atelier Novembre, 2024). The project is an interesting example of how an industrial space can be used for culture and art, similarly to the usage of the former machine hall at Angeredsgymnasiet. It also shows spaces don't need to be highly defined in order to host certain functions, but how a flexible space sometimes also can fulfill that need.

reflection on reference projects

I have chosen these three reference projects as I believe they contain tools for addressing some of the main challenges identified at Angeredsgymnasiet. They have served as source of inspiration during the development of the final design.

First, Lindholmens tekniska gymnasium provides an interesting example of how an educational environment for secondary school students can be designed. Especially relevant is the creation of the central atrium, a continuous space that is used for communication as well as social interaction. By directing all the movement through the atrium a sense of community is created while also providing a safe environment through the experience of seeing and being seen. It also provides a variety of social spaces and experiences, allowing the user to appropriate the space. The school is also a good example of how identity and pride can be reinforced through design, both externally and internally.

The Munkegaard school is interesting as it resembles Angeredsgymnasiet in its structure, but has been very successful and liked while the opposite has been true for Angeredsgymnasiet. I believe that the main difference, at least in the design, is the successful planning of the courtyards. Since each classroom has its own courtyard the risk of disturbances is significantly decreased, meaning the courtyards can be used to their full potential. Even the later renovation and transformation was able to use them for daylight access in underground spaces. Meanwhile, at Angeredsgymnasiet, the courtyards are hardly used for risk of disturbances. However, with some changes of the structure, it might be possible to change that.

Finally, CentQuatre is a good example of how an open and almost "undesigned" space can be beneficial to a community. By providing a great open hall with little to no furniture or walls, the users are able to fully appropriate the space according to their needs, creating interesting interactions that otherwise would not happen.

pedagogy & design

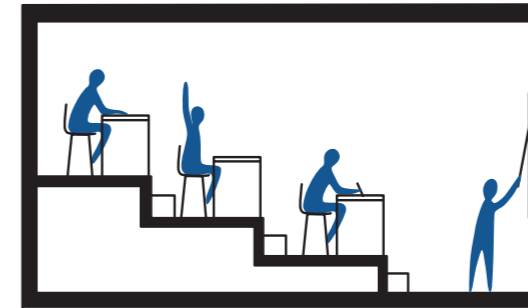
ways of learning

According to a pre-study conducted by Liljewall architects in 2020 we mainly learn in three different ways:

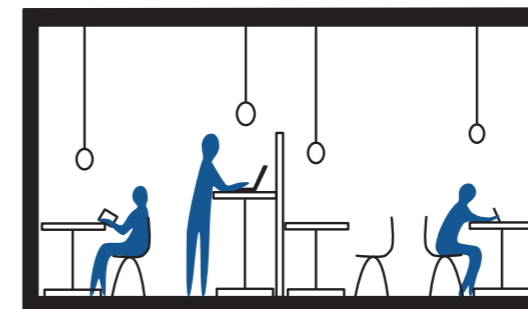
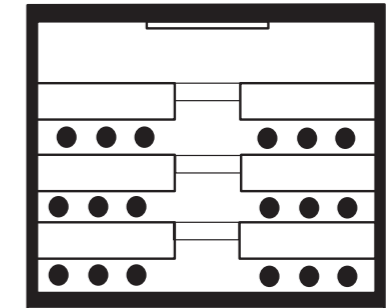
- (1) Receiving information
- (2) Processing information
- (3) Discussing information

The first is the most typical within a school environment and consists of a teacher communicating information to their students, often in a lecture format. The second is done individually and can include reading, writing, etc. The third is conducted in smaller groups where knowledge is shared and discussed (Nilsson & Nordenknekt, 2020). Each way of learning requires certain things from its environment. (1) requires a space where multiple students can see and hear the teacher well at the same time while providing the teacher with space and resources for presentation. (2) requires more remote and quiet spaces where students can reflect in peace. (3) requires spaces that allow for group work and discussion (Nilsson & Nordenknekt, 2020).

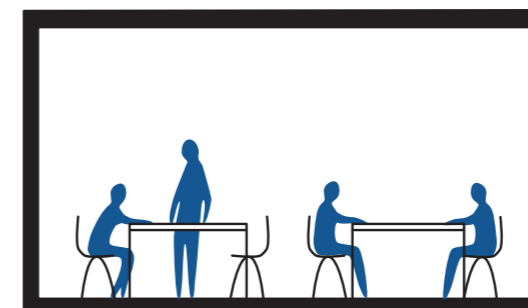
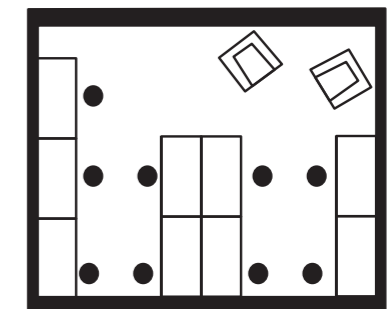
In the text *Att bygga för likvärdighet* (To build for equality) by Frida Brismar Pålsson the author similarly lists “taking in”, “working individually” and “conversation/cooperation” as three ways of learning (de Laval, 2017, p. 55-70). However, Brismar Pålsson adds a fourth way of learning: “doing”. She describes it as learning methods that involve trying, experimenting, moving, creating, or building. Spaces that allow for this type of work are often underrepresented in the school environment, which in turn causes students who thrive in these settings to fall behind (de Laval, 2017, p. 55-70). Therefore, by designing spaces that accommodate for active learning, the architect enables a more diverse range of learning methods that can better cater to the needs of the students. Other factors that can contribute to a more equal learning environment are teacher presence, good acoustics, and secluded “protected” spaces. All of these aim to reduce stress factors in the environment and to create a feeling of safety (de Laval, 2017, p. 55-70).



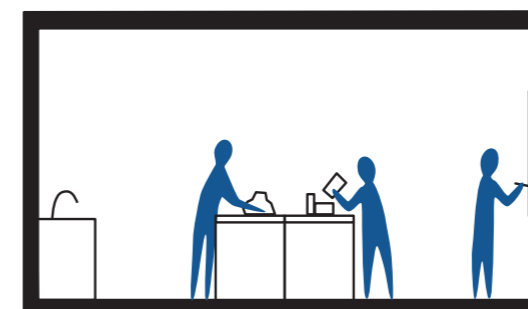
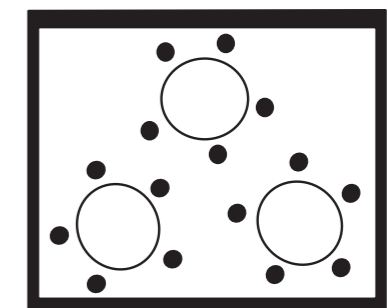
Receiving knowledge



Processing knowledge



Discussing knowledge



Testing knowledge

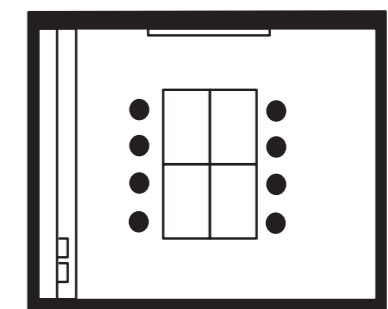


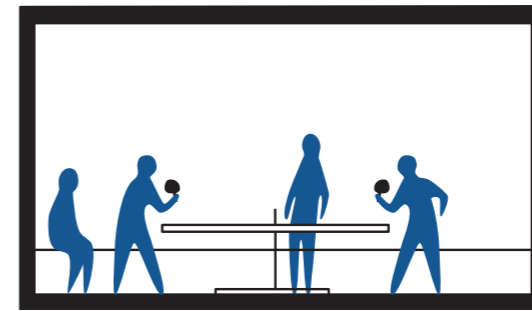
Figure 17. Illustrations showing stereotypical spaces for each of the four ways of learning. Spaces for receiving knowledge should be designed so that students easily can see and hear the teacher, while spaces for processing should provide a low-stimuli environment. Spaces for discussion should enable easy separation into groups, and spaces for testing knowledge should encourage movement and experimentation.

safe social environments

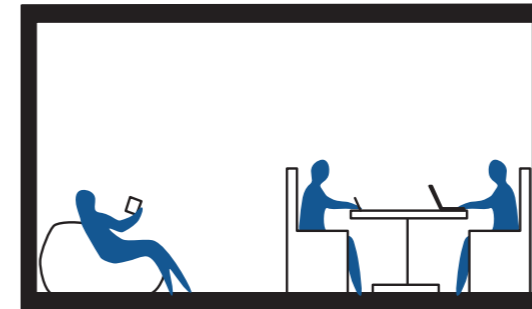
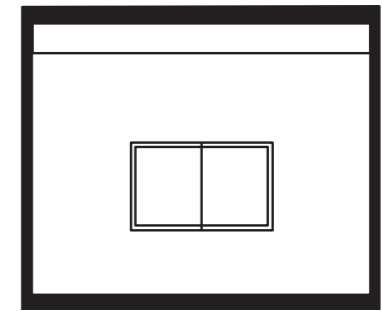
In her text *Skolens rum*, which translates to "Spaces of the School", Inge Mette Kirkeby describes how an individual needs social spaces to prepare for their role in society. She then proceeds to divide the spaces into two types, "closed" social and "open" social. The closed social space is small and secluded, often resembling a cave, and only permits one to two people to use it simultaneously. The open social space contains few barriers and encourages free interaction (de Laval, 2017, p. 73-85). It is important for students to have access to both types of spaces in order to practice social skills while also being able to rest and recover. However, a student should also feel safe while using the space. One way to accomplish this is to enable unobstructed lines of sight and eye contact with teachers as well as other students in bigger spaces; another is the usage of furniture with high backs, creating a sense of being enclosed and protected (de Laval, 2017, p. 73-85) (de Laval, 2017, p. 55-70)

flexibility, appropriation, variety

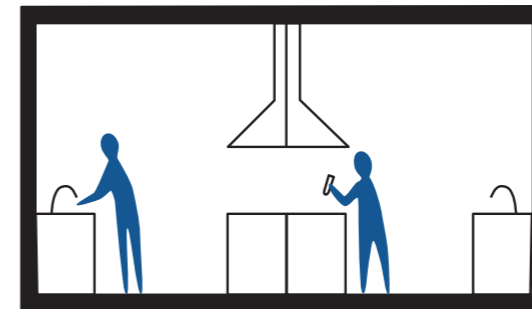
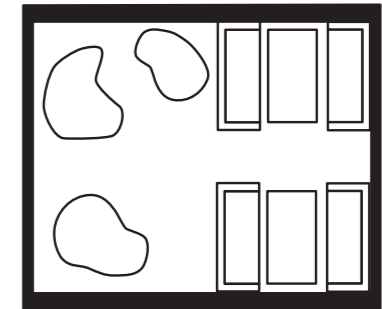
Another important aspect that Kirkeby raises is how the design of spaces affect the activities taking place inside. She explains this using the term "affordance", meaning what range of activities a space allows. If a space has a low level of affordance it can be described as a "hard" functional space, meaning it is specifically designed for a limited set of activities and does not accommodate others. Meanwhile, a high level of affordance corresponds to a "soft" functional space which allows the user to define its usage for themselves (de Laval, 2017, p. 73-85). In an educational environment both spaces are needed as certain learning processes are clearly defined, while others develop and change over time and therefore need flexibility. She concludes by establishing that a school needs to be both flexible and variable, providing a variety of differentiated spaces that fulfill different needs, while also providing environments that can be changed and appropriated by its users (de Laval, 2017, p. 73-85).



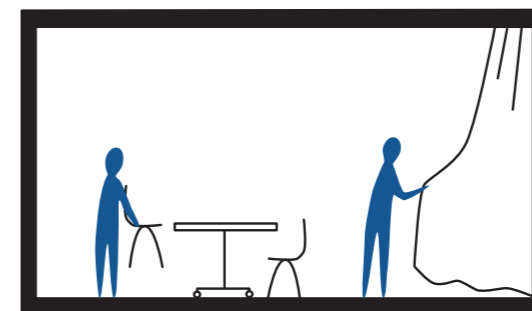
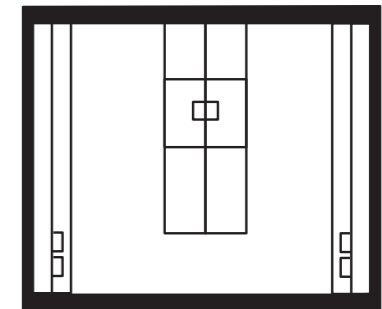
Open social space



Closed social space



Low affordance space



High affordance space

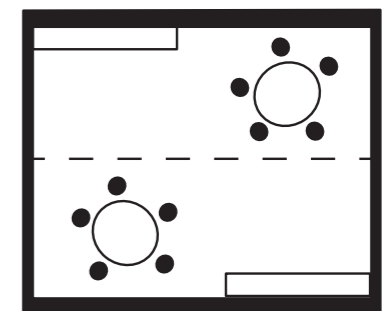
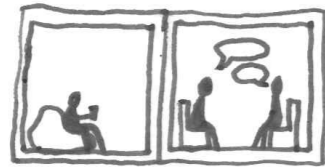


Figure 18. Illustration of closed and open social spaces, as well as spaces with high and low degrees of affordance. As can be seen in the top two drawings, the open social space has few physical and visual boundaries, while the closed is more divided and protected. Low affordance spaces are characterized by highly differentiated spaces, for example laboratories, while high affordance spaces easily can be changed as needed.

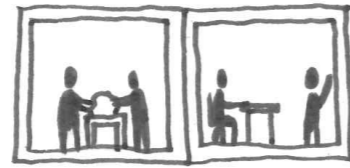
summary

design tools

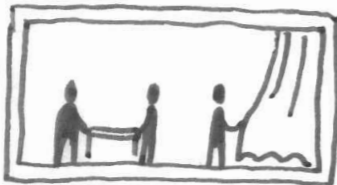
In relation to the challenges identified through the analysis of the building and the participatory reference projects the following design tools have been selected as important based on the research presented in this chapter.



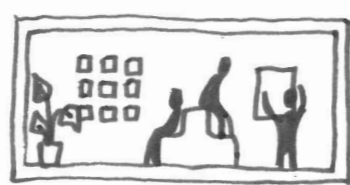
A variety of social spaces that allows for different types of interactions while also providing a sense of safety



A variety of learning spaces providing an inclusive environment for students with different needs



Flexible spaces that allow for changes and can be appropriated by its users



Spaces with a strong identity that display and represent its users, encouraging community and pride

design

A presentation of the suggested design proposal based on the building analysis, the study of the participatory reference projects, and the chosen tools.



design concept

design aims

Based on the conclusions from the study of the previously conducted participatory projects at Angeredsgymnasiet as well as conclusions from the analysis of literature and reference projects, four design aims were developed.



Create a distribution of functions that activates the building as a whole and prevents the creation of "dead" space



Create learning spaces that allow for flexibility and variety in ways of teaching and learning



Create social spaces that allow for different types of interaction while also feeling protected and safe



Create a new design language and identity for the building that communicates pride and care

preservation of the building

As previously stated in the scope, the design proposal aims to preserve and utilize as much of the building as possible if it does not prevent the realization of the design aims. However, the state of the building must also be considered, as there are certain building parts that are in need of heavy maintenance or, in some cases, replacement. Based on the analysis of the building in chapter 3, I have concluded that the existing roof must be replaced as it is an inefficient structure with significant maintenance costs. The replacement of the roof also enables a higher ceiling, skylights, and added insulation, all additions that the students have suggested in the participatory reference projects. Furthermore, since the linear courtyards are currently not used, I suggest transforming them into communication spaces by covering them with a roof. The square courtyards will remain with smaller adjustments of the landscaping and furnishing. The existing load bearing structure will also mainly be preserved, as well as exterior walls.

program explanation

Based on the analysis of the building and the participatory reference projects a new program for the building has been developed. While most of the functions remain, some have been removed or decreased in size, while others have been expanded or moved. Most noteworthy is the removal of Hålsoteket and Riksgymnasiet, as their spatial needs are not specifically tied to the building or location. There is still the possibility that they could exist in the building with small adjustments of the design, but they are not included in this proposal. AtomStudios, Kulturskolan and GUTS, however, are functions that work with youth and therefore have a stronger connection to the building. Especially AtomStudios and Kulturskolan need the unique spaces provided in the high part of the building. I suggest the integration of these functions into the school through the sharing of spaces, aiming to strengthen the community. Finally, I propose the addition of a school cafeteria, as Blå Stället would like to reclaim the current cafeteria for their own use.

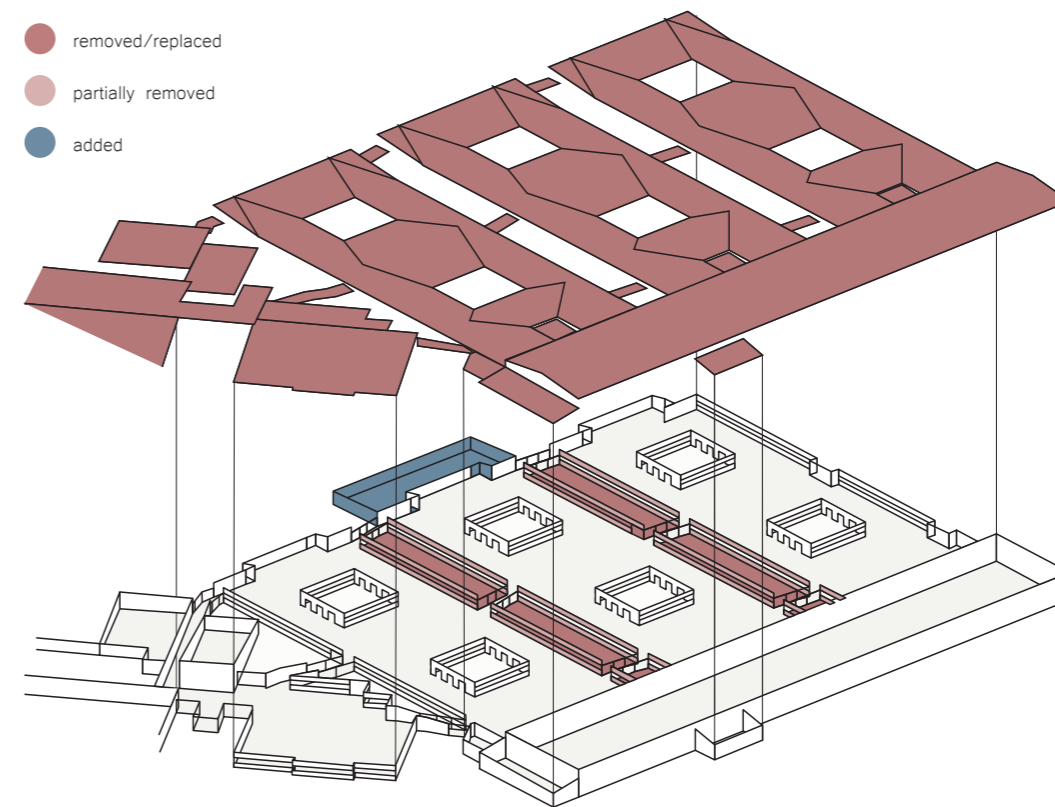


Figure 19. A simplified axonometry of the building displaying what is removed and/or replaced, what is partially removed, and what is added. Interior walls have not been included in this diagram, but as most of them are not loadbearing they have been removed and replaced. However, load-bearing elements such as columns have been kept whenever possible.

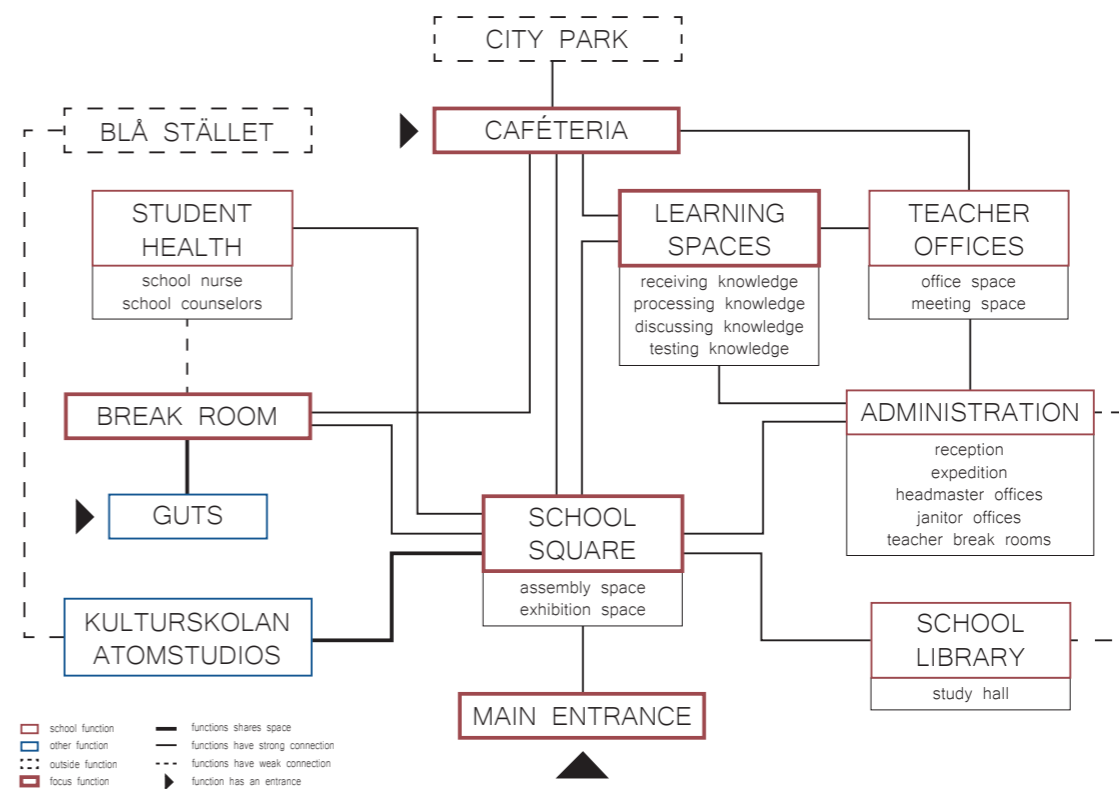
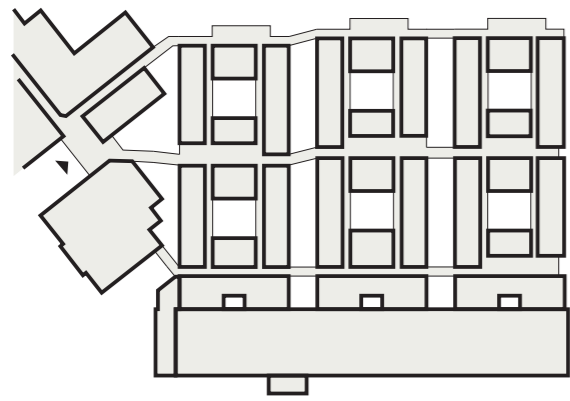
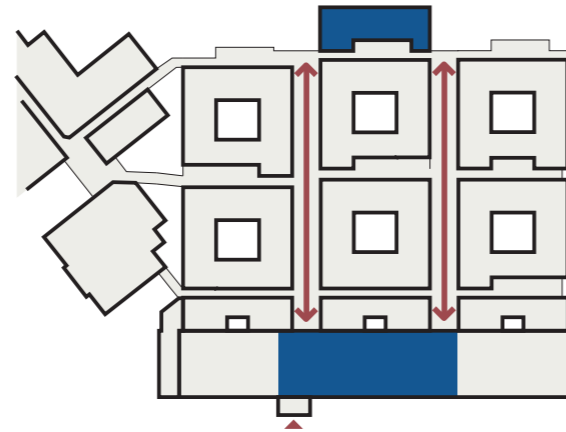


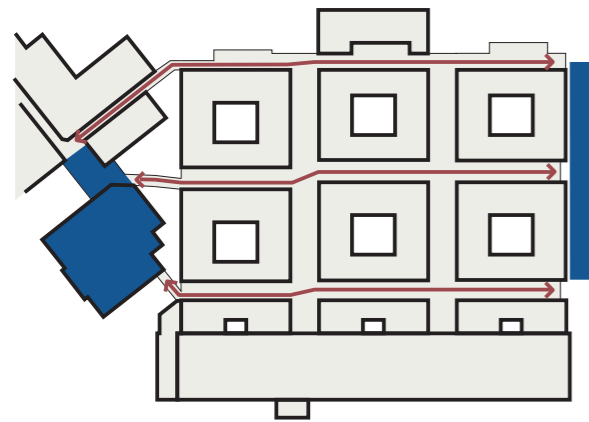
Figure 20. A diagram of the function program as well as the relations between them. Most noteworthy is that remaining municipality functions, GUTS and Kulturskolan/AtomStudios, will share spaces with the school in order to increase cooperation as well as space efficiency.



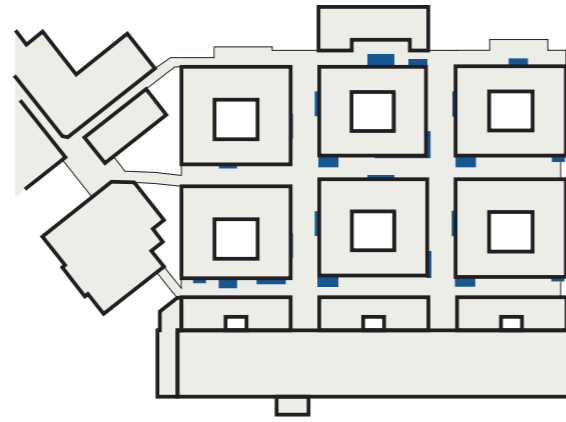
(1) Existing building divided into courtyards, corridors, and enclosed rooms



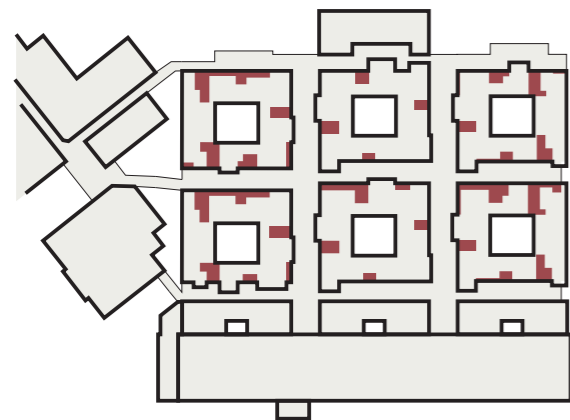
(2) Addition of cafeteria and school square; courtyards transformed to boulevards



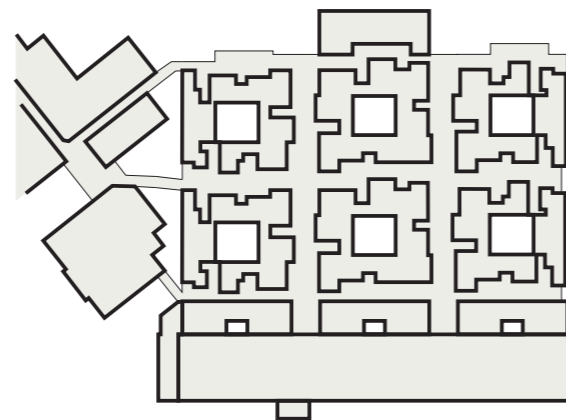
(3) Addition of break room and sports space; widening connecting corridors to streets



(4) Expansion of modules for learning spaces



(5) Expansion of communication space; creating niches for social space



(6) Final module design

Figure 21. A concept diagram showing the design development. First, the functions were redistributed to activate all facades. These were then connected by turning the linear courtyards into corridors. Finally, the modules were developed, creating a dynamic relationship between learning and social spaces.

the building

redistribution of functions

In accordance with the first design aim, the design proposal is based of a redistribution of functions, the purpose of which was the activation of the building as a whole. By moving crucial functions to opposite ends of the building and connecting them with fewer but larger communication spaces a more even spread of activity and movement is created, preventing the creation of hidden or “dead” spaces that are a challenge in the existing building. See figure 20 for the proposed layout.

Most noteworthy is the relocation of the main entrance to the southern high part of the building. The visitor now enters into a semi-public zone, where the cultural functions of AtomStudios and Kulturskolan meet the school expedition, administration and library on an indoor square. On the opposite end of the building, along the northern facade towards the city park, a new expansion building is added to serve as a cafeteria and study hall. On the evenings and weekends, this building used for events or as a café, becoming another semi-public space.

Since the most of the administrative functions are moved to the southern part of the building, the western wing and former entrance is instead transformed to a common room and a student health centre. Outside of school hours the social break area is taken over by the youth centre GUTS. The eastern end of the building is mainly kept as is, but the connection to the sport functions are strengthened through landscaping and the addition of a basketball court.

As the relocation of the functions will cause an increased flow through the building there is a need for high quality communication spaces. For the east-west direction, the existing corridors are kept but widened, enabling a greater capacity while also providing seating areas. In the north-south direction new corridors are introduced by paving and covering the existing linear courtyards. The result is a school similar to a city in structure: blocks centered around peaceful courtyards intermingled with active squares, all connected with lively streets and boulevards.

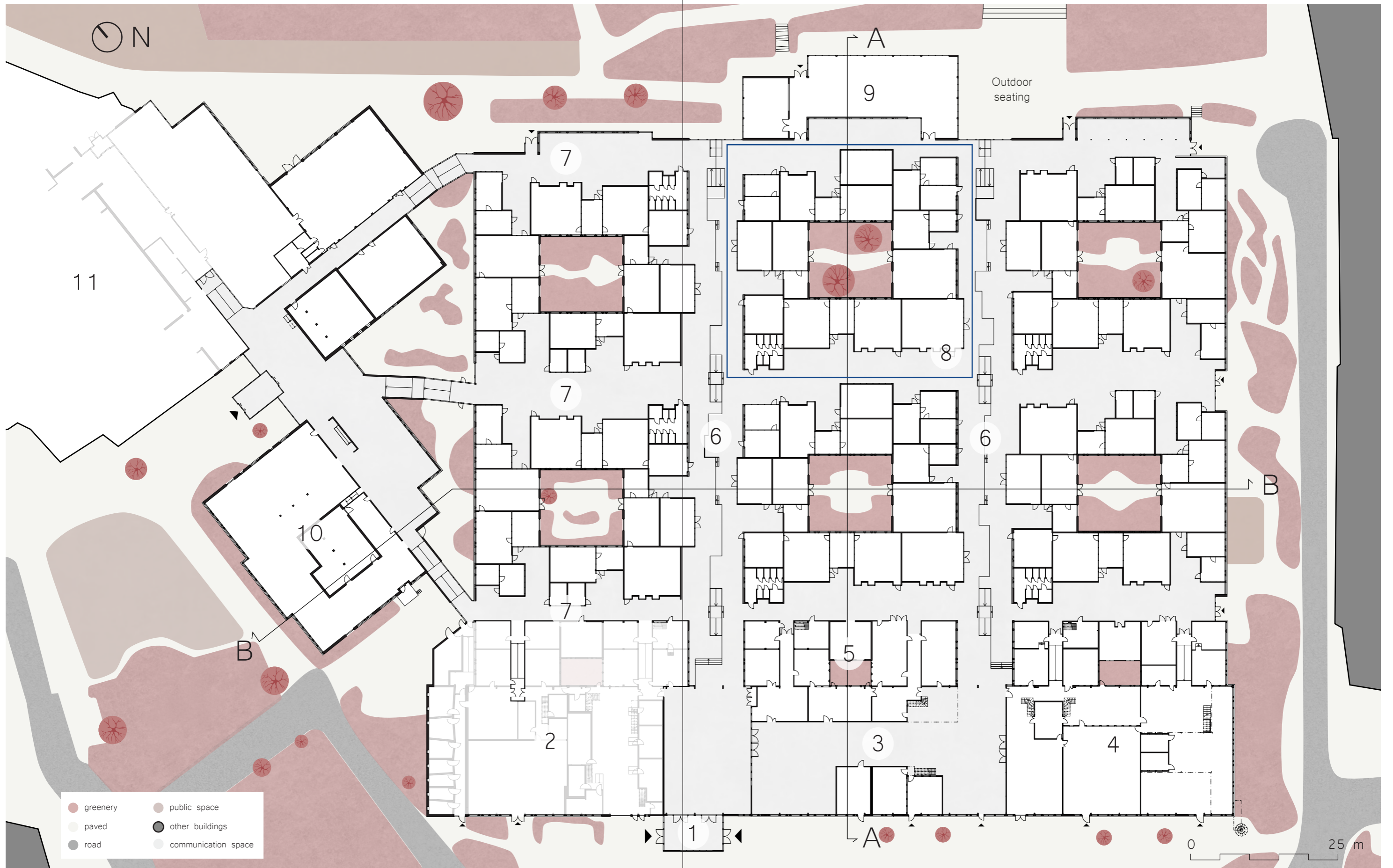
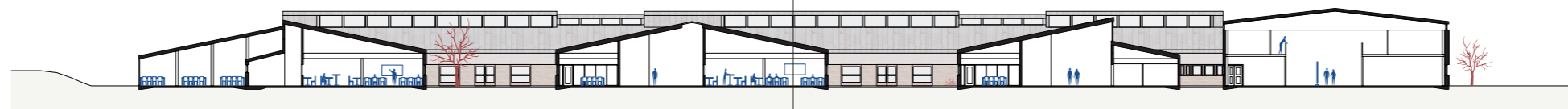
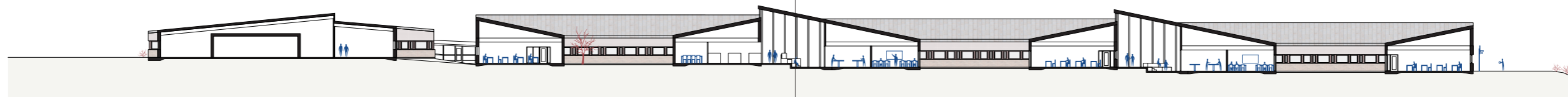


Figure 22. Plan displaying the design proposal for the ground floor, scale 1:600. The numbers correspond to the following functions: (1) Main entrance, (2) Kulturskolan and AtomStudios, (3) school square and culture hub, (4) school library, (5) administrative functions,

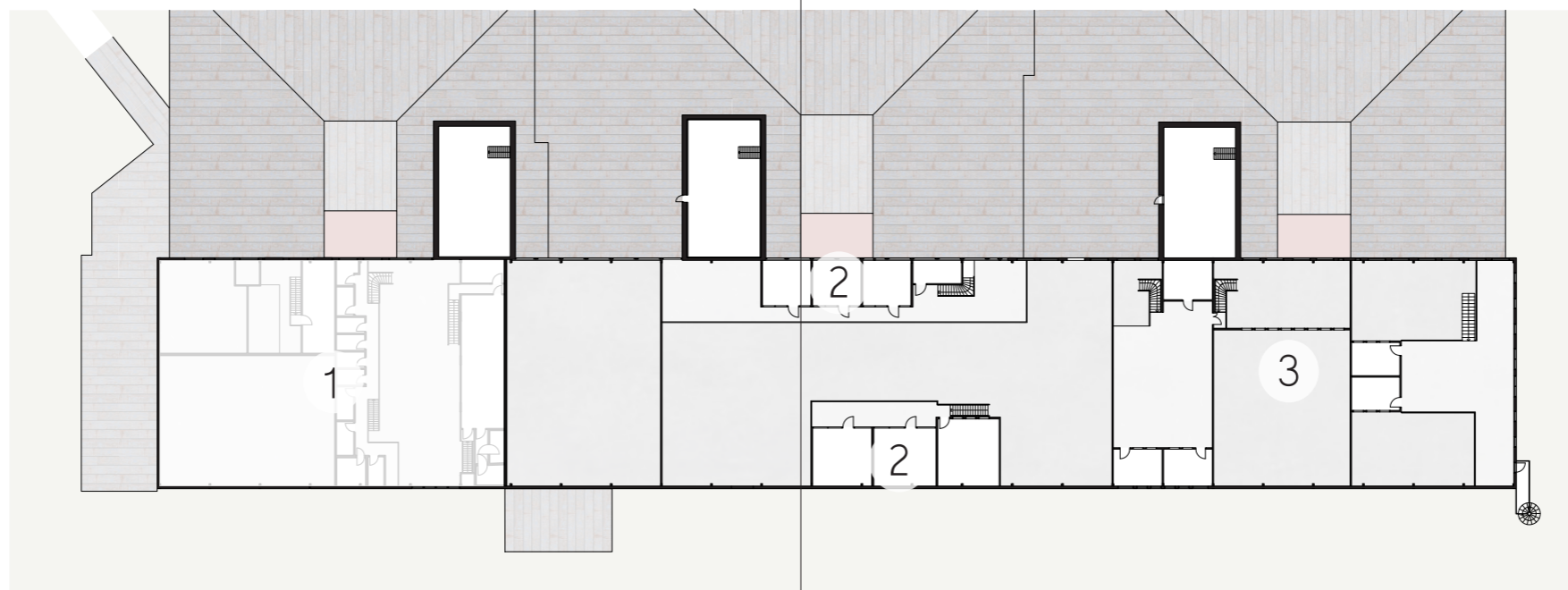
(6) boulevards, (7) streets, (8) learning module marked in blue, (9) school cafeteria and kitchen, (10) break room, health services, and GUTS, (11) Blå Stället. Communication spaces are marked in grey and also function as important social spaces.



section A-A



section B-B



1st floor

● greenery ● paved ● communication space ● double ceiling height

0 25 m

Figure 23. Sections A-A, B-B, and the first floor of the new design, scale 1:600. As seen in the sections the roof of the low part is replaced, creating a new and interesting silhouette. Skylights are used to bring lights to the boulevards and streets transverseing the school. In the plan for the first floor,

the numbered functions are: (1) AtomStudios and Kulturskolan, (2) group rooms, (3) school library. Darker spaces indicate double ceiling height.

the modules

where study meets social

Within this city-like structure, the typical school function - learning - takes place in the blocks centered around the square courtyards. The blocks are framed by the north-south running boulevards and the east-west running streets, which function not only as communication routes but also as the main social spaces of the school. The transition between learning and social spaces has been carefully considered in this proposal, aiming to enhance the learning that takes place both inside and outside class. The boulevards are designed as animated and social places, with the more active learning spaces placed along their stretches. In some places, glazed walls and double doors enable the learning and social spaces to completely intertwine. The streets are designed to be more quiet and calm, enabling students to sit down and reflect on their classes. Consequently, calmer learning spaces are placed along these streets. Evenly distributed teacher offices create a sense of teacher presence and being seen.

flexibility

As pedagogies and school plans change frequently, a school should be easily adjustable to fit new wants and needs. While the rooms of the learning module have been designed with different ways of learning in mind - receiving, processing, discussing and testing knowledge - they are based on similar sizes and can easily be interchanged. Therefore, if the need for active learning spaces is bigger one year, some of the spaces for receiving knowledge could easily be transformed into spaces for testing knowledge. The spaces have also been connected in various ways, enabling the teacher to switch between ways of learning during class. Furthermore, many of the walls are lightweight structures and not load-bearing, which enables the merging of smaller rooms in case there's a need of bigger spaces. Finally, the current structure also enables other functions in the future, in case there would no longer be the need for a school in the area. Some examples are an office complex, a new mall, or maybe even housing.

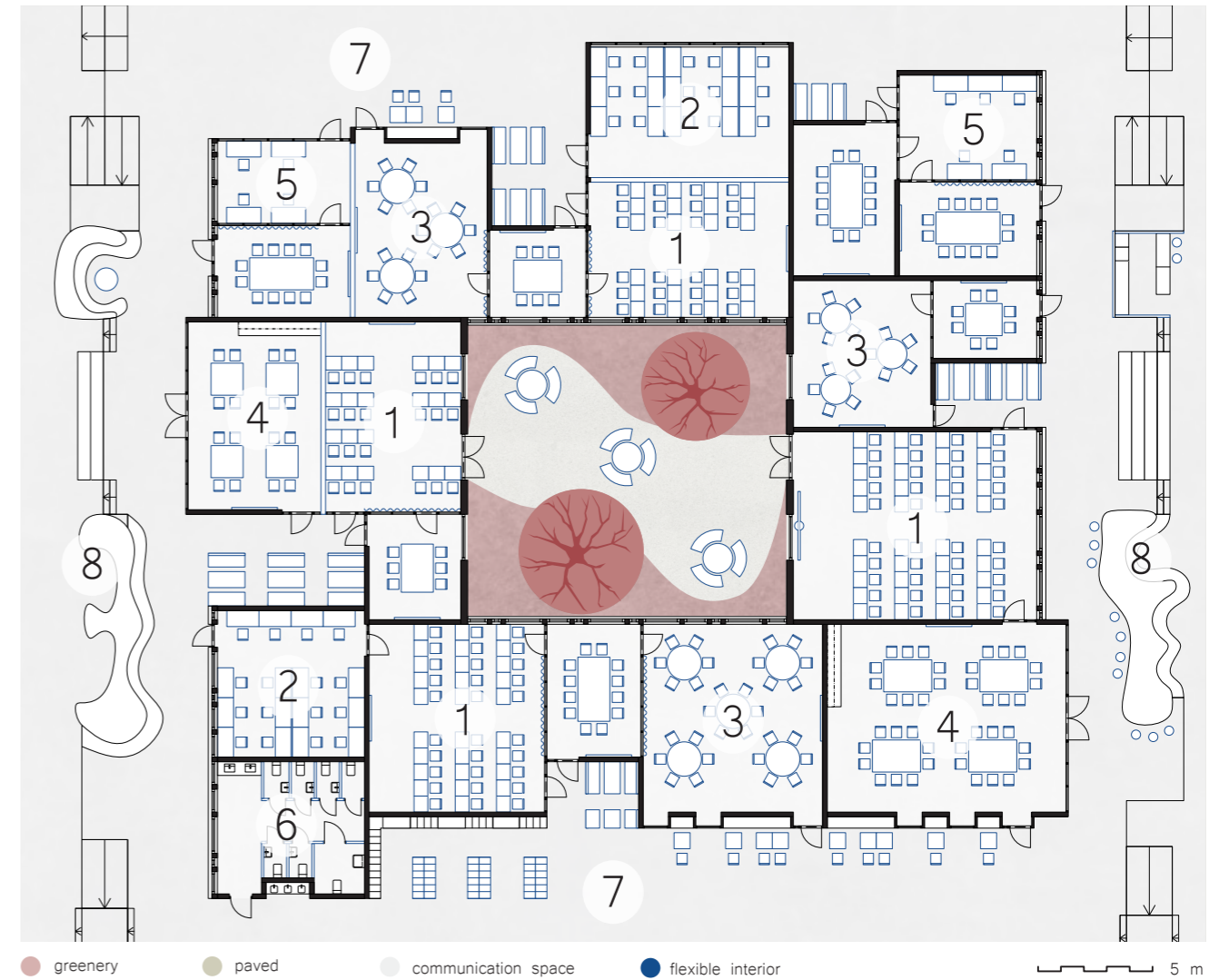


Figure 24. A typical learning module, scale 1:300. The numbers correspond to the following functions: (1) receiving knowledge, (2) processing knowledge, (3) discussing knowledge, (4) testing knowledge, (5) teacher offices, (6) bathrooms, (7) streets, (8) boulevards. Smaller group rooms enables variety during lessons and provides meeting spaces for teachers.

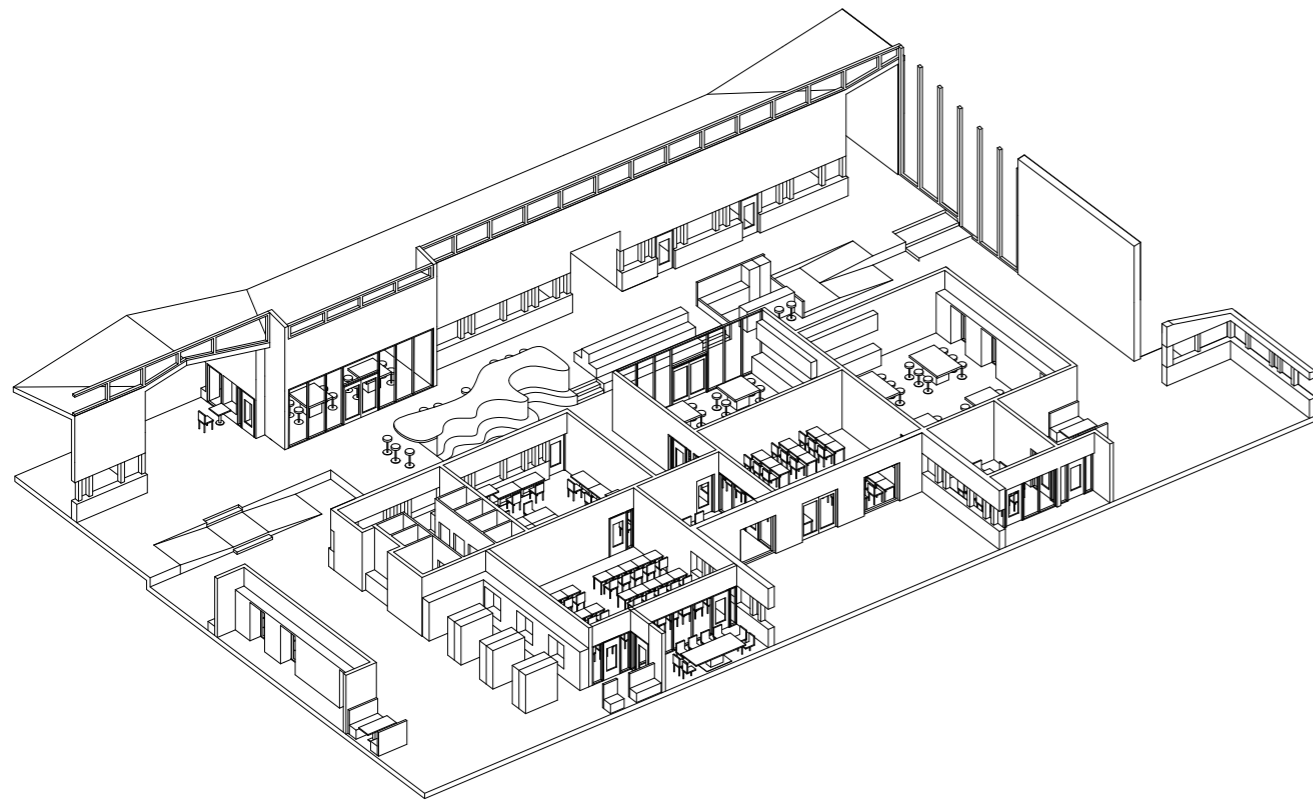


Figure 25. An axonometry showing the interaction between the learning spaces and the boulevards.

boulevards

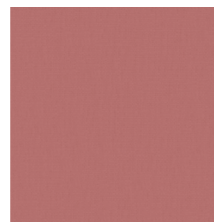
The boulevards are the main social spaces of the school and provides plenty of interesting meeting spaces for the students. Parts of the existing exterior walls are kept, creating visual contact between learning and social spaces, while new walls create interesting nooks and crannies where students can sit. The height difference between modules create two walkways bridged with an ever-changing social zone, characterized by the organically shaped furniture. The new roof contains skylights that provide the space with daylight and interesting light play. Each boulevard contains a small café where students and teachers can buy refreshments between classes. For special events or exhibitions the adjacent learning spaces can be opened up to the boulevards and the boundaries between learning and meeting can be erased.



brick, existing walls



plywood, added walls



fabric, new furniture



concrete, new floor

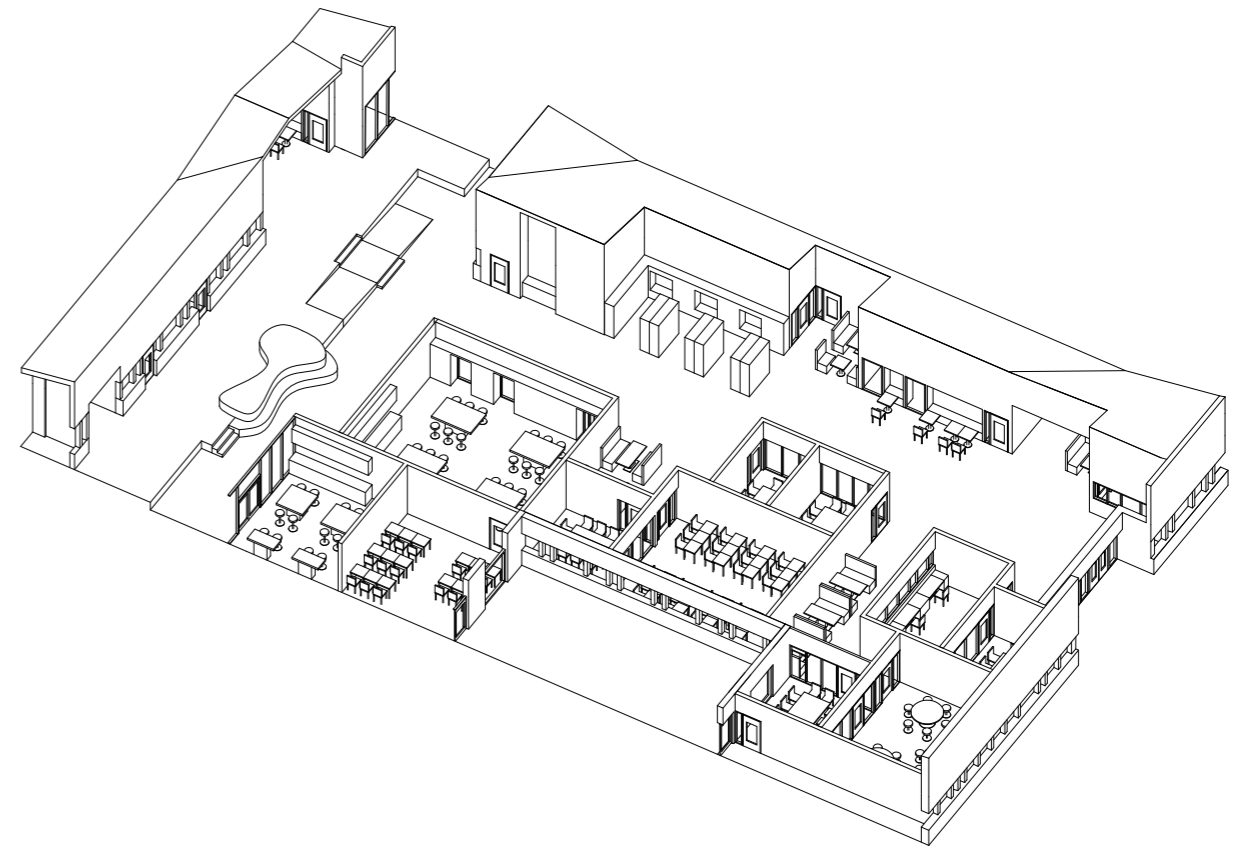
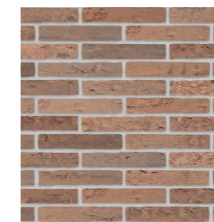


Figure 26. An axonometry showing the interaction between the learning spaces and the streets.

streets

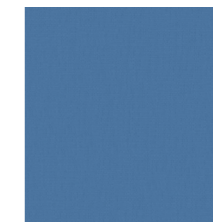
The streets are the calmer version of the boulevards with a focus on more closed and intimate social spaces. This provides space for students to process and reflect on the information they receive during their classes. As each street contains a set of lockers they also serve as a safe point for the students, a space to which they will naturally return throughout the school day. In the street the main movement happens along the central axis while the sides provide seating, often in little nooks, resulting in a protected feeling. The furniture is more conventionally designed with orthogonal shapes, creating a stronger sense of familiarity compared to the boulevards.



brick, existing walls



plywood, added walls



fabric, new furniture



concrete, new floor

spaces for receiving knowledge

The space for receiving knowledge is the space that most closely resembles a traditional classroom. Tables and chairs are placed in rows facing a whiteboard or screen, providing a good view of the teacher and the material they are presenting. By increasing the height of the tables and chairs towards the back of the classroom visibility is improved without sacrificing visibility. Windows are placed carefully to try and minimize distractions.

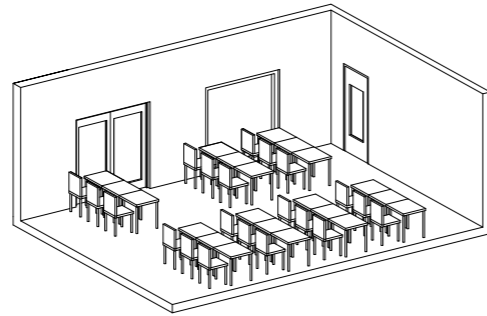


Figure 27. An illustration of a typical space for receiving knowledge.

spaces for processing knowledge

The space for processing knowledge is similar to an office or study halls. Desks are placed facing walls or windows, often separated with screens, preventing distractions while working. The desks can be raised and lowered to provide students with the possibility to stand and work. Windows towards corridors ensure that students feel seen in the room and prevents students from feeling isolated or unsafe.

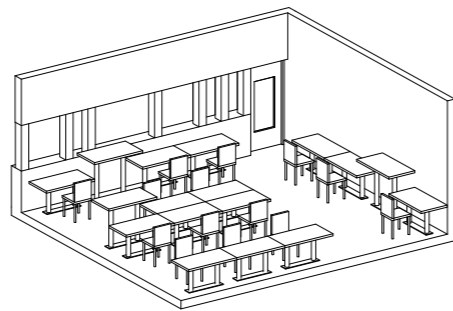


Figure 28. An illustration of a typical space for processing knowledge.

spaces for discussing knowledge

The space for discussing knowledge provides multiple ways of dividing a class into smaller groups. Round tables are distributed in the room, all still with a good view of a whiteboard or screen, enabling discussion with the whole class or conversation in smaller groups. Often the room is linked to a separate group room, which can be used if students need more peace and quiet. These spaces are linked to the main room with glazed walls, maintaining visual contact for safety purposes.

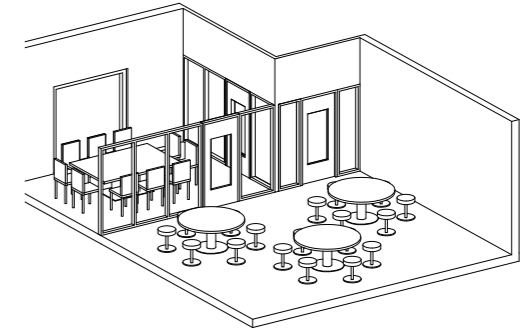


Figure 29. An illustration of a typical space for processing knowledge.

spaces for testing knowledge

The space for testing knowledge is the most active learning space and suffers the least from distraction, resulting in enhanced connections to corridors with big windows. Tables are elevated and placed away from walls to enable students to work freely around them, gathering or dispersing as they please. Each room contains counters for storage, as well as a sink for access to water. The materials are durable and made for wear and tear.

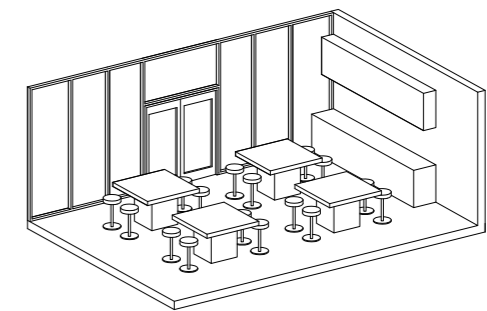


Figure 30. An illustration of a typical space for processing knowledge.

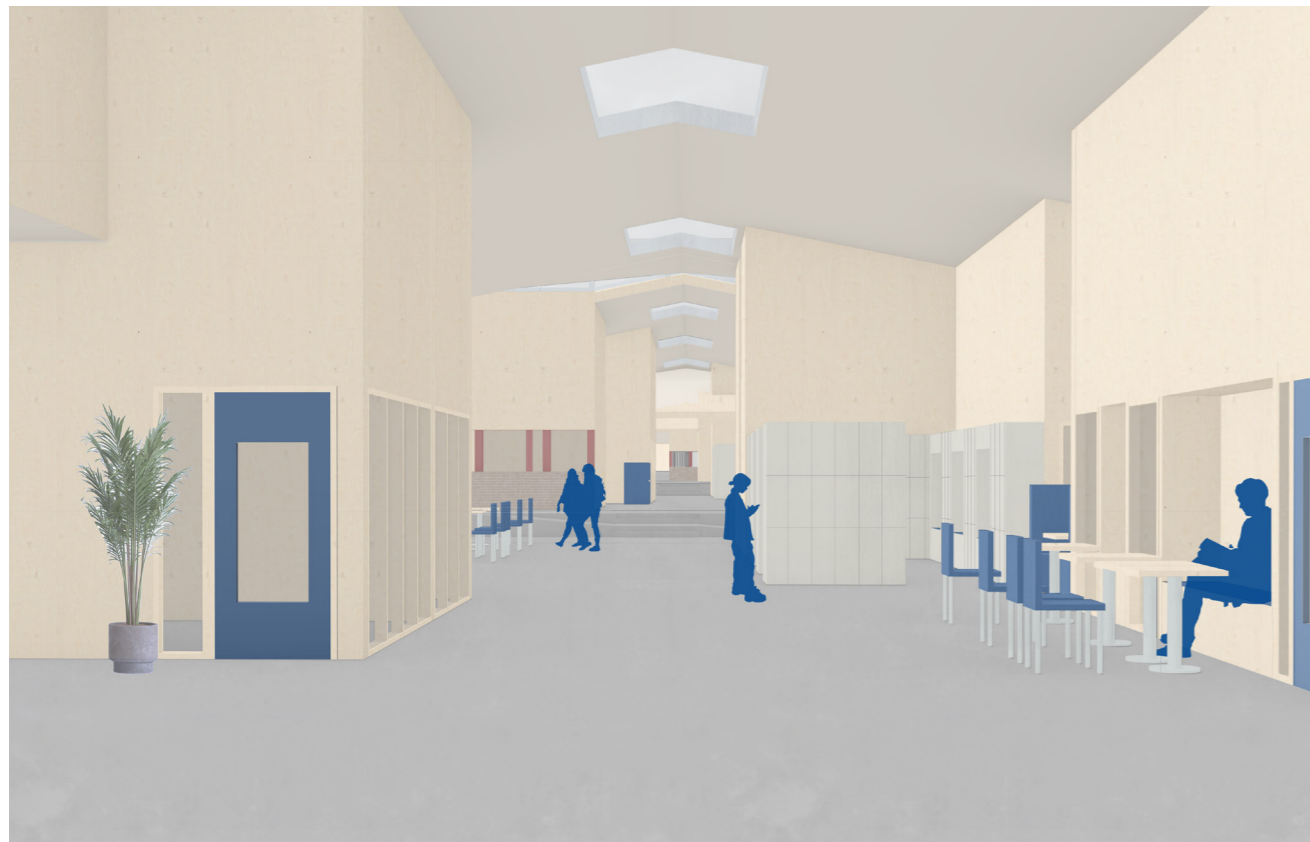


Figure 31. Interior perspectives showing the boulevards (top) and streets (bottom). The boulevards are more active and dynamic, showing a diversity of people engaging in different activities, while the streets are more quiet in nature. Colored accents are used to separate the two.



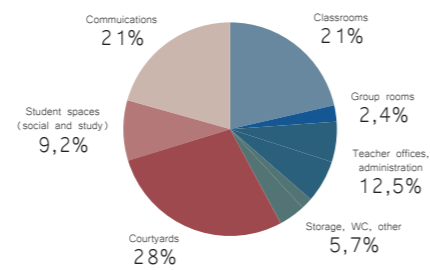
Figure 32. Exterior perspective of the main entrance (top) and the cafeteria (bottom). These two extensions are the main exterior changes to the building and create bridges between the surroundings and the school.

reflection

comparison

The proposal results in many changes in the disposal of the surface area. These include a decrease in administrative and teacher spaces, mainly as these functions are more integrated with the student body, and the addition of new student spaces as well as the cafeteria. The main difference, however, between the existing building and the proposed design is the transformation of the linear courtyards into corridors, as well as the reshaping of the adjacent modules. This intervention results in a significant increase of social space without the area of learning space changing significantly, completely changing the ratio of social vs learning spaces. While this could be considered inefficient, the conducted research suggests that the issues Angeredsgymnasiet face today have little to do with availability of learning spaces but rather relate to social factors. Through the redistribution of area the design communicates a care for its users and, by extension, their environment. Such a care is likely to be reciprocated, resulting in feelings of ownership and pride.

current surface use



design proposal

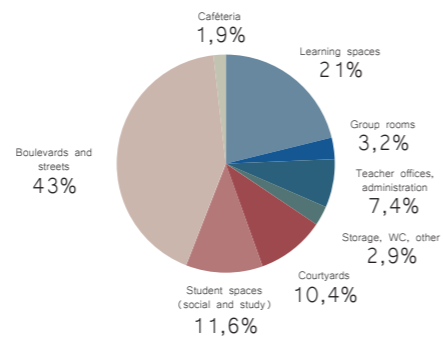
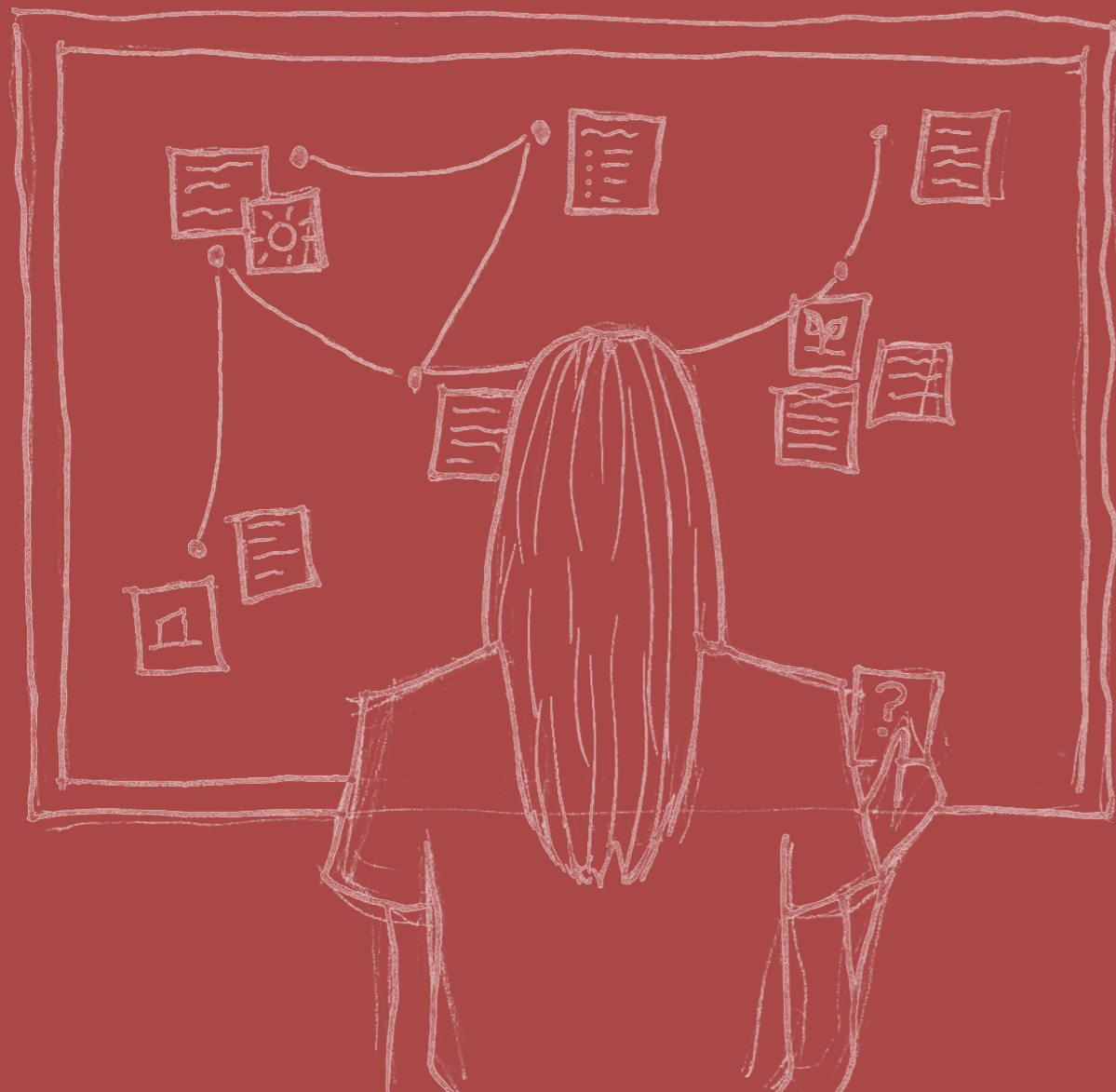


Figure 33. A comparison of the current use and the new design proposal.

discussion

The conclusions of the thesis as well as the discussion and reflection on the approach and outcomes.



conclusion

The aim of this thesis was to answer the question “How can the secondary school Angeredsgymnasiet be architecturally transformed in a way that improves the physical and social environment of the school from a student perspective?”. The research was supported by three sub-questions, the outcomes of which are described below.

sub-question one: context

The first sub-question concerned the challenges and possibilities facing Angeredsgymnasiet as experienced by the students. The study of previously conducted participatory projects revealed that students were very aware of their surroundings. They identified multiple problematic aspects in the school environment, such as the lack of space for break activities while other spaces were inefficiently used due to trust and safety issues. Boring interiors, bad indoor climate, high noise levels, dark corridors, dirty toilets, etc. were other problems identified. This information was then confirmed and expanded upon through site visits and interviews with municipality representatives, school employees, and other users of the space. Additional issues raised were the complex structure of the roof and the spread-out organization of the school.

sub-question two: discourse

The second sub-question concerned the discourse on educational architecture and was answered through literature analysis, case studies, and interviews. The research showed that a variety of spaces is crucial in order to allow students from different backgrounds and with different preferences equal opportunities to learn and develop. This applies both to learning spaces as well as social spaces. The spaces need to be flexible so that they can be adjusted to changing educational and pedagogic needs over time. Other important aspects were visibility and teacher presence for the experience of safety, a strong identity and sense of ownership towards the physical environment, and technical aspects such as a good indoor climate and pleasant lighting.

the main question: design

The main question concerned the application of the previous questions on the transformation of Angeredsgymnasiet and was answered mainly through the design. Based on the analysis of the context and the participatory reference projects a set of design aims was developed, considering such aspects as safety, identity, and variability. Then, these aims were matched to suitable design solutions based on the discourse research. Finally, these were applied on Angeredsgymnasiet through a series of iterative design trials, including methods such as prototyping, mapping, modeling, and scenarios.

The final design is a building where safety has been improved through a relocation of functions, distributing the flow of people more evenly throughout the school and consequently eliminating dead spaces. Communication spaces were relocated and expanded to create a variety of pleasant meeting places while improving internal connections. The roof was replaced with a new structure, enabling a more spacious and bright interior.

Extra attention was paid to the learning spaces, which were redesigned to interact well with the social spaces while providing variability and flexibility in teaching methods. Internal visibility was improved by the widening of corridors and addition of windows in interior walls. Finally, the interior was decorated with new materials, colors, furniture and greenery, giving the school a strong identity. Large interactive spaces, such as the communication spaces and the school square, give students the opportunity to exhibit and share their work.

By answering these three questions the thesis shows how participatory work can be applied in a transformative design proposal, in this case the transformation of Angeredsgymnasiet based on student opinion. The application of the previously conducted participatory work enabled the author to identify issues relevant to the specific user group and to develop targeted design solutions. The result is a school with personality where students can grow and develop as individuals while being themselves – a space of their own.

discussion

secondary education design

During the literature analysis I noticed a lack of research regarding the design of secondary school environments in Sweden. The vast majority of texts I encountered concerned primary schools while secondary schools were hardly ever mentioned. Why remains unclear, but I will list some potential reasons here. First and foremost, secondary school is not mandatory in Sweden, and therefore has less attendees than primary school. Consequently, I believe, the performance of secondary schools is generally considered less important. Second, students who attend secondary are at an age where they are neither adults nor children. This seems to result in a situation where no one speaks for them, as they are considered old enough to do so themselves; and no one listens to them, as they are too young to know what's good for them. As a result, they seem to be forgotten in many debates concerning education and school design, something I hope will change in the future.

participatory methods

This project has heavily relied on the outcomes of participatory design projects. While participation has clear advantages, mainly the direct interaction with the user, there are also some potential risks. First, since I didn't conduct the work myself I rely on the interpretation and representation of the project authors, meaning that there is risk for misrepresentation or unintentional bias. I have tried to minimize this risk by studying multiple projects conducted by different teams over time, and by studying the workshop materials themselves rather than only the final outcomes. I also met with representatives from each Chalmers team to better understand the projects. There is also the risk of missing out on other important perspectives by mainly relying on the opinions of one stakeholder group. Therefore, I have conducted complimentary research and interviews to increase accuracy. Even with these risks considered, however, I still believe that participatory work can be an invaluable source in a design project.

economic aspects

As stated in the introduction, this project does not conduct any calculations concerning the cost of transformation in comparison to demolition and new construction. However, economics are a huge factor in the ongoing investigation regarding the future of Angeredsgymnasiet, and the high maintenance costs of the current building is the main argument for demolition. While I can't prove that my proposal would be cheaper than demolition and reconstruction, nor that it would succeed in decreasing maintenance costs to a more manageable level, I believe there are other costs more important than economic ones. Our planet faces an unprecedented climate crisis, and if we do not address it there might not be an economy left to consider. Furthermore, often a community feels a connection to its buildings, even if they are badly maintained. By demolishing such buildings we signal that the community is not desired. Therefore, I believe that if a building still functions, it is our duty to utilize it rather than demolishing it.

general reflection

A school is a large and complex structure, and to create a complete proposal for Angeredsgymnasiet would take more time than given to this thesis. For that reason I chose to focus on the aspects that I deemed most important in relation to the conducted research, namely the social and learning spaces. However, this is just one potential solution to the presented challenges, and there is much unexplored potential in the building as well as the community surrounding it. In a continued process I would have loved to further explore how the school could interact with the other functions around it, and to develop the new design in more technical detail. Still, I am happy with the result, mainly as I think it serves as an example of how little it takes to breathe some energy into a neglected building. I also feel very honored to have been able to partake in and share the extremely intelligent and creative thoughts of the students of Angeredsgymnasiet. They truly are the future of our society, and I hope that their future education can nourish that.

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figures

Figure 10. Anderson, S., Eikelboom, E., Rafit, M., Kestelyn, M., & Zorn, M. (2019). *Architecture of Young Creators* [Project logbook]. Chalmers University of Technology.

Figure 11. Asplund, J., Oxelman, M., & Peeters, E. (2020). *Collaboration of Dreams* [Project logbook]. Chalmers University of Technology.

Figure 12. Blom, C., Lancelotti, C., Nathorst Westfelt, A., & Sharmin, S. (2022). *MADE WITH CARE* [Project logbook]. Chalmers University of Technology.

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Figure 14. Leandersson, B. (2020). *Lindholmens tekniska gymnasium*. Arkitema.

Figure 15. Strüwing, A. (1957). *Munkegaard School*. Jørgen Strüwing.

Figure 16. Atelier Novembre. (2024). *CENTQUATRE-PARIS*. <https://novembre-architecture.com/projet/le-centquatre-centre-de-creation-artistique-paris-19/>

All figures not listed are created and owned by the author.



appendix

A collection of further materials



Figure A. The building exterior. Photo 1 shows the main entrance, 2 the entrance to Blå Stället, and 3 the square west of the city park. 4-6 shows the northeast side facing the park, 7-9 the south-east side towards Angered arena, and 10-12 the south west. All photos are taken by the author.

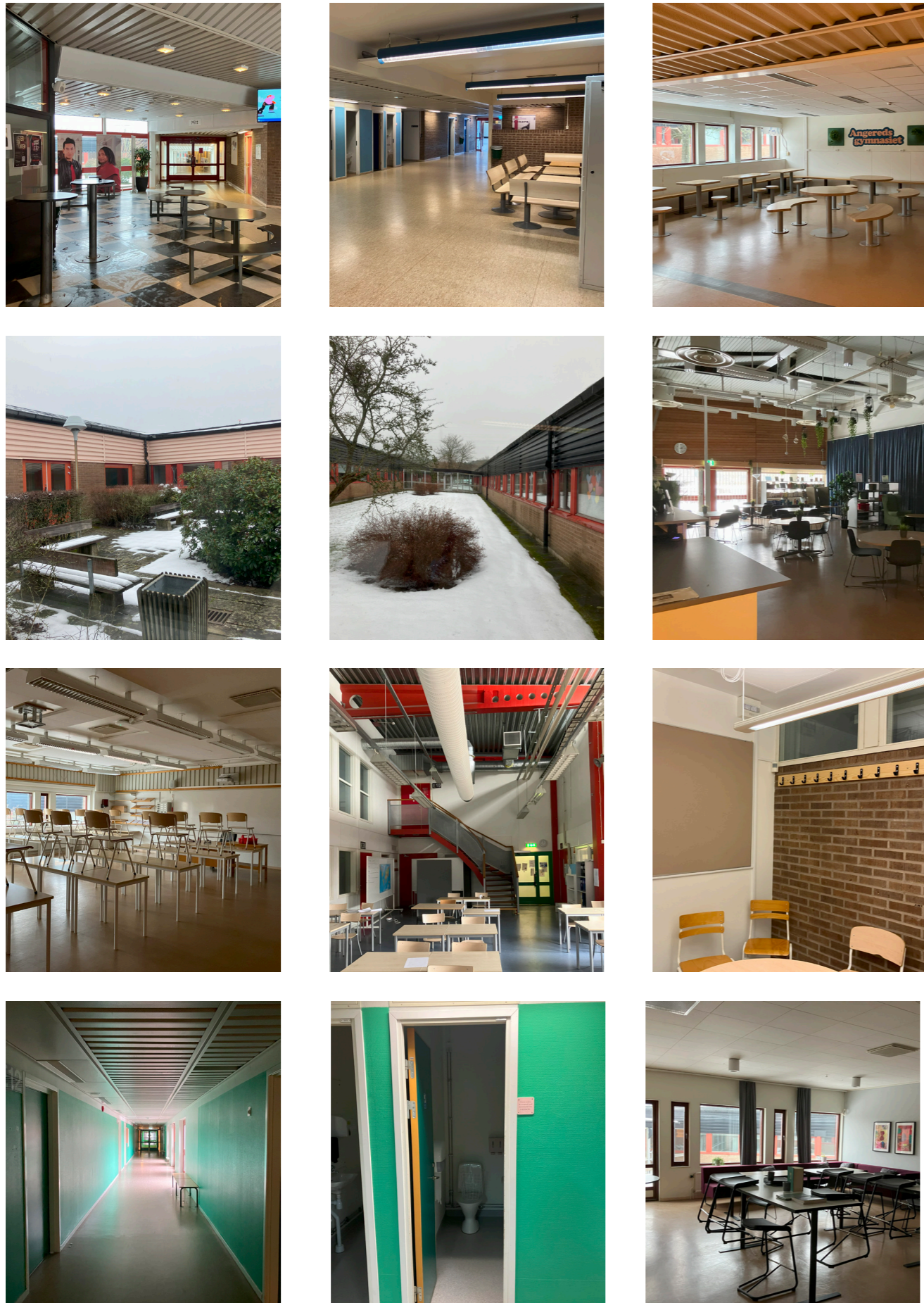


Figure B. Interiors of the school. Photo 1-3 shows entrance and common spaces; photo 4-5 shows the courtyards, photo 6 the library, photo 7-9 classrooms and group rooms, photo 10 a corridor, photo 11 a toilet, and photo 12 the teacher's lounge. All photos taken by the author.

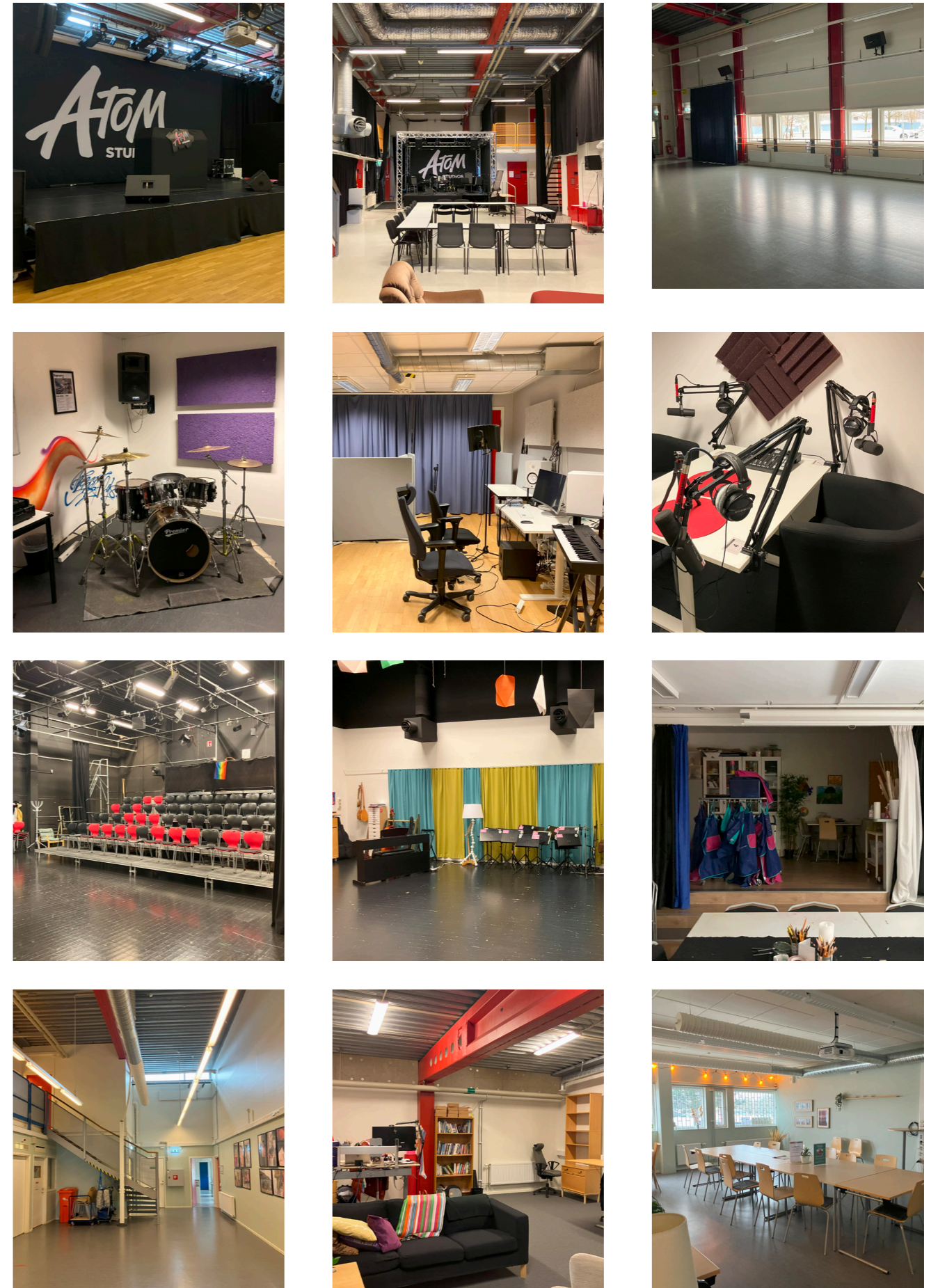


Figure C. Interiors of other building functions. Photos 1-9 show the interiors of Kulturkolan and AtomStudios; 1-3 show some of the bigger halls; 4-6 shows some of the studio spaces; 7-9 show other creative spaces. 10-12 show the interiors of Hälsoteket. All photos are taken by the author.

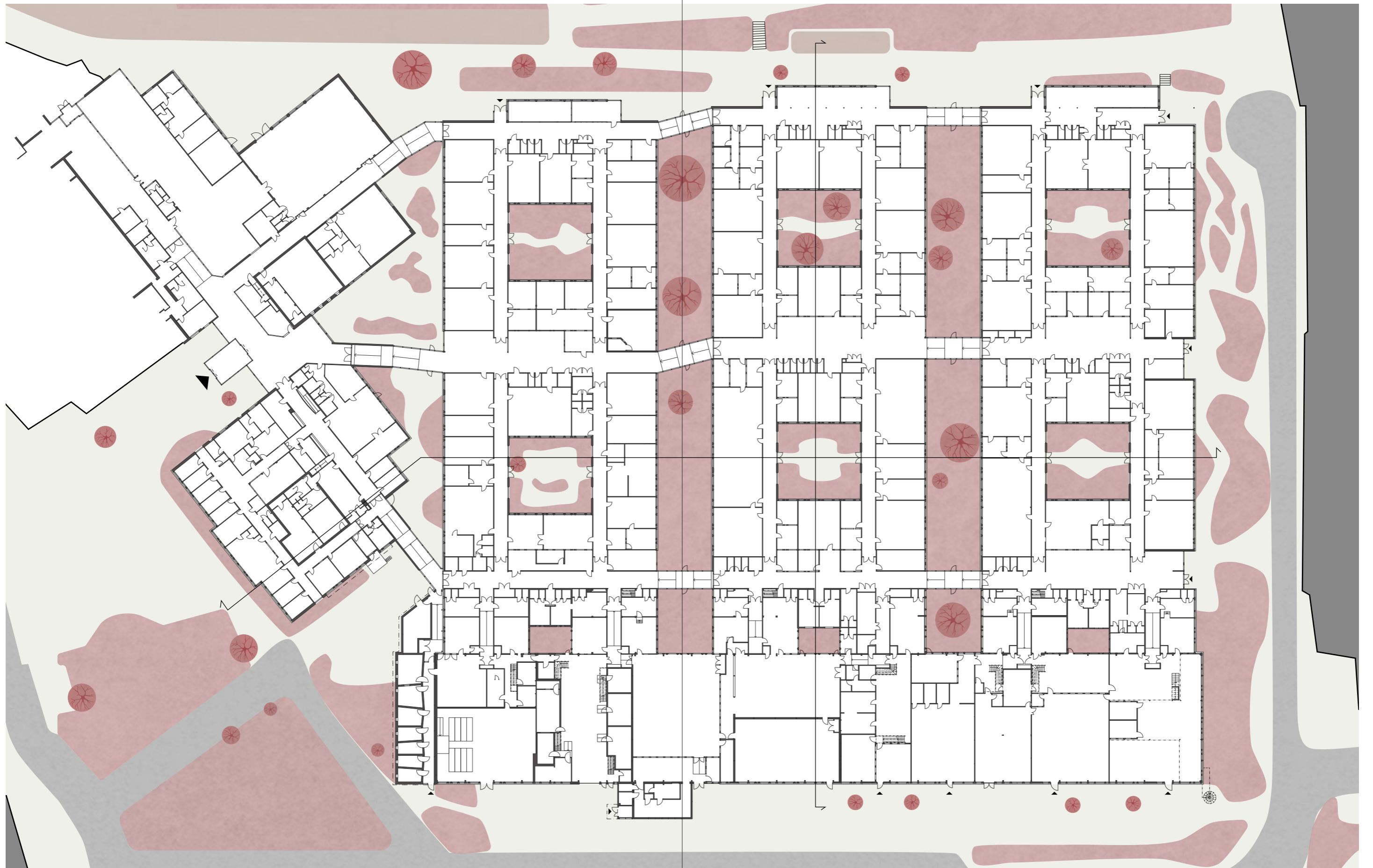
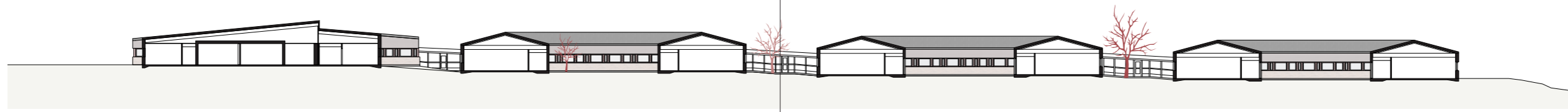
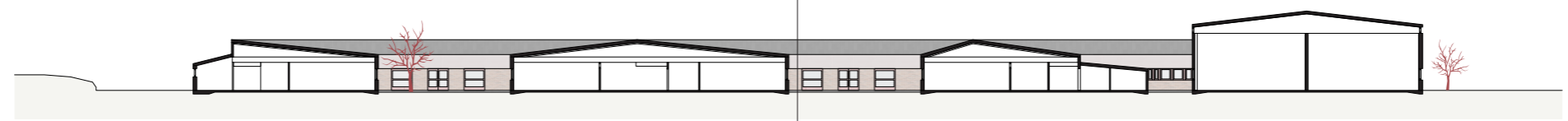


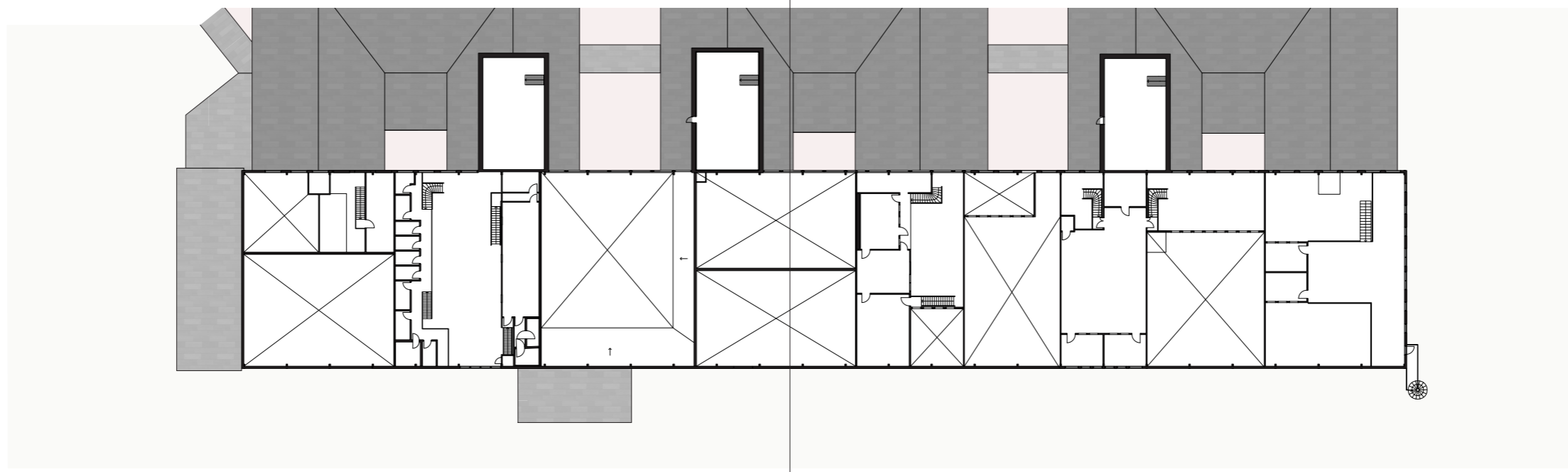
Figure D. The ground floor of Angeredsgymnasiet without annotations, scale 1:600.



section A-A



section B-B



1st floor

Figure E. Section A-A and B-B as well as the first floor of Angeredsgymnasiet without annotations, scale 1:600.

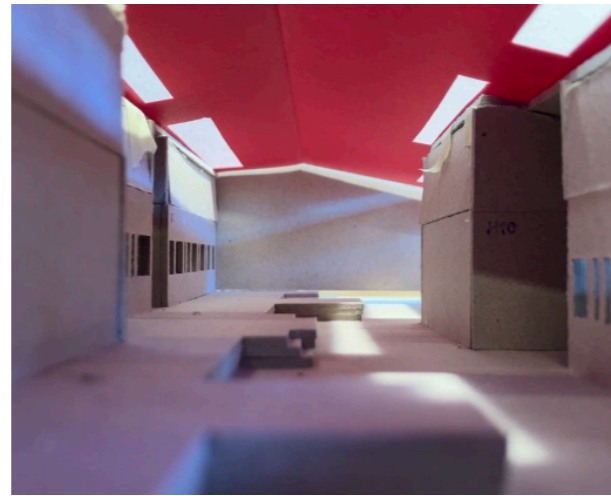
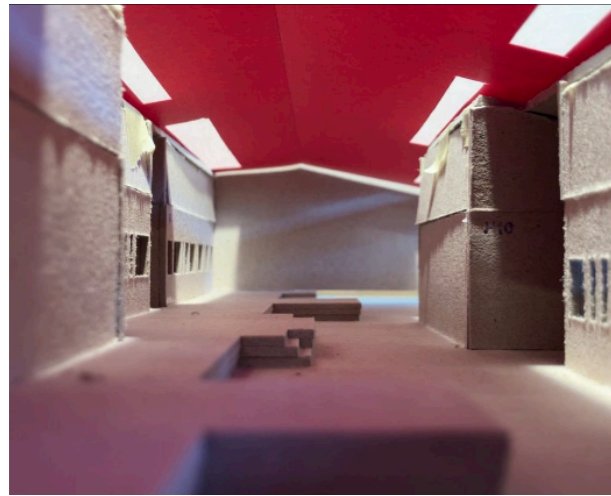
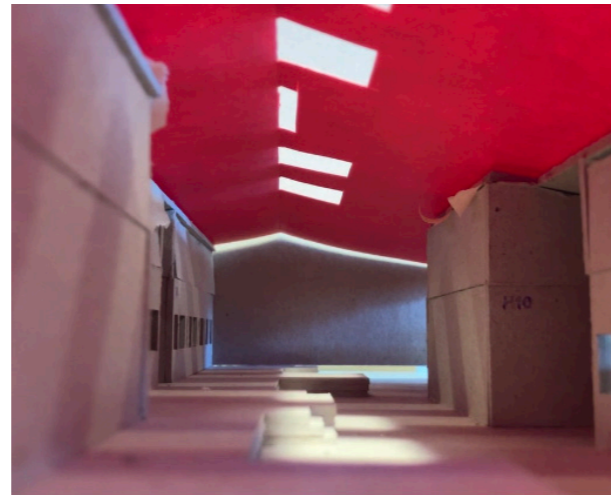
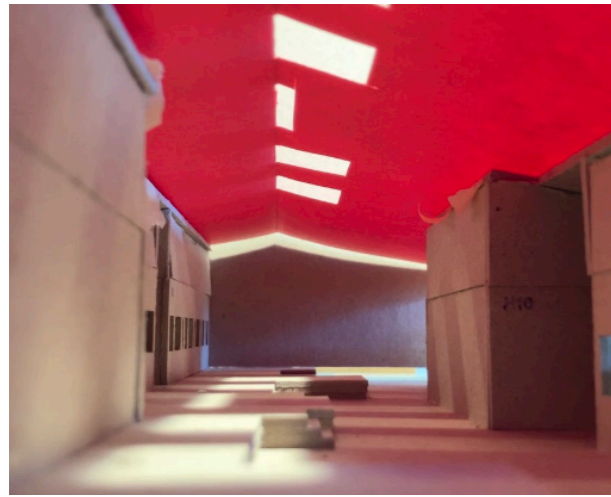


Figure H. A selection of images from studies conducted in the work model. Paper was used to create quick roof shapes and skylights. Shown here are some of the test done for the boulevard, mainly studying how different skylights affect the experience of light.

Figure I. A selection of trials in the work model. The four photos at the top show different trials on the streets, while the two on the bottom show tests done for the niches created through the extensions and retractions of the learning module walls.

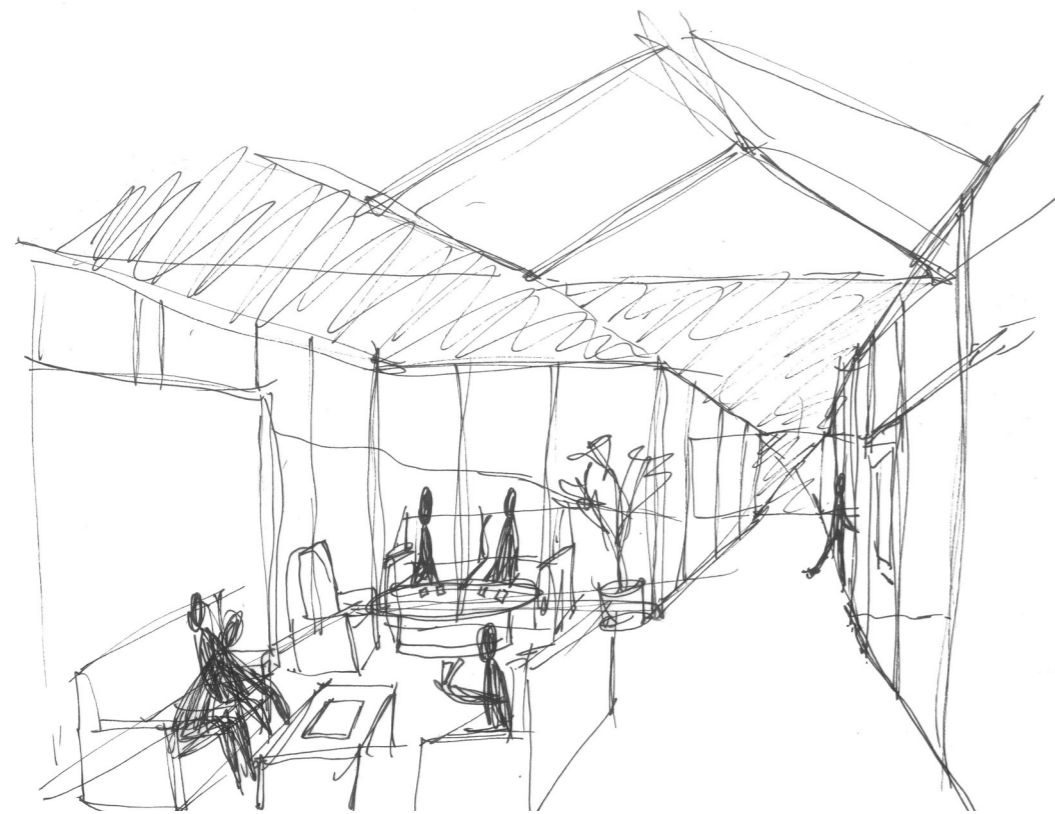
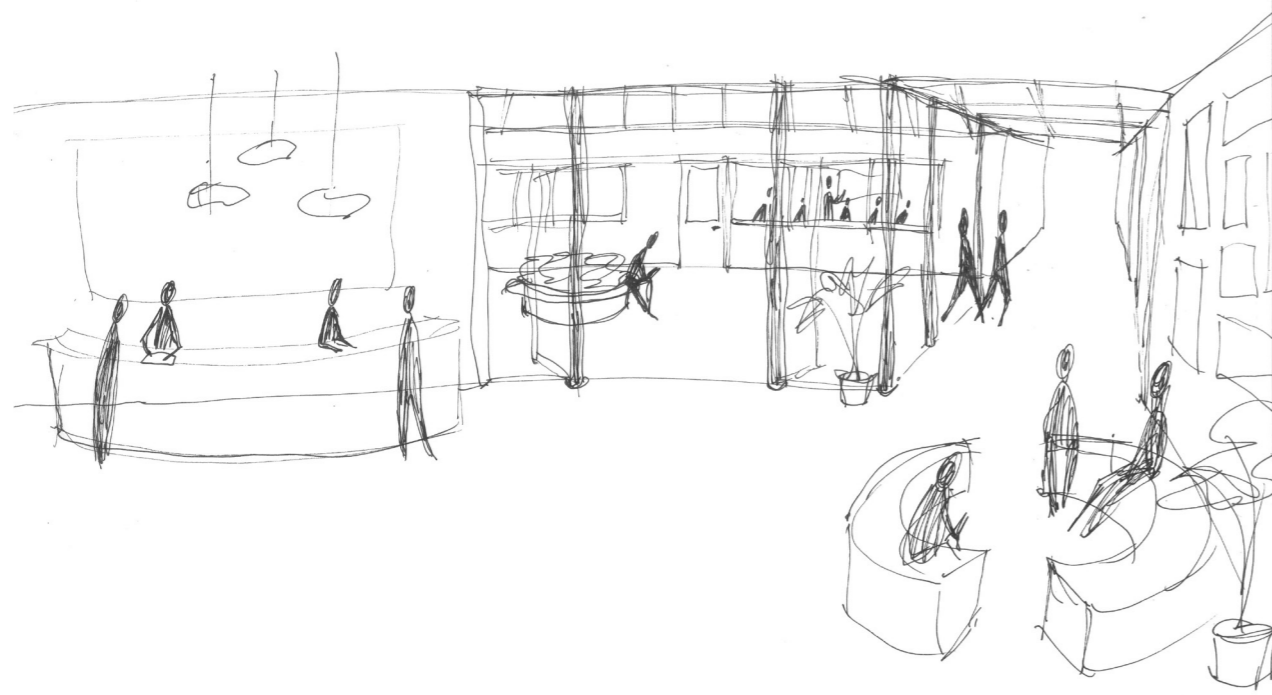


Figure J. Early concept sketches based on the outcomes of the participatory reference projects. On top is the entrance re-imagined and on bottom a common corridor.

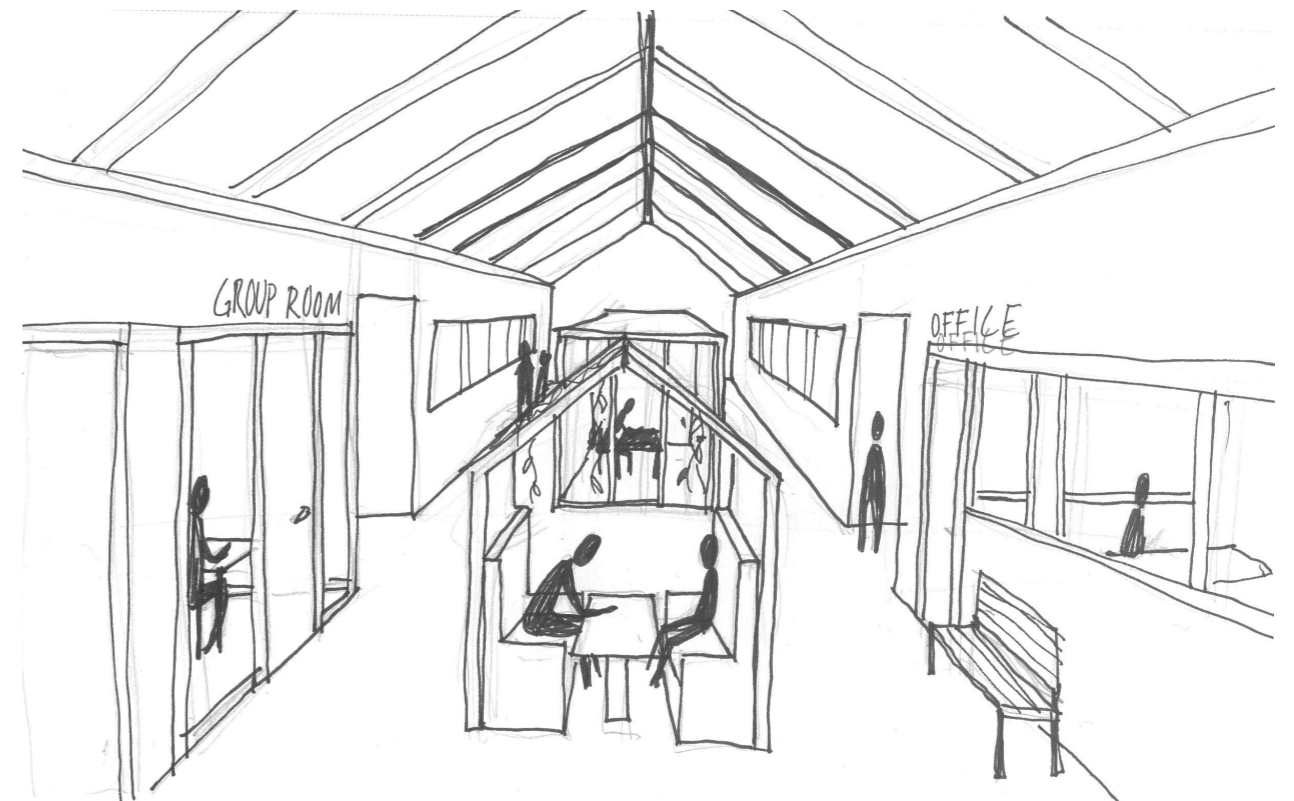
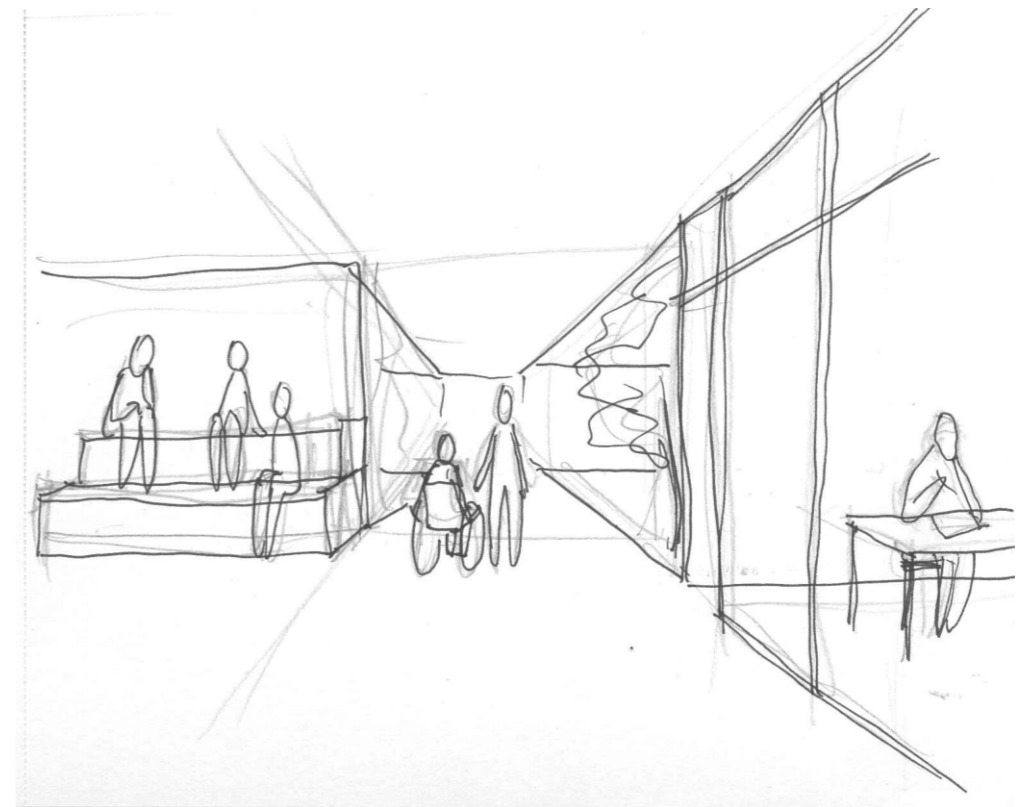


Figure K. Early concept sketches. On top is a vision of a corridor, at the bottom is an early idea for the boulevards.

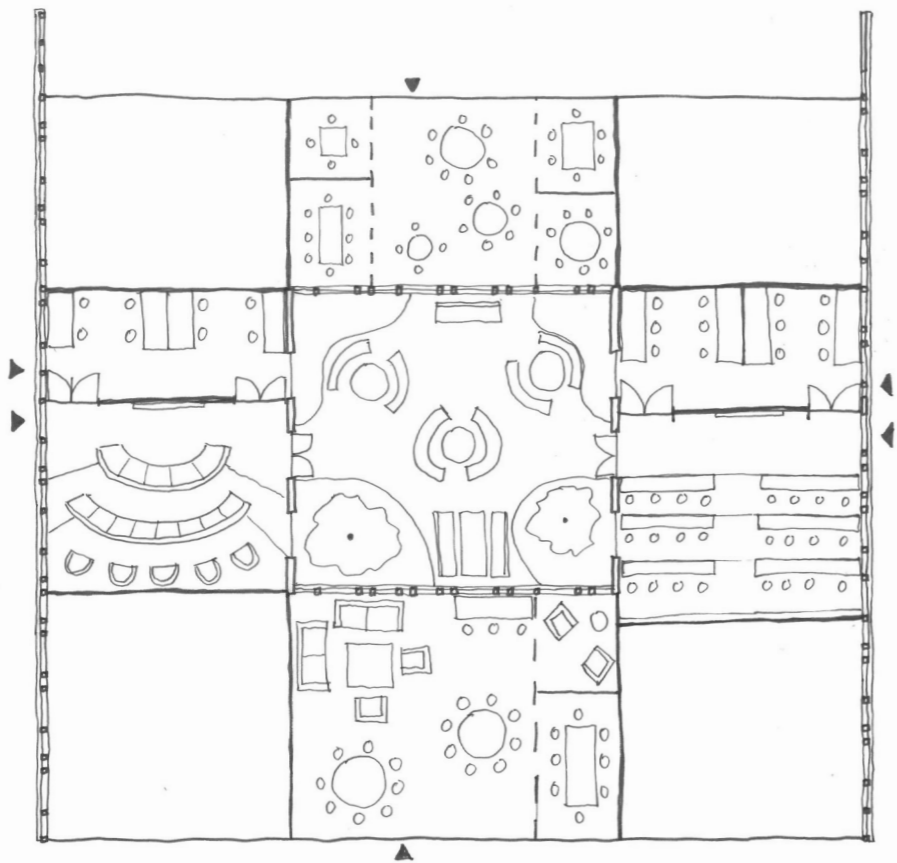


Figure L. Early concept sketches for the learning module. On top is a perspective depicting a shared space for receiving and processing knowledge. Below is an early draft for the learning module function distribution in plan.

