

THE NEXT TRACK

- Transforming a train workshop into a cultural meeting place.

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Abstract

De-industrialization has resulted in many abandoned industrial buildings and the growth of our cities have motivated adaptive reuse of these buildings to become increasingly common. Balancing future visions with preserving historical values is an important part of these projects and according to Benjamin Franger (Douet J. 2013, p. 110) there are many strategies for this. The aim of this thesis is to explore how cultural historical values can be defined and which strategies can and should be used to reflect that in the choices of what to preserve, modify, add an accentuate.

Old industrial sites are often great meeting places, inspiring environments and, before they are transformed, the rents are often low. This makes these areas well suited for new creative initiatives. Another challenge during these projects is to make the areas pleasant and attractive without having excessive rises in property values driving these initiatives away. So, another aim of the thesis is to explore how industrial sites can maintain well suited as meeting places for a diversity of creative initiatives.

This is explored by studying the transformation of the

train carriage workshop of Lokstallarna in Malmö and proposing how it can be used in the future. The explorations consist of analysing the context, interviewing actors involved in the transformation process, studying literature and reference projects, and making design explorations concerning program, volume, circulation and material choices.

The outcome of the explorations is that the aspects of the site that is increasing the understanding of how it was originally used is of higher historical value than the physical building elements. The movement created by the line of production is important, and creating similar movement for the new functions is a way reflect this in the design. Differentiating new additions from the existing using modern materials and production methods makes the project true to the layers of time. Yet, cohesion in colour scheme and character of materials bring harmony between old and new. A slow process where the site has a wide range of activities and more established actors can help lift new initiatives is a way to promote creative diversity. Creating safe and convenient walking paths between apartments and the cultural actors is another.

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Student background

Education

Architecture and Engineering
Chalmers University of Technology

Structural Engineering and Building Technology
Chalmers University of Technology

Architecture and Urban Design
Chalmers University of Technology

Studios:
Material & Detail
Public Buildings
Structural Design
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Professional

Structural engineering intern
Schlaich Bergermann und Partner, Stuttgart (one year)

Structural engineering intern
ELU, Gothenburg (one summer)



INTRODUCTION

The aim of this chapter is to present the research topic of the thesis and its background. It will start by presenting my personal experience of the area and why it is interesting to me. Then the theoretical background and relevance of the topic is explained, followed by presenting the aim, research questions, limitations and method of the thesis. The chapter is ended with a vocabulary and some theory relevant for the thesis.

Experiencing our industrial heritage

Growing up in Norrköping I have spent a lot of time in the old industrial landscape consisting of buildings which were previously used for the textile and paper industry. Today the buildings are used for several different functions such as a concert hall, conference centre, offices, apartments and educational facilities used by the university. I have always appreciated the industrial landscape and found that the materials and details of the historical industrial buildings show great craftsmanship and care, which in combination with the functional and rational rawness and massive scales becomes very interesting. Knowing about the positive socio-economic consequences that the industry has had for the area, I also read the quality and care of the buildings as an expression of great pride and optimism, that all these new jobs within production would provide a better future.

Today the industrial landscape is a great place for cultural activities ranging between dance spaces, art exhibitions and concerts with the symphonic orchestra. However, unfortunately, the city is brought up by Massimo Preite in the book *Industrial Heritage Retooled* (Douet J. 2013, p. 106) as a classic example of gentrification and of how excessive rise in property values has led to a loss of affordable, creative space, in turn leading to a fading character of the area.

Moving away from Norrköping, I have experienced the phenomenon of old industrial buildings used for new purposes in several contexts. For example, from staying at the Steam hotel in Västerås and visiting the Tate Modern in London, which were both originally functioning as power plants. Also, here in Gothenburg there are several old industrial areas undergoing transformations, such as Gamestads Torg, Almedal, Krokslätt etcetera. The old industrial areas, which were previously considered to be located in the outskirts, are now becoming parts of the city fabrics as our cities are growing. In all these examples I have found that there is something in the meeting between the old and the new that is sparking my interest. From leaving a modern concert hall built within an old paper factory for mingling surrounded by robust steel beams and wall pilasters and having dinner in an old steam-boiler central with heavy brick walls, timeworn plaster, powerful ceiling height and modern light installations of different colours.

However, sometimes I would argue that new additions in these historical areas look like they were designed out of their context and there are no clear relations between what is old and what is new. And even though I have spent a lot of time in the industrial landscape of Norrköping, I know very little about how the spaces were used originally. Not much is done in the architecture to inform the new users of the history of the spaces from the perspective of the original users.



From a concert and dinner in Värmekyrkan, an old steam-boiler central which is now used for cultural events. (Own photograph)

Adaptive reuse of our Industrial heritage

Existing buildings which do no longer fulfil the current needs of society have according to Bie Plevoets and Koenraad Cleempoel historically typically been either demolished or conserved as heritage monuments (Plevoets B., Cleempoel K. 2019, p. 1). However, they mean that today this tradition is changing and repairing existing buildings to ensure their future existence as well as altering their properties to adapt them for new needs and functions has become an increasingly common strategy within architecture, commonly referred to as “adaptive reuse”. The reason for this is that the density of the city fabric as well as economical means may limit our opportunities to construct new buildings. The number of buildings of cultural historical value is also now so great that we don’t have economical means to exclusively conserve and protect them. Instead, Plevoets and Cleempeol mean that using our cultural heritage for new functions has proven to have a potential of bringing social, cultural and economic value to society. Another reason that adaptive reuse is becoming an increasingly common strategy is that, according to Leanne Wong, climate change has led to a global focus on saving resources (Wong L. 2017).

The field of industrial heritage is no exception from this trend and according to Neil Cossons old industrial buildings have gone from being seen as liabilities to be considered as assets with the potential of lifting the

areas in which they are built (Douet J. 2013, p. 8). According to Cossons the effects of both the arrival and the decline of industrialization has been equally dramatic in changing society (Douet J. 2013, p. 6). While its’ arrival has led to a lift from agrarian dependency and, in many cases, an increased standard of living, its’ decline has resulted in decay, dereliction and despair. Using the industrial heritage for the regeneration of these areas is according to James Douet now a mainstream strategy within urban planning (Douet J. 2013, p 1).

Seeing the industrial heritage as an asset is, according to Douet, natural due to its’ quantity, versatility and amount of embodied energy (Douet J. 2013, p 1). However, he means that it can also be a challenge due to technical complexity, economic weight, large scale, social consequences and negative perceptions that might be associated with abandoned industry. At worst Douet means that the sites can be described as “ghost towns” (Douet J. 2013, p 1) and, according to Cossons, also as “urban rust belts” and a “dangerous toxic wilderness” (Douet J. 2013, p 14).

But historical industrial architecture also has many qualities for which it is appreciated. According to Cossons the buildings have often housed large employers and thereby played an important role in defining the identity of the areas in which they are built (Douet J. 2013, p 8). He means that the buildings have a large value as evidence of history, that great innovation and entrepreneurship has taken place there and that they

have a large potential of regenerating communities and reinforcing cultural identity. He also means that the buildings are often appreciated for their aesthetical qualities. (Douet J. 2013, p 14).

Some of the most famous examples of adaptive reuse of industrial buildings has according to Massimo Preite been to turn the building into a museum of itself (Douet J. 2013, p 107). Here, the function itself motivates preservation and to clearly show how the building was originally used. However, he means that there is a limited need for museums and that modern regeneration projects most often aims at achieving an economical boost, creating new jobs, build new communities and create vibrant places (Douet J. 2013, p. 106). These ambitions applied on the large and technically complex facilities that the industrial buildings often are, makes these transformation projects into a balance between economic interests and protecting historical values. At the same time, Benjamin Franger means that adaptive reuse has become a hot topic in architecture and the quest for finding new creative solutions attracting investors have started to overshadow the issues of heritage preservation (Douet J. 2013, p. 110). According to Franger different strategies for reusing industrial buildings can historically be observed for different transformation projects. These strategies range from pure conservation, to finding the right degree of creative interventions to abusing the building and ending up destroying the values that motivated the reuse in the first place.

“... understanding is the key. It requires good architects and historians with the right level of understanding of intrinsic quality to effect an economically viable transformation that reinforces rather than erodes the fundamental values of the place – the buildings internally and externally, their context and setting.”

- (Douet J. 2013, p. 13)

“Our duty is to preserve what the past has had to say for itself, and to say to say for ourselves what shall be true for the future.”

- John Ruskin (Hunt R. & Boyd I. 2017, p V)

Aim

The aim of this thesis is to explore how a transformation can be made in such a way that historical values are preserved, respected and understood within a new modern context. This leads to a discussion on how to define these values. The aim is also to explore how the role of repurposed industrial sites as meeting places for a diversity of new cultural actors and initiatives can be maintained through a transformation project.

This will be done by proposing a transformation of Lokstallarna in Malmö, from one of the six main train workshops in Sweden to a part of a mixed city, with a focus on the carriage workshop. Lokstallarna is interesting because the development of the area is in an early stage, so how it will be used is not already known. It has recently started to become one of these meeting places for creative actors and ideas and its' scale and technical complexity is representative of the challenge of working with industrial heritage. It also has that combination of craftsmanship, attention to detail, scale and rawness that draws my interest towards historical industrial architecture.

Research questions

How can the values and essence of a cultural historical industrial site be defined and reflected in the choices of what to preserve, modify, add and accentuate? And how can added elements become modern interpretations and developments of the existing essence of a site?

How can an ongoing process transforming an abandoned industrial site into a meeting place for a diversity of new creative initiatives be promoted and preserved through a transformation project?

Limitations

The focus of the project will be on defining needs and program based on functions which are already considered and discussed for the area. Some functions will also be proposed based on what is well suited for the building and its closest surrounding context. No extensive analysis of the needs on a municipal or regional level will be done. The focus of the thesis will be on proposing a program and organisation of functions which is well suited for making the area into a diverse creative

meeting place. While in reality, of course, many other focuses and incentives would need to be considered as well, but these are out of the scope for this thesis.

The organisation of functions as well as circulation in the building will be considered on a diagrammatic level. More detailed design and thorough analysis of the compatibility of the features of the building (such as window size and placement etc.) and needs of each function will only be made for the parts of the building which are most important for the design concept.

The integrity of the structural system is questioned and parts of it probably needs to be replaced or strengthened. However, due to lack of knowledge of the condition of the structure in more detail, an assumption is made in the design work that the structure can remain and can be strengthened to carry increased loads. What the strengthening will look like in detail will be out of the scope for this thesis. The impact of the proposed alterations on the structural system will however be a part of the discussions and influence the design decisions.

Method

The method for the thesis will be a combination of research by design and research for design where design studies and literature studies are carried out in parallel.

The context will be analysed by visiting the site, reading the overview plan and interviewing the building owner as well as a representant from Stadsbyggnadskontoret. The historical value of the buildings will be analysed by reading the antiquarian preliminary investigation of the area, and literature on industrial heritage.

Strategies for performing interventions during transformation projects will be explored by literature studies and a study of reference projects will be performed with the aim of positioning myself in relation to the theoretical strategies.

The design process will be iterative where several ideas and options concerning program, volume and materiality are initially explored. This will be followed by evaluations, selections and increase in design resolution.

Critical evaluation of the end result as well as the evaluating discussions motivating selections throughout the design process will then be used as a base for a concluding discussion and conclusion.

Vocabulary

Essence – The basic and most important characteristic which gives something its individual identity (Collins Dictionary, n.d.)

Harmony – A consistent, orderly or pleasing arrangement of parts (dictionary.com, n.d.). Analogy can be seen to the definition within music of the simultaneous combination of tones blended into chords that are pleasing to the ear.

Authenticity – The quality of being real or true (Cambridge dictionary, n.d)

Genius loci – The spirit of place which can be understood through its individual features (Plevoets B., Cleempoel K. 2019, p. 81)

Restoration - Returning a place to a known earlier state (Plevoets B., Cleempoel K. 2019, p. 33)

Intervention strategies

Translatio – Strives for similarity according to Plevoets and Cleempoel (Plevoets B., Cleempoel K. 2019, p. 33). They mean that parallels can be drawn between translatio and the act of restoration, but in pure restoration there is a risk of an overly literal imitation of original features and a blind following of the original building. Translatio aims to translate the building from a past era to a present and involves a critical and creative standpoint against the original building.

Imitatio – Strives for equality rather than similarity according to Plevoets and Cleempoel (Plevoets B., Cleempoel K. 2019, p. 33). They mean that it incorporates a more liberal adaptation of the host space and promote selective restoration.

Aemulatio – Strives to copy the original building and improve it (Plevoets B., Cleempoel K. 2019, p. 34).

Translatio, imitatio, aemulatio are all strategies which question whether a clear differentiation between old and new is essential (Plevoets B., Cleempoel K. 2019, p. 30).

Facadism – Preserves historic facades and creates new structures behind it (Plevoets B., Cleempoel K. 2019, p. 35). According to Plevoets and Cleempoel it is a heavily criticised strategy that can lead to loss of the building's integrity. They mean that interpreted in a literal way facadism can lead to Disneyfication of the historic core of a building, but interpreted in a wider sense it can be a useful term when discussing buildings where the façade is not an immediate expression of the interior.

The SPAB Manifesto

The Society for the Protection of Ancient Buildings (SPAB) was founded in England in 1877 by William Morris and Philip Webb (Hunt & Boyd, 2017, p. xv) and have a long experience of working with the relationship between conservation methods and new design applied to buildings of historical value. In the book *New Design for Old Buildings* their working principles, which has been published as a manifesto, are explained by Roger Hunt and Iain Boyd.

In contrast to the strategies of translatio, imitatio and aemulatio the SPAB argues that a clear differentiation between old and new has been a characteristic of most successful adaptation projects. They argue that architecture which is readable as clearly of its time and where interventions are legible is true, honest and creates an understanding of the layers of history (Hunt & Boyd, 2017, p. xvii). They do not promote to recreate the past or to construct new buildings and additions in imitation of the style of a past era since they argue that this approach is seldom successful. Materials, details and execution nearly always show concession to modernity anyhow. Instead, they argue that responses to cultural creations must be relevant to their own time.

However, Hunt and Boyd are pointing out that the wide spread of images over different media that we have today has led to a large interest in design and that the images which get attention are those promoting grand design and communicates the idea that buildings can be radically changed (Hunt & Boyd, 2017, p. 7). This is also pointed out as a problem causing old buildings to be damaged due to lack of understanding. Instead, the SPAB are promoting an approach where the old building is thoroughly understood and where additions are

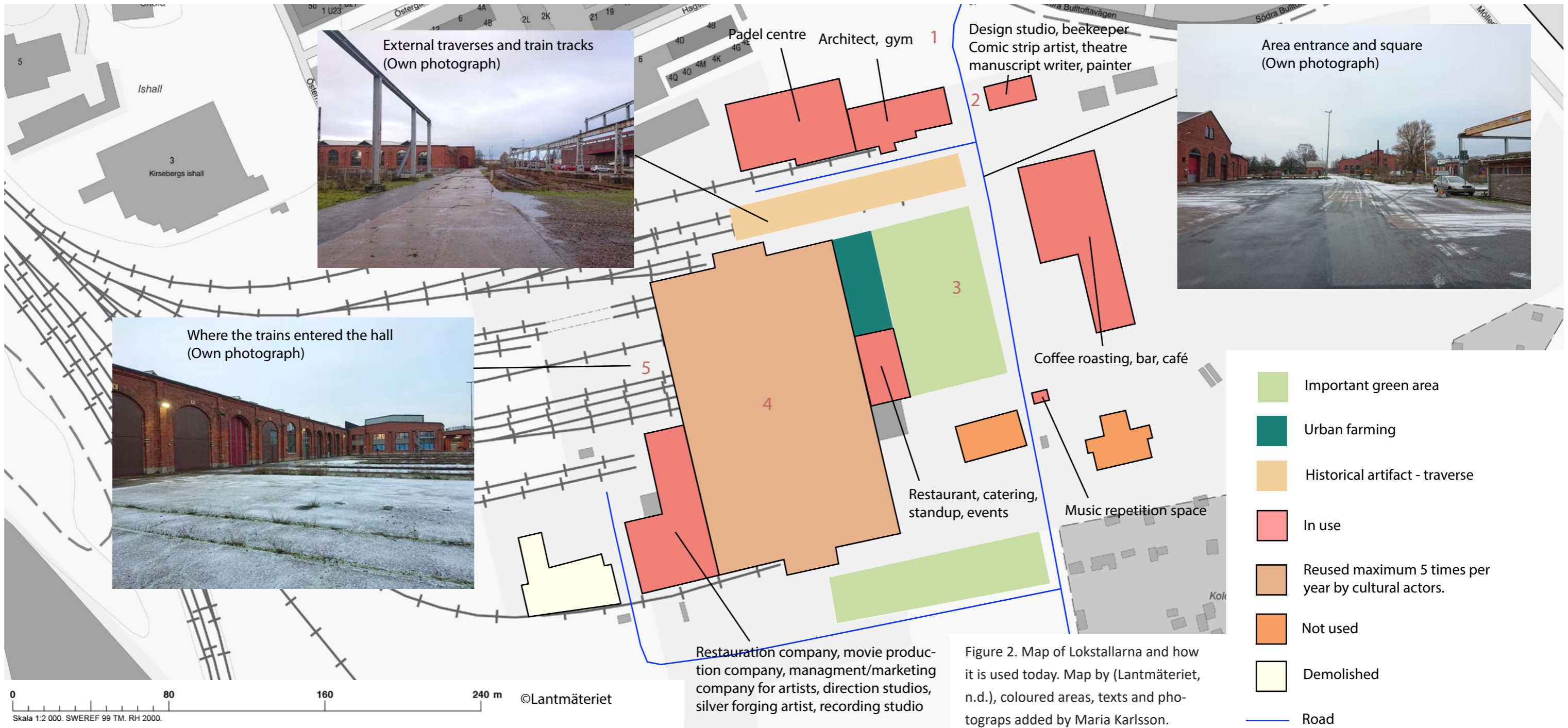
in sympathy with the historic fabric yet clearly differentiated from it (Hunt & Boyd, 2017, p. xvii). They should be distinct, yet harmonious and good new design should be a continuation of good past design. They are also describing this the terms of new additions being well-mannered in the sense that they do not compete with the old building, and they do not ape it. Instead, they are complementing it in a way that is “not necessarily quiet, but mannerly rather than rude” (Hunt & Boyd, 2017, p. 4).



CONTEXT

This chapter aims at explaining the context of Lokstallarna. It will start by the documentation of a visit to the site followed by interviews with the building owner and a representant from Stadsbyggnadskontoret. Then the future plans according to the overview plan will be presented followed by explaining the cultural historical value of the site according to the preliminary antiquarian investigation. The chapter is ended by a description of the workshop building and its materials.

Figure 1. Map of Malmö with Lokstallarna marked out with a pin. Map by (Lantmäteriet, n.d.), pin added by Maria Karlsson.



Site visit

I reach the site by taking a ten-minute bus ride from Malmö central to the bus stop by the church of Kirseberg. After a five-minute walk through the smaller streets in the city of Kirseberg, I reach a larger road, Södra Bulltoftavägen, and a parking lot (number 1 on the map). After crossing the parking lot, I reach the entrance of the area. You enter the area by walking in between two brick buildings (number 2 on the map) and entering a large open space enclosed by the old workshop buildings (number 3 on the map). The site is relatively empty. Occasionally someone walking their dog passes me, occasionally a car drives across the

area and occasionally a truck makes a delivery to one of the buildings. The sound from reversing busses is almost constantly present in the background from the neighbouring buss terminal.

The workshop buildings create a cohesive whole but with strong individual characters. They are very much alike each other and at the same time they are very different. The scales vary from huge and ungraspable to small and cosy. Gable roofs face different directions, and one roof stands out by being cylindrical. The brick is a constant throughout the area, both the colour and the bond. The repetition of façade modules containing two pilasters and a window framed by a brick arch is a characteristic trait of the area. At first glance

these modules appear similar, but after a closer look, it becomes apparent that they all have their own slight variations.

After a walk around the area admiring the facades, I am meeting up Anna-Karin from Järnhusen who is showing me around inside the carriage workshop (number 4 on the map). The scale of the hall really is impressive, around 16000 m². Large beams of concrete are spanning large distances and filtered light is entering the hall through the long roof windows. Concrete surfaces, walls painted in white, green and yellow and columns painted in red is defining the colour scheme. Even though I was not there when the hall was used and know very little about maintenance of trains, the

structural grid, remaining train tracks and maintenance areas are giving me an idea about how the space was used. The trains entered the hall on the western side (number 5 on the map), drove along a straight axes and were parked on the sides of a middle aisle between the two gable sides on which the workers could transport themselves and get an overview of the hall.

A quality about the site that I really appreciate is that it is apparent that great care has been taken in the design on every scale. The logistic and large areas in between the buildings, each façade module, and the detailing of each brick all show great craftsmanship and care.

A conversation with Anna-Karin Eklund from Järnhusen

A meeting place for cultural actors

While showing me around on the site, Anna-Karin is telling me about the actors using the buildings today. The old train workshops are more and more becoming a meeting place for cultural initiatives where low rents and an inspiring environment have enabled many creative ideas to become reality. There is a hotel where the rooms are modified circus carriages, a beekeeper doing lectures and tastings, a company roasting their own coffee and many more.

Actors that started out small have expanded which attracts more actors. Some actors benefit from each other, and some have ambitions of expanding even more. The location outside the city centre has also forced the actors to be creative and do multiple things. During winter, when there are no customers drawn to the area, the local restaurant is doing catering and hosting events.

The existing buildings

The existing buildings have both strengths and weaknesses according to Anna-Karin. While the size of the carriage workshop enables events such as Southern Sweden Design Days, it could also make it a barrier obstructing people from easily moving between the residential area which is planned on the western side of the building and the cultural square on the eastern side. Today, only five events per year are allowed to be held in the building. To host more, a new building permit would need to be applied for requiring expensive work to be made on the building. So, for most part of the year, the hall is empty. Since the roof was rebuilt after a fire during the 50s, it is the part of the building with least cultural historical value.

The additions to the carriage workshop are, according to Anna-Karin, creating subspaces between the buildings and are, in some places, adding to the pleasant atmosphere of the area. In

other places, they make the hall dark and difficult to use.

For the future developments, the possibility of preserving the sightline between the two gables as well as the green area outside the food workshop and the grove of birches on the southern side is investigated.

The ground is heavily contaminated and will be sanitized in the future. But there is a great biological diversity since the trains have brought seeds with them from many different places.

Future visions

The future vision for the area according to Anna-Karin is that more established actors can help lift new initiatives. The square by the area entrance needs residential buildings in close proximity to make it a vibrant meeting place and create the right conditions for the cultural actors to grow. A variation of everyday life with residential buildings, service, job opportunities and cultural actors is necessary for the meeting place to survive.

Several functions are considered for the carriage workshop, maybe it can be used for apartments, maybe it can become offices, what happens in the core? Further investigation is needed to answer that. Connections between the eastern side and the western side needs to be created through the building and collecting residential services, such as a bike workshop, along the western façade could create a pleasant social meeting place outside the workshop.

Also, the street along the traverse could become a vibrant meeting place and the bottom floors of the buildings facing the street should host outgoing functions. The train tracks will need to be removed when the ground is sanitized, but maybe the structure of the tracks can serve as an inspiration when planning for the new buildings.



Figure 3. Outdoor seating for a restaurant using one of the additions to the carriage workshop. The old steam central is shown in the background. (Lokstallarna, n.d.)



Figure 4. The maintenance hall of the carriage workshop used for hosting Southern Sweden Design Days (Lokstallarna, n.d.)

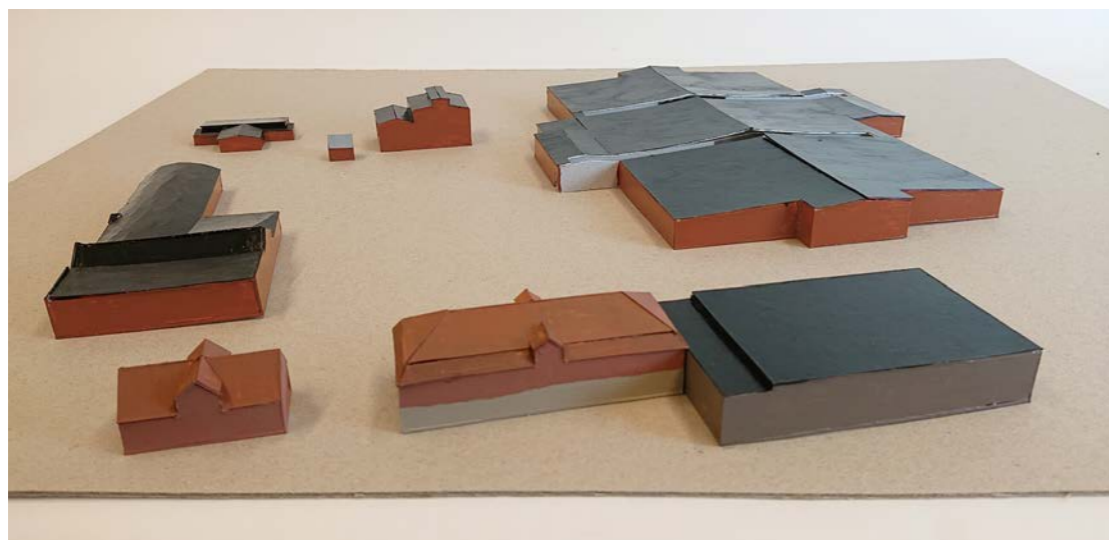
A conversation with Lars Böhme - landscape architect at the strategical department of Stadsbyggnadskontoret

Deciding goals and priorities

During our conversation, Lars stresses the importance of defining the ambitions of the project when working within a cultural historical context. To decide what you should be able to read from the area, which of the qualities are worth preserving and what experiences you want a future visitor to bring with them. You should not need a guide to understand these qualities and how the space was originally used.

Meeting places, sightlines and facades

Concerning Lokstallarna, Lars sees a value in the structure and ensemble of the workshop buildings. The square defined in between the buildings by the area entrance makes you read the history of the site, how this space used to function as a meeting place for the workers. The axialities and sightlines tell an important story of how the space was used and the facades are of great aesthetical value. Keeping every single brick and preserving the main workshop as a monolithic volume is however of smaller importance according to Lars.



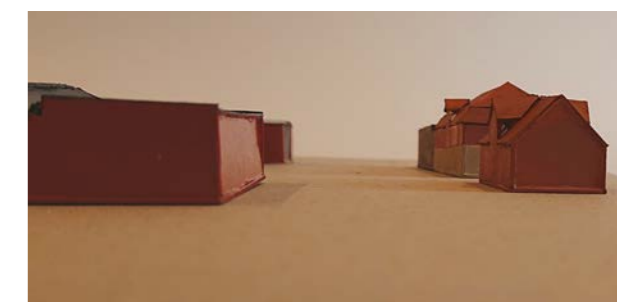
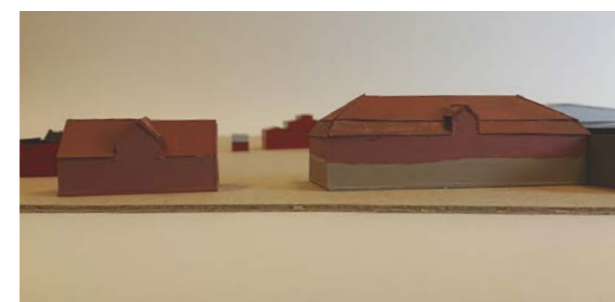
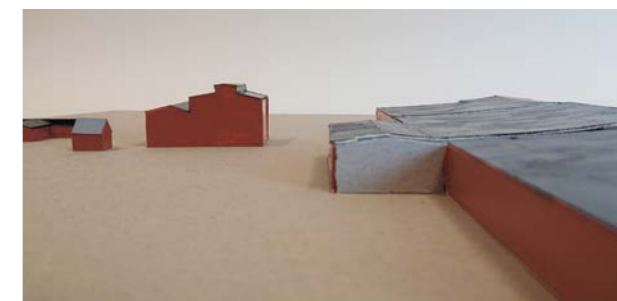
The ensemble of buildings and how they together define a square.

The effect of location and time

We are also discussing the pros and cons of the location of the workshops. Since they are not located in the city centre, it is more difficult to attract investors which makes it harder to make economical profit in the area. However, it takes time for these areas to develop a new character. New actors need to establish themselves and attract more actors. If this process is given time, the actors themselves can naturally and gradually find appropriate uses for the buildings and create an atmosphere that is working well. In more attractive locations this process might happen too quickly, having negative consequences for the character of the area.

Risks

Finally, we are also discussing the phenomenon which was brought up in the introduction of the thesis for the case of Norrköping. That when low rents and an inspiring environment attracts creative initiatives, these initiatives often attract new actors with larger financial means. This can lead to excessive rises in property value and make the area too expensive for the actors that made it attractive in the first place. And this in turn compromises the diversity and social sustainability of the area. Therefore, creating a "hipster area" could according to Lars have these disadvantages. To avoid this, he stresses the importance of attracting municipal actors in the area development.



Important sightlines

Train tracks
 Surrounding rectangle
 Grid lines
 Sight line

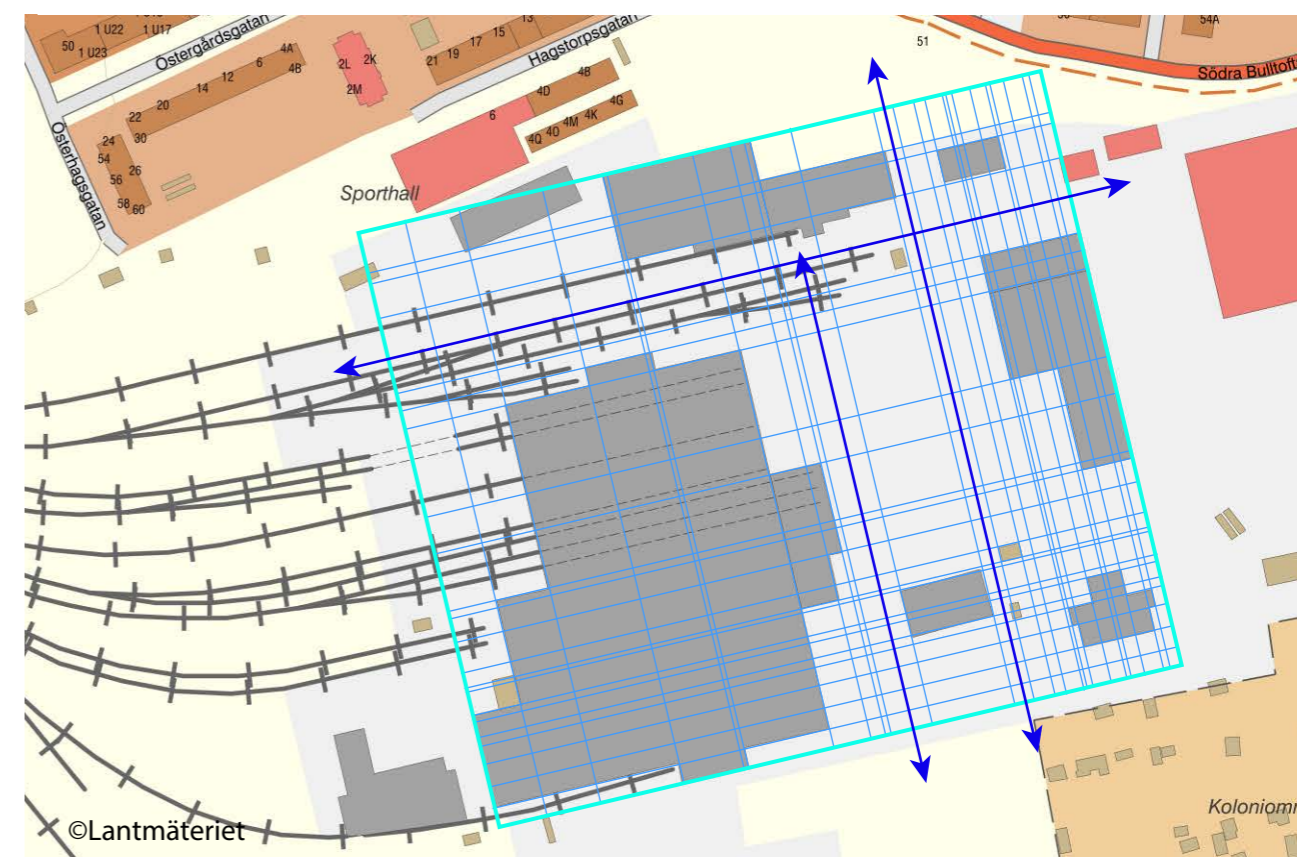


Figure 5. The structure of the buildings according to an irregular grid which creates subspaces, axialities and sightlines. Map by (Lantmäteriet, n.d.), grid, rectangle and arrows added by Maria Karlsson. Diagram inspired by (Wahlgren, 2014, p. 18).

The overview plan

The opening of Östervärn Station in 2018/2019 has given the area around the city of Kirseberg a new potential to grow (Malmö Stad 2020). In the Overview plan it is stated that the growth of the city towards the south will join Kirseberg and the area of the workshop buildings. Even though Kirseberg is close to the city centre it is according to Malmö Stad perceived as quite small, and it is appreciated for its variation and compact structure. Maybe it will be a source of inspiration for the design of the new buildings surrounding the workshops.

The expansion of Kirseberg will include multi-family residential buildings, one-family houses, service, retail, sports and cultural activities. Green spaces will be prioritized, and urban

farming encouraged. The large workshop building has a large potential for the development of the area, but its future use is difficult to predict. There will be further evaluation whether it can house craft, education, offices, sports, cultural activities or residential buildings. Maybe it will be used for several functions at the same time. The building volume can either be preserved or divided, but in such a way that the original volume is still readable.

In the future development, it is important that the history of the site is still readable and that new additions are inspired by the existing buildings. A richness in variation is also aimed for.

“By preserving and developing the architectural features of the cultural-historically interesting buildings, the area will have its own identity.”

- (Malmö Stad, 2020, p. 7)



The variation and compact structure of Kirsebergsstaden. (Own photograph)



The variation of Kirsebergsstaden. (Own photograph)

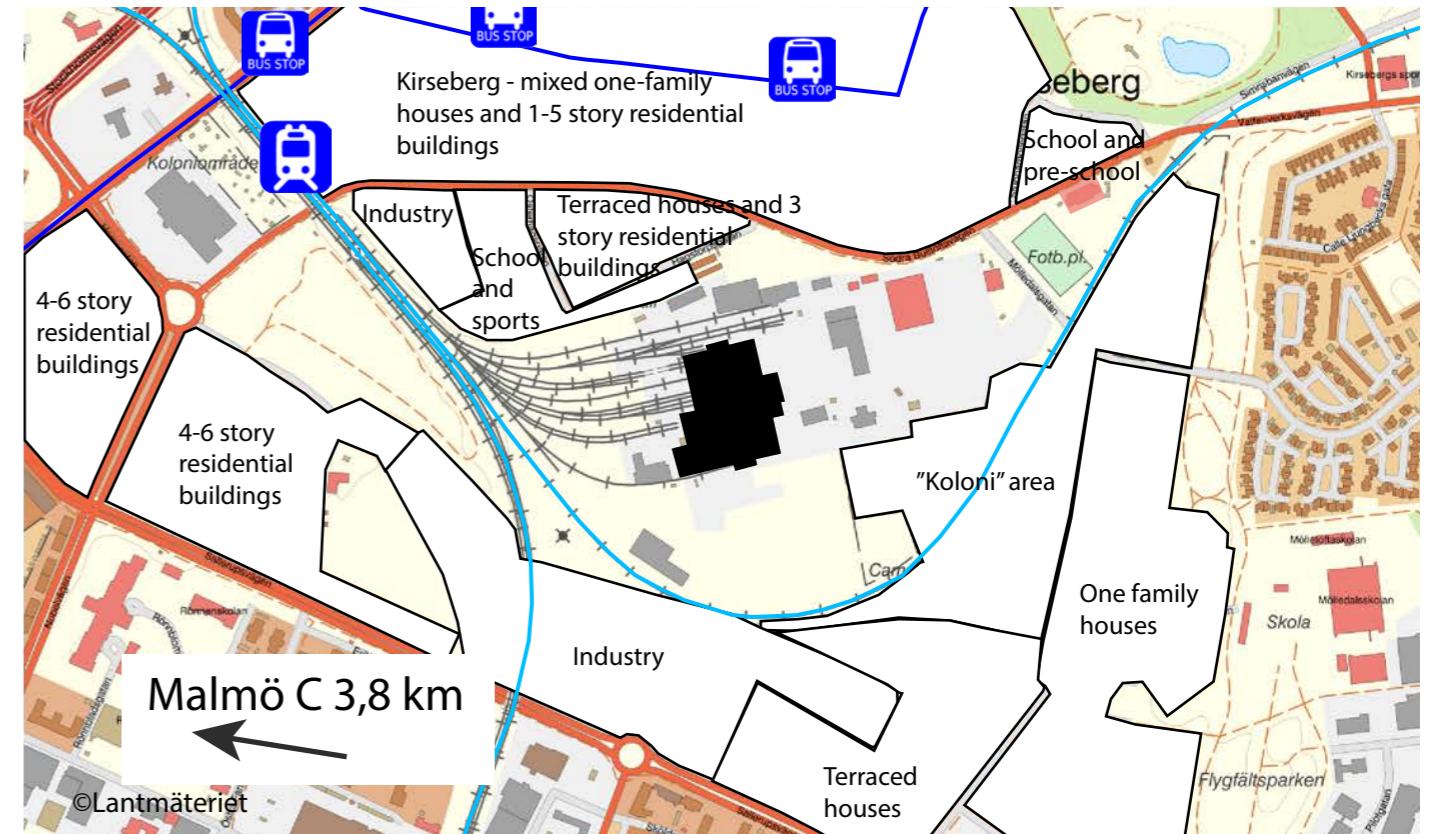


Figure 6. The area today. Map by (Lantmäteriet, n.d), white areas, texts and buss stops added by Maria Karlsson.

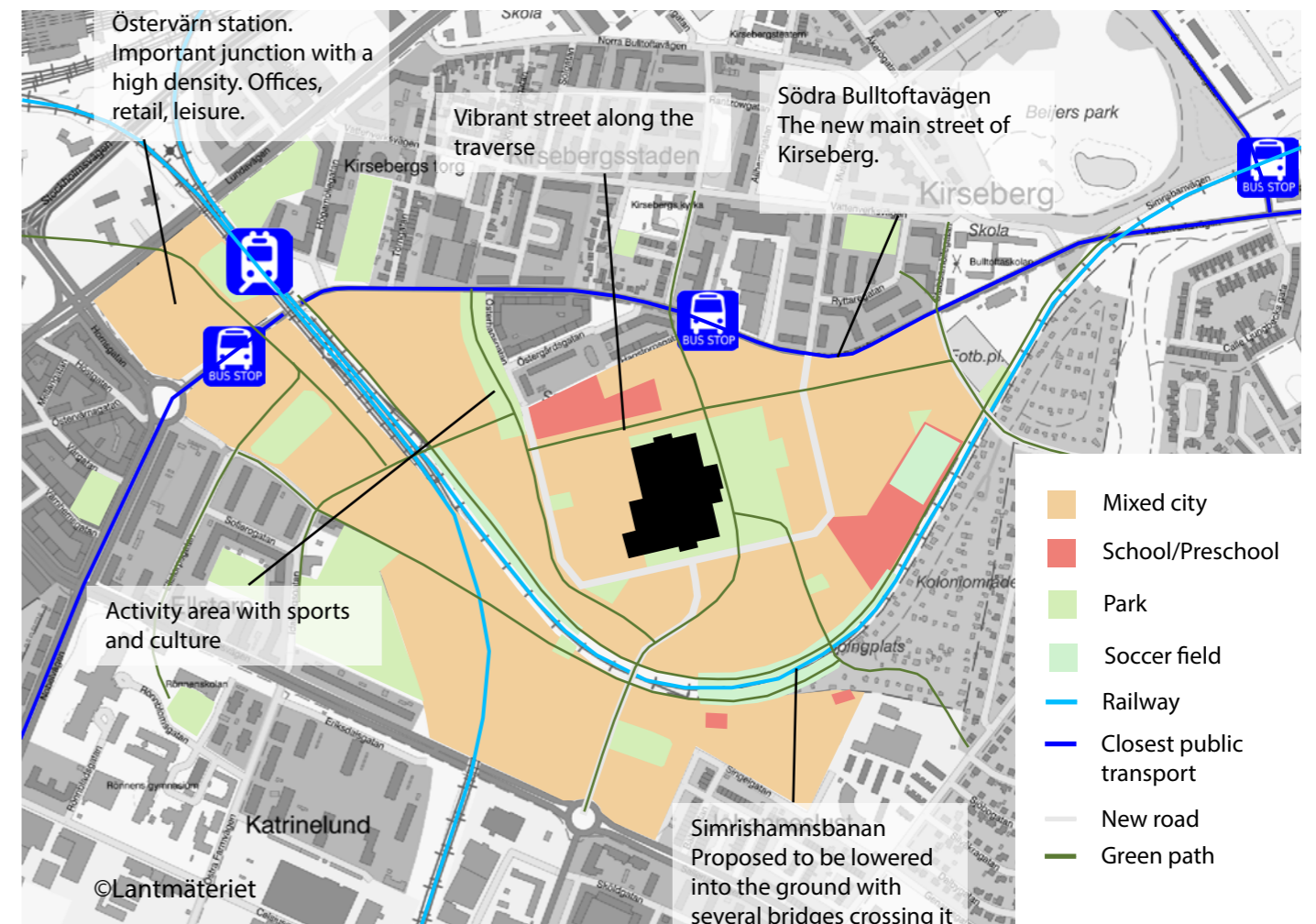


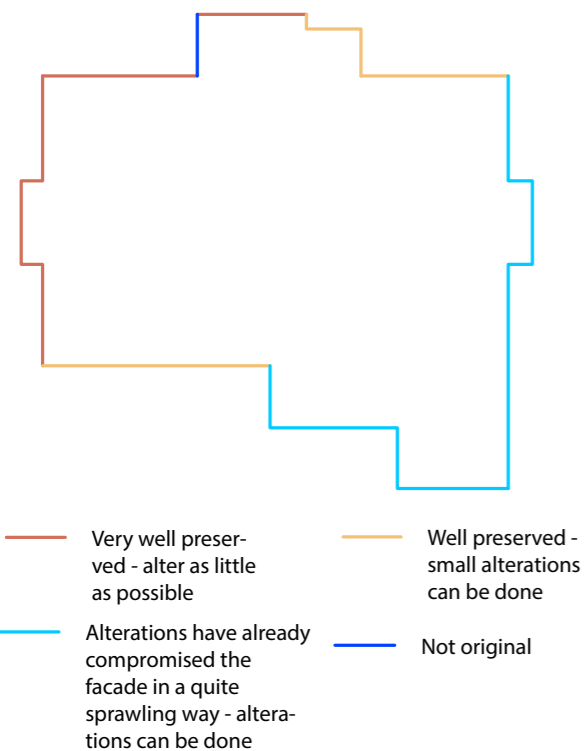
Figure 7. The area in the future according to the overview plan. Map by (Lantmäteriet, n.d.), coloured areas and strokes, buss stops and texts added by Maria Karlsson)

The historical value of Lokstallarna

According to the antiquarian preliminary investigation written by Bengt Wahlgren, the area around Lokstallarna was rather empty and mostly consisted of agricultural fields before the workshop buildings were constructed (Wahlgren B 2014, p. 5). The first building to be constructed was the guard house by the entrance which was built in 1914. The carriage workshop was built in a large hurry. The foundation works was started in June 1917, the masonry work was started in September the same year, the roof construction was started in November and the building was finalized during 1918.

Around 1100 people was working in the workshops and in 1918 it became one of the six main workshops in Sweden. Passenger carriages, freight carriages, steam locomotives and electric locomotives were maintained here, and the techniques were very modern for its time. In 1953 there was an explosion fire in the carpentry workshop meaning that the roof on the entire carriage workshop needed to be replaced.

According to the website of Lokstallarna were many railroads in Sweden shut down during



Categorizing the facades according to my own judgement. (Own diagram)

the decades of 1950-1980 and the need for the workshop decreased (Lokstallarna, n.d.). In 1983 the locomotive workshop was demolished and replaced by a garage for busses and in 1991 the workshops were sold by SJ and private actors started to use the space. The last industrial company that used the buildings moved out in 2017. The buildings that remain today are, according to Wahlgren, the carriage workshop, a wheel workshop, a main storage, an office building, a forge, a steam central and a gasworks.

The workshop buildings are valuable from many perspectives according to Wahlgren (Wahlgren B 2014, p. 31). It was a large employer, during the 1930s it was the second largest employer in Malmö, meaning that it has value from a societal and local-historical perspective. Since it was one of the six main train workshops it has value from a railway historical perspective. Due to its large scale, short construction time and good quality it has value from a technical point of view. The buildings are well preserved, typical for their time and designed by influential architects and engineers such as Folke Zetterwall, Karl-Axel Bladh and Ernst Nilsson. Therefore, they also have value for architecture and engineering history.



The original functions of the hall according to (Wahlgren B. 2014, p. 53). (Own diagram)

1914 - The guard house is constructed

1918 - The carriage workshops is finalized and Lokstallarna becomes one of the six main workshops in Sweden



Figure 8. Lokstallarna in use 1933 (Lokstallarna, n.d.)

1950 - 1980 - many railroads in Sweden are shut down

1991 - The workshops are sold by SJ to private actors

Today - The area is becoming a meeting place for creative initiatives

Past



Present

1917 - The construction of the carriage workshops is started



Figure 9. The carriage workshop in 1920 (Lokstallarna, n.d.)

1953 - A fire destroyed the roof and original timber trusses

1983 - The locomotive workshop is demolished

2017 - The last industrial actor moves out

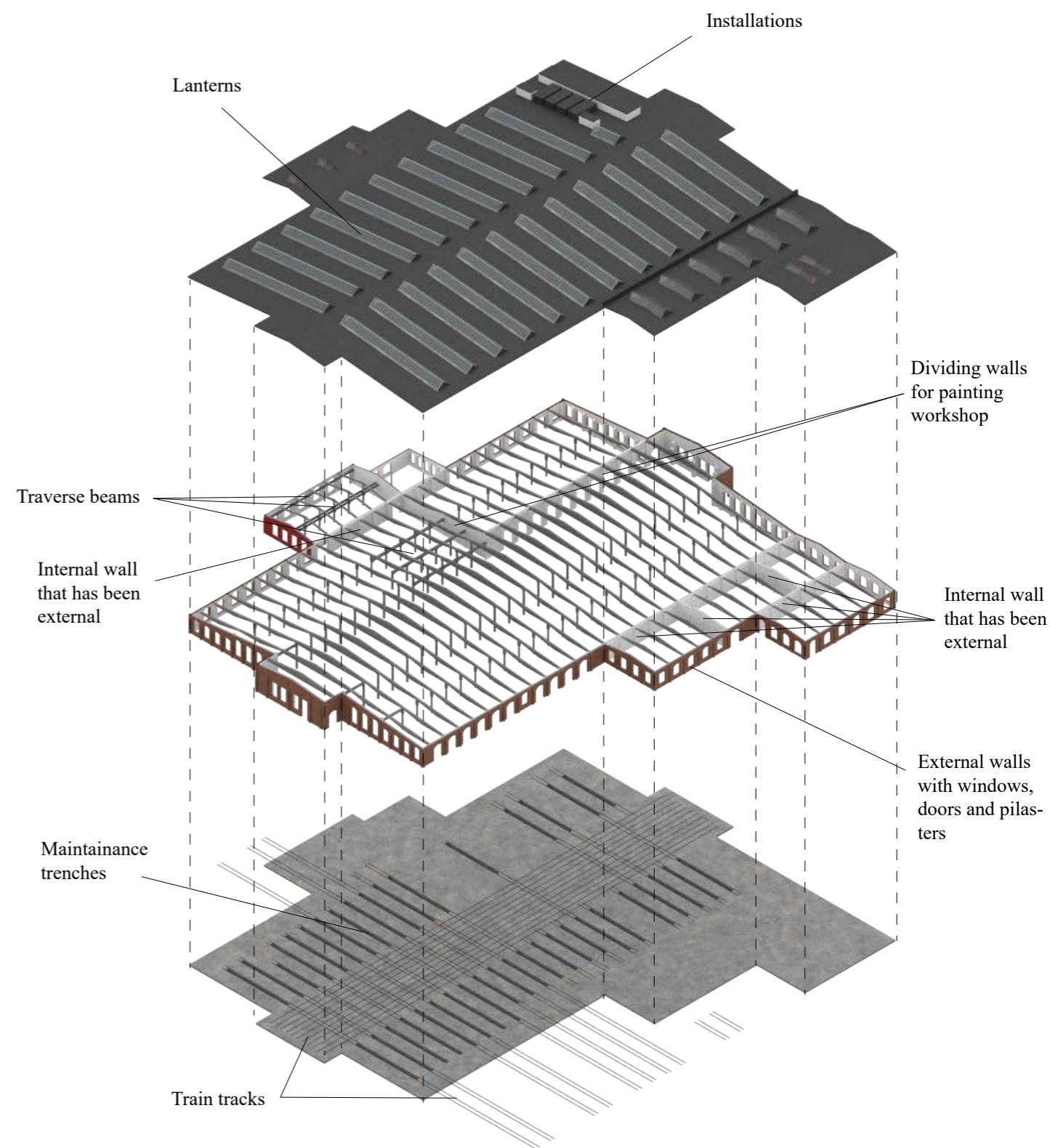
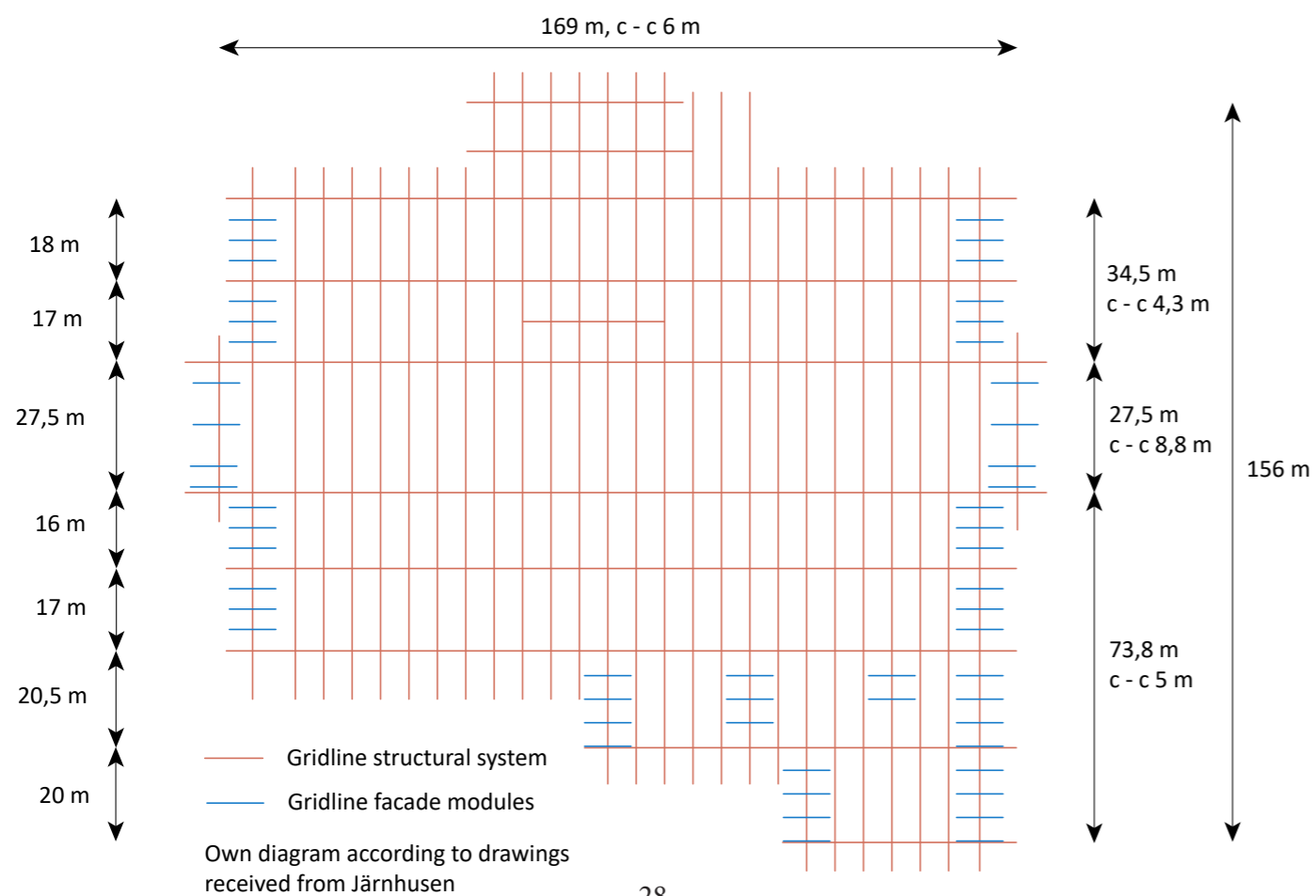
The building and its materials

The workshop buildings were constructed in the middle of the first world war which meant that materials were very expensive (Wahlgren B 2014, p. 22). The pillars and trusses were originally designed for iron but, due to the prices, they were instead constructed in concrete and timber. 1450 m³ of timber was used for the trusses and it required 68 wood workers and 30 assistants to erect the roof. In total 225 workers were involved in building the carriage workshop and it costed 1.7 million SEK. The design was done by Fabrikbyggnadsbyrå and the drawings were signed by the engineers Ernst Nilsson, Nils Bolinder och Gustav Cervin.

The foundation is made of un-reinforced concrete and the walls of red, hand cut bricks in the thickness of two stones. Probably, limestone mortar was used, and 950 000 bricks were used for the main workshop building. The Yorkshire brick bond is used for all buildings which gives both variety and continuity to the facades. Even though the brick pattern and offset can influence the walls load-bearing capacity, this bond is main-

ly used due to its decorative qualities (Kummer N 2007, p. 21). The openings of the doors and windows are supported by shallow arches and there is one pilaster in between each opening, giving depth and rhythm to the facades. Since all internal walls are thin and have large openings, I will assume that the openings in the façade are small enough and the pilasters are strong enough to provide both in-plane and lateral stability. The function of the pilasters is probably also to strengthen the walls for vertical loads transferred from the beams. Both the pilasters and the lower parts of the windows are covered with reinforced steel-sharpened concrete.

The workshop is 16 000 m² large and internally, the roof is carried by concrete beams and pillars which replaced the timber truss after the fire. In east-west direction, the structural grid is regular, while in south north direction it is more irregular. Parts of the internal wall surfaces and the pillars are covered with flat mortar and lime to make them white, while the rest of them are painted in a green/grey colour. For the beams, floor and ceiling the concrete surfaces are exposed.



Exploded Axo containing maintenance trenches, train tracks, structural system, external walls (or walls that has previously been external), dividing walls for the painting workshop and the roof including lanterns. (Own diagram according to drawings received from Järnhusen)



BUILT REFERENCES

This chapter aims at finding inspiration for answering the question of how new elements can be a continuation of the essence of an industrial historical site, and how to choose what should be preserved, modified, added and accentuated. It contains two comparison studies where the degree of contrast and extent of the alterations are analyzed for different reference projects. Only projects that I like and find inspiring are included in the comparison and they can be both adaptive reuse projects and new buildings that are in close proximity to the historic fabric. This will be followed by a discussion relating my own reflections to the context of Lokstallarna, and the chapter is ended with reflections from a visit to Innovatum in Trollhättan.

Contrast



Figure 11. 837 Washington (Morris Adjmi Architects, Severin A., Williams M., Schenck T., Weidele A., n.d.)



Figure 13. Atlantic Plumbing (Morris Adjmi Architects, Karchmer A., n.d.)

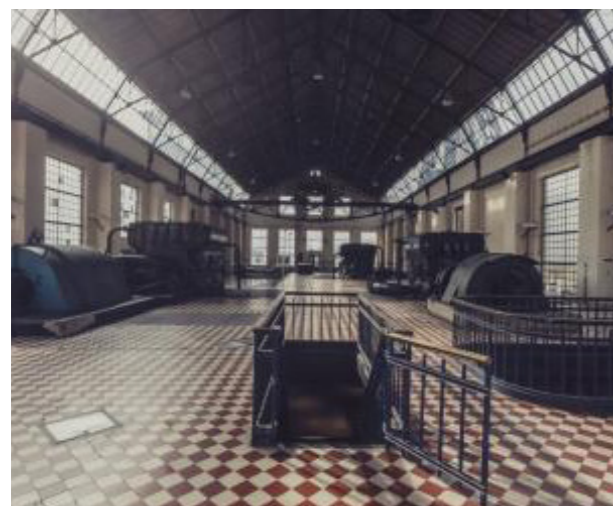


Figure 14. C-Mine (c-mine.be n.d.)

Similarity



Figure 10. Higgins Hall (Henderson J. 2018)



Figure 12. The Granary (Meinhold B. Inhabitat 2011)



Bengt Dahlgren's Office in Gothenburg (Own photograph)

Reference study - Degree of contrast

Pratt Institute, Higgins Hall insertion in Brooklyn

By Steven Holl Architects

The Higgins Hall is connecting two buildings of the School of Architecture in Brooklyn and contains functions such as classrooms and an auditorium (Archdaily, 2019). The floors of the two buildings are not vertically aligned which is accentuated in the façade of the insertion and creates a dissonant zone in its centre. The main material that is used is channel glass which, according to the architects, is an economical industrial structural glass with translucent insulation (Steven Holl Architects, 2005).

My own reflections – At first glance there is a very large contrast between the insertion and the historical buildings. However, knowing about the floor alignments, I appreciate the relation between the new and old buildings even though you need to be familiar with them to understand it. While especially the left old building is characterized by strict order and verticality, the insertion is bringing a horizontal accentuation and an element of randomness. To its scale the insertion is clearly subordinate the historical buildings and the channel glass brings a large contrast in materiality and texture compared to the brick. However, it gave me associations to corrugated metal which in turn gave me association to more recent industry. So, the industrial character is somehow kept even though it is a bit far-fetched. The red details and brick pavement is sticking to the original colour scheme and brings harmony to the project.

837 Washington in the Old Meatpacking districts of New York

By Morris Adjmi Architects

In this project the architects have aimed at designing a building that both fits in and stands out (Morris Adjmi Architects, n.d.). It includes a renovation of an old warehouse used for meat-

packing and adding a twisting tower. The building is today used for offices and retail and a focus of the renovation has been to restore the building's gritty charm. Garage doors and loading bays have become store front windows, a new canopy is designed to evoke memories of the cantilevers where meat was hanged, and windows have been designed with factory-style sashes. A contrast between the warehouse and vertical addition is created by the pronounced set-back and twist of the structure. However, the mullions in the curtain wall have the same proportions as the factory-style windows. The structural exoskeleton is based on engineering principles of old railroad structures.

My own reflections – In the adaptation of the existing building the architects have followed the strategies of of imitatio and aemulato, while for the vertical addition they have taken an approach towards clearly differentiating between old and new. The twist is a powerful expression, but the tower is in my opinion in sympathy and harmony with the surrounding, which probably have to do with associations. The steel and glass are clear contrasts to the surrounding brickwork, but it is easy to imagine that the old buildings have similar steel structures on the inside. If there is some correspondence in rhythm and division between the old and new building, it becomes difficult to distinguish due to the set-back.

The Granary in Barking creek

By Pollard Thomas Edward Architects

This project includes a renovation of a granary into an office and an extension building (Archdaily, 2012). In the renovation, all non-original additions such as internal partitions and secondary structures have been removed and blocked windows have been re-opened. The existing building have a strong gable form and the bronze-clad extension building takes its cue from this. Hunt and Boyd are describing the buildings as non-identical

twins and argues that the buildings are complementary and balanced in weight and respectful of proportions (Hunt & Boyd, 2017, p. 51).

My own reflections – Just as the SPAB is using the aspect of being true and honest to the layers of time as an argument for clearly differentiating between existing and added elements, one could argue that removing non-original elements is also unauthentic to the history of the building. However, if the non-original additions are compromising values, I would argue that it is defensible. I appreciate how it is clear that the architects of the extension has taken a starting point in the volume, proportions and rhythm of the existing building, and then allowed themselves to creatively explore and add some new shapes as well.

Atlantic Plumbing in Washington DC

By Morris Adjmi Architects

This is a revitalisation project that includes four new mixed-use buildings in a creative up-and-coming neighbourhood that previously housed overgrown warehouses (Morris Adjmi Architects, n.d.). The buildings are designed to bring industrial buildings that line the railways leading to Washington to mind and to combine both a modern and industrial language. The materials used for the buildings are brick, glass and steel.

My own reflections – Here, connections to industry and the past are made by using brick, steel and glass but made contemporary by utilizing the creative freedom of using modern construction methods. As beautiful and appreciated as load-carrying brick walls are, the restrictions of the designer to create vertical load paths, add pilasters where necessary and use arches above openings sets certain limitations to the creative freedom for the facades. That today's column-slab constructions allow for another type of playful creativity when it comes to facades have clearly been utilized in these buildings and made part of their expressions. The window divisions of the closest building in the image bring associations to brickwork but on a totally different scale.

For the other building, the stabilizing elements are given a decorative role and its dimensions in combination with visible connections brings associations to industry.

Bengt Dahlgren Office in Gothenburg

This project is mostly mentioned in the context of energy efficiency since it is certified as a green building and the aspects of indoor climate have been given large focus in the design (Mitsubishi Electric, n.d.).

My own reflection – In addition to the energy efficiency aspect, I highly appreciate how the project is aesthetically integrated in its historical context, surrounded by old textile factories. Its volume brings associations to factory buildings, and it continues the rhythm and vertical lines characteristic for the factory buildings in its surrounding. It uses the same materials but its contrast lies in the manufacturing and execution. Here the bricks and white elements are placed in front of a curtain wall and there is no ornamentation. Instead, there is a modern “cleanness” to the expression of the building.

C-Mine in Genk, Belgium

By 51N4E

In this project a former coal mine has been transformed into cultural centre and the compressor hall shown in the image is used for exhibitions and events. According to Dezeen the architects has aimed for a “light restoration” (Dezeen 2011).

Own reflections – Not much is written about what has been done in the machine hall and everything seems to be in the style of the original construction. Some surfaces look suspiciously clean and polished, but I cannot see in the images whether they are new or just recently maintained. The architects have taken an approach towards *translatio* and *imitatio* and in my opinion they have succeeded very well in their attention to detail.

High degree of alteration



Figure 15. CaixaForum (Garcia L. 2011)



Figure 17. Finlyson area (Monto T. 2018)

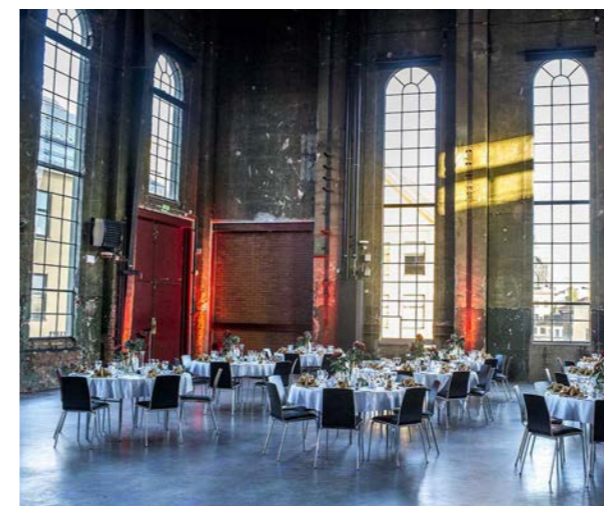


Figure 19. Värmekyrkan (Louis de Geer Konsert & Kongress i Norrköping, n.d.)



Figure 16. Zeitz MOCAA (Heatherwick Studio, n.d.)



Figure 18. Salts Mill (Mark J. Creative Commons, 2006.)

Low degree of alteration

Reference study - Degree of alteration

CaixaForum in Madrid.

By Herzog & de Meuron

In this project a former power station has been transformed into a cultural art centre (Herzog & de Meuron, n.d.). Only the facades have been kept as a shell around a new interior and some windows have been filled and opened to accommodate for this. The street next to the building is narrow and the plinth is removed from the façade drawing the visitor inside and making the building appear as if it is defying gravity. The origami-like steel sheets in the entrance are a strong contrast in shape and materiality while the shape of the vertical addition is echoing the roofscape of the surrounding buildings.

My own reflections – I would argue that this is a quite extreme and radical approach towards the historic fabric and a clear example of facadism. I appreciate the spatial quality of walking on a narrow street and entering the building from underneath. I also appreciate the effect of defying gravity, how the volume of the vertical addition draws its shape from the surrounding roofscape and how its colour is differentiated but in the same scheme as the original building. However, I find the entrance to be of an extreme contrast since it seems to be designed out of its context, and from looking at interior images, I have no idea about how the building was used originally. I don't know which state the interior of the building was in, but if it was so bad that it would have been dangerous to use it, I would argue that this is an interesting and refreshing solution. But if it could have been kept and repaired, I would argue that this is a waste of resources and a large compromise of the integrity of our historical fabric.

Zeitz MOCAA in Cape Town

By Heatherwick Studio

In this project forty-two silos which were previ-

ously used to store grains have been transformed into a museum of contemporary art by carving the interior spaces out of the concrete (Archdaily, 2017).

Own reflections – Again I find this to be a quite extreme and radical approach towards the historic fabric. But I have to regularly admit that I like the spaces that are created, and I find them very effectful, raw and beautiful. I can understand that it would have been very difficult to find a suitable program for the silos without large interventions. I would also argue than the exterior shape of the silos still gives a clear idea of how they were used originally.

Finlyson Area in Tampere

In this project several textile factories have been transformed and given a large variety of new functions according to Benjamin Franger (Douet, 2013, p 108). For example, more than 100 commercial premises, a hospital, museums and restaurants are now using the buildings. This project did, according to Franger, renounce the principles of fundamentalist conservation and shifted the focus from the mere built heritage to the rules that had generated it. Old working methods, textures and details were identified and continuously applied when making the alterations adapting the buildings to this diverse program.

Salts Mill in Brandford

In this project a textile factory has been transformed into a mixed-use building. According to Benjamin Franger the transformation has been a slow process starting with the opening of an art gallery (Douet, 2013, p 113). The building has then been repaired step by step by the income from rents and developing businesses. No radical structural changes have been made to the build-

ing which led to it making it onto the UNESCO World Heritage List leading to increased funding from public sources. A wide spectrum of activities and tenants has surmounted the risk of investments with the intent of changing the building. According to Franger this model of a slow transformation process with support from both public and private actors is usually the most successful.

Värmekyrkan in Norrköping

In this project a steam boiler central has been reused as a venue for cultural events (Louis de Geer Konsert och Kongress Norrköping, n.d.). The only alterations that have been made has been to remove the machines and carefully restore some of the surfaces. This means that the time-worn surfaces have been preserved which according to Hunt and Boyd have the potential of evoking nostalgia, romance and fantasy (Hunt & Boyd, 2017, p. 6). They mean that it is not only visually appealing, but also contains information of how the space was used.

My own reflections – By preserving the time-worn surfaces the building is kept very authentic and it is a very powerful space. However, from attending events in the building, I know that it has also caused some compromising on the acoustics and thermal comfort.

Concluding discussion and positioning

In the contrast comparison I could have chosen projects with a lot more contrast, but I could also have chosen more projects such as the C-mine, where there is barely any contrast at all. So, the projects that inspire me are somewhere in the middle. The chosen projects all have some aspects which are referring directly to something specific about the historic fabric, and some aspects which bring something refreshing and new to their sites. Almost all projects also use and

utilize modern means of production. One possible way of adding new elements to the area of Lokstallarna would be to be inspired by The Granary project. To take a starting point in imitating what is already there, but then allowing for some creative playfulness to explore what new refreshing qualities could be brought to the site. Another way would be to, in a similar manner as in the 837 Washington project, be inspired by something related to the area and its original function. In their case the engineering principles of old railroad structures, which could be a relevant source of inspiration in the case of Lokstallarna as well.

Concerning alterations, I am intrigued by the more radical measures when they can be motivated, for example in the case of the silos when the structures would be almost impossible to use otherwise. I understand that the concept of facadism is sometimes necessary due to, for example, structural integrity, which as I understand it might become the case, at least for parts, of Lokstallarna as well. However, if this would be the case, I would test the hypothesis that some of the building's integrity can be kept if constructing the new interior in a way that resembles the original and brings associations to its original functions. With a starting point in the assumption that the roof and structural system can remain, I would work from the principle to not do radical alterations to the construction and interior unless they can be clearly motivated. However, the building is very large and, in its core, it is only lit by the lanterns, so probably some alterations will be necessary for the building to be useful. Here, inspiration will be taken from the Finlyson project in aiming at identifying the rules that created the area in the first place and continue to apply them, while exploring how literally they should be interpreted. Identifying and accentuating time-worn surfaces that can be preserved without compromising the indoor climate will also be a focus.

Reflections from Innovatum in Trollhättan

The science park Innovatum is located in Trollhättan and it is using the buildings which were previously used by the workshop company NO-HAB. In the area there are, for example, offices, the Saab Museum, a science centre for children and restaurants. To get inspiration for the project I visited the area and some of my reflections from the visit will be presented below.

I was inspired by how the architects had worked with shapes, proportions and characteristic traits such as vertical lines in the meetings between old and new. They had chosen materials such as corrugated and perforated metal sheets which remind of industry and used them in a decorative and pleasant way. The colour scheme was in harmony and the shapes and materials show both variety and cohesion.

The atmosphere created by the materials, details and program had an expensive and luxurious feel to them which is probably what they aimed for when designing the place for mostly tech companies. This atmosphere applied to Lokstallarna however I think would compromise the diversity of the area and lead to a loss of character. All

interior surfaces were painted in white which felt a bit sterile, and I found it a bit disappointing that they had hidden the time-worn surfaces containing traces of history. I don't know if this was the result of regulations on fire safety and indoor climate or if they deliberately had covered surfaces perceived as "dirty and ugly". A material that was frequently used was Corten steel which after a short time express aging in its appearance. I found it a bit contradicting that all the long-term authentic aging of the interior surfaces had been covered up with white paint while a short-time aging had been introduced through the Corten steel.

The building which today contains the Saab Museum was previously used to build locomotives. The building was built in such a way that several locomotives could be placed after each other making the building very long and, just as for Lokstallarna, having a clear axis. Even though I perceived this axis when walking inside the building, dividing walls of frosted glass and ramps which were slightly rotated from the direction of the axis reduced its effect quite a lot.



The gable shape and vertical lines of the old buildings being interpreted in a modern way in the insertion building. (Own photograph)



The shape and colour scheme of the old building being interpreted in a modern way in the neighbouring building. (Own photograph)



Dividing wall of frosted glass compromising the effect of the axis of the building. (Own photograph)



DESIGN

The aim of this chapter is to present the design process of the project. It will start by formulating the intentions of the project followed by exploring several volumes and potential programs. Based on defined selection criteria, a preferred volume and program scenario is then presented. The chapter is ended by presenting material selections and a more detailed design for the parts of the building which are most important for fulfilling the design intentions.

Design intentions

As was seen in the reference study on page 36 regarding the Finlyson area, one strategy for preserving the character of a site while adjusting it to a new program is to shift the focus from the mere built structures to the rules that created them and continuously apply them in the alterations (Douet, 2013, p 108). To allow movement of the carriages along straight lines in west-east direction and for the centre isle of the building to give the workers an overview of the hall as well as possibility to move heavy equipment between the carriages are two important rules that has become characterizing for the structure of the carriage workshop. Movement along these axes and the sightline created in the centre of the building is therefore a big part of defining its essence and tells the story of how it was originally used. To preserve and enhance these axialities and this sightline is therefore an important design intention which is connected to research question one.

One of the biggest qualities of the building its materiality and attention to detail and how the red brickwork is creating cohesion between the

buildings of the area. In the reference study it was concluded that the added elements that I am inspired by all have clear harmonious relations to the existing shapes, proportions and materiality but are still allowed to creatively express new and refreshing qualities. So, this will be an important intention for the project that relates to research question one. Due to the size of the building, it will most likely contain several different functions which makes it important to create cohesion within the building which will also be an important intention.

The cultural square is, as Anna-Karin is mentioning on page 22, depending on having apartments close by so that spontaneous visits can be made to the cultural actors. Related to this she is also expressing a worry that the carriage workshop will become a barrier between the cultural square and residential area to the west of the workshop. Therefore, an important intention connected to research question two is to counteract this and instead make the carriage workshop into a connecting element.

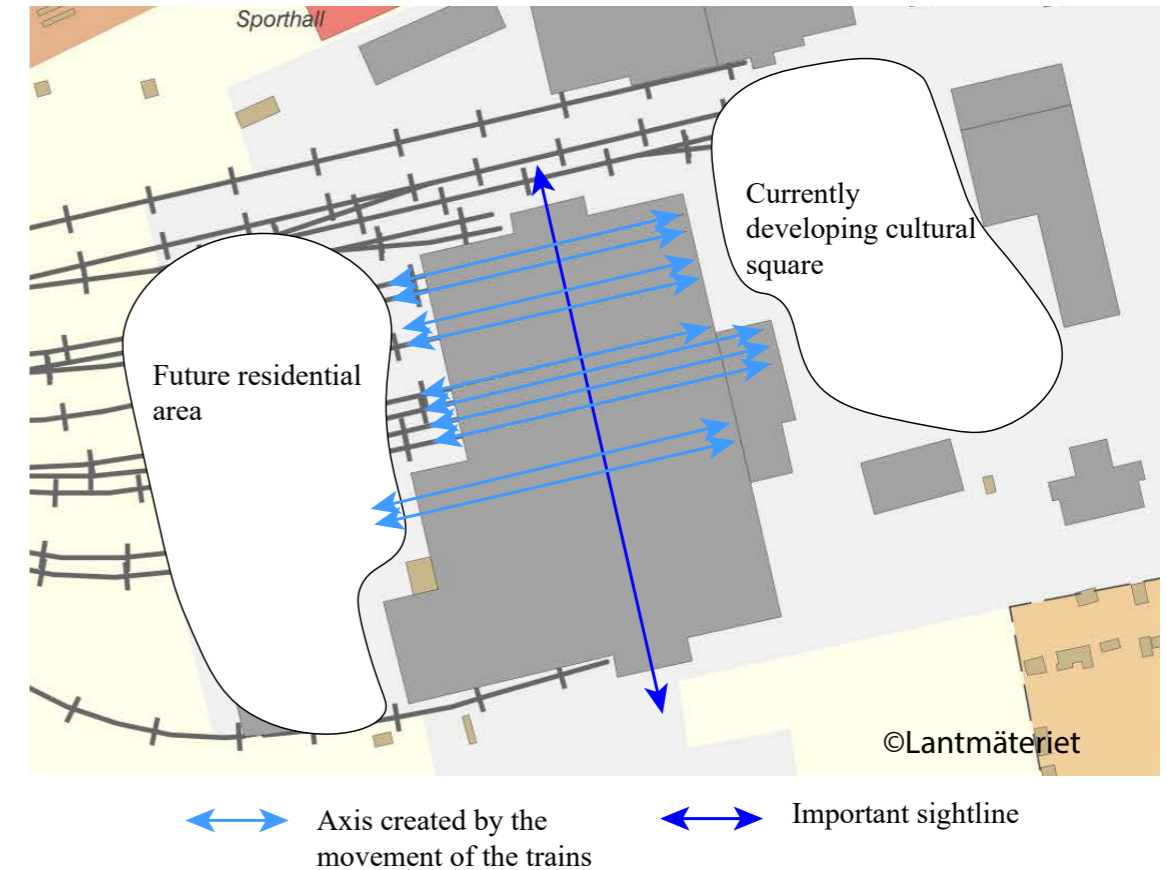


Figure 20. Existing axialities and important sightline. Map by (Lantmäteriet, n.d.), White areas, text and arrows added by Maria Karlsson.

Repetition of research questions

1. How can the values and essence of a cultural historical industrial site be defined and reflected in the choices of what to preserve, modify, add and accentuate? And how can added elements become modern interpretations and developments of the existing essence of a site?
2. How can an ongoing process from abandoned industrial site to a meeting place for a diversity of new creative initiatives be promoted and preserved through a transformation project?

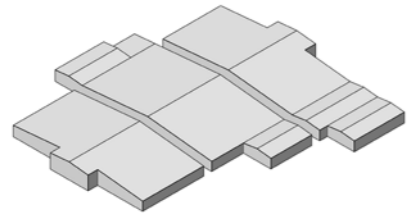
Primary intentions

1. To preserve and enhance existing axialities and important sightlines.
2. To design new additions and alterations in such a way that they have clear harmonious relations to the existing shapes, materiality and proportions while also bringing new and refreshing qualities to the site.
3. To make the carriage workshop into a connecting element bridging the cultural square and residential area instead of becoming a barrier between them.

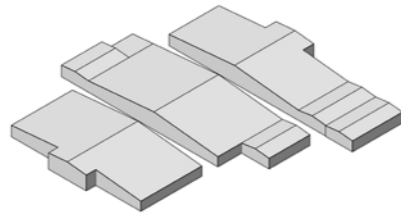
Volume study

To prevent the carriage workshop from becoming a barrier, passages need to be created through the building between the cultural square and the residential area. The building is very deep and is only lit by the lanterns in its core. Therefore, courtyards will likely be needed to bring more

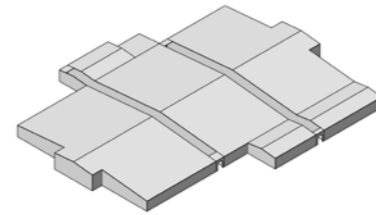
light into the building. A vertical extension could also maybe add value and increase the exploitation of the area. Below, it is studied how these aspects can be designed and how it affects the volume of the building. The explorations have been made fast, intuitively and independent of each other.



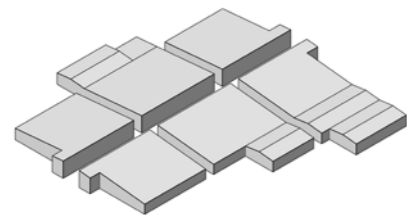
1. Two passages with a width of 5 m in west-east direction



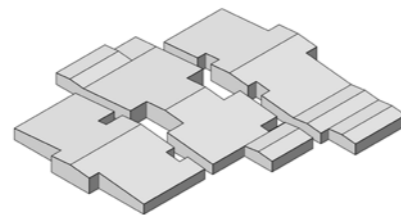
2. Two passages with a width of 10 m in west-east direction



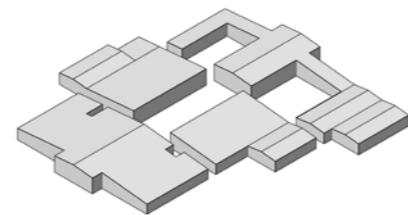
3. Two passages with a width of 5 m and roof covering the entrances in west-east direction



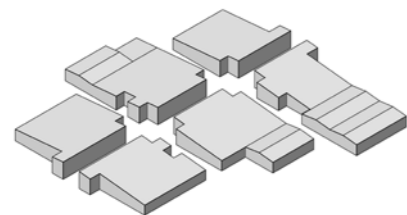
4. Two passages with a width of 5 m in west-east direction and one perpendicular of 10 m.



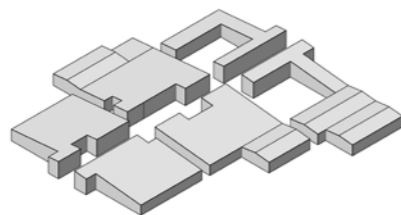
5. Two passages with a width of 5 m in west-east direction and smaller court yards.



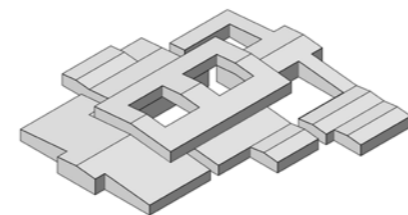
6. Two passages with a width of 5 m in west-east direction and larger court yards.



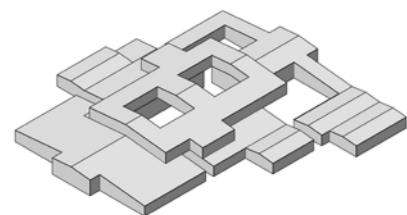
7. Passages in both directions and small and medium sized court yards.



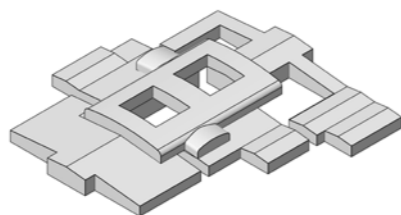
8. Passages in both directions and small, medium and large sized court yards.



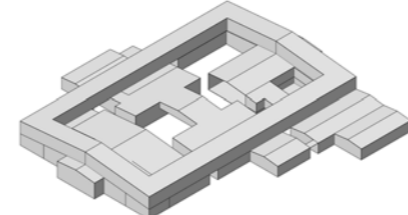
9. Vertical addition around the court yards with a simple gable shape.



10. Vertical addition around the court yards with a simple gable shape and side additions.



11. Vertical addition around the court yards with a cylindrical shape and cylindrical side additions.



12. Vertical addition around the perimeter of the main hall.

The conclusion from the study is that two passages would be placed about 50 m apart which would correspond to a smaller city block and create natural divisions of the large volume into graspable functions but where the perception of a large volume is not lost. Too wide passages disturb the readability of the building as one volume and too narrow passages will not be perceived as pleasant to use. Continuing, I will work from the hypothesis that 5 m is wide enough, and that light materials and carefully designed details can make the passages pleasant. Adding a passage in the perpendicular direction might add value depending on the program.

Applying courtyards of different scales in an irregular grid is creating subspaces within the building in a similar manner as the buildings create subspaces on the site. Smaller courtyards could be used for marking out entrances and larger ones

for letting in light. There is however a risk that they will make the passages feel unsafe since you can't see what is happening around the corners. The need for courtyards and their effect on the safety will depend a lot on the program.

Adding a vertical addition around a centre courtyard will add a vertical dimension to the existing creation of subspaces by adding extensions to the main hall. Adding side extensions to the vertical addition accentuates this even more. Walking through the passages could become a varied and effectful spatial experience when the heights of the side walls differ, when you need to pass under the extension and where the space becomes a lot more open when you reach the courtyard. Adding the vertical addition around the perimeter instead increases the exploitation but accentuates the main rectangle in way that makes the existing extensions look a bit odd.

Program and organisation of functions

According to *The International Committee for the Conservation of the Industrial Heritage (TCCIH)* is finding an appropriate program crucial for the success of a project where industrial heritage is reused (Douet J. 2013, p. 113). Many textile mills and warehouses have successfully been reused as flats and offices and smaller halls and workshops have shown to be appropriate for studios, clubs and commerce. Large facilities built for single purpose production, however, is a larger challenge when it comes to program but if done successfully, they have the potential of being the focal point for the regeneration of an entire area.

As Lars Böhme is mentioning on page 22 and as was seen in the reference study on page 36 regarding Salts Mill in Bradford, it is an advantage if a transformation process can be given time to let new actors naturally and gradually find appropriate uses for a building. The aim of this section is

to present three future scenarios of what could be the result of such a gradual development process and to choose a scenario that in my opinion would be beneficial for the area in terms of making it a meeting place for a diversity of creative initiatives.

The programs and organisations of functions of all three scenarios are designed to meet the design intentions, and to evaluate to which degree this has been successful, three evaluation criteria are formulated. The first criterion is related to intention one and evaluates how well the axialities and sightline have been preserved and accentuated. The second criterion is related to intention two and evaluates how well the alterations and additions are working as part of a whole in the area. The third criterion is related to intention three and evaluates how safe and pleasant the connections through the building will be to use,

with the argument that an unsafe connection is as much of a barrier as no connection at all.

Additionally, two more criteria are formulated which are of less importance than the first three, but also related to the research questions. According to Benjamin Franger there are two risks when choosing a program in an adaptive reuse project (Douet J. 2013, p. 108). One is to only focus on economically marginalized actors, such as using an entire building for social housing. This might mean that the economical means for restoration and maintenance puts the building at risk for a second cycle of decay. In contrast, according to Franger, there is also a risk of loss of character and social sustainability with only attracting economically strong actors, pushing economically weak actors away. As seen in the reference study on page 36 regarding Salts Mill in Bradford, one way to successfully preserve the qualities of a building while promoting social sustainability, is to attract a wide spectrum of activities and tenants, and funding from both public and private actors. So, related to research question three, the fourth criterion is evaluating the diversity of the activities and tenants.

Finally, as explained in the context analysis on page 26 and 28, the roof and large parts of the structural system was built after the fire in the 50s and are therefore of less historical value than the rest of the building. It is also questioned for how much longer they will be safe to use. While being beautiful in their logic and materiality, the roof and structural system is blocking light from entering the core of the building and would make a smaller room feel dark and trapped. One could argue that only keeping the facades as a shell

around a new structure compromises the authenticity of the project. But one could also argue that, since the future safety of the construction is questioned, the rational thing would be to replace the structural system with one that is better adapted to a new program that is fulfilling the needs of society, eliminating the problem of finding a program adapted to the existing structure. In the reference study on page 37 I conclude that I will work from the principle to not do alterations to the interior and structural system unless they can be clearly motivated. So, the last criterion evaluates the risk of facadism and compares the degree of alteration to the interior to the importance of its motivations.

Based on the evaluations of the scenarios, one *intention for the preferred scenario* is presented for each criterion. Where the first three are more specified and concrete versions of the primary design intentions and the last two are of less importance. Based on these intentions a fourth scenario will be presented which is the preferred scenario and will be further developed in the thesis.

The functions that have been considered for the program are listed below.

Apartments: In the overview plan it is stated that the possibility of using the old buildings for apartments will be examined and could result in a varied and different experience of housing (Malmö Stad 2020, p. 19)

Offices: It is stated in the overview plan that the carriage workshop might be used for offices (Malmö Stad 2020, p. 23)

Curling tracks: According to SkåneSport, the curling team in Malmö have previously had their practises in the ice rink of Kirseberg which is just next to Lokstallarna, since there is no dedicated curling track in the city (SkåneSport, 2022). However, this year, the curling practise have been cancelled since the ice rink has been fully booked. My reflection is that curling is an activity which is performed in a straight line and could therefore accentuate the axiality of the spaces of the carriage workshop and imitate the movement of the trains, workers or traverses.

Matverkstaden: A restaurant which is currently using the building.

Theatre/cinema/music venue: It is stated in the overview plan that the carriage workshop might be used for cultural activities (Malmö Stad 2020, p. 23). I will explore if a performance venue could be a complement to the existing cultural actors on the site.

Space for new cultural actors: There will be some room next to the cultural square that new actors could use. Exactly what type of cultural actor I will not specify.

Swimming hall: During my site visit, it was mentioned by Anna-Karin that a swimming hall is in consideration for the core of the building. My reflection is that swimming is another example of activity which is performed in straight lines and that it could accentuate the axiality of the spaces.

Gym: I would argue that it could be suitable for the building since it requires large spaces and would be complementary to the swimming hall.

Shared residential services such as a bike work-

shop: Placing residential service along the western façade, which is facing the future residential area could, according to Anna-Karin, make the space in front of it into a vibrant meeting place promoting social sustainability.

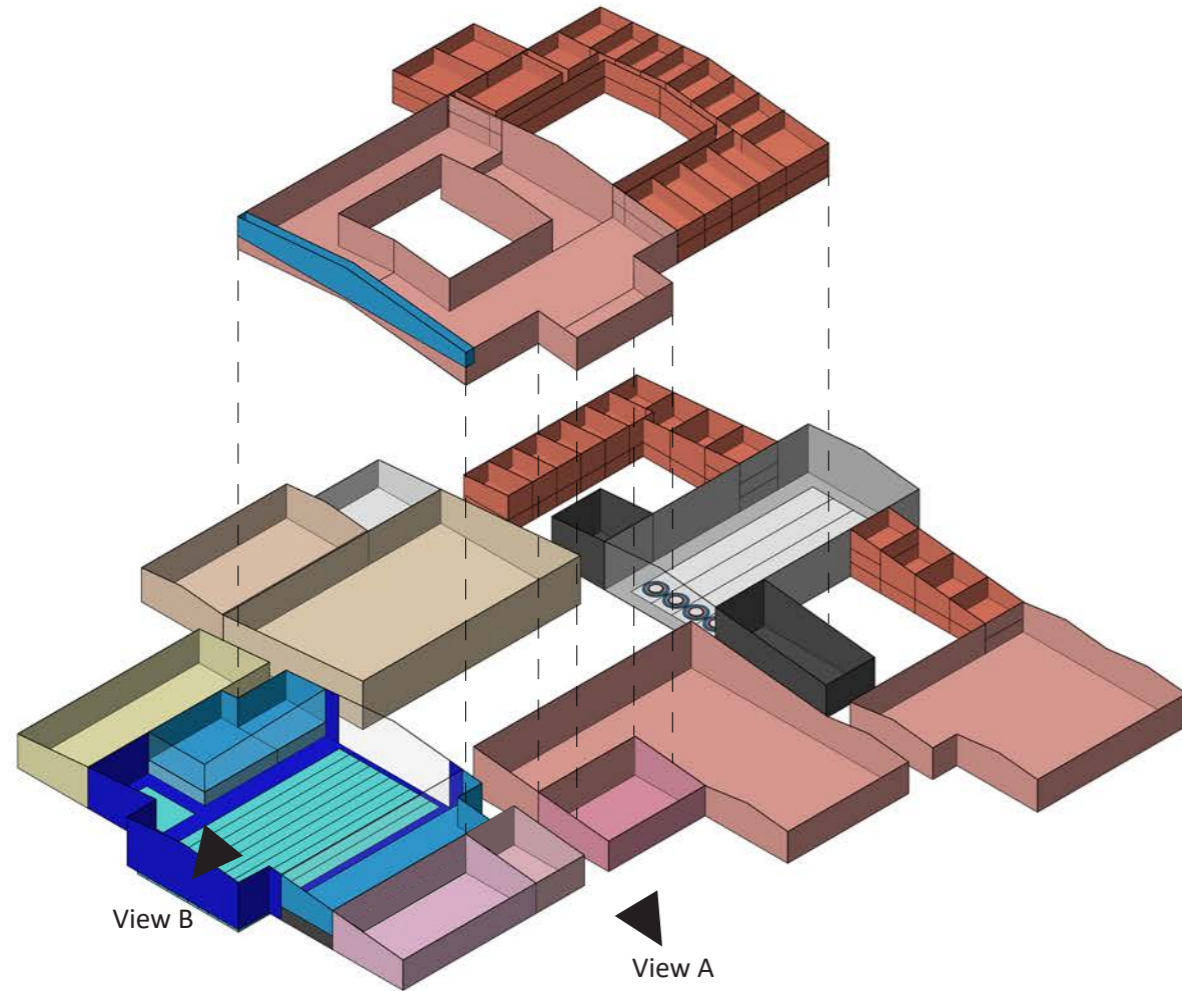
Grocery store: I would argue that a grocery store could be a complement to the residential service along the western façade.

Second hand store: I would argue that it could be suitable for the building since it requires large spaces and is not as dependant on light as, for example, an office.

Exhibition: Industrial monuments are according to Wolfgan Ebert becoming important parts of our cultural landscapes and can play an important role as a destination for tourism that can give good economic returns (Douet, 2013, p 201). Since the building according to the antiquarian preliminary investigation have historical value in so many aspects, as explained on page 28, I would argue that it deserves to be showcased and explained to those who take an interest. It could also maybe host temporary exhibitions. Here I take inspiration from Arbetets Museum in Norrköping that I have visited many times. There, a part of the building is dedicated to explaining the history of the industrial landscape, a part is dedicated for smaller temporary exhibitions and a part is dedicated for more interactive exhibitions relevant for children.

Bowling and boule hall: I would argue that bowling and boule are also examples of activities performed in straight lines that could accentuate the axiality of the building.

Program scenario 1



■ Residential	■ Office	■ Curling tracks	■ Tech room
■ Building owner office	■ Matverkstaden	■ Theatre/cinema/music venue	■ Space for new cultural actors
■ Swimming hall	■ Gym	■ Reception/administration/dressing room	■ Grocery store
■ Bike workshop	■ Shared residential services and equipment		

In the first program scenario, there are two passages in west-east direction following the movement of the trains, as in image 1 of the volume study. A swimming hall, large centre courtyard and curling hall are placed along the sightline and divided by two glass facades. There is a large variety of the scales of the proposed functions and a

vertical addition is increasing the exploitation of the area and adds spatial variety to the passages, as in image 10 of the volume study. The courtyards are either large to bring a lot of light into the building or small to mark out entrances and create subspaces, as in image 6 of the volume study.

Summary of pros and cons

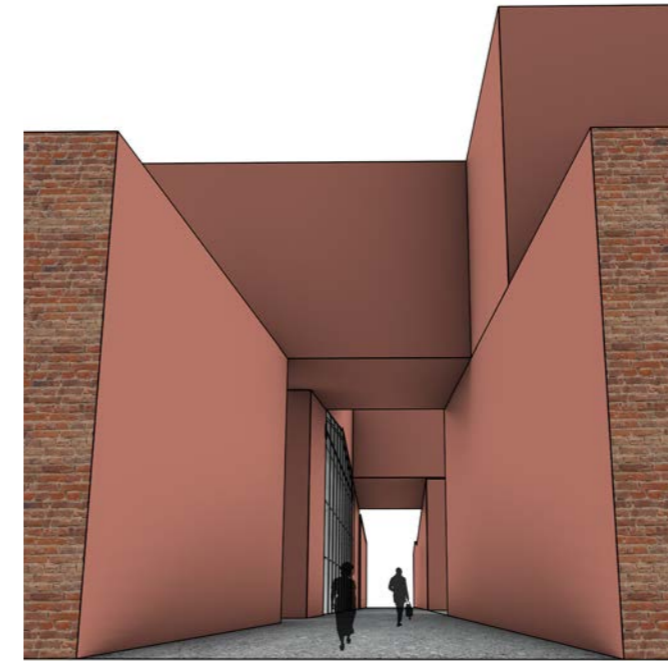
+ effectfull spacial variations

+ The activites enhances the sightline and axiality

+ More residents and offices generating revenue

- Technically complex functions could be a risk for the cultural heritage

- Inefficient use of the space in the centre

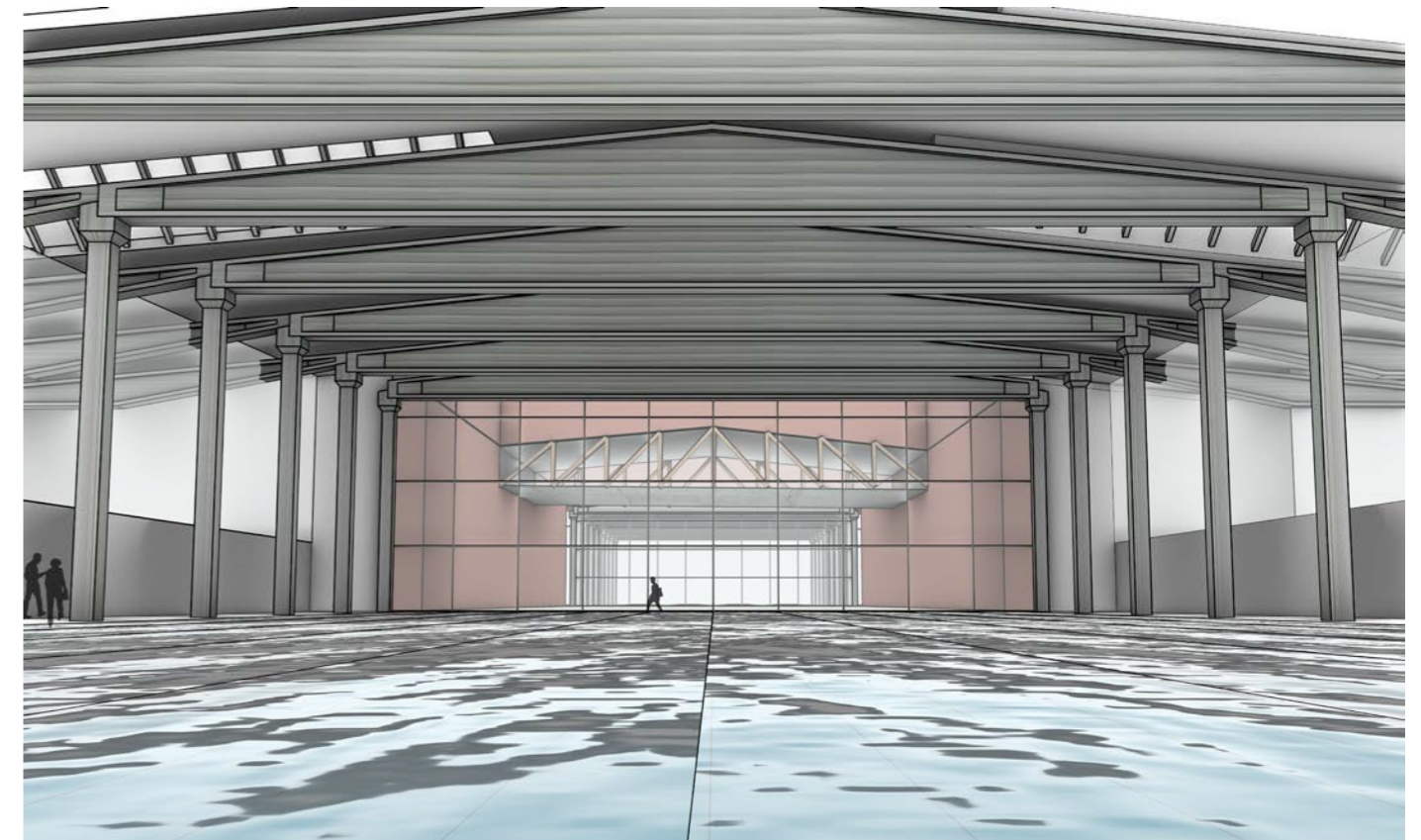


View A: Passage between the cultural square and residential area.

■ Existing ■ Added



The volume from outside the building.



View B: The swimming hall placed along the centre sightline of the building.

Evaluation

Axialities and sightline

Both the passages and rooms along the sightline have clearly defined directions and a feeling of movement. However, the spatial variation of the vertical addition is competing a bit with this. The movement through the building and between its different functions takes place mainly along the west-east axes and the swimming and curling halls mean that there will be movement in straight lines within the rooms along the south-north direction. The vertical addition also adds movement in these directions, but it also adds several vertical layers to this. Having movement in both directions in several vertical layers is, in my opinion, adding interest to the building. At ground level, it is showcasing the original movement of the building from both the carriages and workers perspective and at the other vertical levels it brings dynamic to the project. However, there is a risk that the vertical layers will make the movement too complex for it to be graspable. The centre sightline is divided by two glass facades, which compromises the transparency a bit but, in my opinion, the sightline is still preserved.

As part of a whole

The vertical addition is very visible from the outside and becomes part of the overall impression of the area. The density of the area will most likely increase in the future, so there will be a mix of old and new buildings. The vertical addition blurs the line between old and new, since the workshop building would have parts of both. The smaller horizontal additions make subspaces in a similar way as the additions added in the 50s, creating two vertical levels of subspaces. The entrances to the passages through the building are clearly marked out but the perception of the building as one volume is a bit compromised. However, due to the narrowness of the passages and the vertical addition, the building volume is still readable.

Safety

There are two small court yards along the northern passage where someone could be hiding behind a corner making the space feel unsafe. However, this space is visible from the gym which is probably open and used all around the day. The southern passage is visible from the apartments, either on the ground level or in the vertical addition. The centre courtyard is visible from both the gym and apartments. So, I would argue that the degree of safety of this scenario is good.

Diversity of activities and tenants

There is also a good diversity of activities ranging between culture, sports, residential, offices and service, meaning that users of different interests and age groups would be attracted to the area. Ideally, part of the office space would be used by established actors with possibility of paying more rent, and part by more emerging initiatives. More luxurious private housing would generate more revenue while simpler public housing would increase diversity. The balance of this would need to be further evaluated.

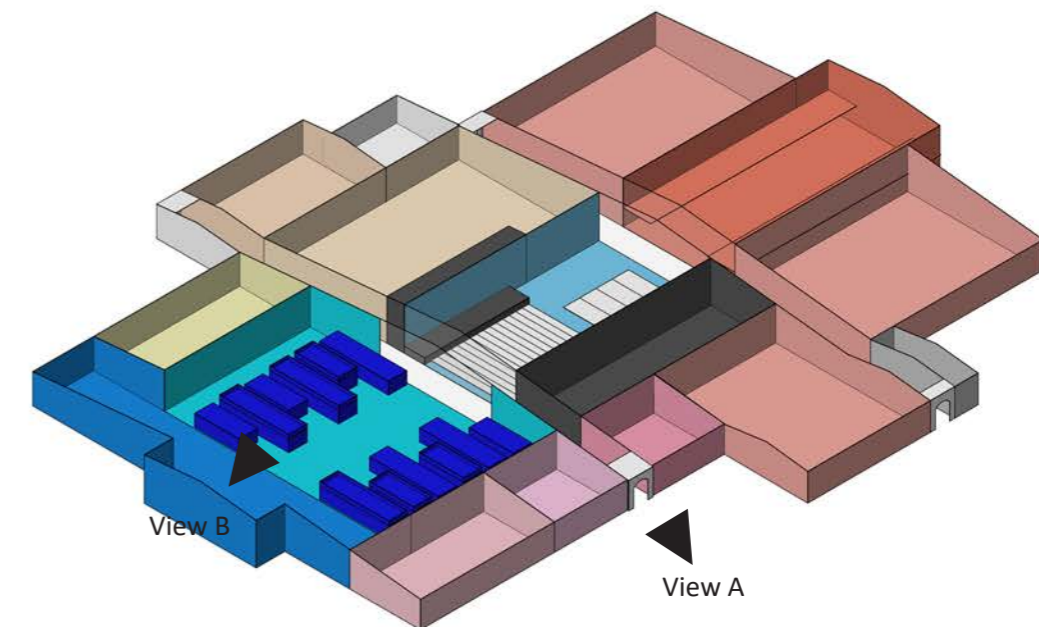
Risk for facadism and its motivations

The vertical addition would increase the loads on the structure increasing the risk of needing to replace it or build a free-standing structure around it carrying the addition, which would both be quite large alterations. The main motivation for the addition is the increase in exploitation and possibility of having more revenue generating functions. However, it could be argued that the cost of building the addition could neutralise this and that income from apartments and offices built in the surrounding area could house these functions instead. The spans between the columns of around 17 m would be too deep for the apartments and the small subdivisions would cause the beams and columns to be perceived as odd and out of scale. So here, the roof and structural system would need to be replaced. However, the spacing of the façade modules of around

6 m would create a pleasant row-house feeling and the apartments would bring more life to both the cultural square and the inner passages. They would also generate revenue. The technical complexity of the swimming and curling hall would change the indoor environment a lot concerning moisture and temperature, which could require

large alterations to the interior. However, they add value by attracting a wider group of users and improving health. The parts of the building where the risk for facadism is the smallest are the offices and cultural spaces which are not underneath the addition.

Program scenario 2



■ Second hand store	■ Office	■ Storage	■ Tech room
■ Building owner office	■ Matverkstaden	■ Theatre/cinema/music venue	■ Space for new cultural actors
■ Technology adventure activity hall	■ Railway museum	■ Bowling and boule hall	■ Grocery store
■ Bike workshop	■ Shared residential services and equipment		

In the second program scenario, there are also two passages in the west-east direction following the movement of the trains and placed where there are large doors on both sides of the building, so no parts of the facades need to be removed, as in image 3 of the volume study. A second-hand store, a bowling and boule hall and an exhibition hall are placed along the sightline divided by four glass facades. The exhibition hall is meant to partly contain materials showcas-

ing the history of the area and partly host more temporary exhibitions. More interactive parts of the exhibitions take place in rooms placed and designed with inspiration from old train carriages, so the movement between those rooms will remind of the movement when the hall was originally used. Only large functions are included, there are no court yards and a part of the extension is removed to let in more light to the core.

+ The activities enhances the sightline and axiality

+ No extremely technically complex functions

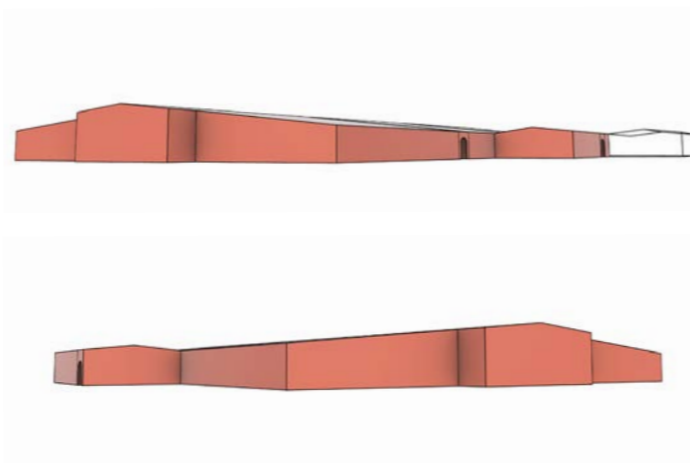
- The amount of glass facades will weaken the sightline

- Parts of the facade and volume are removed



View A: Passage between the cultural square and residential area.

Existing Removed



The volume from outside the building.



View B: The exhibition hall placed along the centre sightline of the building.

Evaluation

Axialities and sightline

Also here, the passages and rooms along the sightline have clear directions and a feeling of movement. However, the actual movement through the building, between its different functions and within the rooms that are clearly along straight lines all take place in west-east direction. So, only the movement of the trains is accentuated and not the movement along the sightline of workers and equipment, meaning that part of the building's dynamic character is lost. Dividing the sightline by as many as four glass facades compromises the transparency and might mean that the sightline is not preserved in practise. However, not seeing where the sightline ends could create the effect of it continuing endlessly which could create another quality.

As part of a whole

Since the entrances of the passages through the building will blend in with the other windows and doors, the perception of the building as one volume is preserved, and it will not be visible from the outside that any alterations have been made to it. This will preserve the character of the area.

Safety

Since the entrances to the passages through the building are blending in with the rest of the

facades, they are not as welcoming and public which might lead to the passages not working as well as they could have. However, there are no corners that someone could hide behind and the bowling hall located in the core is probably used most frequently during the evening when the safety of the passages is most important. Towards the openings of the passages, they are only surrounded by offices and cultural actors, so during evenings when there are no cultural events these places might be perceived as unsafe.

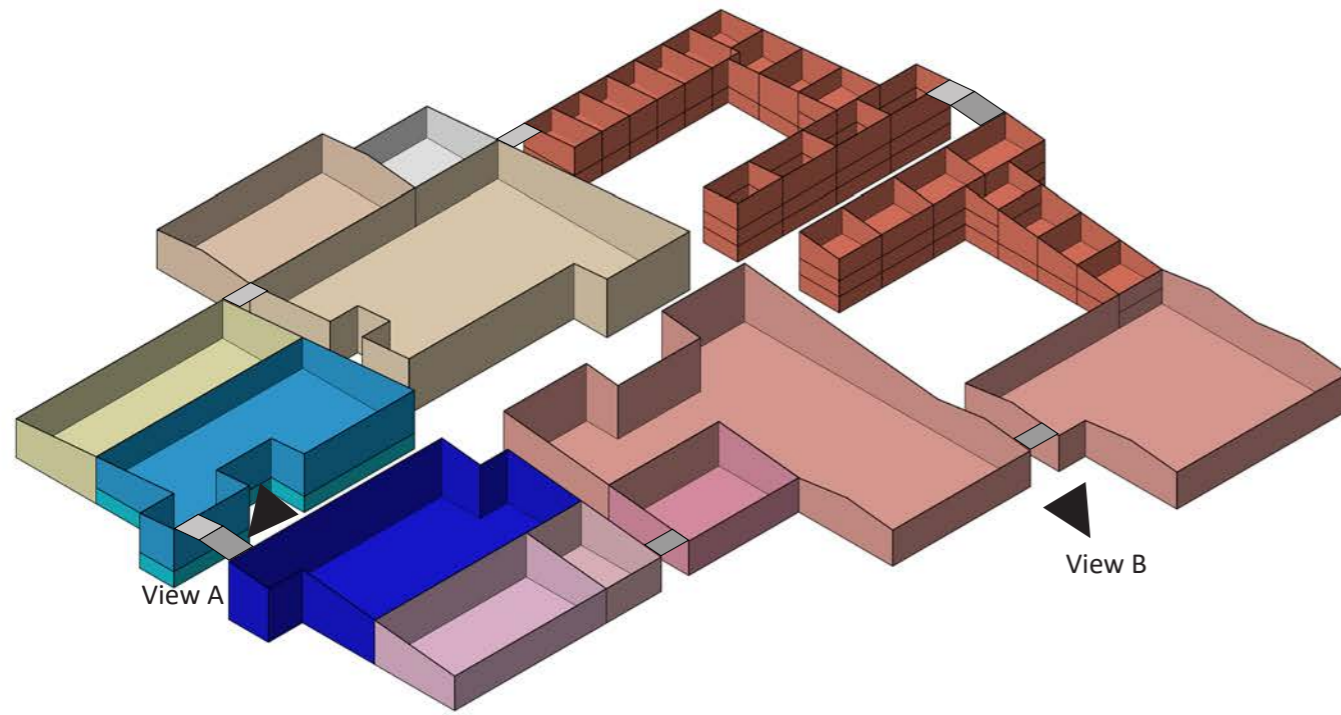
Diversity of activities and tenants

Since only large functions are included in this program scenario, there is an emphasis on cultural activities and shopping in the second-hand store. Only the offices have the potential of generating more revenue meaning that most of the office space would need to be used by established actors with the possibility of paying more rent. So, either this program would be difficult to motivate financially, or the property values would need to rise in a way that would compromise the social diversity.

Risk for facadism and its motivations

The risk for facadism is low in this scenario and no radical alterations to the interior would need to be made.

Program scenario 3



- Residential
- Office
- Bike workshop
- Shared residential services and equipment
- Building owner office
- Matverkstaden
- Theatre/cinema/music venue
- Space for new cultural actors
- Second hand store
- Gym
- Retail
- Grocery store

In the third scenario, there are two passages through the building in west-east direction following the movement of the trains, and one passage in the north-south direction placed along the centre sightline, as in image 4 of the volume

study. Also here, there is a large variety of the scale of the different functions. There is also a large variety in the scale of the courtyards, as in image 8 of the volume study.

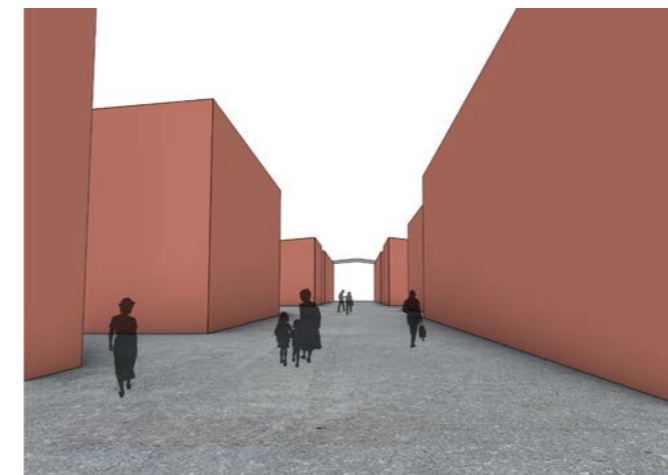
+ Interesting spacial variations sideways

- Only the facades are kept and large parts will only consist of new elements.

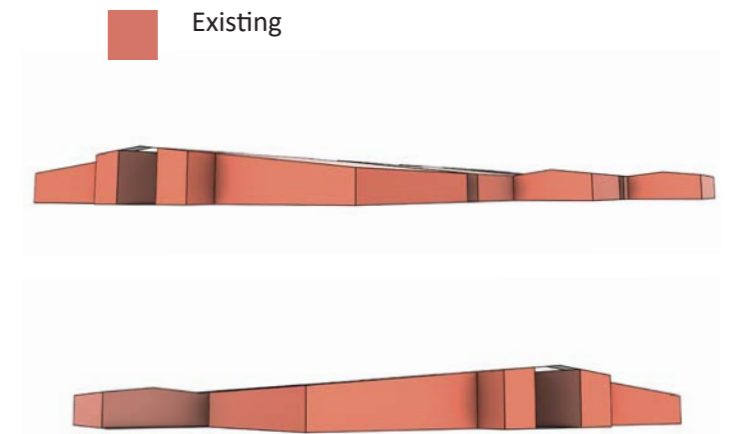
+ Probably good light conditions so the interior becomes easier to use

- The entire structural system needs to be replaced.

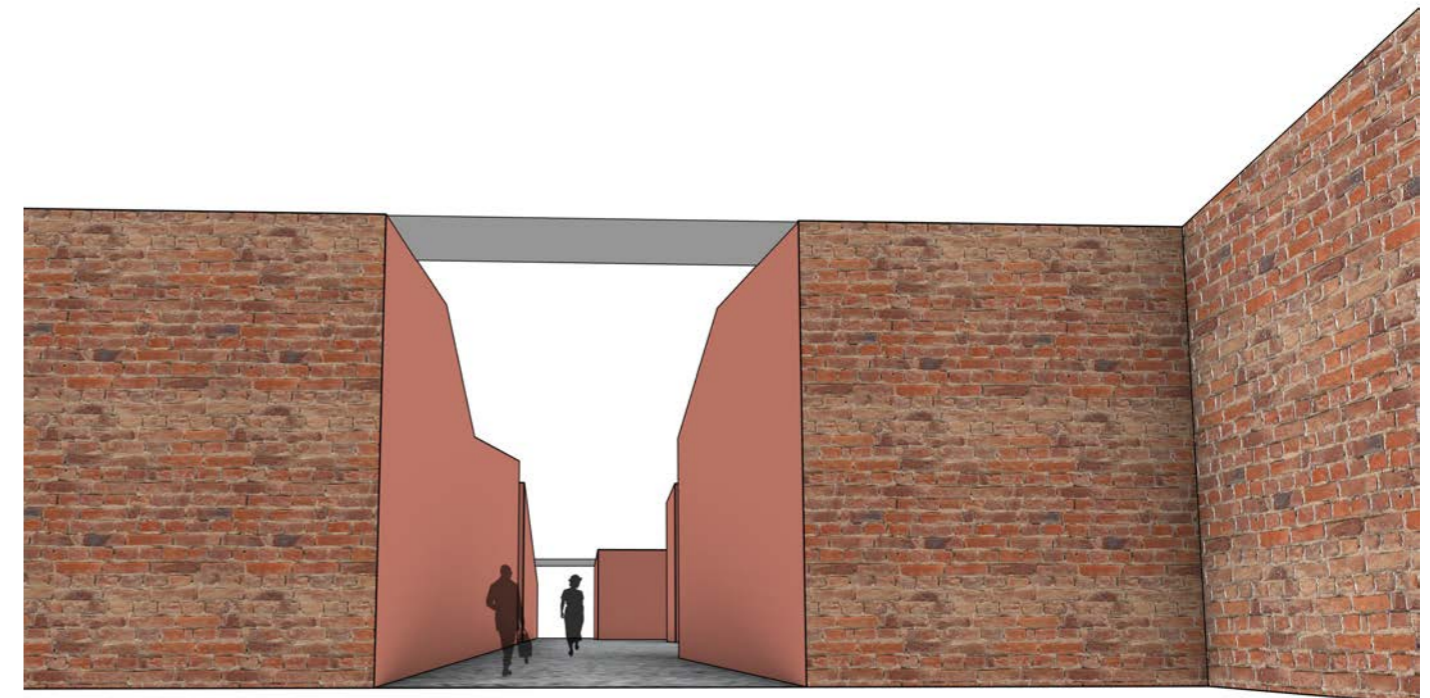
- Large parts with either new or old. few meetings.



View A: Passage along the sightline



The volume from outside the building.



View B: Passage between the cultural square and residential area.

Evaluation

Axialities and sightline

The movement through the building and between its different functions takes place in both west-east and south-north direction crossing each other which adds dynamic to the building. However, there are no functions performed in straight lines accentuating the axialities within the rooms. There are no glass facades along the sightline meaning that the transparency is not compromised at all. The external walls added to create the passage along the sightline is changing the spatial experience quite a lot. The direction of the space is more clearly defined, but the sense of scale and airiness, which is very characteristic for the hall, is lost.

As part of a whole

The passage in south-north direction is so wide that the perception of the building as one volume is compromised, but keeping the roof by the entrance is however reducing this effect. The entrances to the streets are more clearly marked out than in program scenario 2 and the roof is keeping the perception of the volume better than in program scenario 1.

Safety

There are many corners along the passages

where someone could be hiding. However, towards north the passages are mostly visible from the gym and to the south from the flats making them safer. The core could probably be perceived as unsafe during the evenings when the music venue is not used.

Diversity of activities and tenants

Just as in program scenario 1, there is a good diversity of actors and activities attracting user groups with different interests and ages. Depending on the kind of housing and office spaces, there is potential for a good social diversity.

Risk for facadism and its motivations

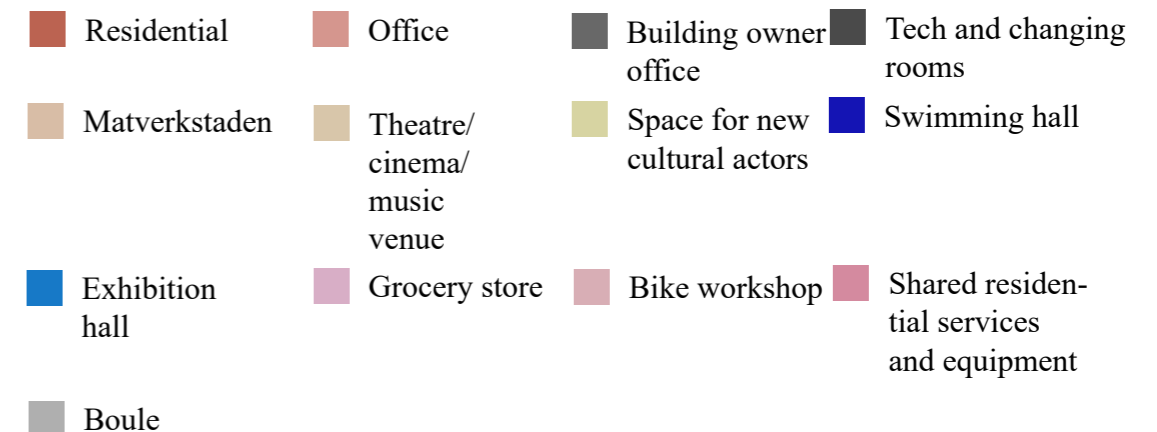
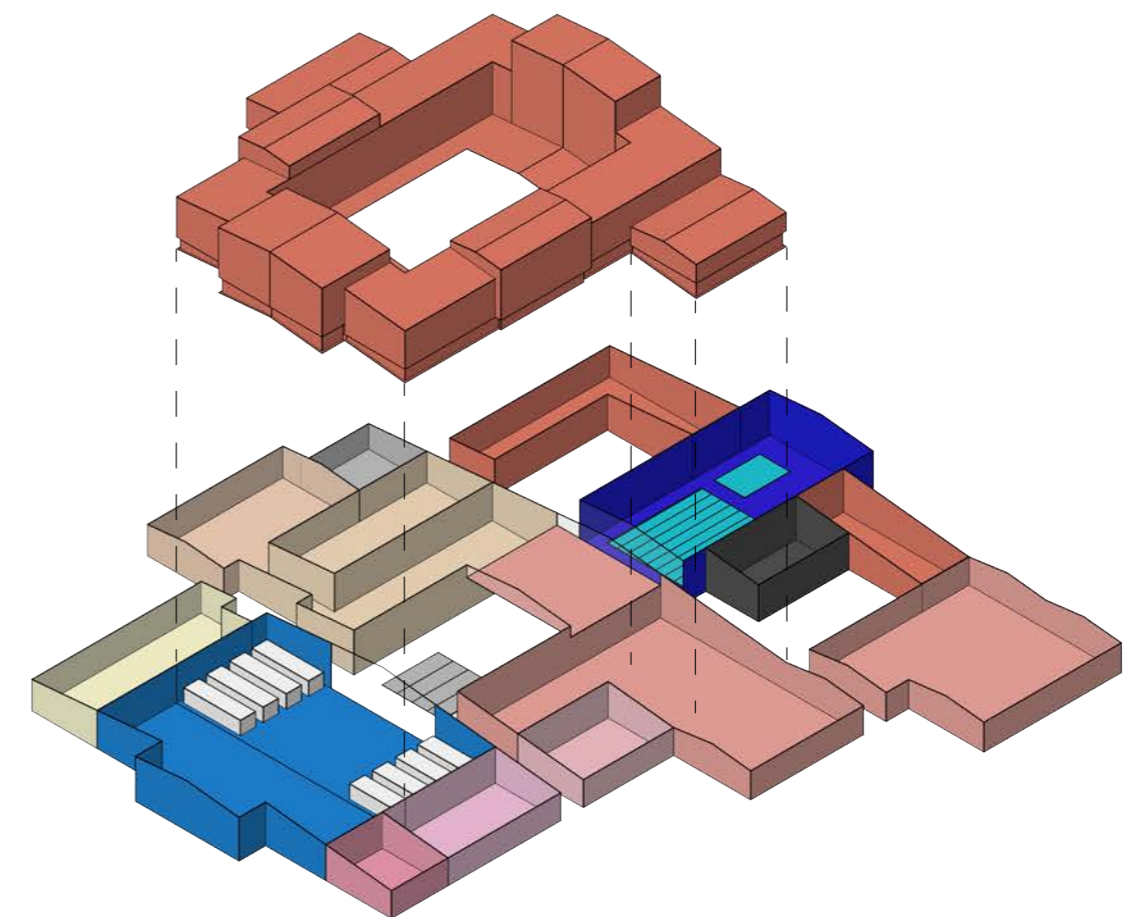
Large portions of the roof and structural system would need to be removed or replaced in this scenario. For example, all the beams of the centre isle would need to be removed, the structure in the area of the apartments would need to be replaced, and the alterations to create the court yards might make it more rational to replace the roof and structural system in the bays next to the centre isle as well. So, only in very isolated places the construction could be preserved.

can be perceived as unsafe visible from functions used during the evening.

Diversity of activities and tenants: To have a wide spectrum of activities and tenants. To include both functions generating more economical revenue and functions including economically weaker actors. To include both private and public actors.

Risk for facadism and its motivations: To preserve the roof and structural system in some parts of the building while allowing to replace and remove them in other parts.

Preferred scenario



Intentions for the preferred scenario

Below, intentions for the preferred future scenario which are based on the evaluation of program scenario one to three are presented. The most important intentions are underlined>.

Axialities and sightline: To have movement in both directions, include activities performed in straight lines enhancing the axiality and to minimize the amount of glass facades along the sightline.

As part of a whole: To preserve the perception of the building as one volume and at the same time make the entrances marked out clearly enough for them to be perceived as welcoming. To preserve and possibly add to the creation of subspaces by adding extensions.

Safety: To include functions attracting people all around the day and all around the year. To have spaces that

For the preferred scenario, the intentions listed above are used to choose the best parts of scenario one to three which are combined into one program and organisation of functions. This has resulted in a larger focus on preserving both the exterior and interior of the building towards the northeast, where larger cultural functions are placed. Towards southwest, larger alterations are allowed, and the functions are more focused on everyday life with apartments, offices and activities focusing on physical activity. The exhibition hall from scenario two is chosen for the northern part of the centre sightline while the large and technically complex 50 m swimming pool from scenario one is reduced to a 25 m pool and placed towards the south where larger alterations are allowed.

The movement of the different users of the building is presented in six process diagrams on the following page. To improve the light conditions, the room bridging the office and music venue has been moved towards the swimming hall and the number of courtyards of vertical addition has been reduced to one, since these diagrams were produced. But the principle of the movement is still the same. As seen in diagram 3, 4 and 5, the swimming pool and boulevards creates movement along straight lines in north-south direction while the exhibition hall will be planned to create movements in both directions. The movement through the building and between the different functions will mainly take place in straight lines in east-west direction, as seen in diagram 1 and 2. So, there is movement in both directions preserving the dynamic aspect of the hall. Only two glass facades are used along the sightline and the bridge in east-west direction is placed high enough to not cover the view.

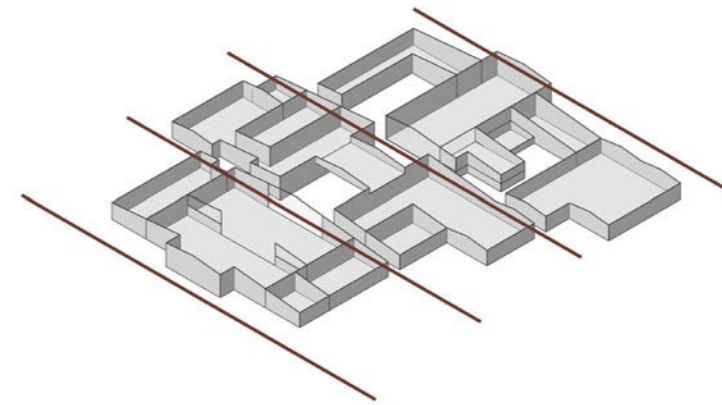
The functions are chosen to complement each other. During the day, the companies using the office space can use the music venue auditorium and neighbouring mingling area for company presentations and conferences and the offices will provide lunch guests for Matverkstaden. This

is illustrated in movement diagram 3. The centre courtyard could be used both as a break and afterwork area for the companies and for outdoor cultural events and mingles of the theatre/music venue. The swimming hall will be a quality for the residents living in the apartments. Planning the exhibition hall for movements similar to those when the hall was originally used will increase the understanding of its' history and complement the exhibited material.

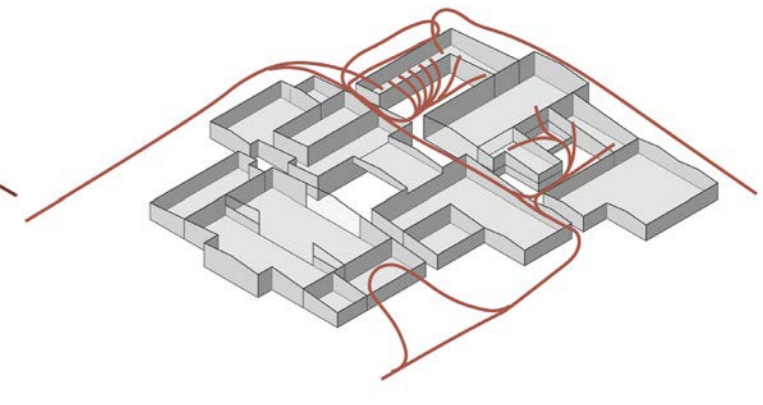
In appendix A, diagrams of the activity density of the building for different times of the year, week and day are presented. Especially important are the diagrams of mornings during both winter and summer and of evenings during winter. Those diagrams are presented after the movement diagrams. During those times the only reason that there are people using the northern passage (the blue dots in the passage closest to the camera) is due to the apartments in the vertical extension. As seen in movement diagram 6, the residents reach their apartments by using stairs, lifts and external corridors surrounding the centre courtyard. Without the vertical extension the northern passage and centre courtyard would be empty at these times and probably be experienced as unsafe since the surrounding internal spaces would also be empty. Another motivation for the vertical extension is the additional income it would provide. Some arguments against the vertical extension would be that it makes the project more technically complex, increases the risk of facadism and would cost a lot to build. It can also be questioned how attractive the apartments above the music venue would be due to the noise. But, since making the passages safe and welcoming to use is a larger priority for the project than avoiding the risk of facadism, the vertical addition is included in the preferred scenario and the problem concerning noise will need to be addressed.

A compilation of the program and circulation diagrams are presented in appendix C.

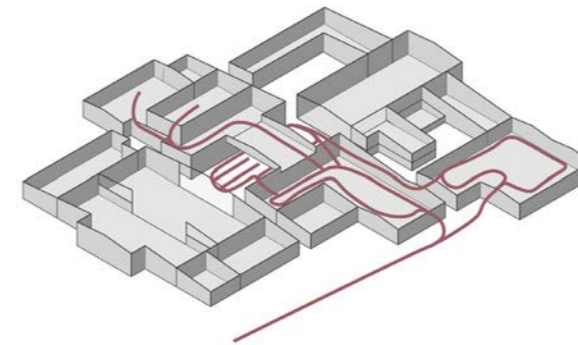
Movement diagrams



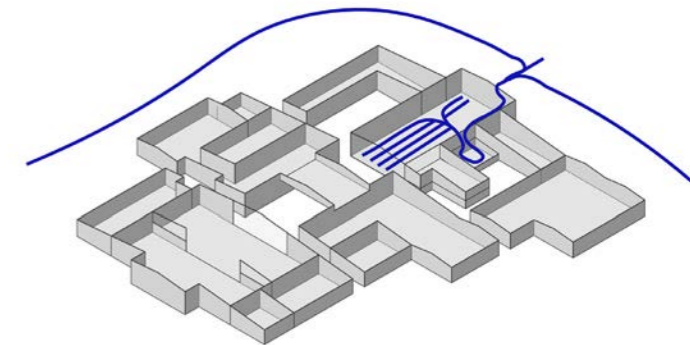
Movement diagram 1: Person passing through the building



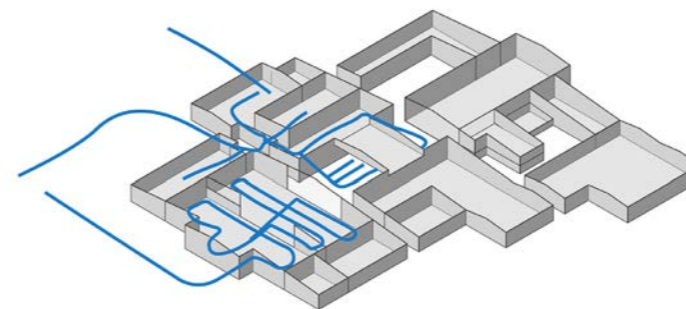
Movement diagram 2: Residents living in the existing building



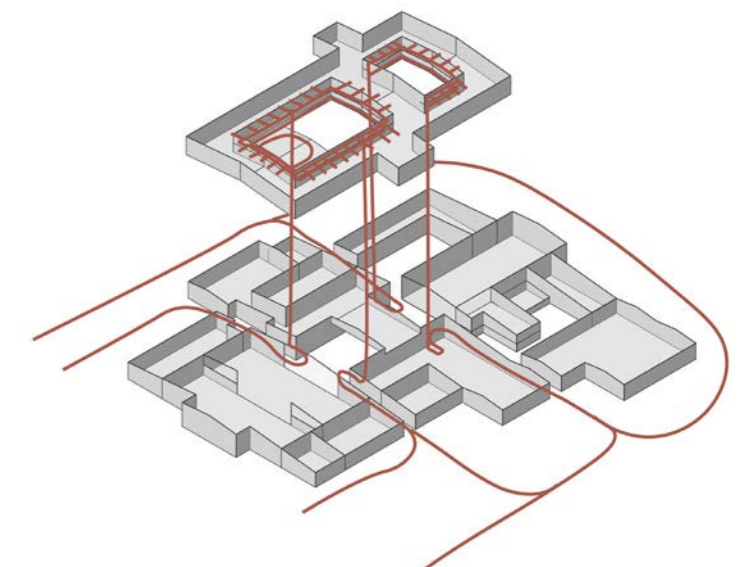
Movement diagram 3: Office worker



Movement diagram 4: Swimming hall visitor

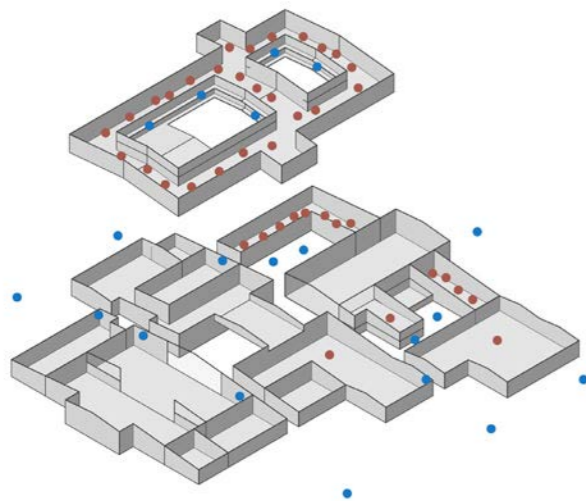


Movement diagram 5: Cultural visitor

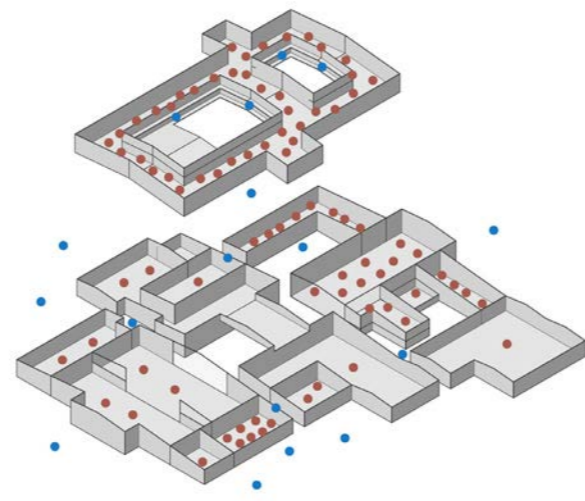


Movement diagram 6: Residents living in the vertical extension

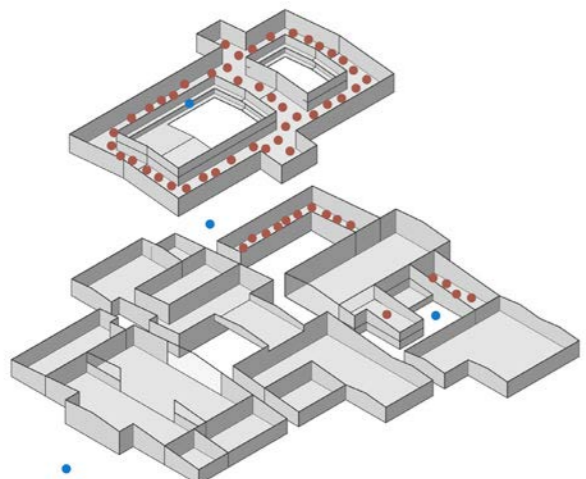
Most important activity density diagrams (red = inside, blue = outside)



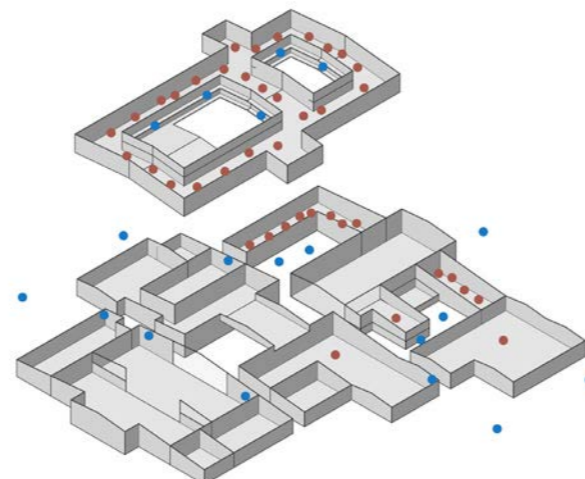
Summer weekday morning



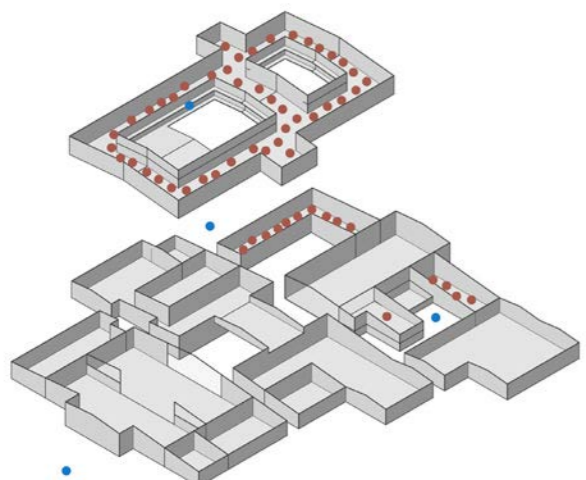
Winter weekday evening



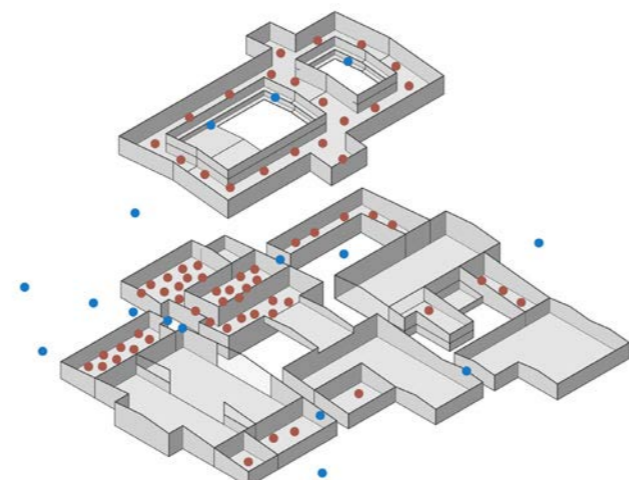
Summer weekend morning



Winter weekday morning



Winter weekend morning



Winter weekend evening

Material selection

A careful choice of materials and appreciation of the attributes of the materials of the old building is, according to Hund and Boyd, essential for good design in a historic environment (Hunt R. & Boyd I. 2017, p. 67). In Appendix B, fast and intuitive material explorations together with photographs of materials that have inspired me are collected. Aims of the material exploration have been to capture the industrial character, find sources of inspiration related to trains, make interpretations of the brick work and see how the meeting between old and new can create interesting tensions. In the same way as the old materials create cohesion between the different buildings of Lokstallarna, the new materials need to create cohesion between the different functions within the building while being versatile enough to accommodate for the program. Below, the desired traits and character of the selected materials are defined and in the following two pages images of materials fitting to that character and that creates a harmonic colour scheme and collection of textures are presented.

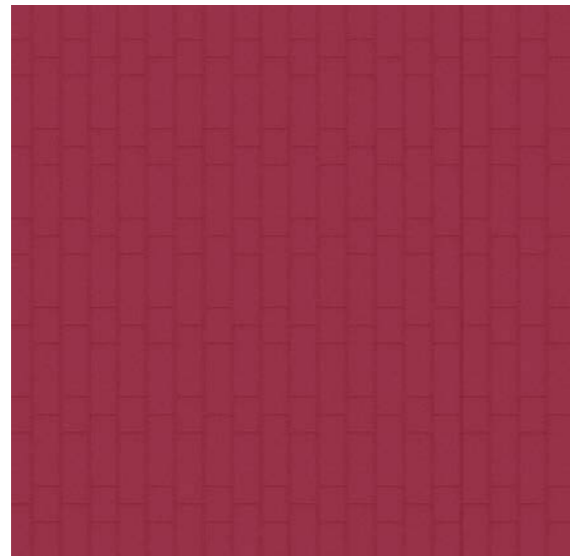
Raw yet decorative

The carriage workshop is characterised by the combination of natural materials with exposed surfaces and paint of white, green and red, creating both rawness and playfulness. Technical necessities such as pilasters and weather protections of the bricks are not hidden or toned down in fear that they will be ugly, but rather made into decorative elements. The character of "raw yet decorative" will be important to preserve in the transformation. Corrugated metal, exposed timber, brick, lime render, composite façade panels of wood fibre and cement all have that natural

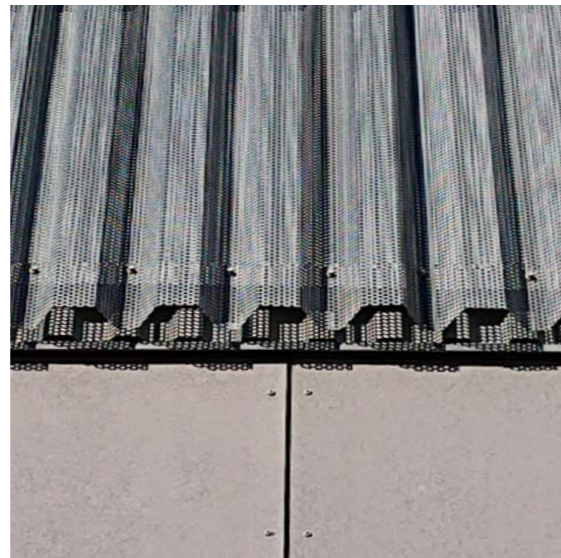
rawness. Perforations, dividing the corrugated sheets by plates enhancing their curves and careful placement of the folding of the sheets will provide the decorative quality. However, the timber panels with windows in the material exploration on page 85 ended up too decorative and having a cute and delicate feeling to them which was working against the rawness. Therefore, they were not chosen for the material palette of the project. A colour scheme with natural colours ranging from a cold gray to a warmer sand tone to a reddish brown in combination with paints in different shades of red will create rawness, playfulness and the warmth necessary to make the spaces pleasant and welcoming. Technical necessities such as structural elements will be allowed to take up visual space and designed in a decorative manner.

Humble yet cared for

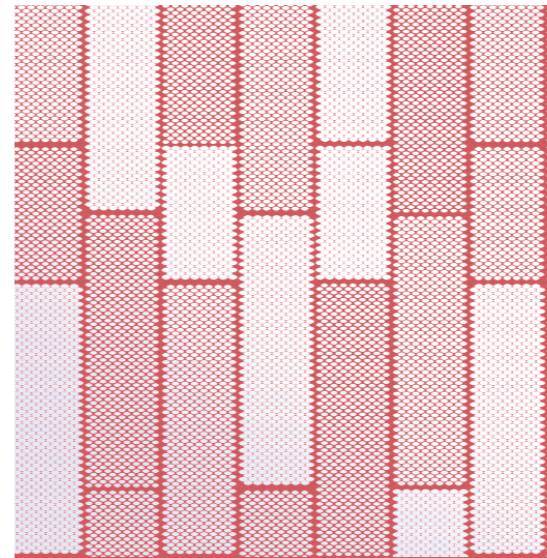
The craftsmanship of Lokstallarna is also characterized by quality, durability and care, but not in an expensive and flashy way meant to boast to the visitor. And, as was concluded on page 38 related to the visit to Innovatum in Trollhättan, giving the materials and details an expensive feeling might make the area more exclusive and compromise the social diversity. Therefore, choosing humble and simple materials but using them in a way that is careful and worked through will also be important for the project. For example, plates of Schiffer stone were included in the material exploration on page 85, but they ended up looking fancy and exclusive. If the task was to design a luxury hotel next to the workshops, they would have been appropriate, but not now.



Painted and folded metal sheet



Perforated corrugated metal sheet. Own photograph from Innovatum



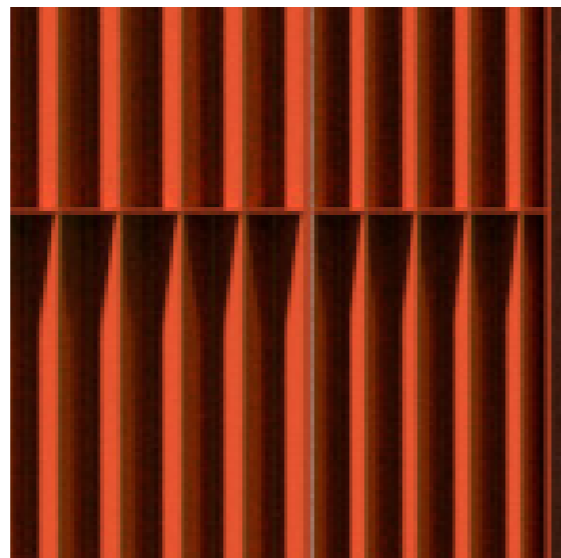
Painted and perforated metal sheets



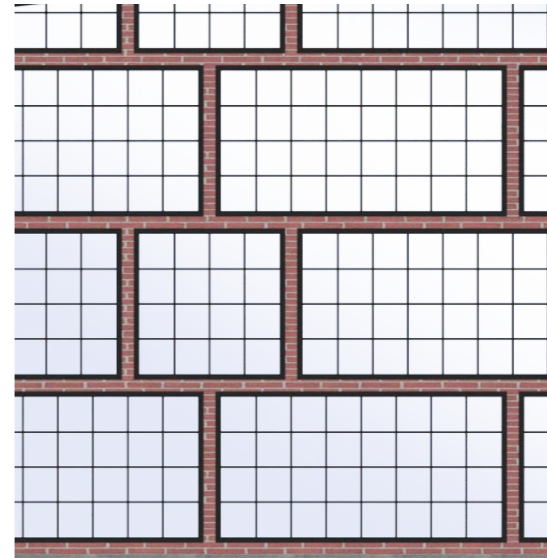
CLT, own photograph from Chalmers. And ThermoWood, own photograph from Titterdamm in Angered.



Figure 21. Viroc cement bonded wood particle boards (Intervestwood.pt.en, n.d.)



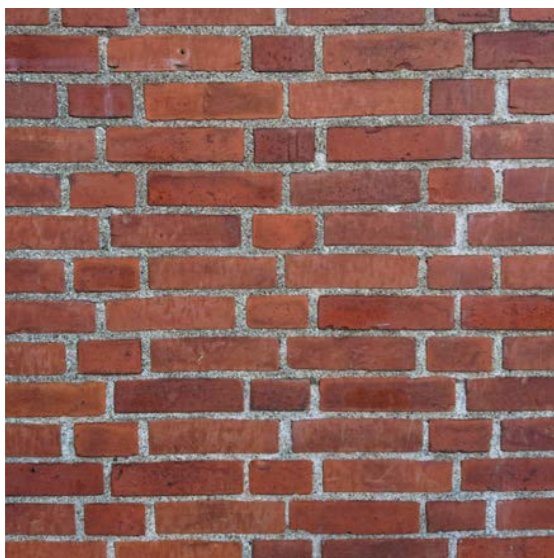
Hollow brick



Industrial style glass facade with brick divisions.



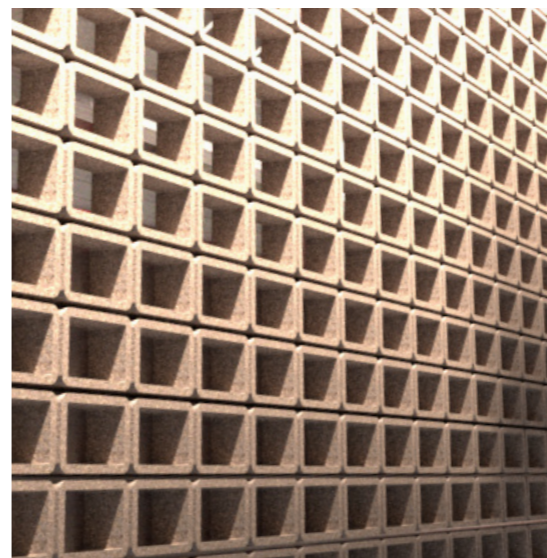
Figure 22. Course lime plaster (Limeplanet.co.uk, n.d.)



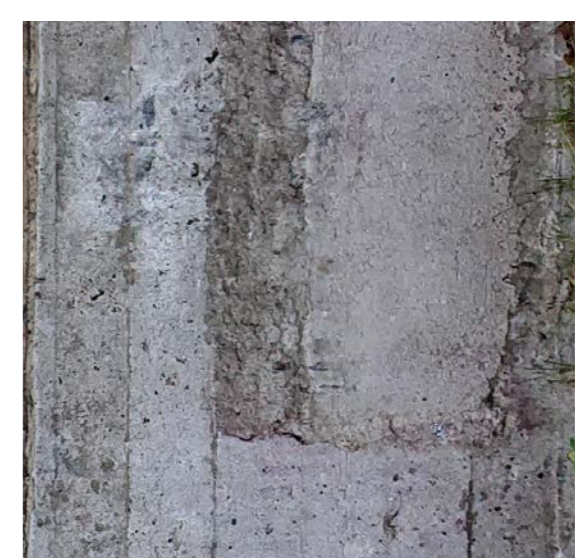
Yorkshire brick band. Own photograph from Lokstallarna



Corrugated metal sheet. Own photograph from Innovatum

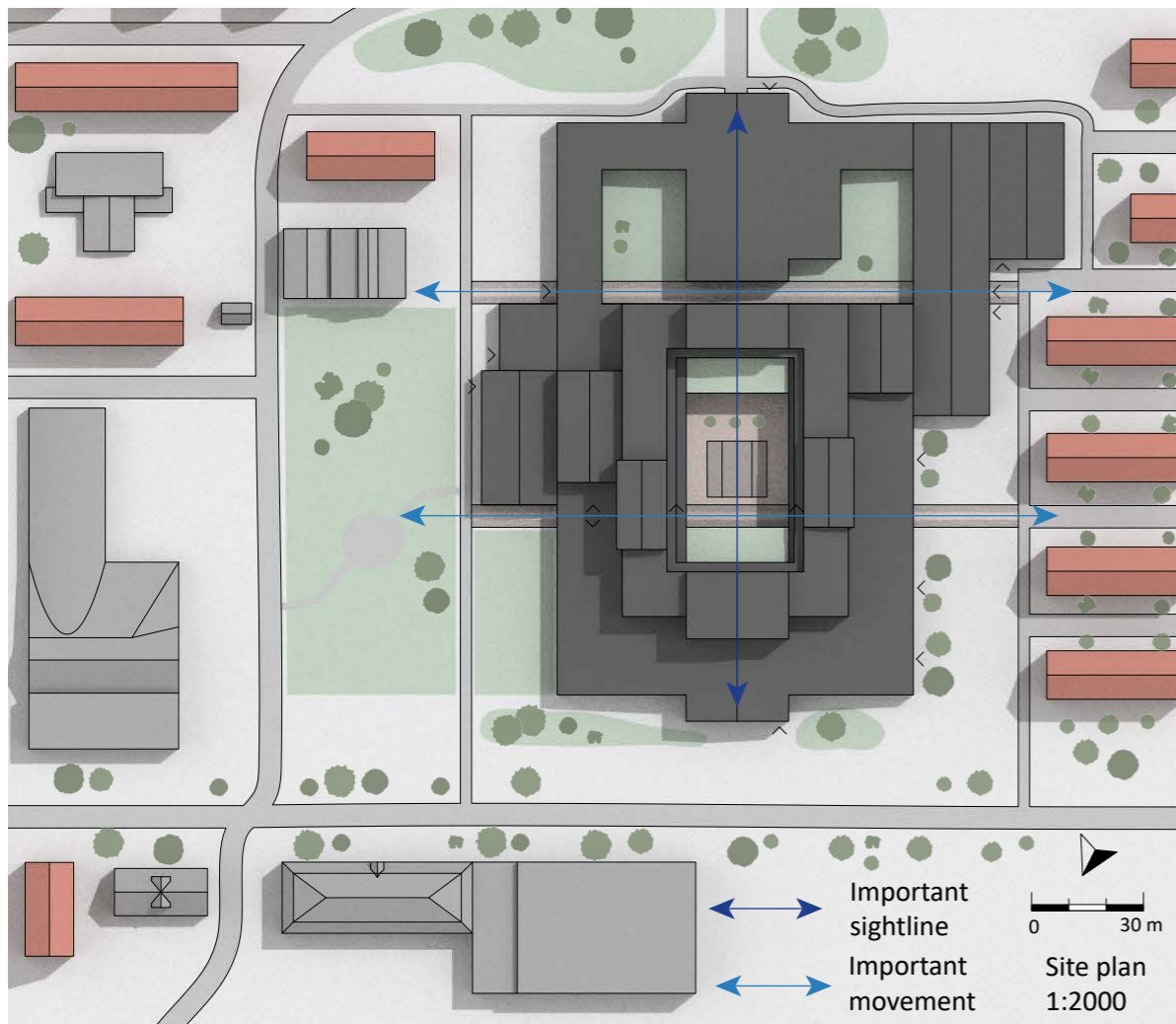


Hollow bricks in front of a glass facade



Time-worn concrete. Own photograph from Lokstallarna

Passages and sightline



As seen on page 68, the materials applied to the narrower parts of the passages are predominantly in a grey scale referencing the concrete interior of the hall and to differentiate from the façade materials and mark out that you are entering the inside of the complex. Course lime plaster and hollow bricks are light and bring some texture and tactility. The rhythm of the structural system is kept, and some warmth is introduced by using red corrugated metal sheets. A combination of asphalt and cobble stone is used for the ground to mark out the previous location of the tracks and enhance the axially. The centre courtyard is meant to be used for lunches and after-works by the companies using the offices and can also be used as an extension of the mingle area outside

the auditorium. Here, a warmer material palette is used, and some vegetation is introduced using flowerpots.

The sightline is preserved by using clear glass and a lightweight structural system for the inner facades. More interactive parts of the exhibitions shown in the exhibition space are placed in smaller rooms with appearance and placement reminding of the carriages, creating movement similar to when the hall was in use. Objects along the sightline such as exhibition tables, flowerpots, the swimming pool and the boules tracks are placed along its direction to accentuate it.

An important part of preserving the centre sightline of the building is to design the dividing glass

facades as transparent as possible. Here, inspiration is taken from the façade of Hilton Munich Airport hotel designed by Schlaich Bergermann und Partner where the glass is carried by a pre-tensioned cable net. To carry the tension forces a frame is designed around it which also frames the sightline. The frame is designed as a truss inspired by the traverse outside the workshop and the truss preventing deformations of the floor slab of the bridge between the office and music venue is designed in the same style, as seen in the rendering on page 66. This means that several frames are placed after each other creating a spatiality reminding of trusses along a train track.

The truss is painted in a red shade to bring some warmth and playfulness to the design.

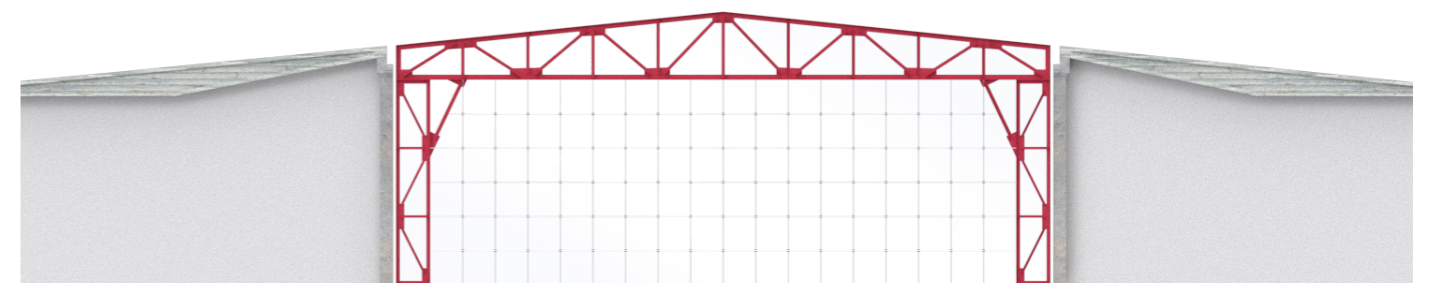
Keeping the lanterns in the exhibition space underneath the vertical addition, even though no light is being brought in through them anymore, is celebrating their design and the history of the space. Covering the glass with red surfaces and placing artificial light sources in the lanterns will reflect the red colour in the lighting of the room and create interesting meetings between red light and the timeworn concrete surfaces. This can be seen in the rendering on page 66 and the same effect can be seen in the upper right image on page 87.



Traverse next to the carriage workshop. (Own photograph)



Trusses by train tracks. (Own photograph)



Process image. Glass facade dividing the sightline



Perspective of the sightline from the exhibition hall.

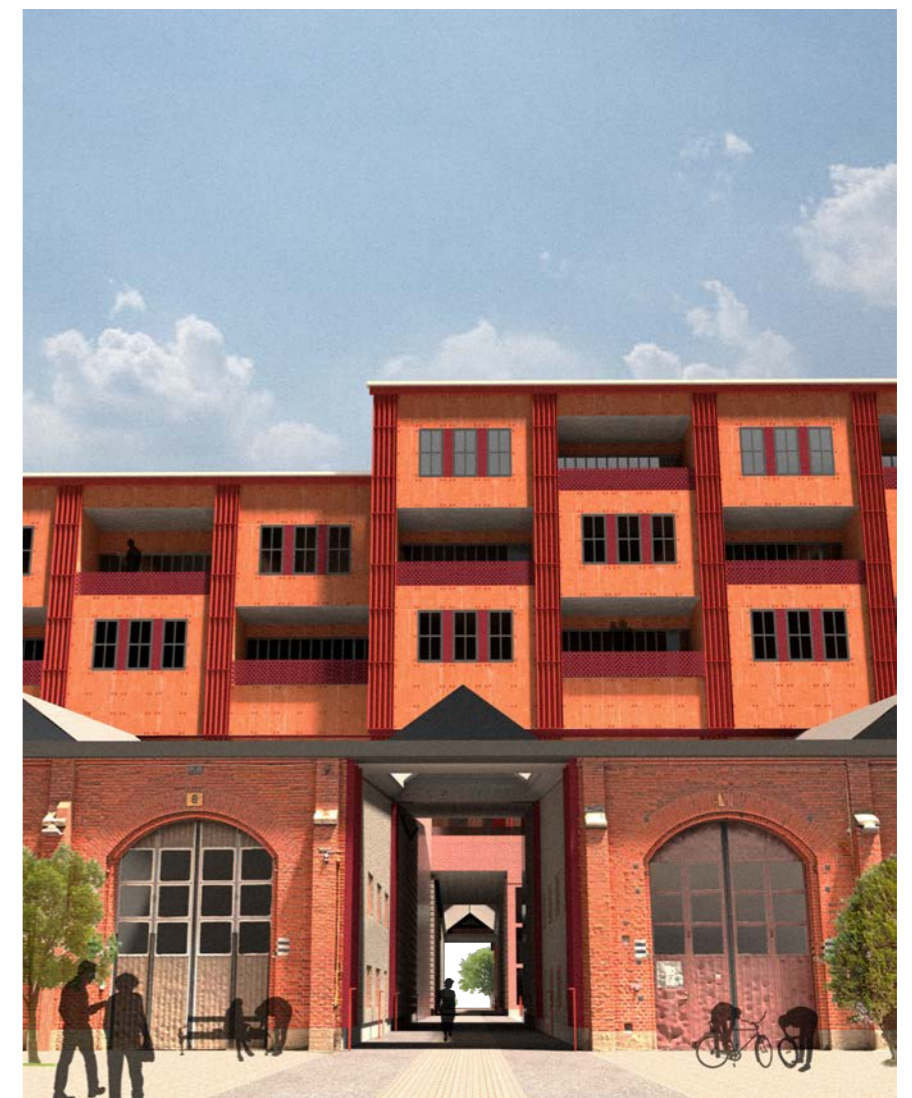


Section through the northern passage.

Section 1:400



Perspectives of the northern passage.





Perspectives of the northern passage.

Vertical addition

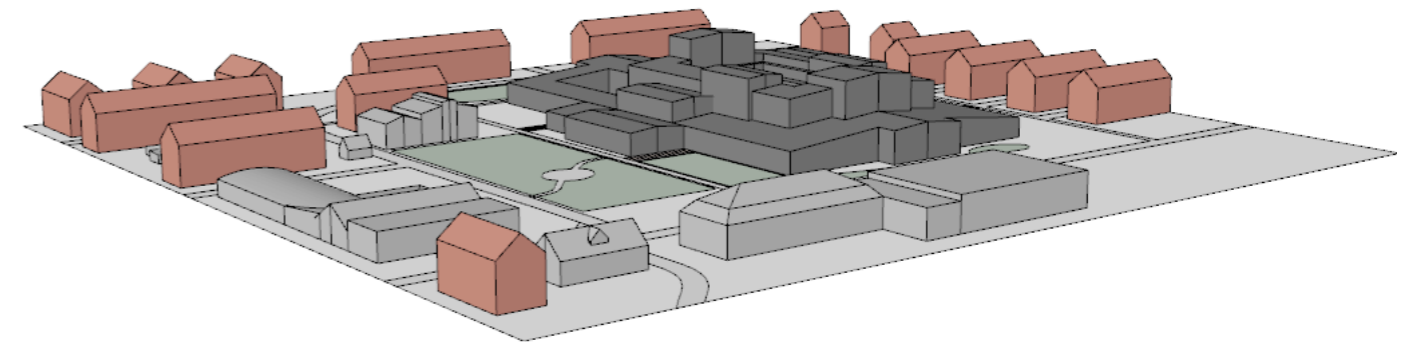
The shape of the workshop and its existing extensions makes the repetition of the gable shape in different depths a characteristic trait of the building. The vertical addition is echoing this while bringing a vertical dimension to the project. The addition is placed slightly towards the north where the surrounding buildings will be taller according to the overview plan, and where it leaves space for the southern courtyards to bring light into the apartments. By accentuating the addition as several smaller volumes, the workshop continues being the dominant horizontal element of the area.

To bring life and safety to the courtyards and passages through the building, the residents reach their apartments through external corridors surrounding the courtyards. The floors are arranged to make the apartments and corridors flat and accessible while adjusting to the inclination of the existing roof and minimizing the amount of unusable space between the added floors and existing roof.

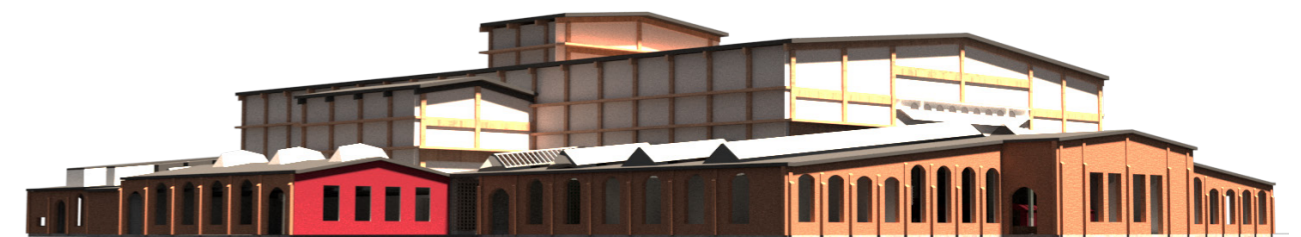
To minimize the structural impact of the vertical

addition on the existing structure, the loads are transferred between the systems directly above the existing columns, as seen in the section on page 68. To reduce the spans of the added floors, large beams supporting additional columns are placed between the addition and existing roof. Timber is used to minimize the weight of the structure except for the largest spans where steel beams with holes are used. The floor bridging the office and mingle area outside the auditorium is suspended in cables to avoid having large structural elements obscuring the sightline, and deflections from asymmetric loads are prevented by a truss in the same style as the ones carrying the pre-tensed cable facades.

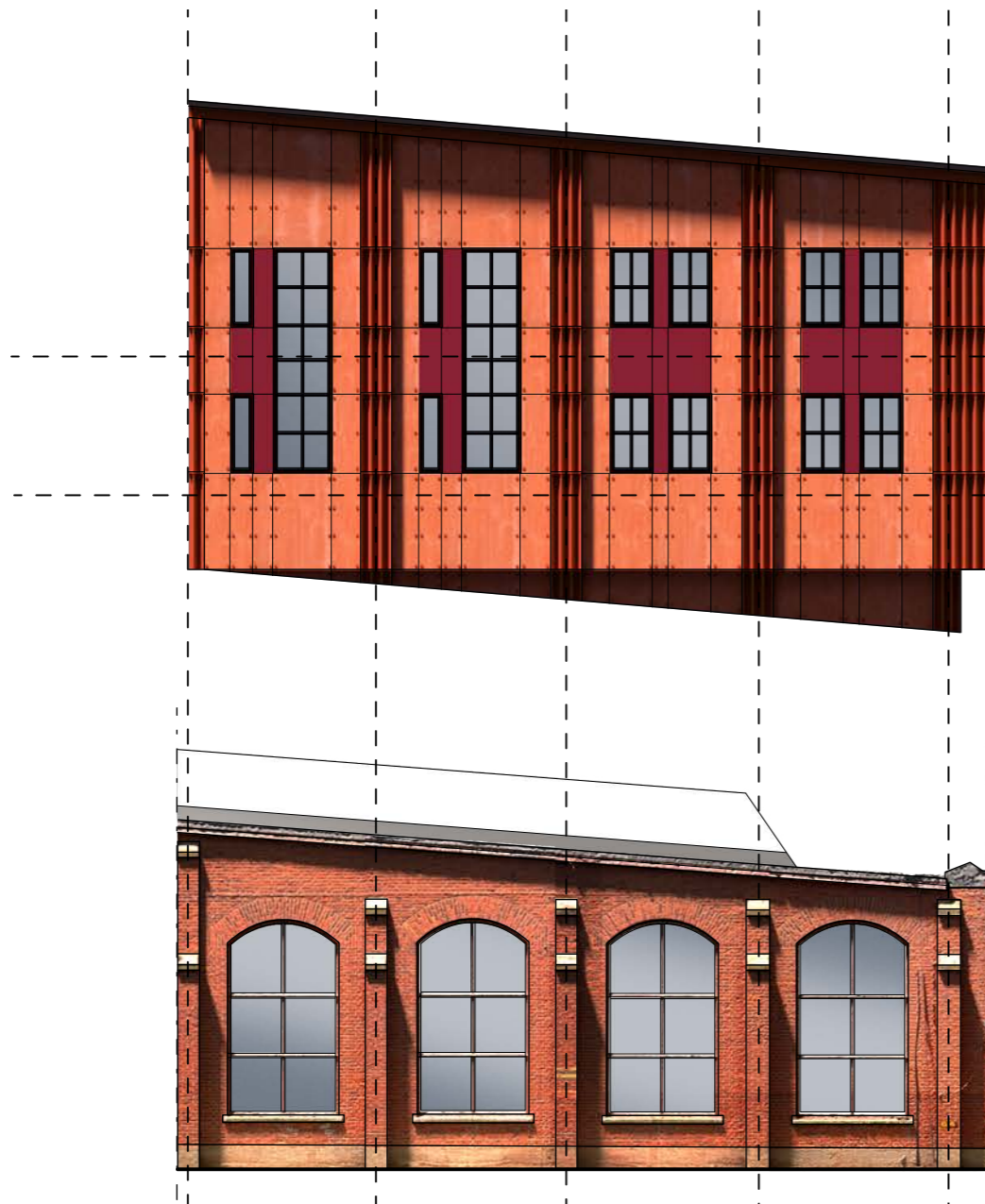
Even though the set-back of the addition volume prevents alignments from being perceived, aligning the new structural system with the existing ones enables similarity and harmony in rhythm and proportions of the façade. The materials of the addition are in different shades of red, sticking to the existing colour scheme but adds variation in shades and textures.



Process exploration - Accentuating the addition as several volumes in the scale of the surrounding buildings lets the carriage workshop be the only large horizontal object and avoids competition between the volumes.



Process exploration - aligning the volume and structural system of the addition to the existing structural system creates harmony in rhythm and proportions.



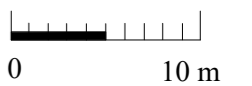
Facade principle without balconies.



Facade principle with balconies.



North facade 1:400





DISCUSSION

The aim of this chapter is to reflect on the outcome of the thesis and draw conclusions based on the process and end result of the design project. It will start by relating the project to theory which has been presented through the thesis followed by critical reflections on the end result and design process. The chapter is ended with conclusions answering the research questions.

Intervention strategies

Looking at the alterations and elements that have been added to the project it is seen that they are differentiated from the existing building in some aspects, while being more similar in others. Overall, the strategies for performing interventions have been leaning towards the approach of the SBAB, meaning to make it visually clear what is old and what is new. Using the exact same materials and building techniques as have been used for the workshop have been avoided, favoring more current building methods. However, the color of the added facades is similar to the existing brick work, the exhibition rooms are inspired by train carriages and the trusses are in the same style as the existing traverse. In these aspects the intervention strategy is more about copying and improving which is characteristic for the aemulatio strategy.

On the scale comparing degree of contrast which was used for the study of reference projects this project would be placed somewhere in the middle, as was concluded as an ambition during the study. The degree of alteration of the project would be placed towards the higher end of the scale. This since large parts of the interior and small parts of the facades needs to be removed to create the passages and inner courtyards. However, these alterations can be motivated by functionality and are not destroying the parts of

the building which is most important for its character. The concept of facadism would need to be applied at least for the apartments of the existing building and possibly also underneath the vertical addition and where the structural system is assessed to not fulfil its purpose anymore.

Relations between old and new

One way of creating visual relations between what is old and what is new has been to reference the brick work in the design of new elements. Both the balconies of the vertical addition and the pattern dividing the glass façades between the offices, centre courtyard and mingle area outside the auditorium are inspired by brick work but in a different scale. Aligning proportions, rhythm and the structural system brings cohesion while the sizes and exact placement of the windows bring some variation. Accentuating the vertical addition as many smaller volumes put together leaves the workshop building as the only large horizontal element in the area, avoiding competition between the elements. The colours of the added elements are in the same scheme as the existing while the textures, patterns and tactility of the materials bring new and refreshing qualities.

The industrial character of the area is kept by having grids in an industrial style over the win-

dows and curtain walls. Structural elements such as trusses are allowed to take up space and become part of the architectural expression and the corrugated steel brings associations to modern industry. Cute and delicate materials and details are avoided and instead a rawness is aimed for. In a more detailed design phase, emphasizing the structural connections as large and raw could further contribute to the industrial character.

The end result

The centre isle of the building is kept open, airy and has a clear direction. Whether the sightline is preserved or not depends a lot upon how much of a visual barrier the glass facades will become in practice. Even when using a clear glass, reflections will probably limit the transparency and reduce the effect of the sightline. A program scenario where the entire centre aisle is kept as one room where smaller functions are placed in rooms within the room should also have been investigated and could maybe have been a better option.

The alterations and additions of the project are not hidden and quiet, but I would argue that most of them do take over and compete with the existing buildings either. The vertical addition, however, is dominant vertically and its scale and shapes are not entirely in harmony with the ex-

isting building. The principle of accentuating the addition as several smaller volumes put together, I think is working well, but some more iterations experimenting with the shapes would have been needed. Also, more creative interpretations of the gable shape could have brought some refreshing qualities. Creating the height variation while allowing for a reasonable degree of exploitation has in some places made the vertical addition so high that the amount of light reaching the courtyards and terraces has been compromised. So, in further iterations of the shape, this aspect would have been needed to be considered as well.

The design of the passages has preserved the axiality and created an interesting and varied spatial experience when walking through them. Sticking to the original grid of the building has presented the challenge of either making them very wide or very narrow. If two bays would have been used for the width of the passages, the light conditions would have been better and the spatial experience would have been airier. However, the perception of the building as one volume would be compromised and a lot of, otherwise rentable, space would be taken up by the passages. As now, when only one bay is used and the roof, including the lantern, is kept, the perception of the building volume is preserved, the passages look aesthetically pleasing and you get a feeling of being inside the building while you are actually outside. However, there is a risk that the passag-

es would be perceived as too narrow and dark to be pleasant, even though the use of light materials and bringing warmth with details in timber and pops of colour would counteract this. Not sticking to the original grid of the building would have negative consequences for the facades. So, in the design of the passages there is a conflict between preserving cultural historical values and creating functional spaces, and for this project the preservation of cultural historical values has been prioritised.

Adding the apartments of the vertical addition ensures life and presence of people close to the passages at all times, which contributes to their safety. However, it could also add a feeling of privacy and create clashes between public and private space. This aspect would have needed to be examined further.

The process

Analysing the context by interviewing actors involved in the transformation process was both informative and inspiring. Since the line of production and everyday life of the workers proved to be important for the essence and character of the area, more time should have been spent on understanding these aspects and interviewing someone who has worked in the facilities could

have made the project stronger.

Formulating design intentions and clearly prioritized evaluation criteria along the design process has provided a clear direction and made it easier to make and motivate design choices. The design explorations and literature studies have been complementing each other, so performing both in parallel along the process have been working well. Questions raised during the design studies has helped knowing which sources and chapters that are most relevant to read, and information from literature has helped making informed design decisions.

Conclusion

The essence of a cultural historical industrial site is characterized by the elements that gives you an understanding of how the site was originally used and evokes fantasies of what it was like to be there in the past. The line of production has a large influence on the structure of the site and buildings, and the movement along it becomes a characteristic trait of the area. The meeting places which once created a sense of community for the workers are of value since they have the potential of becoming new meeting places. There is also value in elements that show good craftsmanship and aesthetical qualities since they add to the pleasant atmosphere of the area. Elements constructed a long time ago have a larger historical value than elements added later. An example of both the aesthetical and historical aspect is the facades of the workshop which are of high cultural historical value since they are considered beautiful and are constructed a long time ago.

The essence of the site can be reflected in identifying the structure and movement generated by the line of production and continuously apply them in the new design. For example, to preserve and accentuate the movement through the workshop following the movement of the trains and to preserve the overview of the build-

ing along the centre isle which have been large priorities in the design project. Finding new activities that have the same type of movements, in this case along straight lines, accentuates this even more. This means that the understanding and readability of the area is more important than the physical structures. An example of this is program scenario two presented on page 54, which would involve the least alterations of all scenarios to the physical structures, but also the least amount of transparency along the centre sightline. The preferred program scenario is not much alike program scenario two, showing that the value of readability has a larger priority than the physical elements. The size of the building also enables different focuses for different parts. In the preferred scenario, one part of the building is a museum with a large focus on preserving the physical interior, while other parts of the building allow for larger alterations. This contrasts with program scenario three where large alterations would need to be made everywhere.

Another way to reflect the essence of the site is to evoke memories and fantasy through preserving industrial artifacts such as machines and equipment and to design new elements in the same style as these. For example, the traverse will be preserved as an industrial artifact and the trusses added in the project are in the same style. And even though the tracks need to be re-

moved due to contamination, the ground can be designed in a way that evokes thoughts of them, as the cobble stone added to the ground along the passages.

To reflect the values of the site, the existing meeting places can be preserved and made pleasant using parks and vegetation. Also, to make it a priority to preserve the elements of greatest aesthetic and historical value is way to reflect this.

New additions can be made into modern continuations of the essence of the site through starting the design process by imitating some chosen characteristics of the existing elements and then allow for some creative freedom. Like the design of the vertical addition takes a starting point in the gable shape. Using currently relevant materials and production methods will make the project true to the layers of time and avoid the details and execution looking poor and fake. Designing new additions following existing grids will create harmony in rhythm and proportions, and the hierarchy of scales should be the result of conscious choices. Sticking to the existing colour scheme but allowing variations in texture and tactility keeps the project cohesive while also adding variation. Being conscious about the atmosphere created by the materials in relation to both the history of the site and the future program is also important. For example, choosing

materials with a rawness preserves the industrial character and making them look decorative and cared for creates a pleasant environment.

The transformation of an abandoned industrial site into a meeting place for a diversity of creative initiatives can be preserved by giving the process time. A slow transformation process means that new actors can establish gradually and give the area a genuine character. A wide range of actors and activities where more established actors can help lift new initiatives promotes diversity while providing economical means for the renovation. Having apartments in proximity will promote the cultural actors since it allows for spontaneous visits by customers. And, for this to be effective, convenient and safe walking paths between the apartments and cultural actors must be created.

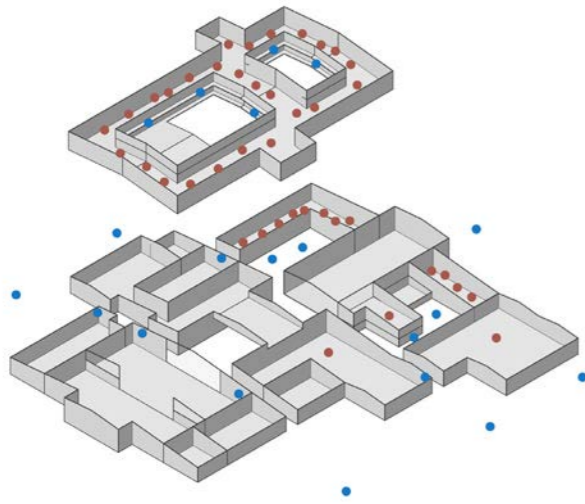
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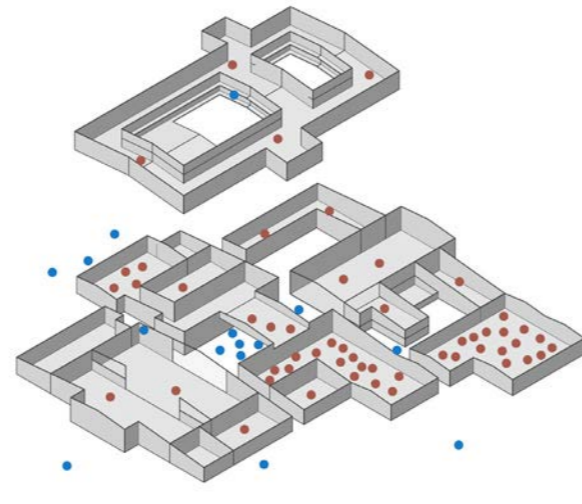
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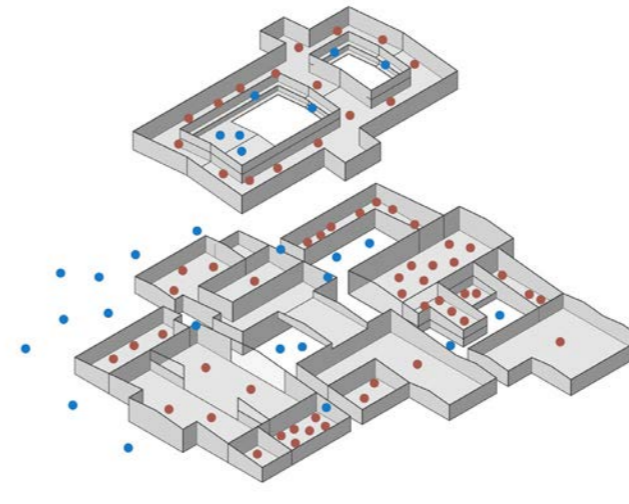
Appendix A - Activity density diagrams



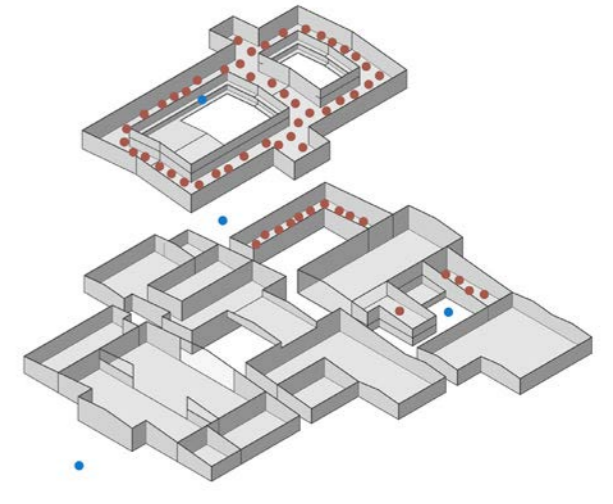
Summer weekday morning



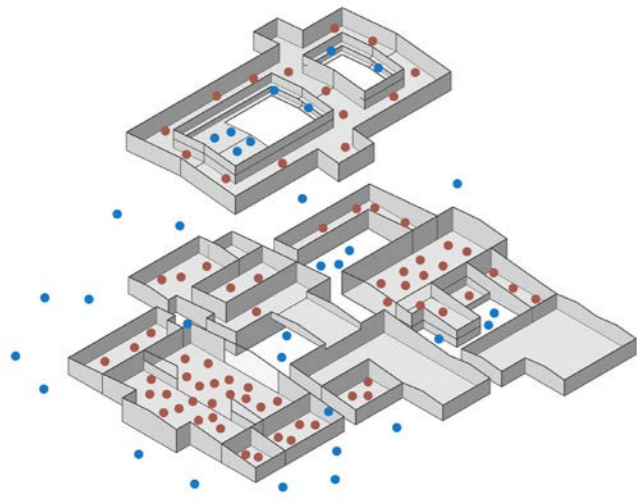
Summer weekday day



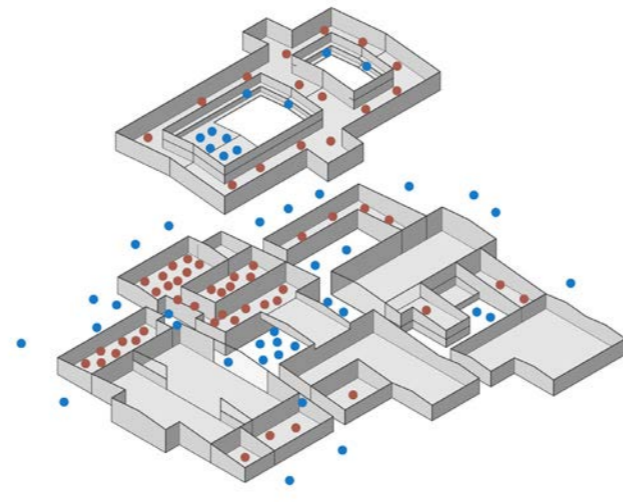
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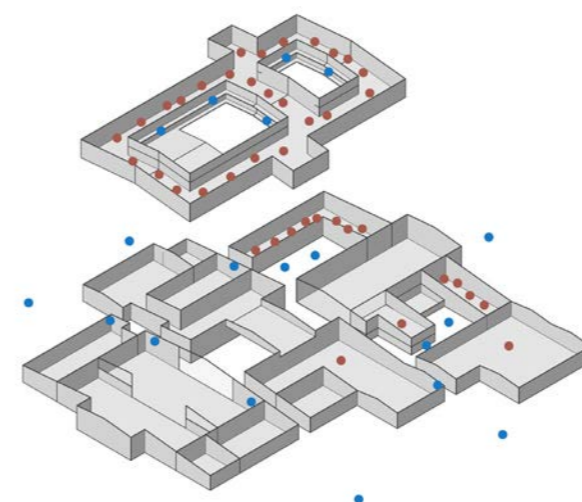
Summer weekend morning



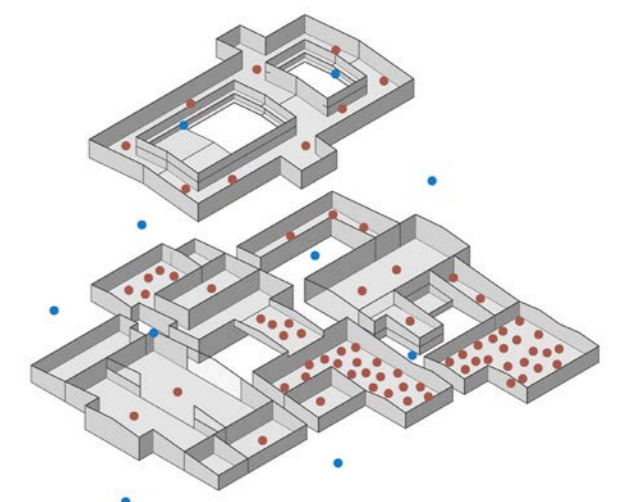
Summer weekend day



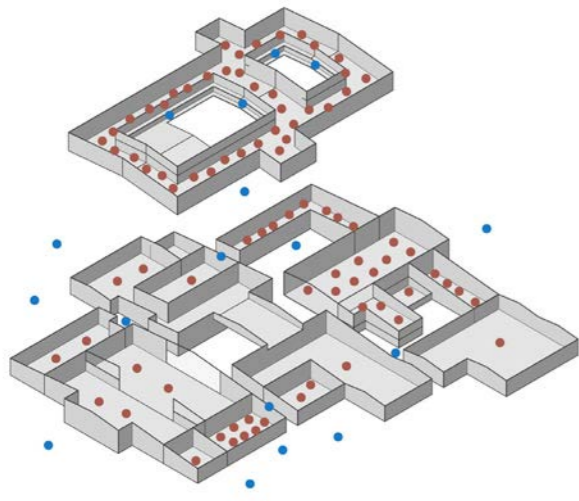
Summer weekend evening



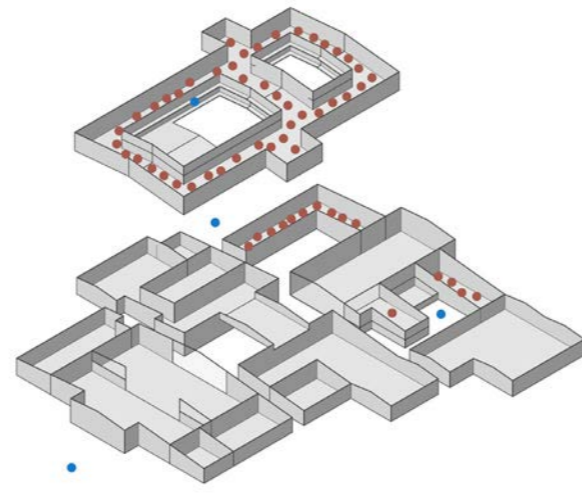
Winter weekday morning



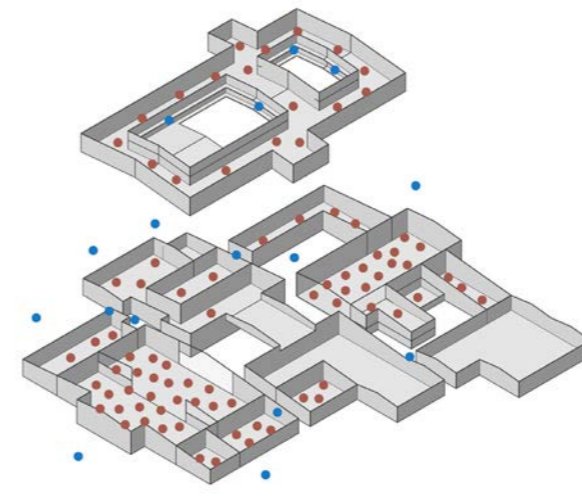
Winter weekday day



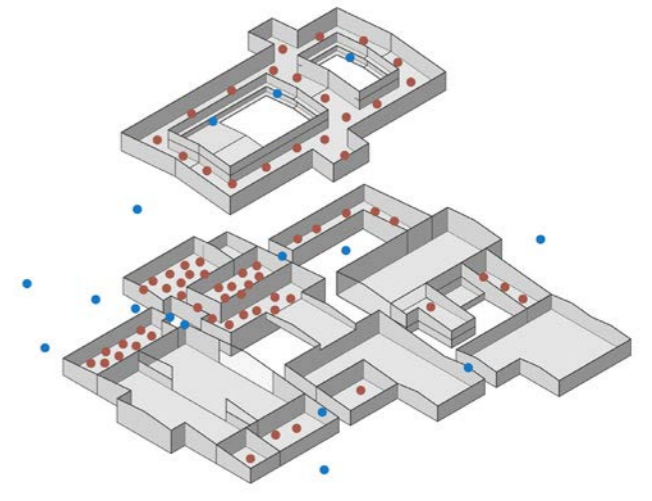
Winter weekday evening



Winter weekend morning

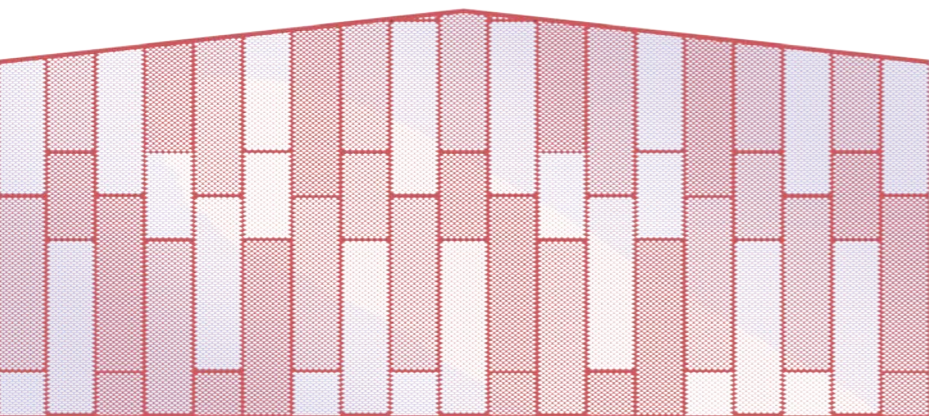
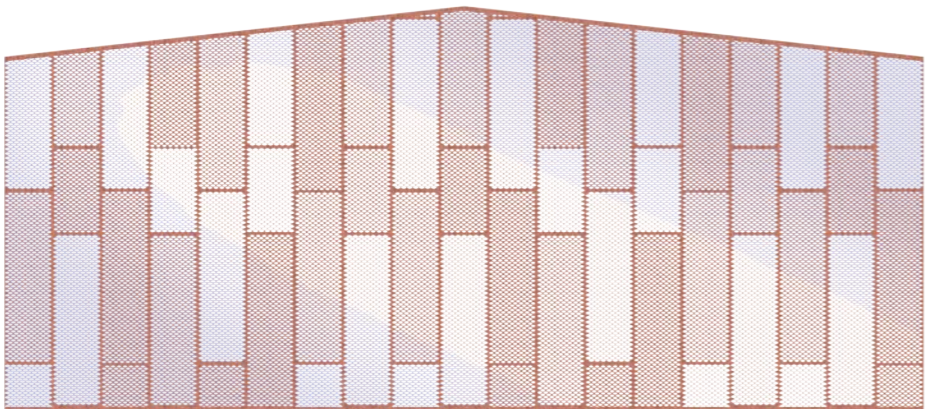
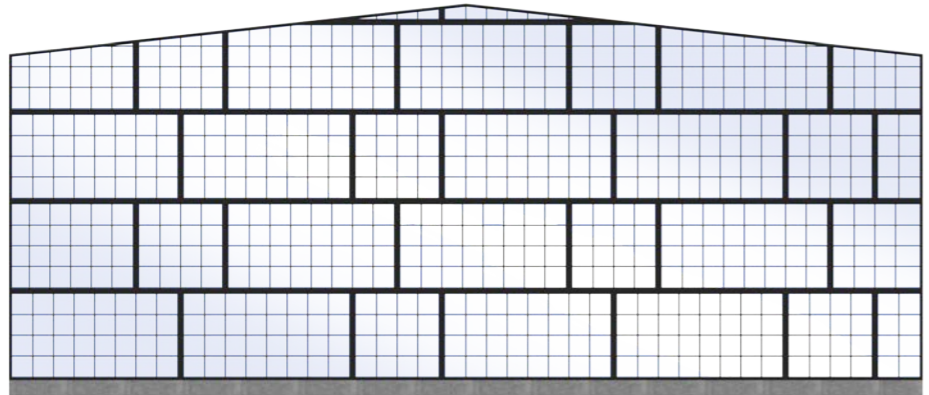
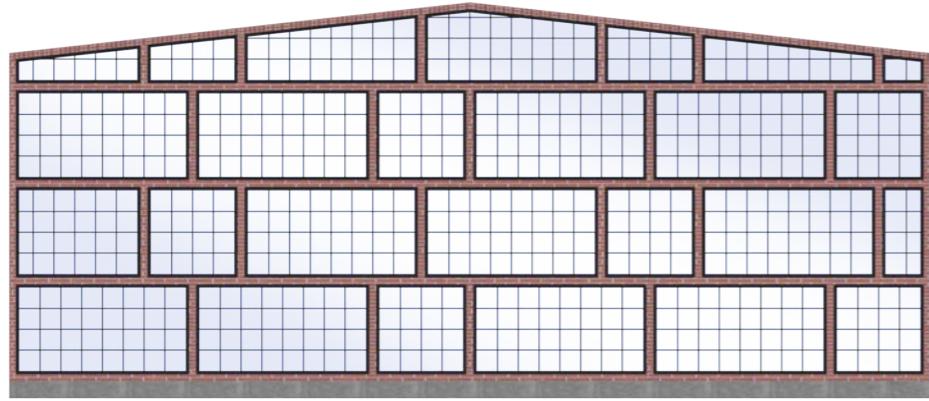


Winter weekend day

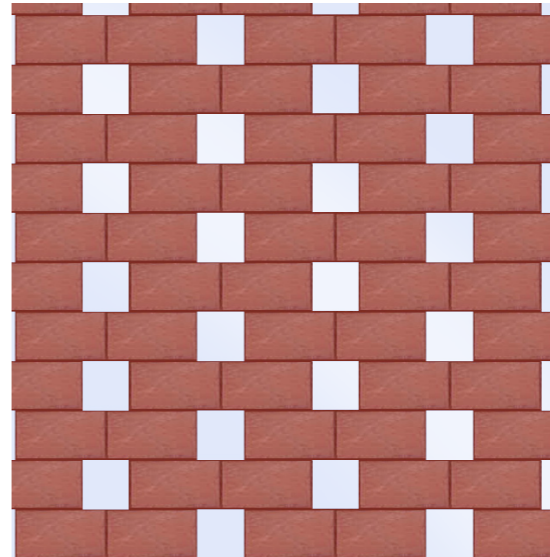


Winter weekend evening

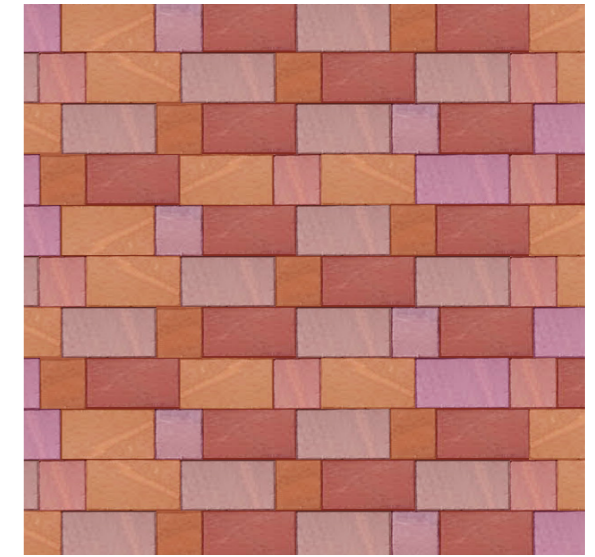
Appendix B- Material explorations



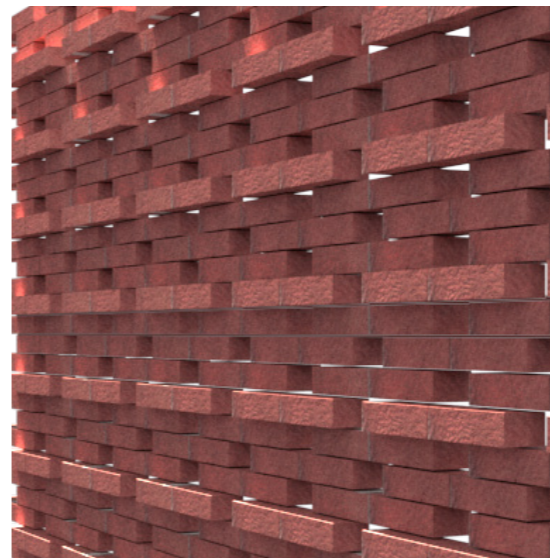
Glass facades inspired by the Yorkshire brick band



Red stones in front of a window



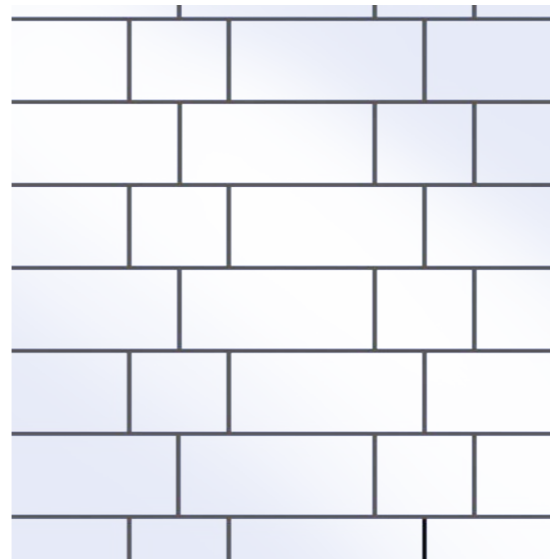
Mixed red stones



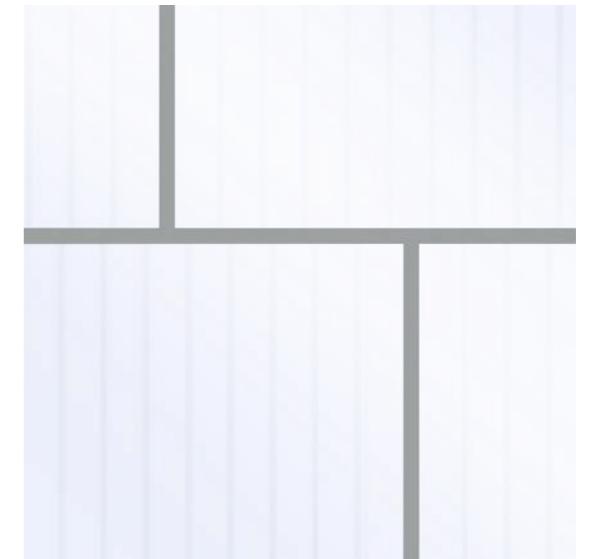
Brick facade with depth



Timber panels with windows



Glass facade



Polycarbonate plastic



Corrugated metal plates. Own photograph from Ringön.



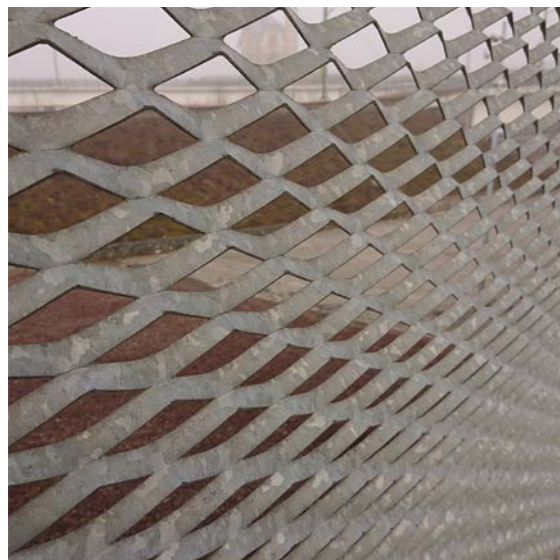
Corten steel. Own photograph from Innovatum.



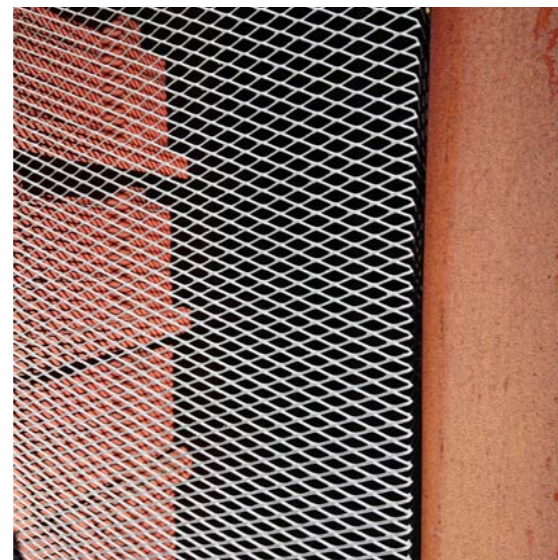
Angles, glass and trusses. Own photograph from Innovatum



White surfaces and artificial light reflecting the brick color. Own photograph from Innovatum



Metal sheet mesh. Own photograph from the train stop at Gamlestads torg.



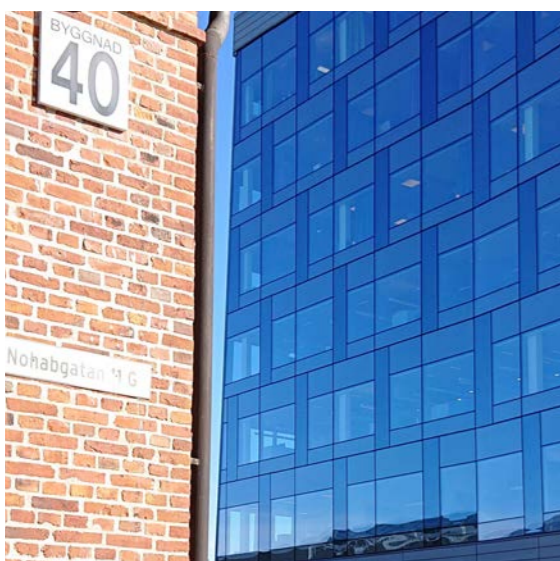
Steel mesh in front of corten steel. Own photograph from Innovatum.



White plaster and folded metal sheets. Own photograph from Innovatum



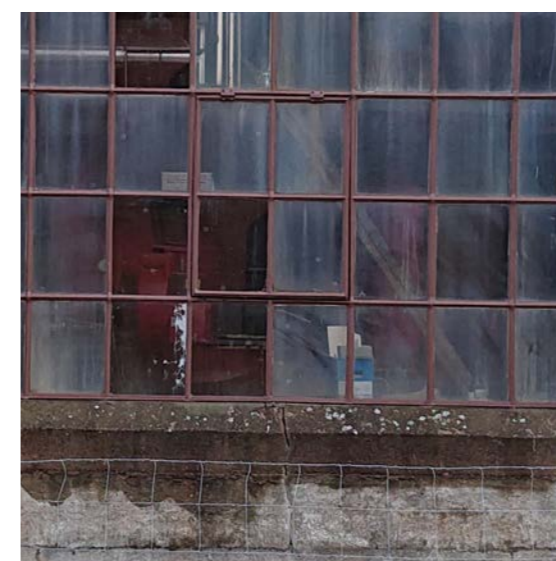
Light and transparent opening in a heavy brick and concrete wall. Own photograph from Innovatum



Glass facade relating to brick work. Own photograph from Innovatum.



Shades. Own photograph from Innovatum.

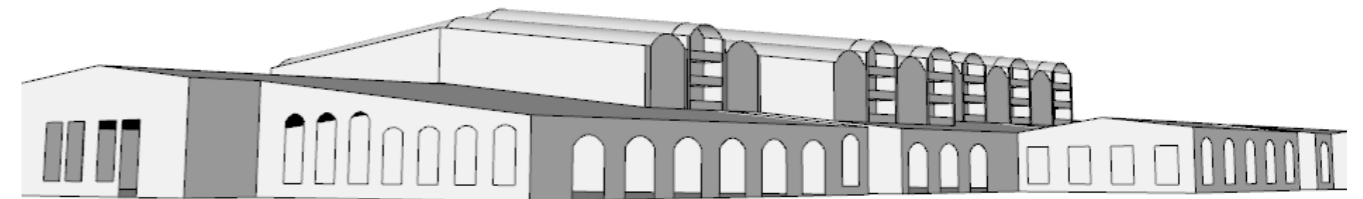
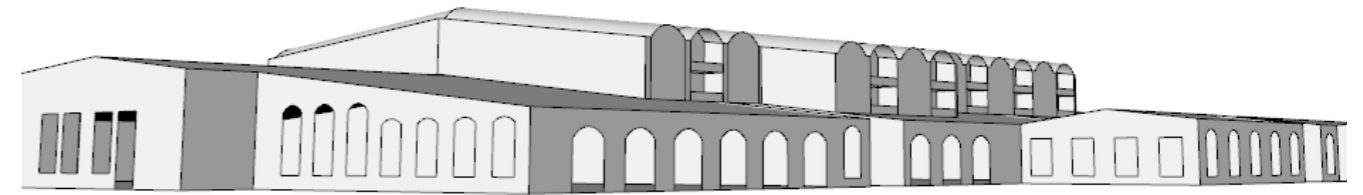
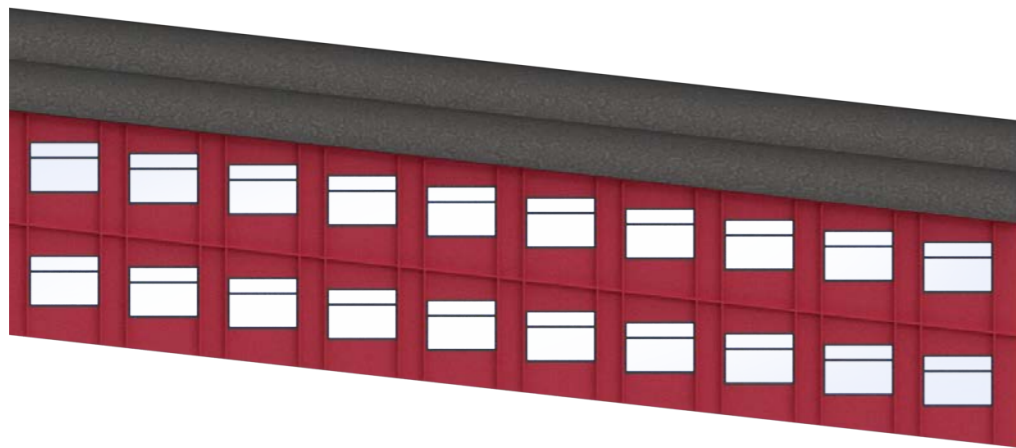
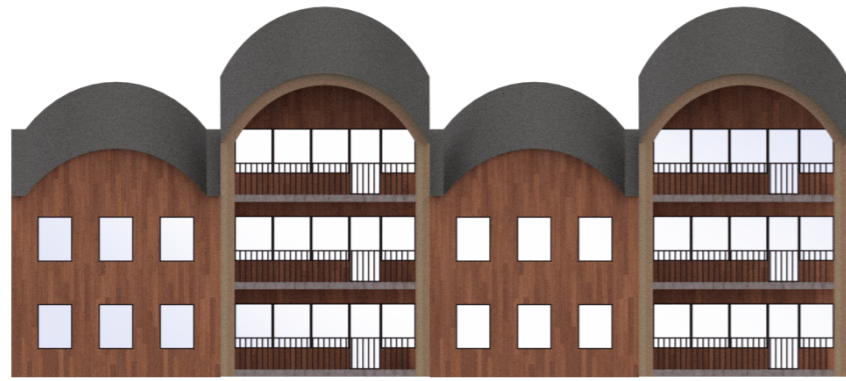


Time-worn window. Own photograph from Lokstallarna



Time-worn metal surface of an industrial artefact. Own photograph from Innovatum

Material and shape study - Inspired by train carriages from 1900-1950



Appendix C - program and circulation diagram

