



AN ARCHITECTURE CENTER INSIDE OUR HERITAGE

A DEMONSTRATION PROJECT FOR A SUSTAINABLE BUILDING TRANSFORMATION

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MASTER'S THESIS | SPRING 2023
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MASTER'S PROGRAM OF ARCHITECTURE AND URBAN DESIGN (MPARC)
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the process.

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and encouragement. This would not
have been as fun without you.

Family and friends for always cheering
on me and believing in me.

ABSTRACT

Architecture creates the framework in which we all live our lives and together. It creates observations and interactions. In other words, it shapes life and makes us experience our surroundings. We all encounter it every day, it affects our well-being daily. It can change our existence today, tomorrow and in the future.

Further, current, and future generations are facing a new era. An era that requires change and responsibility in the way we live our everyday lives to reduce the consequences of climate change. The construction industry is one of the major sectors that has contributed to the global warming that we have seen over the years. Architects will be part of the modification required to lead the construction industry in the right direction which will require a change in the way we work and design. We have a responsibility to react and act.

The vision of the thesis is to develop an Architecture Center inside an existing industrial building to show the power of architecture. The project will be transformed inside a former shipyard building where both functions and added building materials will represent sustainability in different ways. In other words, a space to share and experience knowled-

ge about architecture and sustainability in a transformed building.

To develop a successful Architecture Center and transformation an investigation for a potential program was done. Through interviews, case studies of existing architecture centers and transformation projects of industrial buildings, several different functions and qualities could be analyzed during the process. To be able to select sustainable additional parts for the transformation, alternative building methods were researched through literature studies.

The final outcome achieved a public Architecture Center where knowledge and experience can be shared to increase the general interest for architecture in the city. The transformation project represents alternative sustainable building methods where the existing structure and architectural qualities, such as long sight lines and repetitive construction, have been respectfully taken care of. The project represent architecture for the future.

Keywords: Architecture Center | Transformation | Sustainability

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INSTRUCTIONS

The thesis structure was developed with a vision to clarify the different stages of the project. The Background give the reader a good understanding of why the project is relevant. Chapter three, Location, presents where it will be developed. The next part, Investigation, will be the basis for how the project can be transformed. The result of this stage will be tested in the following chapter Demonstration. The final outcome of the structure, result and project will be presented in the last part, Transformation.

1 | INTRODUCTION

AUTHORS BACKGROUND AND MOTIVES

CHALMERS UNIVERSITY OF TECHNOLOGY
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For almost five years in architecture school and 26 years in Gothenburg, this city has been undergoing a major transformation meanwhile I've been growing up with big headlines about the climate change. During these years I have also learned a lot about architecture and the affect it has on us as human beings. Therefore, I decided to combine my reflections and

make it represent my master's thesis. I wanted to create a space in Gothenburg where you can take part of architecture through exhibitions to increase knowledge. With this project, I want to develop an architecture center that increases sustainability, based on transformation and alternative building methods, as something with potential and unexplored.



Figure 1: Selected building for the transformation project. Interior detailed photograph.

HOW CAN AN ARCHITECTURE CENTER
IN AN INDUSTRIAL BUILDING ENHANCE
A SUSTAINABLE TRANSFORMATION?

HOW CAN WE INCREASE KNOWLEDGE
WITHIN ARCHITECTURE BY MAKING IT
AVAILABLE FOR THE PUBLIC?

AIM

The aim of the thesis is to develop an Architecture Center in Gothenburg to create a space where architectural knowledge and inspiration can be presented and shared. The center is transformed within an existing industrial building, a former shipyard, to inspire the construction industry to use our existing buildings and adaptive reuse. The building has multiple visions. By using alternative building methods for the additional parts, the building act like a showroom of possible new building techniques. The project also shows how an old industrial building can be used today; in

other words, the concept can be implemented in other buildings with similar conditions. The transformation focuses on clarifying the building's existing structure and architectural qualities, such as long sight lines and repetitive construction. The building's program for the center consists of space for architectural exhibitions as well as other relevant functions for the district. By combining all purposes, an Architecture Center inside an industrial building is achieved where transformation, alternative building methods and architectural exhibitions are the focus.

SCOPE

Sustainability is a broad subject and therefore a necessary demarcation. This thesis will focus on transformation and adaptive reuse, to inspire how we can take care of existing industrial buildings. The added parts in the building will be developed with alternative building methods that can be related to the existing site and building. The selected functions for the building will also be linked to sustainability, from a social and ecological point of view. The thesis will not consider sustainability from an economical perspective because of the limited time for this project but underlines the

importance of this aspect and will be brought up in the reflection.

The chosen location is the old shipyard Göteverken in Gothenburg. An area that is undergoing a major transformation but that requires time and an extensive work to create flow and activity because of its location in the city. Therefore, the project will focus on the transformation of the selected building and develop potential functions within the building for the future development of the area. With other words, this project will be a part of a future vision for the area.

METHODS

SITE VISIT

To gain a better understanding of the chosen area and its history, a site visit was made together with a representative from the owner Älvstranden Utveckling. The method also explored the conditions of the selected existing building for the transformation. For example, photograph representative details and important existing elements. A mapping of the district with nearby functions and flows, to create a deeper understanding of which functions are needed in the area, was also done.

CASE STUDIES

Case studies contributed to a better understanding of what kind of space an architecture center can represent. Visits were made at the Danish Architecture Center in Copenhagen and ArkDes in Stockholm. By mapping their presented exhibitions, spaces and functions, information was gathered as a basis for a part of the thesis potential program. The visits were also made to analyze what kind of spaces architecture exhibitions can be found within near Gothenburg. Further, to get different perspectives on how an old industrial building can be transformed, two reference projects were selected for analyzing. Chongqing Industrial Museum, converted from an old steel factory. In addition, LocHal, an industrial building, located in Tillburg in the Netherlands, was transformed into a public library.

INTERVIEWS

The result of this method was important to gain more knowledge about possible combinations of functions within the chosen building to be able to create a successful architecture center. By interviewing people with different experiences and roles in the construction industry, a broader understanding and a more reliable result was achieved. The first interview was scheduled with the architecture critic and journalist Mark Isitt. An outspoken person who has an independent overview without having to hold a company behind his back. To follow up, a meeting was arranged with the architect Mattias Gunneflo to get a different point of view. Gunneflo was interviewed because of his known commitment of developing an architectural node in Gothenburg.

LITERATURE REVIEW

This method included articles and scientific literature. For example, topics like climate change and how architecture affects people, to explain the general reason for choosing the thesis topic. A literature study within alternative construction methods for the, as mentioned, added elements that can be related to the site was also carried out. The literature reviews will strengthen the essay because of the independent point of view, which complements the other methods.



Figure 2: Selected building for the transformation project. Photograph of the preserved cranes.

2 | BACKGROUND

AN ARCHITECTURE CENTER

An Architecture Center acts as a cultural destination for a city where architecture can be discussed to raise awareness of the purpose of designing our cities and environments. By illustrating, on a local level, what you are surrounded by as a citizen through exhibitions and activities, people will have the opportunity to connect with architectural appreciation. The most efficient way to get the public to connect and understand the power of architecture is to show them, in an educational and simplistic way, which an architecture center can do. With other words, a center for architecture is not only a place for architects and the construction industry, but also a space for everyone (The District for Architecture, n.d.). It is important to share knowledge about architecture because it can contribute to physical and visual appearance that relates to human emotions and behaviors. What we are surrounded by affects our health and mind, which means it can contribute to negative effects as well, such as depression. In other words, by including the public in the power of architecture, a discussion is opened about our common environment (Re-thinking the Future, 2022). An architecture center would encourage the public to take part in the future for the transformation of Gothenburg but also an opportunity to deepen a general knowledge of architecture. A crucial place to develop in the city to arouse greater interest in architecture and how it affects us humans.

CLIMATE CHANGE

Climate change can be explained as a shift in the planet's regular temperature and weather patterns. The main reason is because of burning fossils of coal, oil and gas, with other words the human behavior. When burning

fossils, greenhouse gas emissions function as a layer of insulation enveloping the planet. This layer captures the sun's warmth which make the temperature rise (United Nations, n.d.). Further, the construction industry is responsible for 40% of the total emissions in the world where 27% come from building operations and the remaining 13% from materials and construction. Meanwhile, the planet's gross building area is expected to be twice as big in 40 years because of the human growth on the planet. This means that we need to find new ways of solving the global building stock to achieve zero embodied emissions. Possible principles will be reusing our existing buildings, use materials that can be recycled and design with disassemble possibilities (Architecture 2030, 2023).

GLOBAL SUSTAINABLE DEVELOPMENT GOALS

In 2015, the UN developed the 17 Sustainable Development Goals, which include four main goals. Eradicating extreme poverty. To reduce inequalities and injustices in the world. To promote peace and justice. Solving the climate crisis. All until the year 2030. The 17 goals are structured to benefit from each other, the vision is that there needs to be a balance between social, economic, and environmental sustainability. Several of the 17 goals can be related to this thesis subject and aim. Goal 11, Sustainable cities and communities, covers the need of transforming the way we build our urban spaces and the entire construction industry. The goals involve how we can transform sustainable cities by improving what we already have, investment in public places, recycling, infrastructure as well as innovative constructions. The goal will only be achieved

through cooperation between several different sectors to share experience and knowledge with each other. Goals 12, Responsible Consumption and Production, refers to the urgent need of reducing our ecological footprint on earth by changing our current way of produce and consume our resources. The goal covers up reuse what already have been produced, recycle products, and reduce the amount of waste (United Nations, n.d.). The thesis will mainly focus on Goal 11 and 12, but the project will also partly cover Goal 13, Climate Action, because of its in general vision of stopping climate change. Goal 14, Life Below Water, due to the selected building's location. Goal 15, Life On Land, because of the condition of the ground (United Nations, n.d.) In conclusion, the aim of this thesis is very relevant, and it will discuss several important topics within sustainable development.

ADAPTIVE REUSE

Adaptive reuse refers to transforming an existing building and its structure for a new use. By transforming and adapt an existing building several benefits can be achieved. The method helps preserve the heritage of existing buildings, reduces material usage, hence the construction cost and the impact on the environment for instance. Adaptive reuse of buildings is the future of architecture, it gives life to abandoned structures, does not take up more gross area of our planet and the method fulfills benefits that cannot be achieved within a new construction (Parametric Architecture, 2022). Adaptive reuse is important, through transformation of existing buildings our resources attempt to be saved. Cultural buildings that are not in use anymore

can get a new purpose for a city, instead of being demolished, which can improve urban living conditions (PlanRadar, 2022).

ALTERNATIVE BUILDING METHODS

Alternative building methods can be related to what is called green buildings. The concept aims to consciously develop buildings with an awareness of how they interact with our planet. The concept includes several different focuses depending on what you want to achieve within your project. For example, low construction impact, resource efficiency, sustainable building materials or the aim of trying to resemble a less sustainable material to achieve the same expression and architectural language. But it is important to remember, what a building represents depends mainly on function and it is not linked to climate or available local resources. A building is designed to meet our requirements for temperature, light and flexibility. With other words, the modern concept. This concept can be used anywhere, regardless of the climate. The positive conclusion of this is that if we meet the human comfort requirements, our buildings can basically be built in any material. With other words, it is not the modern building that is the main issue, the problem is what a modern house supposed to be. Alternative building methods is not a specific technique or material, it is a general conscious adjustment towards greener buildings with one or several sustainable aspects included. This theory will be considered within the thesis. The criteria for how alternative methods should be interpreted as a concept will be determined by analyzing the site's existing building materials to find comparable green materials from an aesthetic perspective (Snell & Callahan, 2009).

3 | LOCATION

THE SITE

The chosen site, *Lundbyvassen*, is located on the north side of the riverbank in central Gothenburg. This side of the city is undergoing a major transformation and is included within a program called "Älvstaden", which is one of the largest urban transformations in Scandinavia. The vision is to extend the central part of the city and create activity along the river. The vision and program is developed by Älvstranden, which is a company that runs by the municipality. (Göteborgs stad - Älvstaden, 2022). Here you can find the big investment Karlstaden, big office complexes and residential buildings (Göteborgs stad - Lindholmen, 2022). An accessible site that can be reached by bus and ferry, and within a few years also by tram (Göteborgs-Posten, 2021). As mentioned, the whole district is undergoing a major transformation, but residential buildings and offices will dominate in the area. Public functions and activity during the evening and weekends need to be developed to create activity in the neighborhood but also attract people from other parts of the city (Göteborgs stad - Lindholmen, 2022).

THE HISTORY

Within the selected site the old shipyard *Götaverken*, situated on *Lindholmen*, is located. The ship yard has a history dating back to 1841. At the end of the 19th century, it was the largest shipyard in the city with approximately 5,900 employees. In 1960, Götaverken was moved further west to an area called Arendal, which made it possible for new businesses to take place in the former shipyard buildings. Most of the buildings remain today, some have been demolished, and are well preserved. They represent the old shipyard industry and the city's heritage. Red brick facades and industrial cha-

racter dominate the district, which is important to maintain as it is important to emphasize the historical architecture. Therefore, large parts of the district are protected and under investigation (Lönnroth, n.d.). One of the buildings that have been preserved, and is also not protected, will represent this thesis and the transformation of the Architecture Center. The building is called *Reparationsverkstaden* and represent the former repair shop for the ship yard.

SITE VISIT

A study visit together with Anette Vejen Tellevi, architect at Älvstranden Utveckling AB, was accomplished to get a better understanding for the challenges and future plans of the district. The meeting was informative and will be a significant basis of the thesis and its potential outcome. The statements have been summarized from the meeting.

The district has been owned by Älvstranden Development for around 30 years and is the company that drives the development of the area forward. Because of the extremely polluting ground and river, one of the worst areas in Europe, the district has strict guidelines regarding how the area can be transformed. For example, residential buildings have special rules, but offices and other functions can be developed in the area.

Vejen Tellevi informed during the visit how popular Lindholmen Science Park is, mainly for tech companies. Since science parks are often further out on the edge of town, Lindholmen is very popular because it is so centrally located in Gothenburg. The plan for the district is therefore to extend the science park.

to the old shipyard. She states how important it will be due to this to combine functions in the area that can create a flow during evenings and weekends as well. The area is today very deserted, which needs to be taken care of.

During the visit we enter several of the different old shipyards building. Including, "Plåtverkstaden", "Pannverkstaden", the old dressing rooms and the selected building for this thesis, "Reparationsverkstaden". Reparationsverkstaden is located close to the former dock, which was removed in 2016.

The building is today used as a parking garage (with among 210 parking lots and 70 for bikes) and is there for also completely open for the public. Because of the building's conditions and that it is not insulated Vejen Tellevi states that "preferably a building is needed to be built in the building to achieve an indoor climate". Also, the existing dock in front of the building is today not accessible because of its bad conditions and risk for collapsing. The entire site will be developed over 15-20 years from today. Several plans are underway, but for the chosen building for the thesis the plans have not yet been set. This makes the expected outcome of the thesis very relevant and important.



SWOT ANALYSIS

STRENGTHS

- A unique volume
- Existing historical elements

WEEKNESSES

- Currently low flow to the site
- The building is not insulated

OPPORTUNITIES

- A new innoative district
- A unique transformation

THREATS

- Polluted ground
- High rising water levels

The analysis presented above give a well overview over the district, site, and building's possible future. The district has a great opportunity to be developed into an innovative place that currently cannot be found in Gothenburg today. The plot is located close to the riverbank with a beautiful view over the city's skyline. The site is rough, rustic and has a lot of potential to represent a new node for the entire city. The big and generous volumes, preserved details, and elements from the old harbor as well as the street network make the site unique. The plot's history represents our heritage as the main port city, which the current condition of the site reflects as well. Some of the buildings need to be renovated, included the selected building for this thesis, and the ground is very polluted due to the previous port activities. The site and building have therefor a great possibility to represent a sustainable transformation and act like a learning exemplar. The vision can be summarized

as, *this is what we come from, and this is where we are going.*

The map on the following page clarifies some existing functions, flows such as other relevant information. The analysis will act like a part of the basis for the developed program for the selected building for the thesis. This to increase an extensive flow within the community.

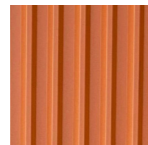
Brick, plaster and tin represent as facade materials in the area. The colors reflect a typical industrial character. Asphalt dominates as a general ground material and extensive greenery is missing. The five old shipyard cranes, in orange and blue, are located near the chosen building, which gives the area a reminder of the history of the area. Based on the analysis and the existing qualities of the site, there is a great potential to develop an attractive and innovative city.

EXISTING MATERIAL PALATTE

BRICK



METAL

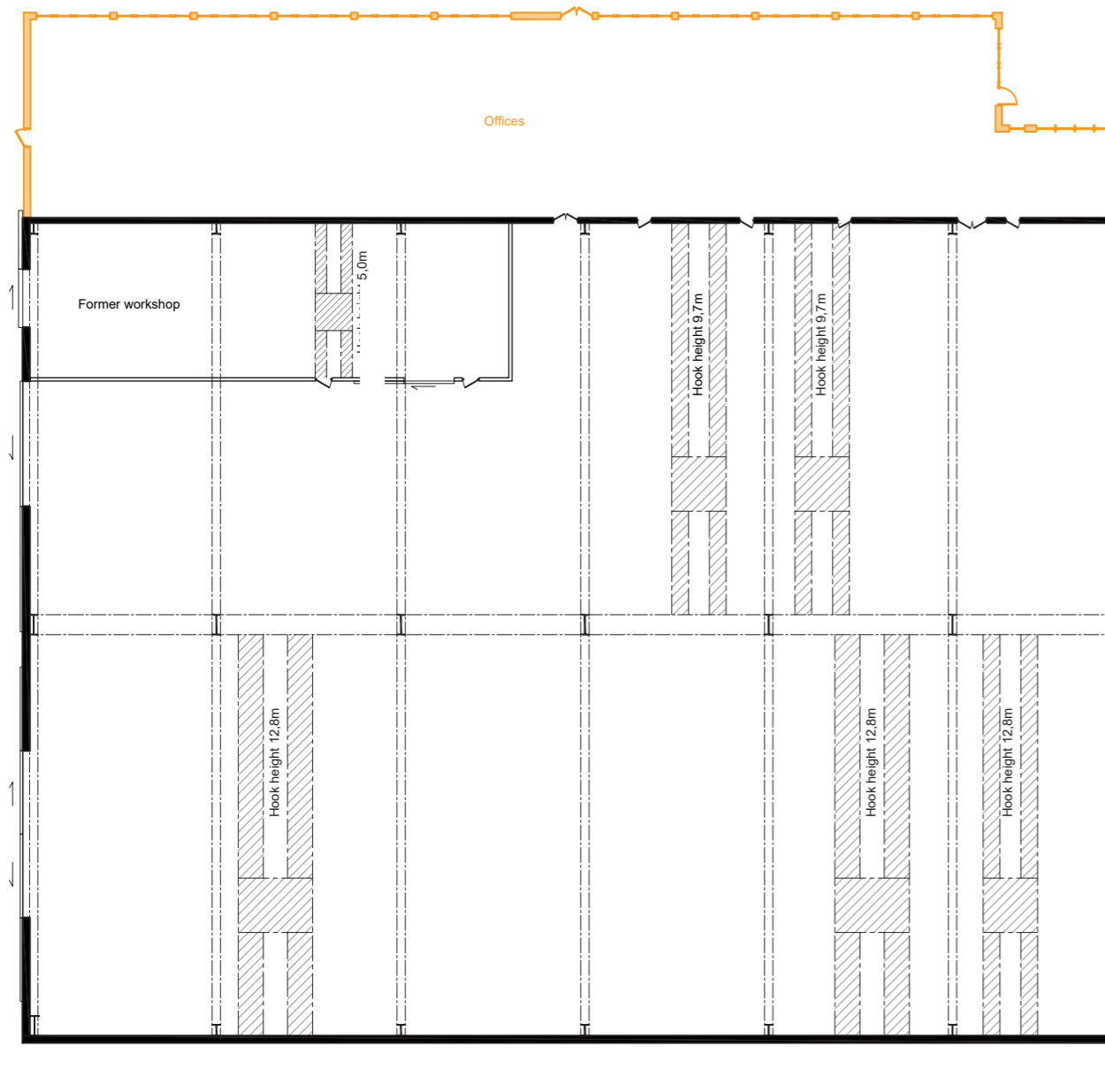


RENDER



THE SELECTED BUILDING
FLOOR PLAN 1:400

■ EXISTING
■ DEMOLISHED



The building is used today as a parking garage that has been adapted to the existing structure. Six large cranes and one small one has been preserved, which, together with the existing structure, represents the building's typical industrial character. The building is poorly insulated and several of the six existing gates are wide open, which means that the building currently consists of a protected outdoor cli-

mate. 39 columns and with a maximum ceiling height of approximately 18 meters represent the volume as well. Some parts of the selected building will be demolished. This is done to emphasize the large original volume. The material that is demolished will be used in the design proposal, which clarifies how you can use reuse material in a new project.

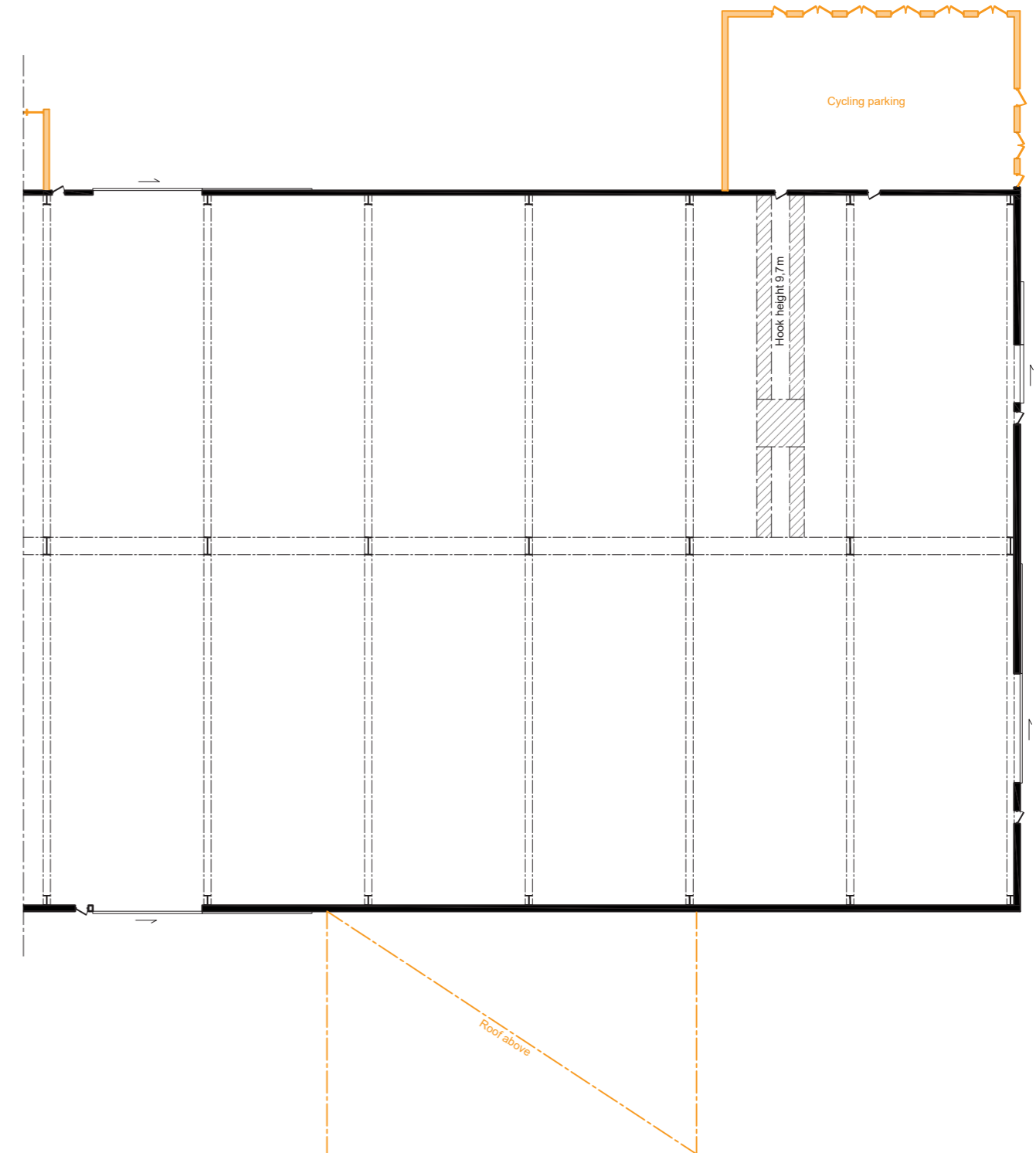
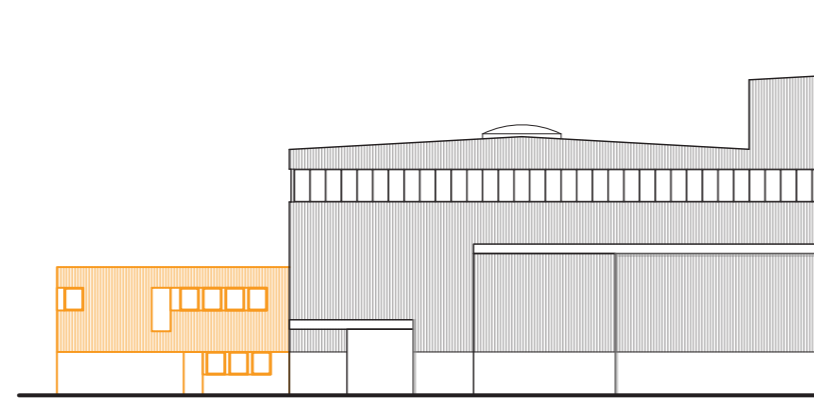


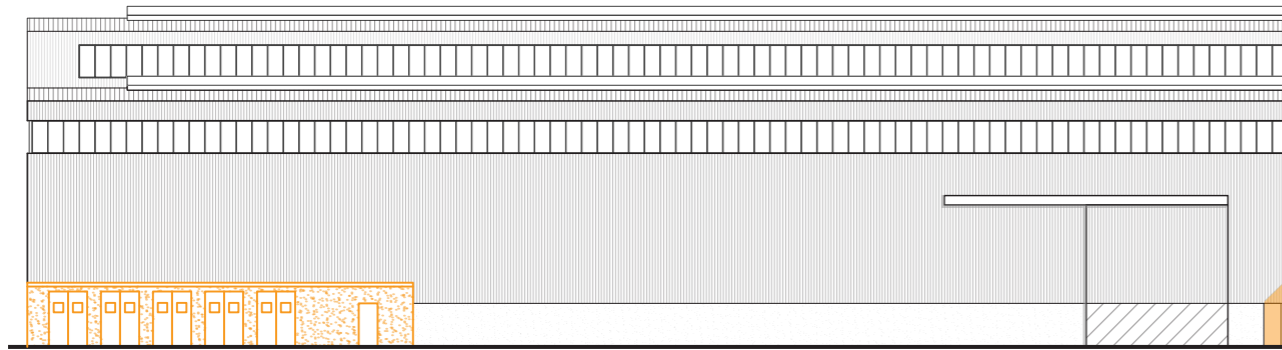


Figure 4: Selected building for the transformation project. Interior photograph of the existing structure.

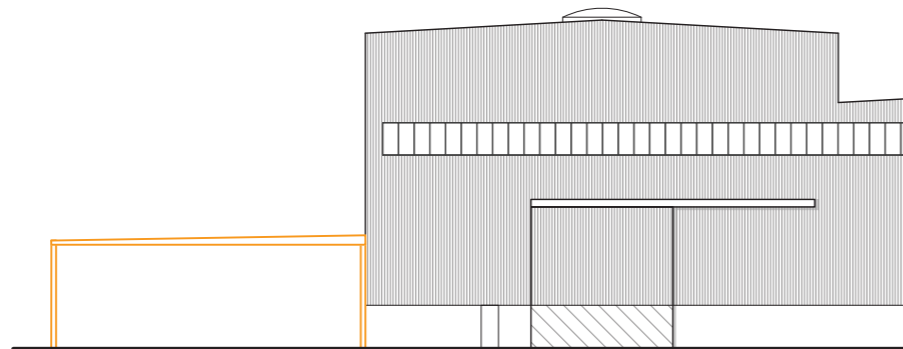
■ EXISTING
■ DEMOLISHED



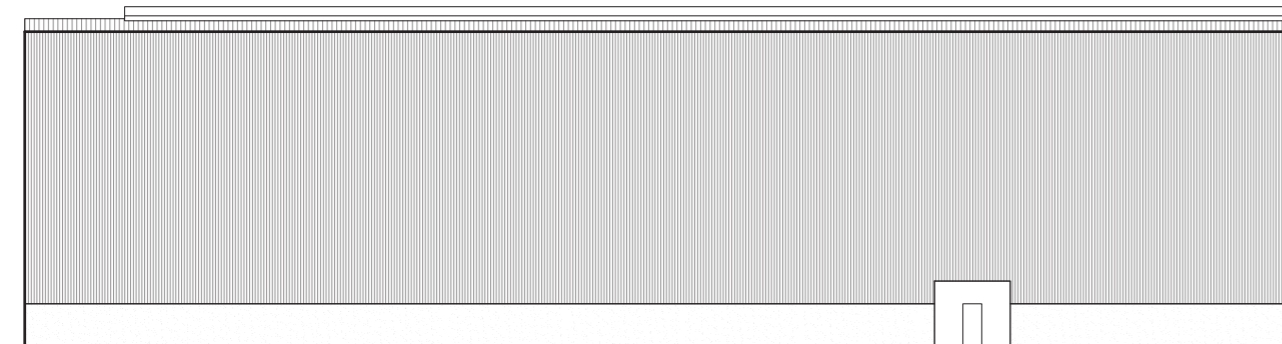
NORTH FACADE 1:400



WEST FACADE 1:400



SOUTH FACADE 1:400



EAST FACADE 1:400

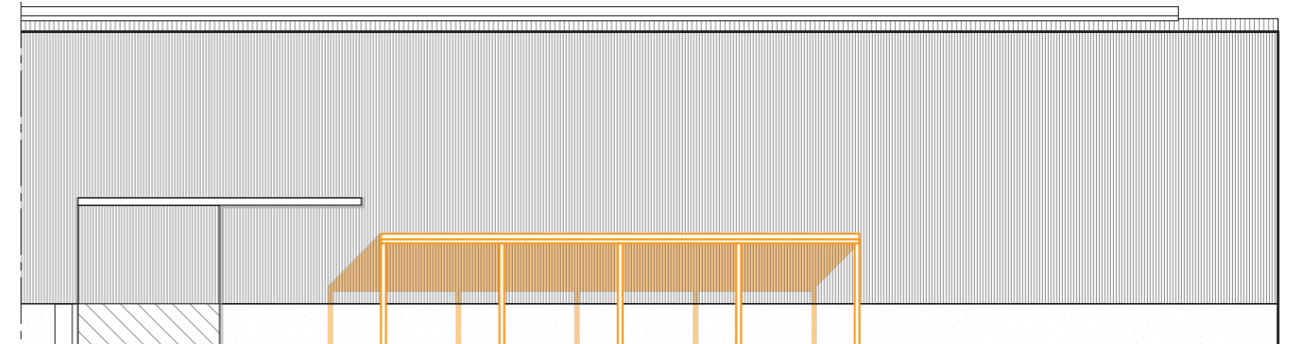
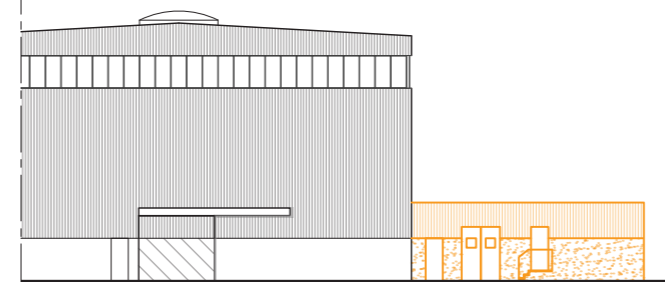
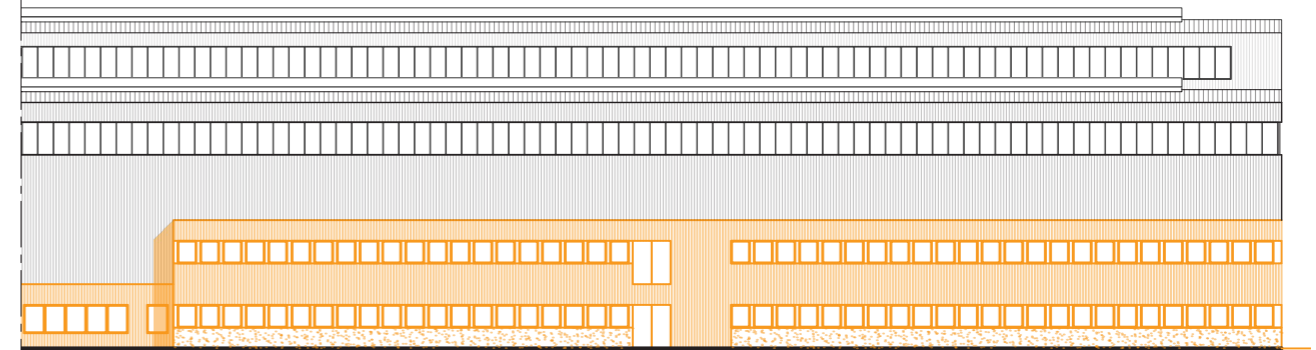
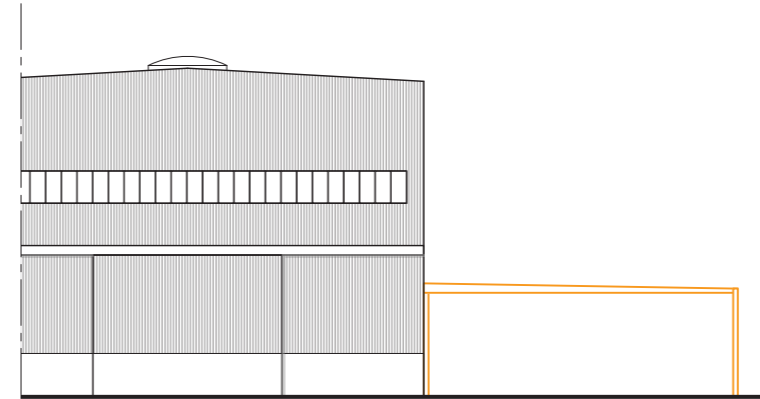




Figure 5: Selected building for the transformation project. Exterior photograph.



Figure 6: Selected building for the transformation project. Exterior photograph.

SUMMARY AND REFLECTION | LOCATION

To be able to achieve the expected outcome of this thesis, develop an Architecture Center which represent sustainability, a site was selected where a suitable building for a transformation project was located. The chosen location needed to be relevant to the expected function of the project, which was a challenge due to the development of a new function in the city that does not exist today. Because of this argument, a place undergoing transformation is relevant to the project. It would give the Architecture Center an opportunity to establish itself together with an entire area. The old shipyard, Götaverken, is a perfect location for an architecture center that stands for sustainability. The shipyard contributed to major environmental destruction; therefore, the area is well suited to represent how we can take care of the industry today from a sustainable perspective. In other words, the building gets the opportunity to show where we come from and where we are going. But as mentioned in the scope, the reflection is based on a non-economic point of view.

The selected site has an industrial character where brick, plaster and sheet metal dominate as facade material. Old port cranes in red remind you of the site's history as well as the beautiful location by the riverbank. The observed materials will be relevant to be able to use alternative building methods for the additional parts within the transformation which represent the site. Further, several different functions are beginning to establish in the area. Restaurants, sports activities and offices dominate. Nearby, residential buildings are located, but due to the bad polluting housing is not suitable for the chosen building for the thesis. An Architecture Center, mixed with relevant functions that can be linked to sustainability, becomes a perfect destination for the area. Cultural activities are missing in the area,

which are important functions for creating a safe and interesting district.

The building chosen for the thesis has architectural potential due to several reasons. The existing structure and elements represent the history of the shipbuilding industry and are conceivable to be transformed into a function that can highlight, let people take part in and experience the spaciousness and volume. The building is in poor condition but the important parts such as supporting structure and rough industrial details with patina make the building interesting. A relevant strategy to investigate to achieve an indoor climate is to add volumes inside the building.

A relevant discussion that needs to be considered is how much the exterior should be transformed. The building represents the shipyard's history but is not protected, which opens the possibility of conversion. On the one hand, the architecture along the riverbank is well known by the citizens, as it can be seen from several central locations in the city, and therefore should not be transformed. But this can also contribute to a negative outcome as people will not understand that a new purpose is taking place inside the building. In other words, some kind of change to the exterior will be appropriate. Possible ways of doing this can be transforming the site in front of the selected building, use the close by port cranes or the water. This will be important to explore in the design proposal.

In conclusion, the building has potential to be developed into an Architecture Center that represent sustainability and architecture for the future due to several reasons. The generous building, the exciting surroundings and its history are convincing reasons for this design proposal to achieve a unique result.



Figure 7: Selected building for the transformation project. Exterior photograph of the closest crane and the connection to the waterfront as well as the city.

4 | INVESTIGATION

EXISTING SPACES FOR ARCHITECTURAL EXHIBITIONS

THE DANISH ARCHITECTURE CENTER | COPENHAGEN, DENMARK

A case study at the Danish Architecture Center in Copenhagen, Denmark was accomplished to collect international information about potential architectural exhibition spaces for the thesis. At the time of arrival, the flow towards the modern glass building and within center has already started. It is easy to tell that the center is a popular weekend-activity, for all ages. When entering the building you walk straight into a lobby with a reception. To access the center, you take a left turn into the retail shop. The shop offers smaller design products such as candles and smaller decorations. A big book shelf with all the popular architectural books can also be found here.

Through the shop you will start to work your way vertically in the building, up the stairs towards the first exhibition area. The room is approximately 350 sqm, which is the smaller exhibition area within the center. Here you can find a temporary exhibition about architecture in Space. Important observations here was how invited the visitor was to take part, touch and experience the presented material. Also, a big table with Lego for the children where they got the opportunity to build their own house for the space. How important it is to include the children is obvious throughout the whole center.

When you continue walking your way upstairs in the building you pass several audio recordings with different topics, for instance "How will the classrooms of the future shape our children?" and "Can architecture cure diseases?". An innovative but simple way to develop the communication areas in the building interesting as well. As soon as you reach the

highest floor you find the big exhibition area, approximately 750 sqm, which is called "Our architecture". Here you can find six stands with different topics and the entire area reflects DAC's motto about sharing knowledge of the power of architecture.

" We all come into contact with architecture and design every day. But not all of us are aware of the enormous impact they both have on us. By creating knowledge, experiences, and debate about how architecture and design can contribute to solving many of the world's biggest challenges in the UN's sustainable development goals. It is our job as a national architecture center and international cultural attraction: to share knowledge about the sustainable development of our physical framework for life through exhibitions, tours, events, learning and in-person and digital networks."

Kika Krista Kjærside | Head of Program at The Danish Design Center



Figure 8: The entrance and retail shop.

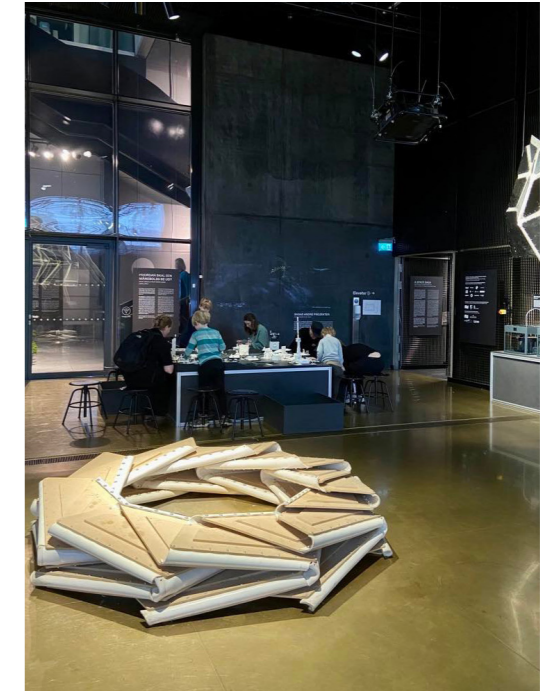


Figure 9: Children playing with lego.



Figure 10: Large physical models can be experienced.

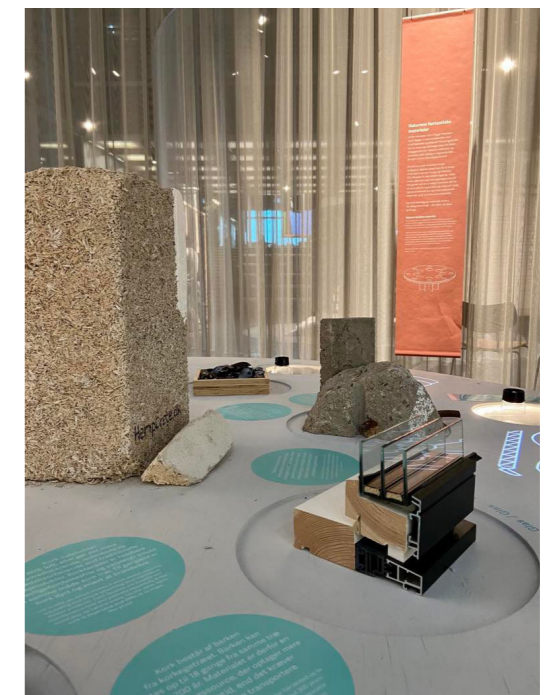


Figure 11: Alternative materials that you can touch and feel.

EXHIBITIONS

OUR ARCHITECTURE

The entire exhibition area represent building's where function, design and life colabrate with a vision of significant architecture. The center wants to reflect the past, present and the future.

CAN CULTURE BRING US CLOSER TOGETHER?

Humans long for interaction and we have a need to experience what culture can provide. The exhibition focuses on how architecture can bring us back from the digital world.

AN INCREASINGLY INTERCONNECTED WORLD

Architecture plays a role in how we develop and design airports. The exhibition focuses on how we can prepare for a expansion of the aviation industry but with climate awareness.

A SCHOOL FOR THE SOCIETY OF TOMORROW

This exhibition discusses how children represent the future. The generation is an outstanding way to find new ways to learn and work together against our global challenges.

CAN THE WORKPLACE ACCOMMODATE MORE OF LIFE?

Because of the amount of time we spend at work it also affect our well-being. The exhibition shows how architecture can provide an attractive office.

DOES ARCHITECTURE HAVE THE POWER TO HEAL US?

Should hospitals only focus on treatments and cleanliness in practical rooms. Can architecture contribute to the healing process through materials and space.

HOW WILL WE LIVE IN THE FUTURE?

Your home is central to the quality of life. This part of the exhibition discusses how we can build efficiently with sustainable materials to create attractive homes.

A SPACE SAGA

The temporary exhibition presents architecture in space and its challenges. The visitor can take part of the entire journey, from the drawing table to an experiment in Greenland with extreme weather conditions.

Other important observations during the case study were the buildings functions besides the exhibitions area, for instance, a café, furniture showrooms and a big seating stair. When visiting DAC you also interact with a gym and office spaces, while experiencing the exhibitions, by visual contact through glazed walls. This is important to increase the flow within and towards the building. The functions are not accessible directly from the center, which also applies to parking and residential buildings. As mentioned, children are included

within the whole center by creating opportunities for them to take part of architecture, by for instance draw your own facade and touch materials.

The visit was inspiring and informative for the potential program and for the thesis design proposal. DAC's exhibitions strengthen the aim of this thesis, how important it is to make architecture available for the public and how its power can promote sustainability.

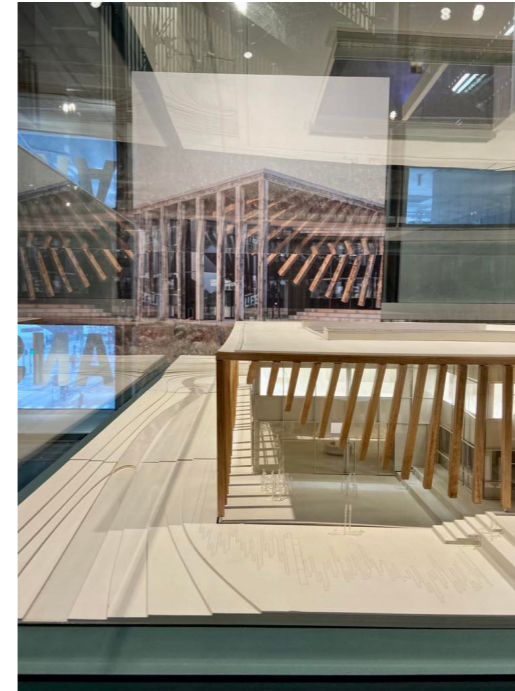


Figure 12: Physical models.

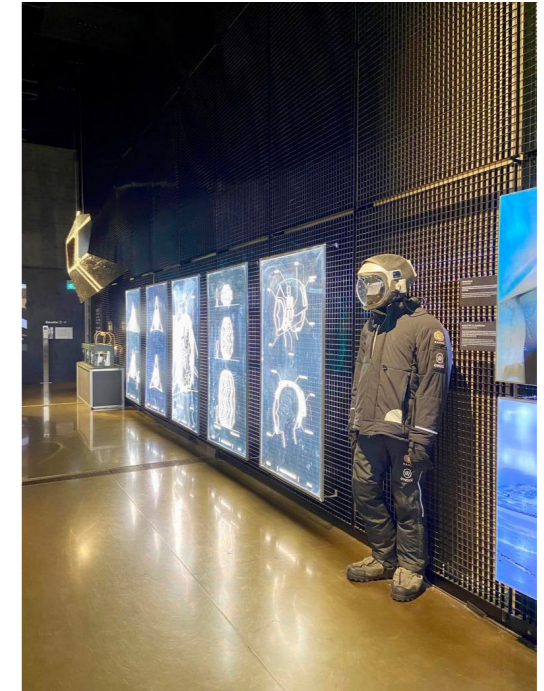


Figure 13: Exhibitions that is easy to follow and understand.



Figure 14: Lego for the children.



Figure 15: Small scale exhibitions.

ARKDES | STOCKHOLM, SWEDEN

A relevant case study for the thesis was to visit Sweden's national center for architecture, ArkDes. It is located in Stockholm in an area called Skeppsholmen which is a central part of the city but not a place you pass by by accident. This is quite noticeable due to the small flow of people there is in the area during the visit. Due to the way the building is facing, it is difficult to find the entrance but thanks to clear signs you find your way. ArkDes is a part of the museum Moderna Museet, but you can visit the architecture center only thanks to the separated flows. ArkDes promote themselves as:

“ArkDes is Sweden’s national centre for architecture and design. It is a museum, a study centre and an arena for debate and discussion about the future of architecture, design och citizenship.”

Once you enter the building you get welcomed by a cafe to your left. The cafe seems to be popular because of the amount of visitors.

Further, to your right you can find a reception dedicated to ArkDes and the museum. Behind the reception a smaller retail shop is located with smaller decorations, books as well as articles for architects such as pencils and sketching paper. A relevant observation here is that you do not have to enter the retail shop to work your way towards the exhibitions, because of a free passage on the right side of the reception. Further, as a visitor, you are offered access to a closet to leave your belongings. Once you have left the closet you are starting to work your way towards the exhibitions. First out is a temporary exhibition room, approximately 200 square meters, by the architectural firm Tham & Videgård. You take part in the exhibition through glass boxes on the floor. A total of 108 boxes are placed in the room, and by walking on them you take part in a variety of projects.



Figure 16: The temporary exhibition room.

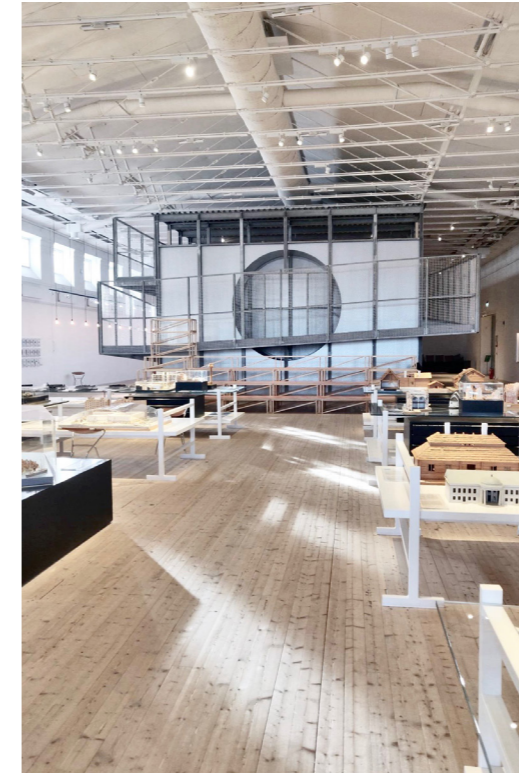


Figure 17: The metal box.



Figure 18: The timeline of architecture along the exhibition space. Further into the room, the playground can be seen.

To enter the second exhibition room, approximately 400 square meters, you must go back towards the closet and walk your way through a hallway and take a right turn. It is easy to tell that you are in an old building, built in 1853, because of the unadopted flow for today's purpose. Once you have entered the second exhibition room you can experience a sculpture, a box made of metal, follow by an exhibition about architecture in Sweden, consisting of how we built in the past until today. Through models and information, you can learn about old timber houses, castles to today's complex constructions, the projects are placed as a timeline. Further into the room a glass box with a playground can be found, meant for children. The playground has nothing to do with architecture, it is only a spot for children to play. From the exhibition area, you can access a second café with associated outdoor sea-

ting. Through the café, you can also reach an architecture library with books and collections about Sweden's foremost architects, such as Gunnar Asplund and Sigurd Lewerentz. To get to the exit from here, you need to go back through the cafe, through the exhibition room about architecture in Sweden, further to the wardrobe and out via the entrance where you entered, alternatively if you want to continue your visit to the museum.

The visit to ArkDes was important since it is the current national center for architecture in Sweden. It was relevant to see what you can already experience today when it comes to this type of exhibition but also how the industry markets themselves.

SUMMARY AND REFLECTION | EXISTING ARCHITECTURE CENTERS

The case studies at the existing architecture centers reflect two very different examples of how architecture can be promoted. The reflection will bring up how architecture can be experienced today, the differences from the centers as well as what I will bring with me into the design of the thesis.

DAC and ArkDes are both located inside a building where other functions can be found, a relevant observation for the potential program of this project. Another important aspect is how the buildings do not match the selected building of the thesis. DAC is in a modern glazed building which does not reflect sustainability, compared to the exhibitions. The center in Stockholm is located inside an old building from 1853, closer to the thesis building, but the exhibitions does not even mention sustainability. Because of this, the center is not associated with sustainability and future architecture even though it is in an older building.

The centers focus on different exhibitions but with similarities. Both centers have a temporary and a general exhibition area. This can be analyzed as prioritizing that a part should be replaceable, that it is important for a recurring flow to the business. A big difference is how the temporary exhibitions are experienced. DAC invite you to take part of the material, touch and feel. As a child you can even build your own house in space. At ArkDes, you can only look and read. With other words, you do not get as invited to take part which is not as exciting as if you get to participate.

The large general exhibition at, as mentioned, DAC's focus on sustainability compared to ArkDes's which does not mention sustainability. Furthermore, how the children are included is also a very relevant observation. In Copenhagen, you are welcome as a kid to

participate compared to in Stockholm where you are invited into a room with a playground, basically so the parents can experience the exhibitions alone. The different methods can be analyzed as two different ways of looking at architecture and its importance for humans. Other functions that can be found within both centers are retail shop and café.

In conclusion, none of the case studies represent the expected outcome of this thesis but are still very relevant regarding how the project will be transformed. The exhibition at DAC corresponds to the purpose of the thesis but not the building. ArkDes's exhibitions do not correspond to the purpose of the thesis, which contributes to not associating the entire center with sustainability. This even though it is located in an existing building that has been transformed. In other words, the entire thesis and architecture center needs to highlight sustainability to be associated with the architecture of the future.

TRANSFORMATION PROJECTS

CHONGQING INDUSTRIAL MUSEUM

In 2019 the Chongqing Industrial Museum was completed, a project done by the architectural firm WallaceLiu. The building was developed with the vision of showcasing the cultural and industrial history of the country's steel production. The factory, which is located along a river, was originally built in 1938.

Due to the expansion of the city the factory was after a while no longer on the edge of the city and therefore the production stopped in 2010. An architectural competition was announced with the aim to create a new cultural purpose of the building, which the firm WallaceLiu won. (WallaceLiu, n. d.)

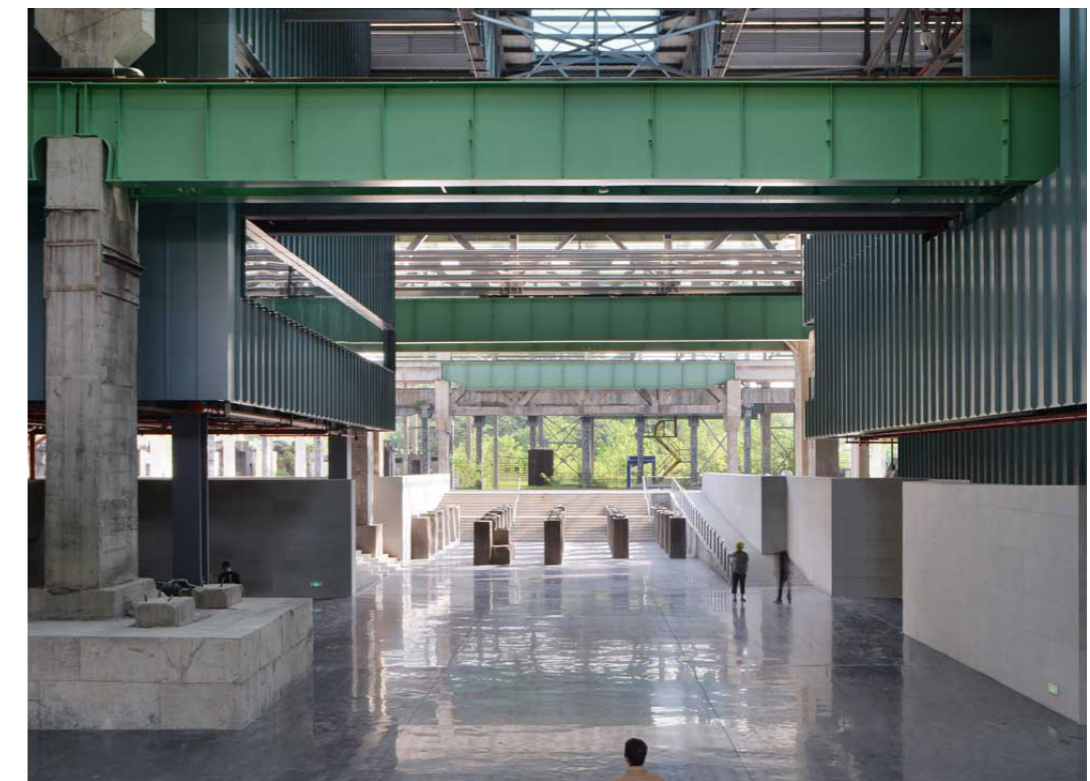


Figure 19: The added volumes inserted in between the existing structure.

The existing building contains a steel frame structure which has been taking care of by adding new volumes inserted in between the old structures. An important aspect within the project was to respect the building's past but also its new role in the city. The concept for the project can be summarized as "Inspi-

red by the long, complex and layered views through the original factory site, we decided to lift the metal boxes that contain the enclosed exhibition spaces off the ground to create a complex, permeable and open ground-floor experience." (WallaceLiu, n. d.).

By connecting the raised added volumes with bridges at various levels, visitors can go back and forth between the new elements and the building's history with its old beams, columns, and trusses (WallaceLiu, n. d.). The architects have worked with different strategies to fulfill the experience of the building and space when visiting the museum. By placing the main entrance with the added raised blocks along the sides, long sight lines are achieved.

In the entrance hall, a full ceiling height can be experienced which ceiling lights helps to exaggerate further. The big entrance hall is covered but not completely insulated to create a comfortable environment. With other words, this part of the building is therefore not in need for heating or cooling compared to the raised blocks. The museum includes exhibition halls, space for events, bookshop, cafe and restaurant (WallaceLiu, n. d.).



Figure 20: The linked bridges between the new added volumes.

When it comes to the added selected materials for the transformation metal and concrete is mostly representative. The new design was made to rearranging and reframing the existing structure and its value. By working with transparency and architectural methods like hanging elements, a contrast from the existing

heavy expression could be achieved. The relationship between the new and old is not always obvious, the architects want it to overlap and be "abstractly intertwined". Some added parts are done with a vision to create a play with shadow and light inside (WallaceLiu, n. d.).



Figure 21: Long sightlines.

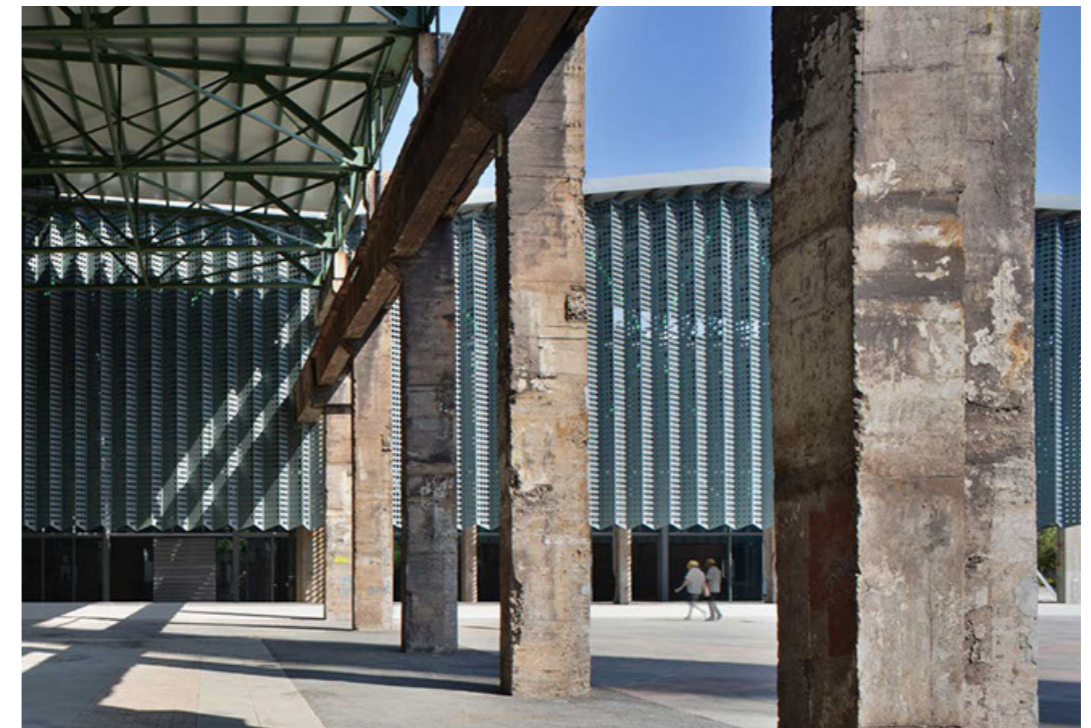


Figure 22: Balance between old and new materials.

LOCHAL PUBLIC LIBRARY

In the city of Tillburg, in The Netherlands, the architectural firm Civic Public Architecture has transformed a former locomotive hangar within an industrial building in glass and steel from 1932 into a public library called LocHal. The project was completed in 2018 and “turns the wrong side of the tracks into a vibrant mixed-use district” (Civic Public Architecture, n.d.). Because of the project’s program, transparent construction, and location the building will act like a hub for sharing knowledge and experiences. An open and adaptive space conditioned for mixed used. (Architect magazine, 2017). The transformation was made with care to respect the existing building’s heritage and

raw industrial character (Inside Outside, 2021).

The architecture is a reinterpretation of the old locomotive hangar with the existing consistent structure as a main inspiration for the new transformation. The building has a generous ceiling height of 15 meter and a footprint of 90 times 60 meters the building which reminds of the selected building for this thesis. The project redefines how a library can be used, co-working areas, lab, lecture halls and other places for interaction represent additional functions. The building can be seen as a covered multi-functional



Figure 23: The exterior transformation of the industrial building.

public building. New steel columns stained in black which together with the existing structure and concrete floor highlights the industrial history (Civic Public Architecture, n.d.).

When entering the building from the east you get welcomed by the enormous entrance hall with a big landscape of stairs. This is used as a vertical communication but also as seating area for events (Civic Public Architecture, n.d.). The landscape of stairs is divided into several areas due to the cut openings which bring light done to the spaces underneath on the ground floor. (Inside Outside, 2021). The landscape of stairs is divided into several areas due

to the cut openings which bring light done to the spaces underneath on the ground floor. (Inside Outside, 2021). To increase a better acoustic six big textile screens are used. These are also working as a way of separating areas in a flexible and interesting way. For instance, a co-working space can be separated from a library area. Because of their generous length, attached in the ceiling, the volume increases further (Civic Public Architecture, n.d.).



Figure 24: The welcoming staircase which creates space underneath and increase the verticality.

The spaciousness atmosphere is experienced through diagonal sight lines, the large balcony and added vertical element. Different climate zones are created inside the building, this was done by keeping the openness of the building and add smaller spaces that can be heated up if needed. Because of this concept, the building could be preserved and not demolished (Civic Public Architecture, n.d.). For instance, the big seating stair can be heated or cooled down as well as the enclosed offices can use a separated sub-climate. This design strategy made it possible to keep the existing shell and the buildings heritage (Architect magazine, 2017).

Lochal is an extensive transformation project

where additional volumes, adapted to the existing structure, have been implemented to create different climate zones. By working vertically and sight lines, the spacious volume is enhanced.



Figure 25: Vertical sight lines.



Figure 26: Cut outs in the staircase.

SUMMARY AND REFLECTION | TRANSFORMATION PROJECTS

The reference projects reflect three ways of transforming an existing industrial building. The buildings represent transformations where the consideration of the architectural balance between old and new has been analyzed differently and with varying qualities and disadvantages. However, the projects will be relevant to the thesis expected outcome, where several of the references' strategies will be the basis of the design proposal.

Different design strategies have been used in the reference projects but a common one is to work with sight lines. Lochal focuses on diagonal lines where you get an opportunity to experience the entire volume and its generous space from several directions. Something that is not achieved within the Industrial Museum in Chongqing due to the strategy of implementing volumes between the existing structure. But on the other hand, long horizontal sight lines represent the project instead to clarify the spacious volume. Both methods work well to mark the volume, which is the main aim. Lochal gives the visitor an opportunity to walk vertically with a transparent view of the transformed building compared to the project in Chongqing. Here you move vertically inside added volumes. Worth mentioning is that you still experience the existing structure at a higher height but from the linked bridges.

One relevant discussion when transforming an existing building is the balance between preserving and renovating. The reference projects have interpreted this in similar ways. Both projects work with different climate zones due to the bad conditions of the original buildings. This allows the existing shell to be preserved and representative of the history. The strategy can be applied to the thesis building, since it is not insulated. The different climate zones can be achieved by adding vo-

lumes inside the building. Lochal implements a large wooden staircase that creates rooms below compared to the project in Chongqing which has inserted volumes in metal cladding, as mentioned, between the structure. In other words, the chosen materials vary for the added elements, which gives two different outcomes. One project where you can more easily separate old and new material compared to the other where the industrial character continues to dominate.

In conclusion, both reference projects represent interesting ways of transforming historic industrial buildings. Working with sight lines and climate zones through increased volumes will be something to experiment with for the design proposal for this thesis. Regarding the type of material that can be used for the added parts, as previously mentioned, there will be alternative materials that can be related to the site and the existing building.

INTERVIEWS | POTENTIAL PROGRAMING AND TRANSFORMATION

MARK ISITT | Journalist and architecture critic

Mark Isitt is a journalist and architecture critic in Gothenburgs newspaper, GP, with an independent overview what is going on, within the building industry, in the city. Several important topics were discussed during the interview.

In what way could an architectural node attract people from the whole city?

It is important to trust that an architectural node can take care of this building first of all, because it can. To get the city's attention and interest for the area one or more elements linked to the existing building, like a parasite, can be an alternative. It will be important to transform the building in a way that makes people look up and understand that something is going on here. The parasite can be used for a function or just represent a replaceable sculpture. Like the Serpentine Pavilion in London, a pavilion that is replaced every year by a new one created by a new architect. Other possibilities could be graffiti-painted facades that can change over time.

What potential functions can be part of the program that can be relatable to sustainability in order to develop a successful multifunctional transformation project?

It is important to choose functions that does not attract the same people with the same interests. For example, a food court, we all need to eat. At the same time, you stumble across an architectural model. It would be great if you can get that effect. Also, it is important to not make this place to perfect. Let the visitor bathe in sawdust. An elegant final result does not always have to be what's best. Show the visitor models that went wrong instead of the final beautiful ones. Let people come inside to experience the real side of architecture. Other possible functions could be a library of build-

ing materials, warehouses for timber, one-to-one scale models, a 3D printing studio, auditorium and lecture halls.

What is your thought of the balance of preserving and transforming the building?

I think as much as possible should be preserved and any additions that need to be made need to be done with incredible care. It doesn't have to be built in gold, but it should be handled as if it were gold. You must make a clear indication of what is old and what is new. Show respect to the industrial heritage and that there is nothing more beautiful. Although it is only about sheet metal. The raw character will become an attraction, it is important not to polish too much.

Other general advises or comments that can be helpful for this transformation project?

Gothenburg was Sweden's harbor city, which it still is, but with now slightly dilapidated harbor areas. By placing a cultural institution in a shipbuilding environment, from which the city originated, this building would mark the transformation that this city has undergone in a respectful way. There are many arguments for why the municipality should want a place like this for the citizens.

MATTIAS GUNNEFLO | Architect and developer of an architecture center in Gothenburg

Mattias Gunneflo is an architect who, in recent years, has been involved within the question of developing an architectural node in Gothenburg. The interview with Gunneflo focused on discussing how important it is to develop this type of space for the city but also what this type of organization can represent.

Why do you think it is important to develop an architectural node in Gothenburg?

There is no place in the city for this type of function. No one can answer that question where to go if they are interested in architecture, because there is none. I'm sure many people are interested in architecture, not just architects themselves. There is a distinct lack when it comes to these types of places. It's a scandal that it doesn't exist.

Who do you see as the main audience for an architecture node?

Architects are a homogenous group with similar economic backgrounds and to make the architectural node relevant the discussion need to extend and become something bigger. With other words, architects and people within the industry cannot be the only audience. Especially if we are talking about sustainability where the social aspect is included.

How can the selected building for this transformation project attract people?

This building is awesome. I've been there myself and thought, God, what a cool place. It is not a place where you just run past, but the location will be relevant for the future. I believe a varied range of functions but also, if a place is cool then it is worth going there no matter what only because it is cool. For instance, Louisiana Museum of Modern Art in Denmark, you just want to be there. If you compare with

other public functions in the city, is there any building that is located just by the waterfront with a big facade towards south. I don't think so. You should take advantage of it and create a place where you really want to go.

What potential functions can be part of the program that can be relatable to sustainability in order to develop a successful multifunctional transformation project?

A full-scale lab connected to sustainability. A place where you can experience how it would be to live without electricity or water for instance. Take sustainability to another level. Also, make sure to make the space very flexible and make it possible to disassemble the chosen functions within the building. With other words, find experimenting ways of connecting the project to sustainability.

Other general advises or comments that can be helpful for this transformation project?

Think about, why do you want to visit the node and who are the visitor.

SUMMARY AND REFLECTION | INTERVIEWS

The interviews contribute to a reflective and analytical point of view for the project. By presenting questions and follow-up questions, the conversations could be moved forward in a direction based on this particular project. In this way, relevant comments and suggestions on how to transform the selected building were made. The results from the two interviews have similarities and differences where the commitment to the idea and the expected result of this thesis was the common strongest similarity.

There is no doubt that Isitt and Gunneflo share the thesis vision. It is interesting to hear about how this project arouses interest and dedication. It is clear that a place where reflection and engagement of architecture needs to be given a greater central place in the city. By always letting the visitor pass a part of the exhibitions, taking part in what went wrong instead of good and letting visitors bathe in sawdust are brought up as examples to arouse interest. A conclusion of these comments could be to ensure that the architecture of the center reflects a form of simplicity and vulnerability. The center needs to be structured pedagogically so that the visitors are able to take part in the messages. The reflection will be investigated in the project.

Preserving as much as possible of the selected building is something both Isitt and Gunneflo state, but at the same time they reflect that the building needs to be transformed and refreshed. Isitt believes that however this is done, it must be done with incredible care and accuracy. Both Isitt and Gunneflo mentioned the challenging location of the chosen building. Which can be seen as another argument that the need to make a change to the building, to let people

know that something is going on here, is needed. An important conclusion after the interviews was how the location by the water and the unique raw character will be attractive and unique. Isitt statement how elegant and the polished result does not always need to be the best one. Something that will be considered during the design proposal.

Isitt and Gunneflo suggested several relevant functions that can be included in the program for this thesis. They both indicated the importance of thinking about who the featured features attract. Possible functions addressed were; material library, full-scale lab, auditorium, lecture halls and one-to-one models. An interesting reflection is, how can these functions be linked to sustainability and flexibility? Perhaps the material library can be represented within the entire building by applying different materials to walls, for example. Flexibility can be achieved by adding separate volumes inside the building that can be moved and disassembled. Based on Isitt's argument about a selective transformation, it is important that a balance between the different functions, sustainability and the existing building is maintained.

In conclusion, the interviews gave several good arguments for the sustainable aim of this thesis. Both Isitt and Gunneflo were able to analyse what might need to be done with the building in order to achieve a significant project. Their comments, reflections and suggestions will be taken into account and tested during the design process.



Figure 27: Selected building for the transformation project. Exterior photograph.

ALTERNATIVE BUILDING METHODS

One aim of this project is to showcase alternative building methods within the transformation that can be related to the site and existing building. As mentioned, brick, plaster and steel dominate in the area and will therefore be the research's focus. An investigation was done to identify building materials that are aligned with the latest sustainable building methods, to achieve this goal. The selected materials will be used in the transformation of the chosen building, to be able to answer the research question, "How can an architecture center in an industrial building enhance a sustainable transformation?". The presented building materials focus on showing how the existing building can benefit from the weaknesses and strengths of different materials. In other words, how can a material disadvantages be taken care of due to the existing conditions of the building for instance. The presented materials have been selected based on research with the aim of mimicking the investigated common existing materials mentioned in the site analysis.

MUD PLASTER

Clay mortar is a very flexible material with a range of qualities that make it suitable as plaster inside a building. The material consists of clay, sand, reeds and water. Clay plaster is a simple, old and ecological method that is today most often used in restoration contexts. It is a pure natural product that is produced completely without foreign chemicals or additives. It is an easy-to-work material and works as plaster on several different substrates, everything from wood to brick. Once the material has dried, it is possible to paint and wallpaper, but the clay can also be pigmented before application. The method is common in ecological construction. A negative aspect of the material is that it cannot withstand being ex-

posed to large amounts of rain, which means that the use of the material outdoors is limited (Ekologiska byggvaruhuset, 2021). As presented in the chapter Location, plaster facades can be found nearby the selected building for this thesis. Clay will be an alternative method for plaster within the transformation and project. Due to the existing shell and the relevant method, work with additional volumes inside the selected building, rain and bad weather will be avoided.

RAMMED EARTH

Rammed earth is an old construction technique made of earth and clay. The material is compressed in layers which develop a sustainable building technique. The ingredients can be found and produced all over the planet, which is one reason why around 30% of the world's population lives in earthen constructions today. But in new production, the material is rarely used, which is one reason why it is today perceived as unusual. The material is load-bearing and can be prefabricated as wall elements which facilitates the manufacturing and assembly process. Alternative building materials do not always correspond to the same properties as other building materials, for example clay is more sensitive to weather and wind than plaster is. The same applies to rammed earth. Rammed earth is flexible and can be prefabricated in all shapes and also used for floor surfaces. It can withstand rain, but the wall can come and change into a more eroded expression (Helmersson, 2022). The appearance of the material gives a rough and natural expression like can relate to the existing site and its industrial character. The material will be suitable and a well alternative building material to work with within the thesis.

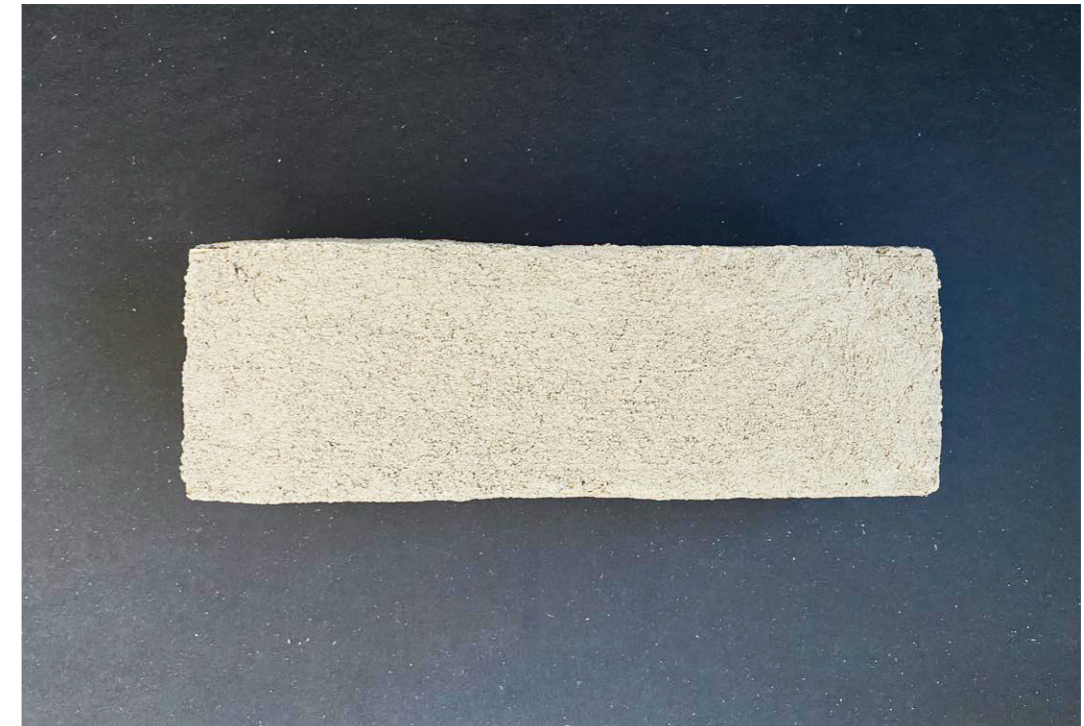


Figure 28: Material sample of earth plaster.

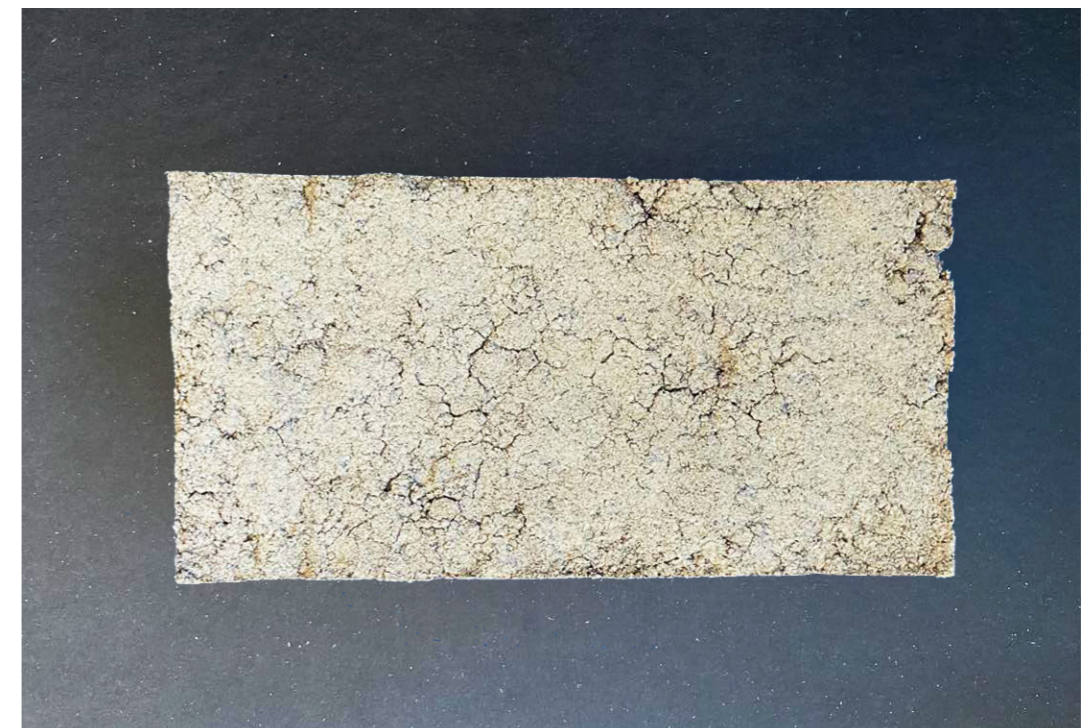


Figure 29: Material sample of rammed earth.

REUSED BRICK

Reused brick are simply bricks that are demolished from an existing building and because of the material's long-life cycle it can often be reused for a new construction and project. The possibility of reuse compensates for the high impact on the climate during the manufacturing process and therefore, by reusing brick among 96% in climate impact can be saved. Beside this, the material requires minimal maintenance (Brukspecialisten, n.d.). Besides the benefits regarding climate impact, reused brick is attractive because of its appearance. For instance, within transformation projects within areas where brick facades already dominate the reclaimed brick are sought. Worth mentioning, when using old bricks, it is important to inspect every single piece and its quality to prevent structural issues (Building Materials, 2022). As mentioned, brick facades dominate on the selected site for this thesis which make reused brick a relevant building method for the additional parts.

TIMBER

Timber is a sustainable material that offers several advantages. It is a completely renewable raw material and due to its low weight, comparable to concrete and steel, the production and transport is very energy efficient. Timber has a high load bearing capacity in relation to its weight and can be used for load bearing constructions. Wooden structures can be prefabricated and assembled on the site, which means that it is also possible to be disassembled and reused. Timber is a good alternative to steel and concrete as a construction material and can at the same time, because of its natural qualities, develop healthy buildings (Holmen, n.d.). There are several steel-framed industrial buildings on the site, including the cho

sen building for the thesis, where timber can serve as an alternative to steel and concrete. For example, potential added volumes inside the transformed building could therefore be made of timber construction instead, to promote sustainability.

REUSE

Reuse refers to using things with the same purpose as before but also for a new function. With other words, making use of products that would otherwise end up in landfill, recycled or incinerated (GoGreenDesign, 2022). In Sweden, the construction industry stands for 10 million tons of waste every single year (Tyrens, 2022). By reusing building materials this number can be reduced which could provide economic and environmental benefits since it extends the life of something that has already been produced. The market is still undeveloped in Sweden because there is no good system yet. In other words, the process of reuse when renovating an existing building is simplified if, for example, parts need to be demolished. For example, a frost-blasted brick facade can be used as a floor indoors (Skanska, 2022). An industry that is on the other hand well developed is reused furniture. We live in a world where the way we work and live is changing rapidly. Trends, requirements, or specific incidents can be reasons why we want to change our furniture, both at home and in, for example, the office. But none of these reasons shorten the lifespan of a chair. In other words, we need start transforming what we have or buy reused furniture.



Figure 30: Material sample of reused brick.



Figure 31: Material sample of timber.

SUMMARY AND REFLECTION | ALTERNATIVE BUILDING MATERIALS

The presented alternative building materials will be important in order to be able to answer the research question "how can an architecture center in an industrial building enhance a sustainable transformation?". By using alternative building materials, that can be related to the site and its architecture, the project will partly enhance a sustainable transformation.

There are several advantages to using alternative building materials in this thesis. Alternative building materials do not always correspond to the same capacity as other building methods and some materials may be more sensitive to weather and wind. For example, mud plaster gives a similar expression to render but cannot withstand rain in the same way that plaster does, the same applies to rammed earth. However, since the project is being developed in a weather-protected industrial building, the building material does not have to achieve the same properties. In other words, the transformation project can take advantage of this by using materials that are more sensitive to rain and wind. This argument can also be covered in the case of recycled bricks as the condition of the material can be allowed to be in a worse condition than required in productions where the material is more exposed.

Reuse is used in several ways in the project. First, the main transformation, use an existing building for a new function. Transforming the selected building refers to Goal 12, Responsible consumption and Production, because the existing building footprint, shell and structure life is extended. The life cycle of what already exists, and is in good condition, continues to live in the same place without unnecessary transport or construction. Also, reused sheet metal and windows will be used within the project. This is because three small-

er additions to the selected building will be demolished for architectural reasons such as clarifying the large volume that is most likely the original building. How and where the demolished sheet metal and windows will be used and applied within the project will be investigated during the design proposal.

An interesting discussion is how the interior design in the center can only consist of recycled materials and reused furniture. It would be interesting to show that reuse does not have to mean bad condition, it can for example include design classics and trends. This would be significant for an architecture center where visitors expect good design but which at the same time focus on sustainability within consumption and production. The argument can also inspire those who today are not familiar with what re-used furniture means.

By using alternative building materials that can be related to the site, the industrial heritage will be respected but at the same time express a potential future towards a more sustainable city and relates to goals 11 and 12. But an important reflection is how the alternative building materials and reused material will not only answer the mentioned question, the building's functionality and main purpose represent sustainability in an equally important aspect. Also, how the building speaks to its environment and surroundings.

SUMMARY AND REFLECTION | INVESTIGATION

This chapter presented the investigative part regarding how this building can be transformed to develop an Architecture Center which represent sustainability. By visiting existing architecture centers, analyze other industrial transformation projects, conducting interviews as well as researching about alternative building methods, a good base has been set to start a design proposal. But before that, a reflection of the result will be made to come up with a conclusion regarding the basis for the start of the design proposal.

FUNCTIONS

In an architecture center it is expected that there will be exhibitions. This can be assumed because of the two study visits to existing architecture centers. However, how these are designed and what they will consist of is on the other hand an appropriate way to make the architecture center in this thesis to become something else. Isitt statement "suddenly you stumble across an architectural model" summarize a potential method for this. To achieve this, other functions are required in buildings. Also, partly to create a continuous flow inside and towards the center. These functions should be related to sustainability due to the aim of this thesis. Several examples were discussed during the two engaged interviews. Based on this a program of functions will be developed.

It is clear based on the interviews and site analysis that this architecture needs to be something else to be successful. It will be transformed within an existing building with alternative building materials but what will bring people here? The selected functions should increase the flow but also arouse curiosity and dare to be different. By finding a balance between everyday functions together with un-

explored sustainable functions, which can be related to architecture, an architecture center that represents the future can be developed. It will also be important to attract people with all ages within different industries.

TRANSFORMATION

How the selected building for the project should be transformed is a relevant discussion due to the thesis focus on sustainability but also based on the site analysis and the building's history. To investigate how this could be done, two case studies of two existing transformed industrial buildings were carried out. The studies resulted in relevant information about potential design strategies to respect the heritage and history of the building. For example, diagonal sight lines to increase the experience of the spacious industrial volume as well as clarify old and new elements. To be able to transform the building in a respectful way, an analysis of the building will be made in the following chapters. Presented selected design strategies, based on the case studies of the transformation projects, will also be clarified.

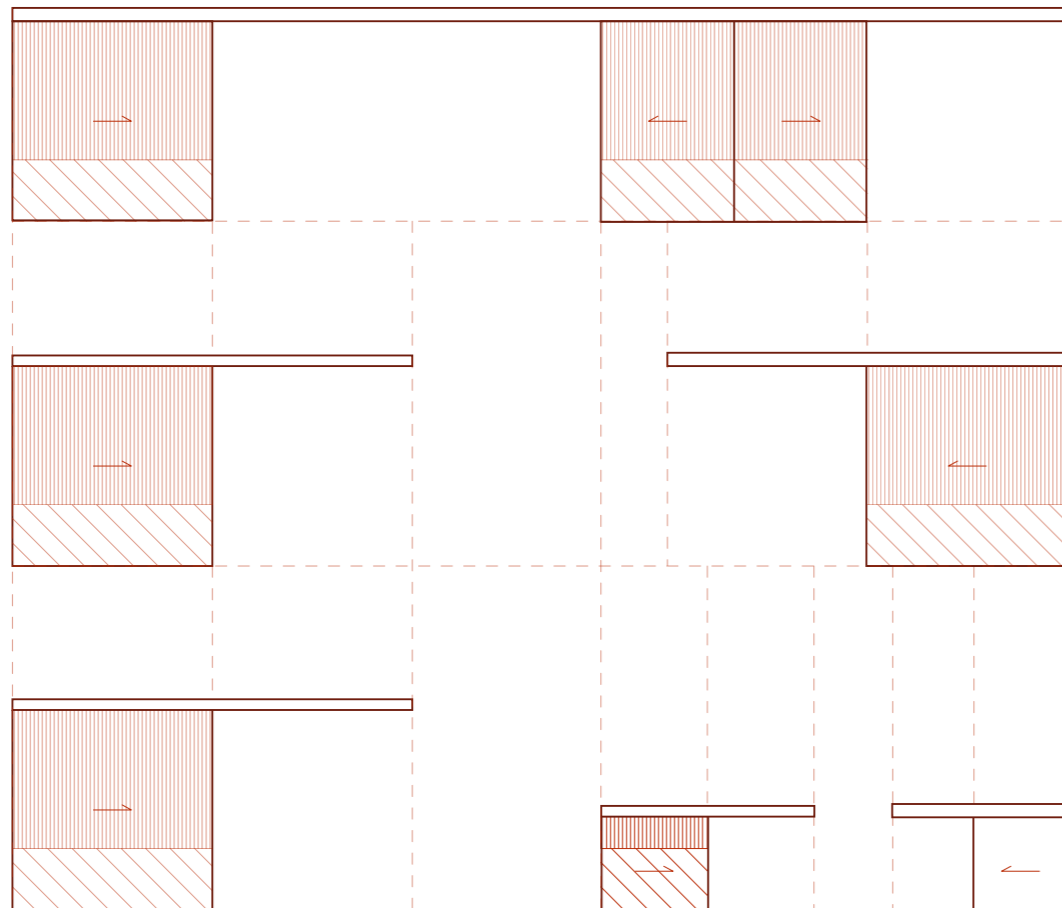
Regarding the transformation of the exterior, Mark's opinion of treating it as if it were made of gold as well as Gunneflo's argument to take care of it the large facade towards the southwest will be considered. Taking care of the buildings existing exterior expression but at the same time letting the southwest facade speak to the river and city will be a decisive factor in the project's exterior renovation to find a balance between preserving and transforming.

5 | DEMONSTRATION

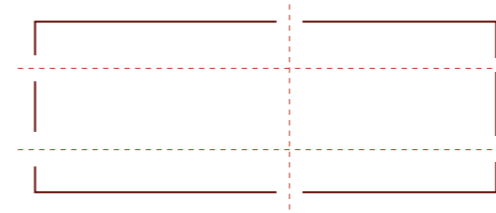
As a result of the previous chapter, it is clear that the building's heritage is important. To create a good starting point for the design proposal, with heritage in focus, existing elements have been identified. The gates represent the history of the building, and its openings create three clear sight lines. These are important to experience the length of the volume as well as the existing light admissions. The ceiling lights follow two of the mentioned sightlines. The

entire building has a clear structure that creates a grid. To respect the building, this will be considered. One of the most important parts of the building's heritage is the existing cranes. They will be used in a significant way. The same importance goes for the building's connection to the waterfront towards the city. By moving the closest port crane in front of the selected building, it will take part of the design of the outdoor environment as well.

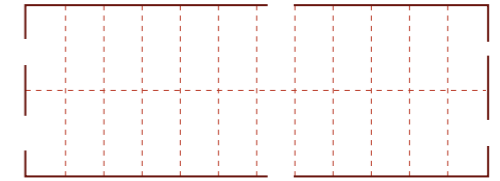
Gates



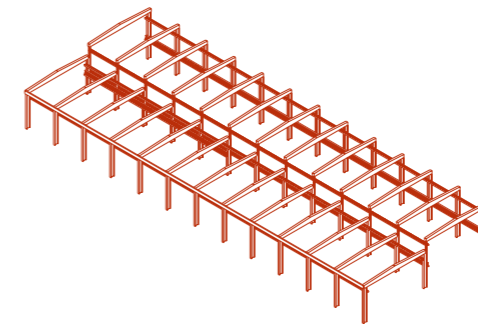
Sight lines



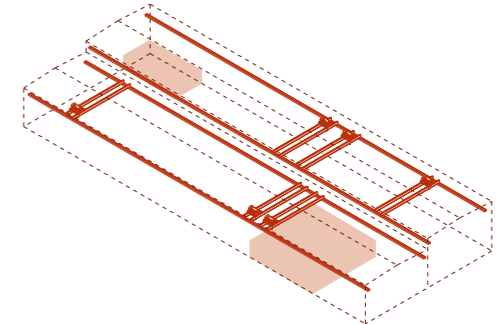
Grid



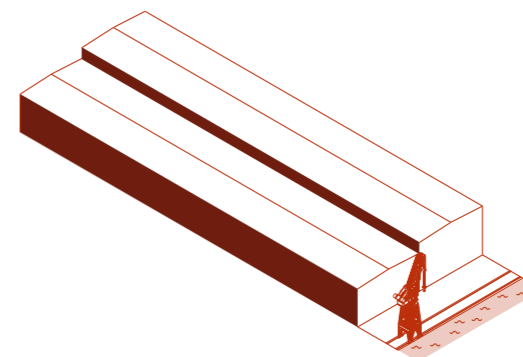
Existing structure



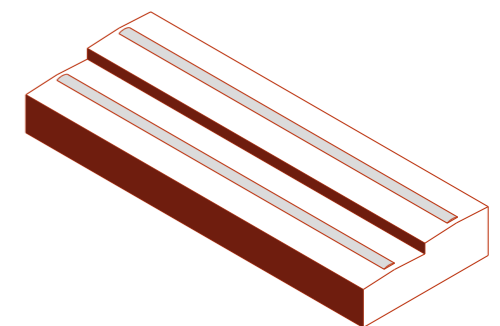
Existing cranes and volumes



Connection to the waterfront



Spacious volume and ceiling lights

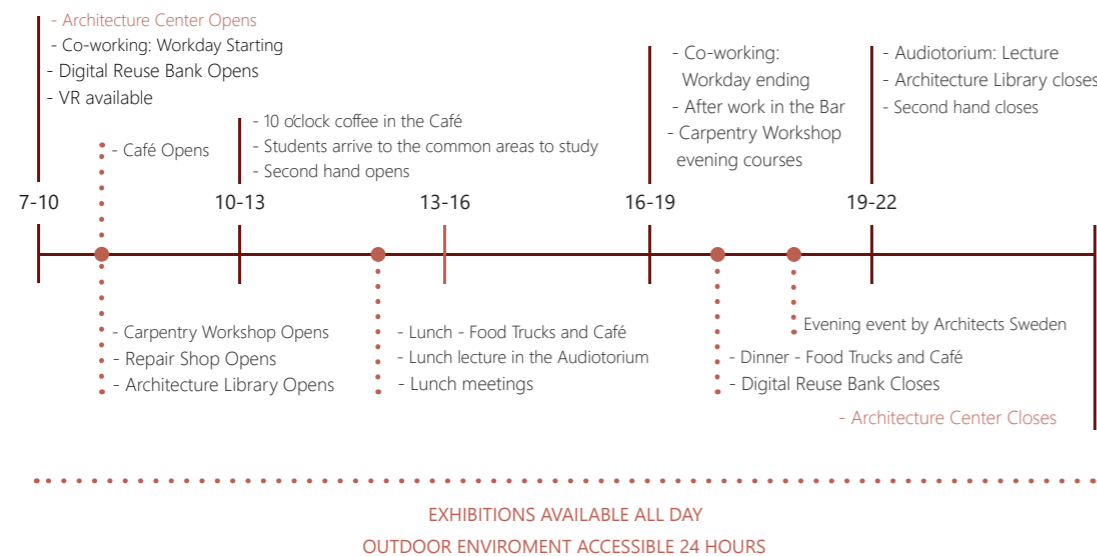


PROGRAM

Based on the results from the previous chapter. The program is the basis for the transformation but will be adapted to the building.

EXHIBITION AREAS Will represent the main part of the architectural center and the function will have a significant place.	EVENT AREA Includes an architecture library and a material library. Also meeting rooms, flex rooms and an auditorium.
SECOND HAND INTERIOR DESIGN Second hand for interior design will promote and inspire a sustainable way of consuming.	DIGITAL REUSE BANK Information about available reuse materials in order to promote sustainable construction.
VR A function where the visitors can experience different things associated with sustainability.	CARPENTRY WORKSHOP A creative place. Courses in carpentry can be held, school children visit as well as for public use.
REPAIR SHOP The repair shop represent to use what we have, fix what is broken, instead of consuming new things.	CO WORKING SCIENCE PARK An extension of the nearby Lindholmen Science Park. Here, experiences and knowledge can be exchanged.
CAFE, FOOD TRUCKS AND BAR An organic café, interchangeable food trucks and a bar placed in water represent the food area.	COMMON SPACES This function represent necessities such as storage, wardrobes and toilets.

ESTIMATED DAILY SCHEDULE



PROGRAM CONCEPT

The exhibition spaces will have a central part in the project to create a successful architecture center where knowledge and inspiration can be shared. To create a center with a continuous flow and activity, additional functions are required. The selected functions relate to architecture in different ways but also represent ecological sustainability in consumption and contribute to an increased knowledge of sustainability in the construction industry. By combining the selected functions with reuse, alternative building materials and adaptive reuse, a sustainable transformation will represent the project.



DESIGN CONCEPT | CREATE SPACES WITHIN A SPACE

The concept of the design proposal represents creating space in an existing space, the chosen building. By utilizing the existing shell, which represents what can be called an intermediate climate, for weather and wind, three different types of spatiality will be used. Apply a floor surface, a

floor surface with a roof, or a floor surface with a roof and attached walls. The concept creates two different climate zones, intermediate climate or indoor climate. The function will control what kind of spatiality will be used where. This concept will be strengthened by the chosen design strategies.



DESIGN STRATEGIES



SIGHT LINES
 By working with long sight lines the experience of the generous volume will increase.



HIGHLIGHT THE HERITAGE
 By clarifying the heritage and taking advantage of the existing elements a unique center will be developed.



CLIMATE ZONES
 Through additional volumes with different climate zones energy and material consumption can be saved



SEPARATE OLD AND NEW
 By allowing the new elements to differ from the existing ones, the heritage of the building is respected

6 | TRANSFORMATION

INTRODUCTION

The old Reparationsverkstaden has been transformed into an innovative Architecture Center where knowledge and experience can be shared through exhibitions and functions. It is a place for everyone - for students who need an inspiring place to study, for start-ups who need a small workplace or the retired person who loves carpentry. This project represents a balance between sharing knowledge about architecture and sustainability within alternative building materials, reuse and adaptive reuse. The design proposal takes care of how we can take care of the buildings that already have been built and how its heritage

and history can be taken care of in a respectful way. It has been important to develop an Architecture Center for the future but with an opportunity to open to allow it to grow and develop over time, just like the entire district. The design proposal presents a proposal for a well base and takes care of the importance of allowing the place to be adapted based on needs, time and interest.

Welcome to the Architecture Center!

ILLUSTRATION



Illustration from the deck towards the south part of the site

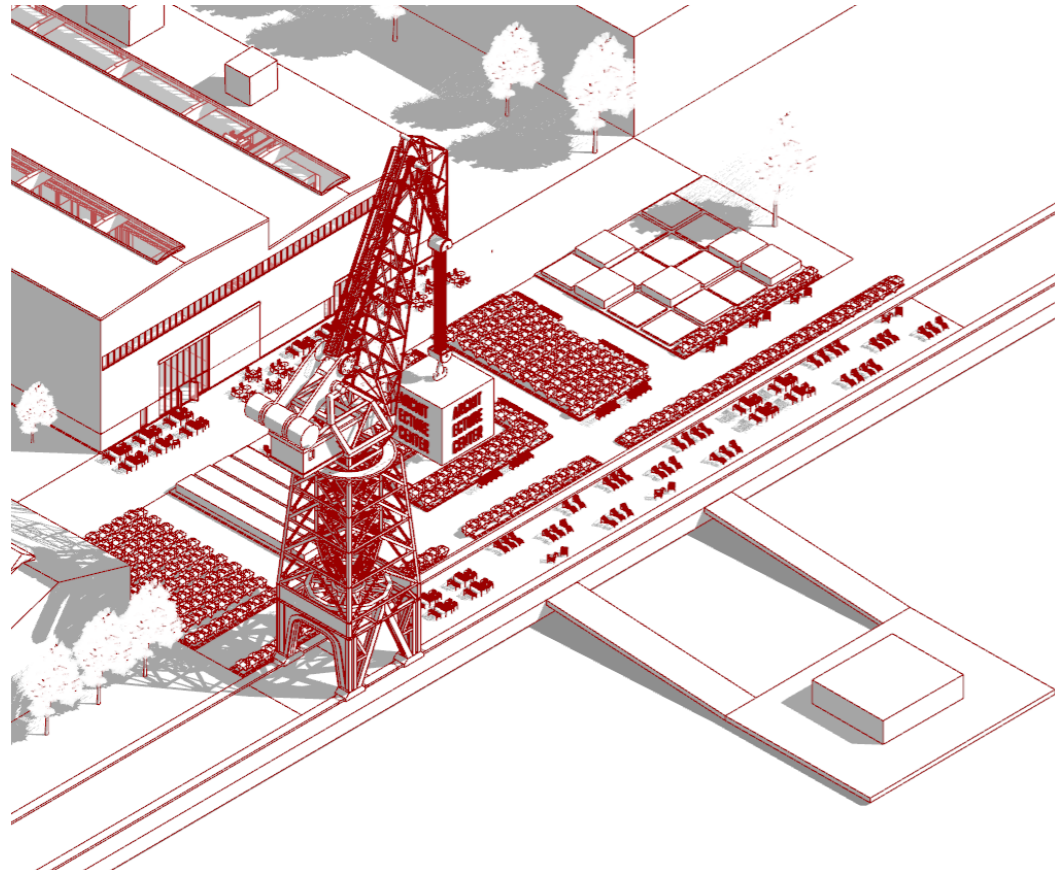
PROCESS

By matching and hierarchizing the building's presented important key elements, the project's design strategies and concepts with the building's expected functions, a credible and rational base for the project was created. For example, the most important function inside the building are the exhibition spaces. An appropriate way to clarify these is with an important element of the building that further strengthens the heritage – the existing cranes. By using the existing cranes, diagonal sight lines are created, which also allows the visitor to take part in the generous space in the existing building. Given that exhibition spaces do not

require an indoor climate, the concept *floor surface* as well as *floor surface + roof* can be used. The example clarifies how the concept will further reduce the material consumption and energy for heating. Similar arguments could be used for the other presented connections between function, element, design strategy and concept. For instance, by placing the additional volumes with alternative building materials in the existing grid, respect for the building was created. The other connections are presented in the columns below.

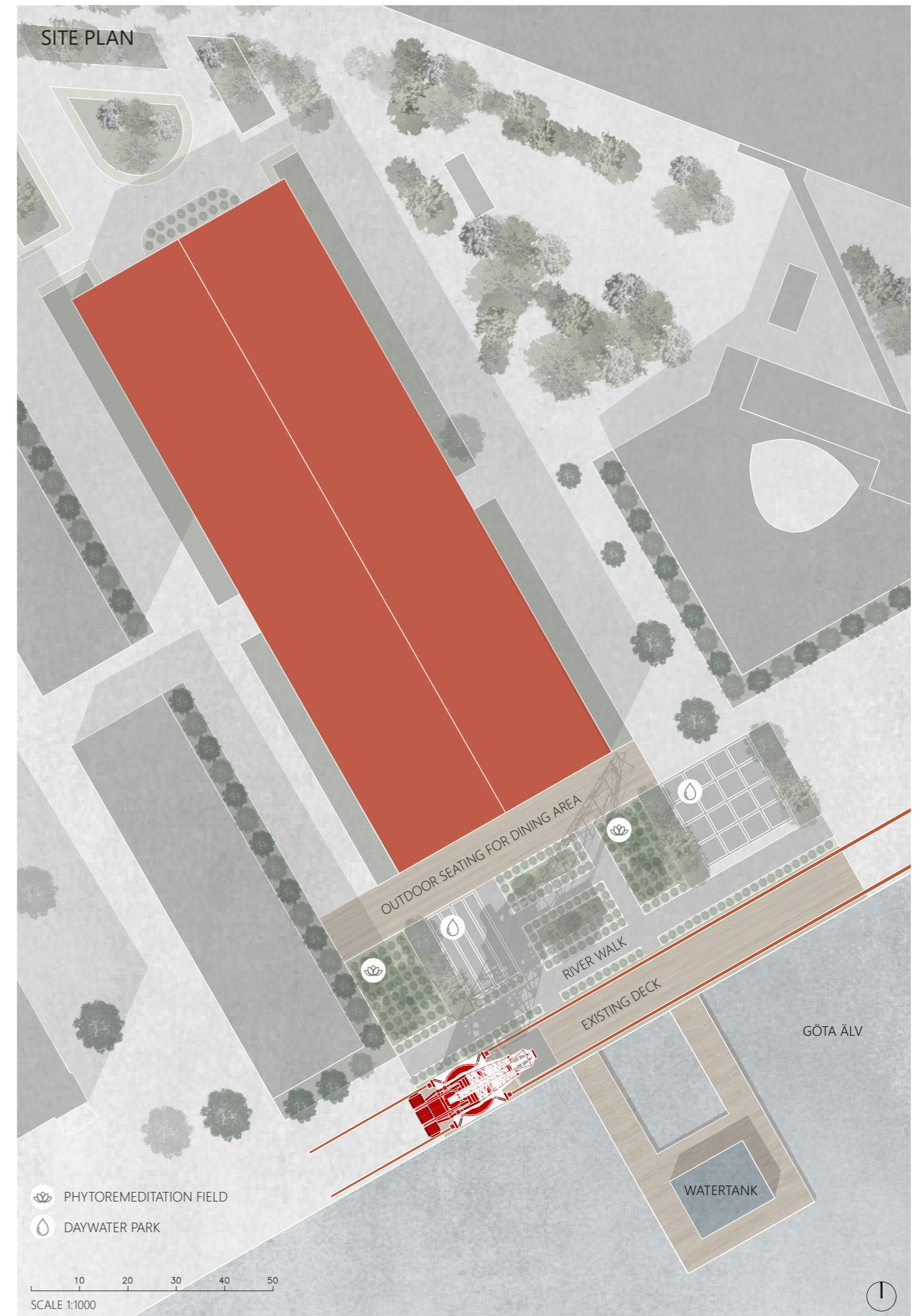
FUNCTION	ELEMENT	DESIGN STRATEGY	CONCEPT
Exhibitions spaces	Existing cranes	Diagonal sight lines	Floor surface Floor surface + Roof
Additional volumes	Existing grid	Separated old and new Alternative building materials	Floor surface Floor surface + Roof Floor surface + Roof + Wall
Additional functions	Existing volumes	Climate zones	Existing volumes Floor surface Floor surface + Roof Floor surface + Roof + Wall
Outdoor space	Existing shipyard cranes	Clarify the heritage	Floor surface Floor surface + Roof

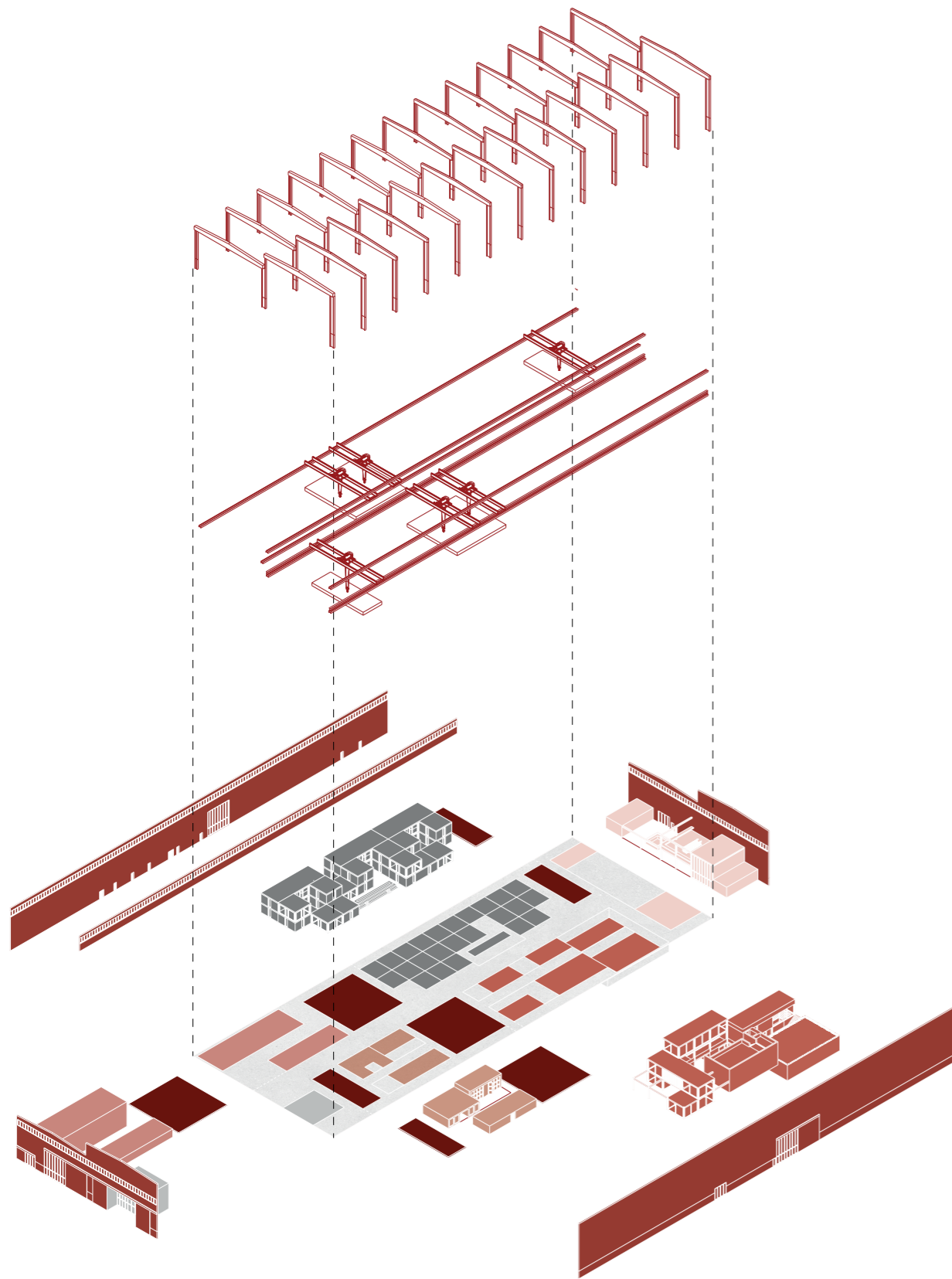
SITE



The renovation of the selected building will be part of the major transformation of the old shipyard and the whole district. However, the focus of the thesis is the transformation of the chosen building, but considering how the building faces Gothenburg's city center, the south part of the site is relevant for the center's general expression towards the city and the overall impression. By moving one of the site's existing old port cranes closer to the selected building, to hang an element in, creating a varied outdoor space with water parks, green areas and outdoor seating, the landscape tells us that something is happening here. The green areas mostly consist of phytoremediation plants. Plants that immobilize, take up and break down compounds in the soil. The river walk pass the architecture

center as well. Underneath the port crane an existing deck will be kept, here you can bring your own picnic for example. Seating furniture are available. An accessible dock can be reached from the deck. With the purpose to take part of the feeling of the river but also a water tank. The water tank represents a future water level. The outdoor entrance room consists of existing greenery, new planting and space for accessible parking. The landscape design is well adapted and helps visitors find their way to the entrances. The western and eastern parts are only updated with greenery due to the importance of maintaining the long sight lines and the old yard's urban grid, but one of these activates due to the new location of the shipyard cranes.





ENTRANCE

Information
MATERIALS: Reused brick

WORKSHOP

Repair shop - Carpentry
MATERIALS: Existing volume, reused brick and windows

ENTRANCE HALL

Second hand interior design - VR - Digital reuse bank - WC
MATERIALS: Reused brick, mud plaster

EVENT AREA

Event area - Architecture library - Material library - Auditorium - Flexible rooms
MATERIALS: Mud plaster, rammed earth and timber

DINING AREA

Café - Bar - Food Trucks - WC
MATERIALS: Mud plaster, reused brick and timber

CO-WORKING SCIENCE PARK

Rentable modules for companies and start ups.
MATERIALS: Mud plaster, timber

EXHIBITION AREAS

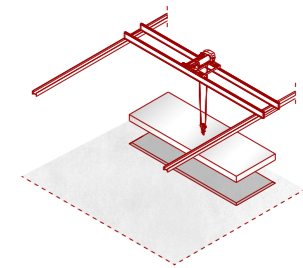
Two large and two small exhibitions spaces. Possibility to change appearance based on current exhibition. See in detail on the page.

EXHIBITION AREAS

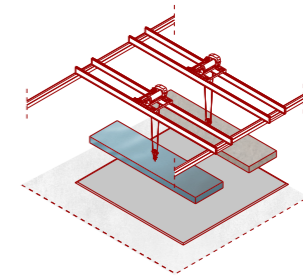
The Architecture Center has four main exhibition areas. These are placed underneath the most important identified element inside the selected building, the cranes. By placing the exhibition spaces here, informative and innovative places can be created. The cranes can

be used to hang heavy elements in which can create unique exhibitions. Based on the investigation, the project presents four possible exhibitions, but these are interchangeable and will change over time.

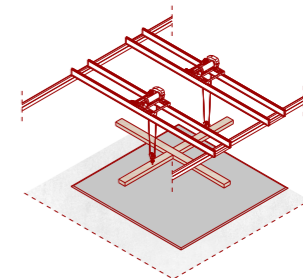
1. The first exhibition area, one of the smaller ones, is located in the entrance hall. Here you can take part in a temporary exhibition by a guest exhibitor. The exhibition uses the crane to hang a box of mirror which give an interesting and an elegant expression.



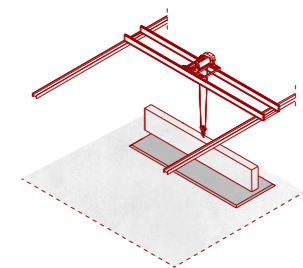
2. The second exhibition area is one of the larger ones and it is located between the entrance hall and the event area. This exhibition is currently about the polluted ground in the area and the future water levels. Contaminated water and soil in blocks hang the shipyard cranes.

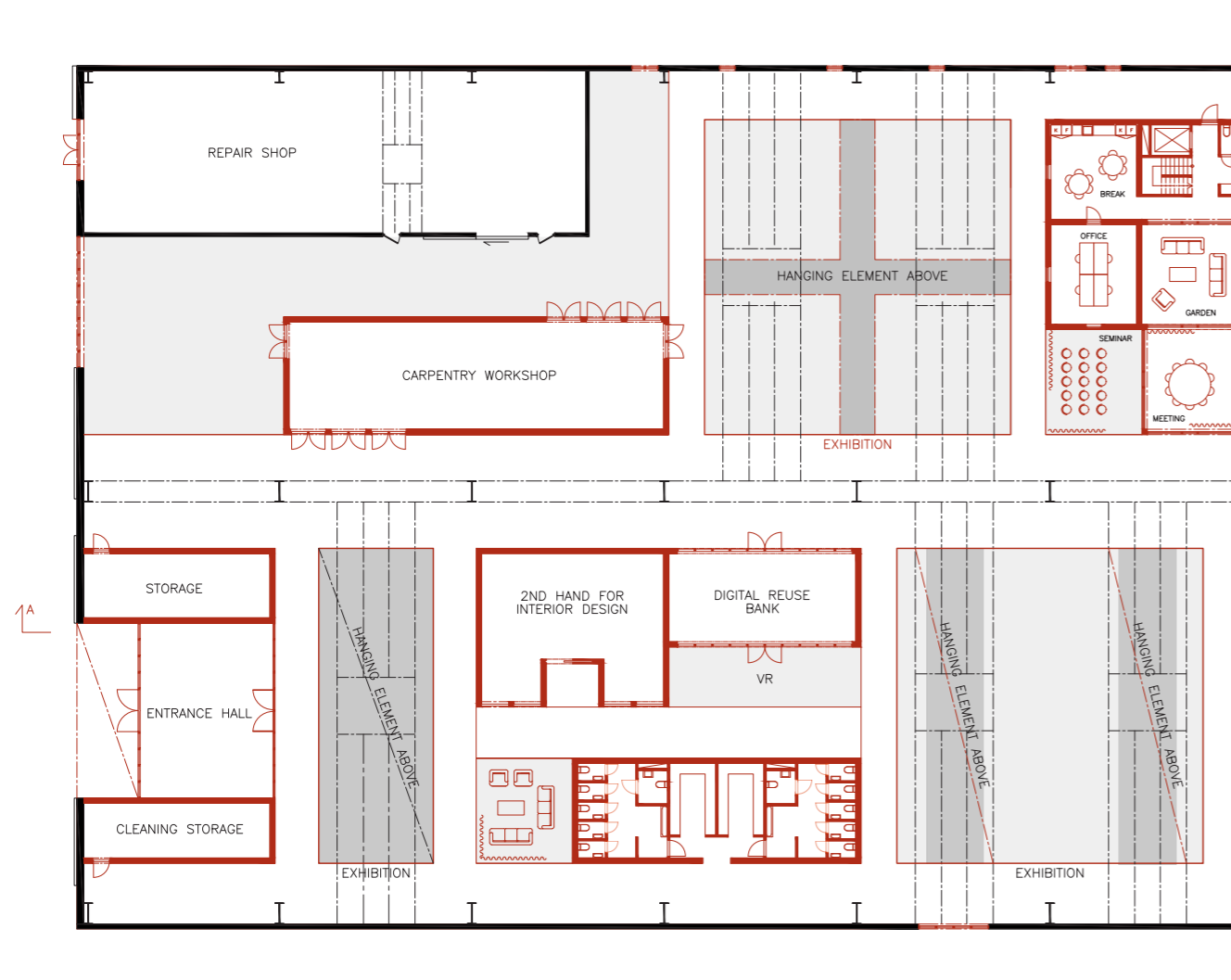


3. The third exhibition area is next to the second. Here you can take part in what is being built in Gothenburg right now and how it affects the city from an economic, ecological and social aspect. In the cranes hangs a wooden cross to which displays are attached.



4. The fourth exhibition area is located close by the cafe and dining area. Just like the first exhibition area this is for guest exhibitor. In the cranes a section of a wall element is hanging.



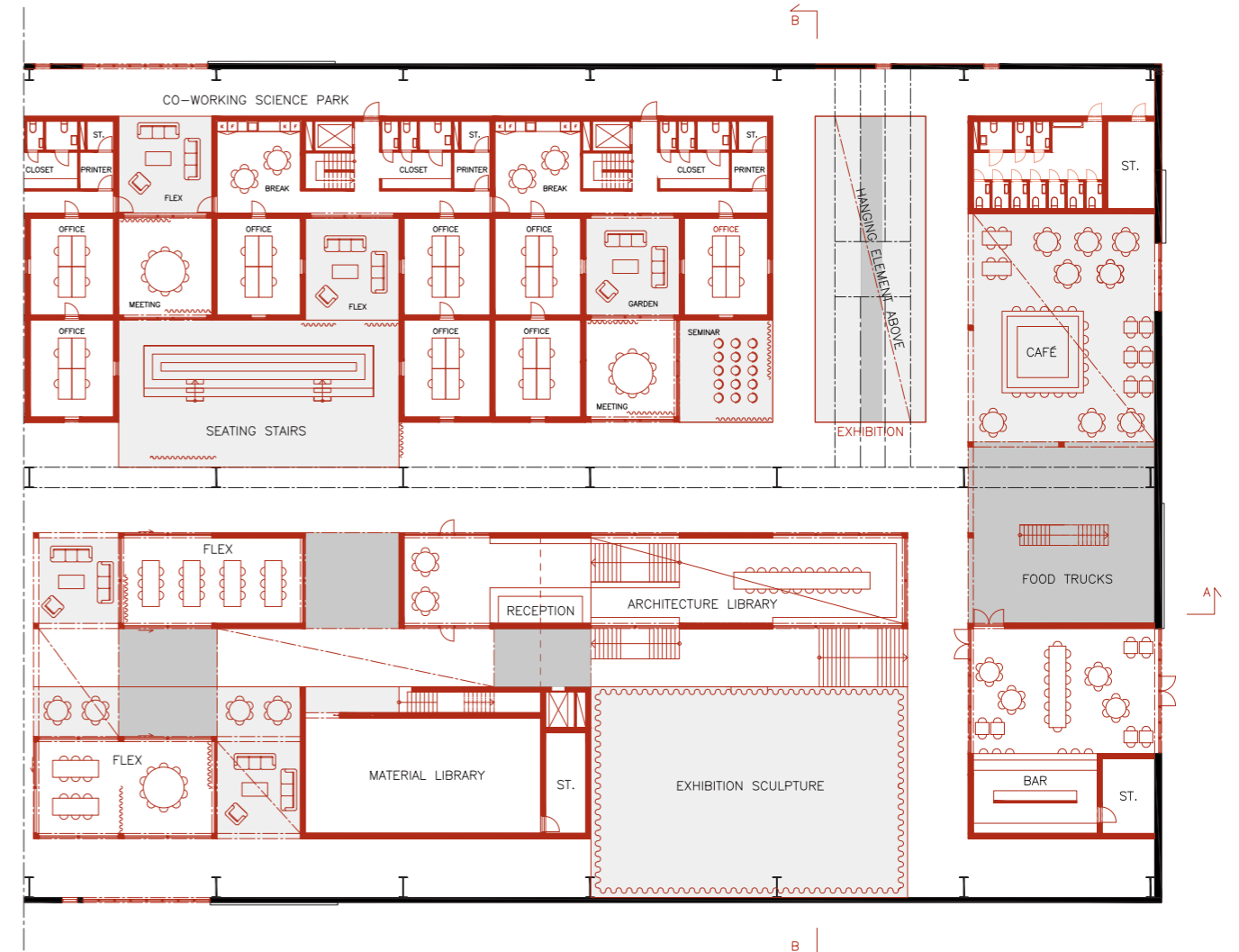


ENTRANCE FLOOR

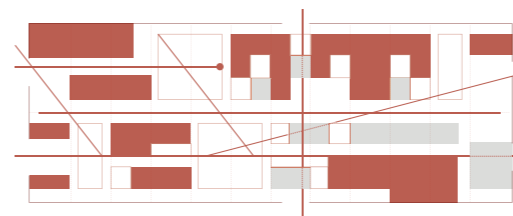
The entrance level of 6,500 square meters represents an innovative flexible design where activities, integration and development are in focus. With the opportunity to develop, both as a company, as an individual and for the center itself. Here you will find exhibition

areas combined with complementary functions that together create an exciting and unique plac in Gotheburg. Spaces within the existing space have been created through the tree selected methods, with other words the presented design concept.

- EXISTING STRUCTURE
- NEW STRUCTURE
- FLOOR SURFACE
- FLOOR SURFACE WITH TOP



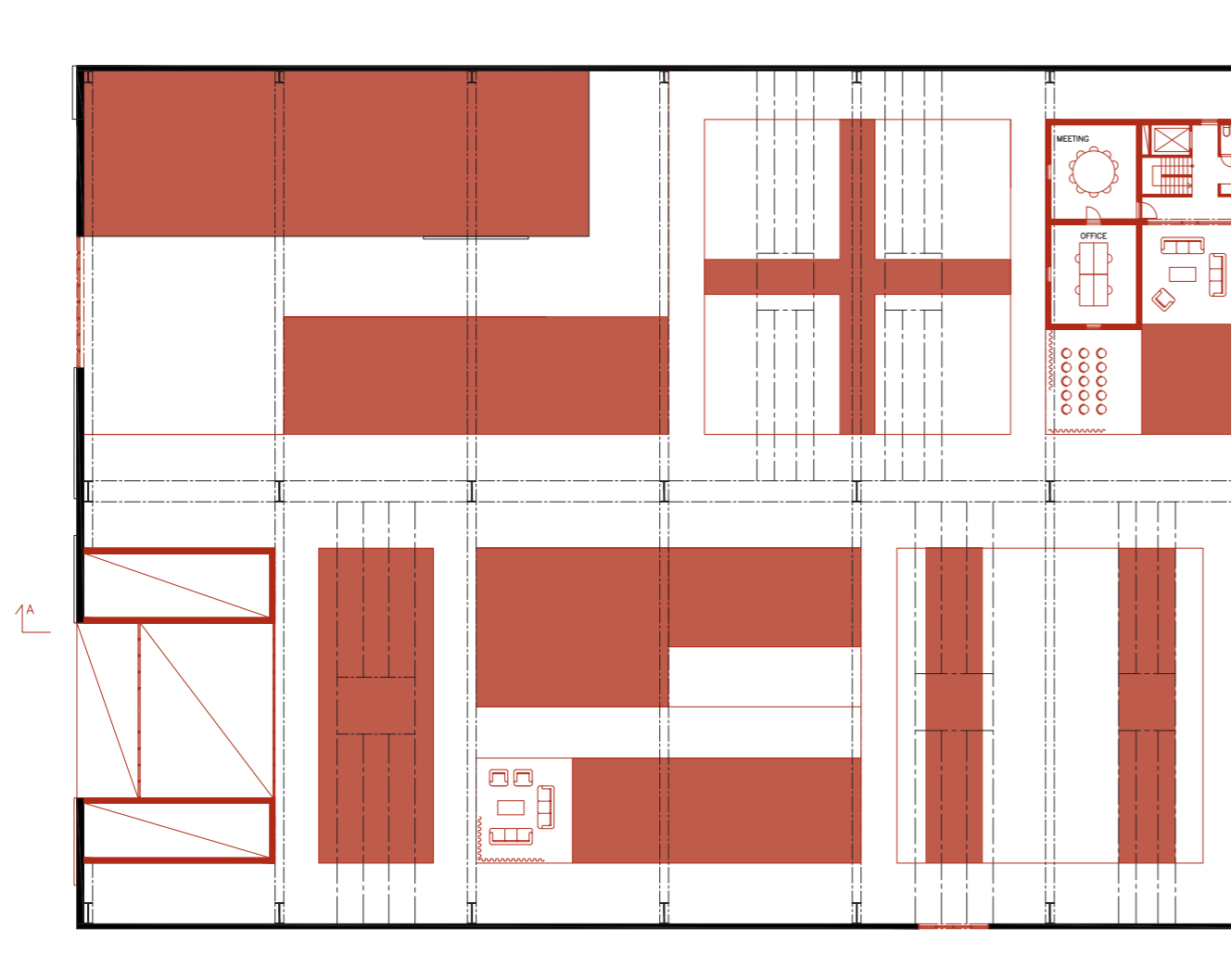
HORIZONTAL SIGHT LINES



The illustration on the left clarifies how two of the three identified important existing lines of sight have been preserved. This has been accomplished by working with transparent volumes and the existing grid. The one that has been blocked enables the co-working space to become more private.

- SOLID VOLUMES
- TRANSPARENT VOLUMES
- SIGHT LINES
- BLOCKED SIGHT LINE



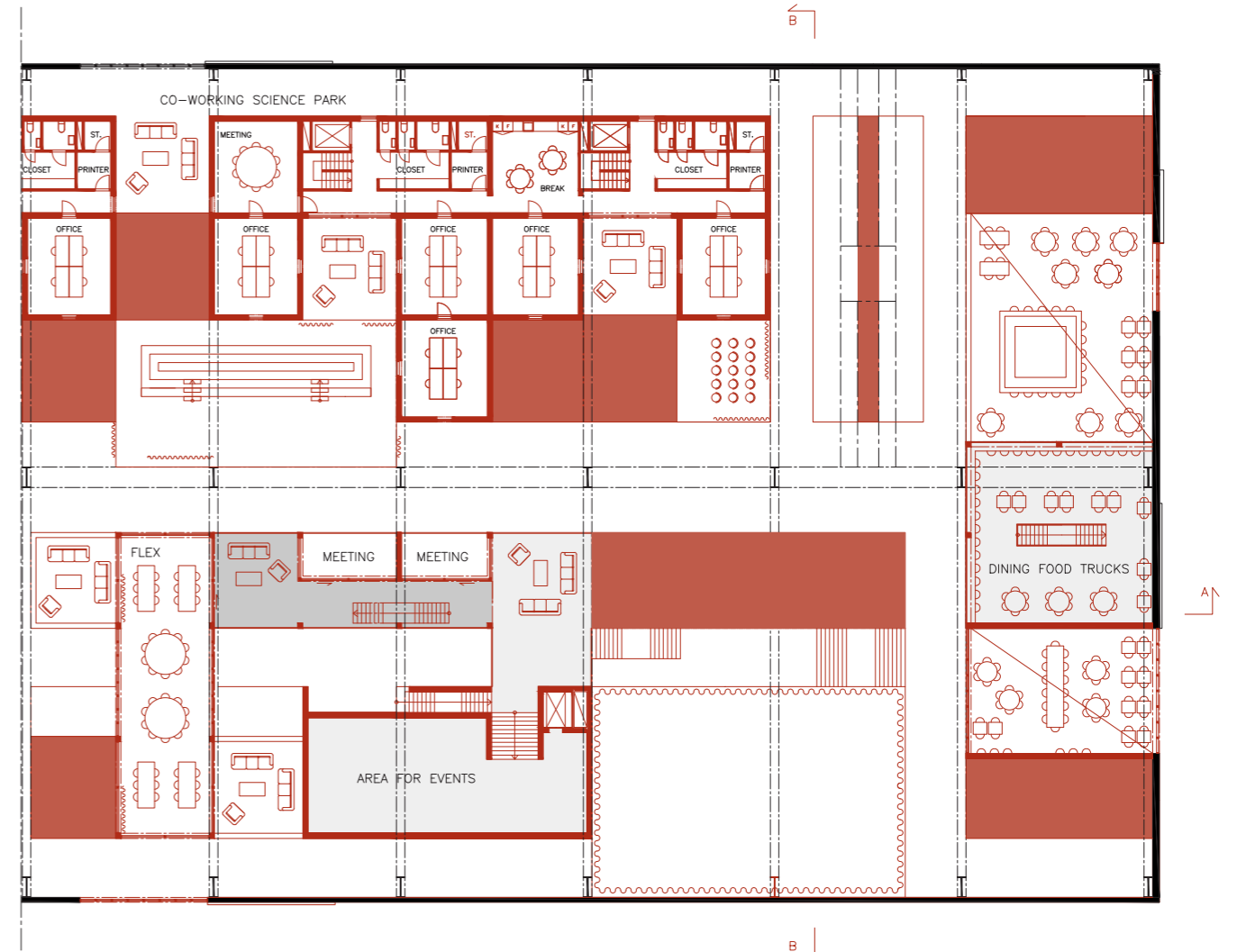


SECOND FLOOR

The second floor can be accessed in the event area, co-working science park and in the dining area. In the event area, you can enter a third floor and a basement as well (see page 72). Also, the co-working science park

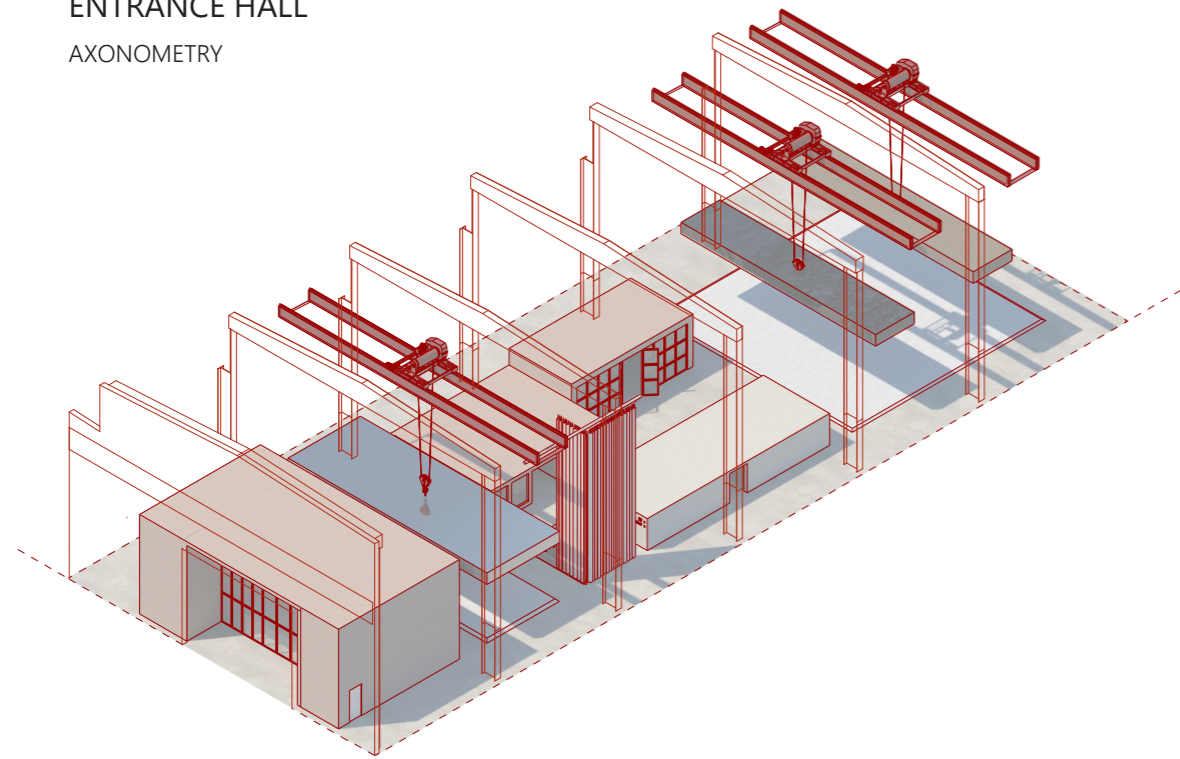
is designed with the aim that it can be easily expanded vertically. By finding a balance between the number of floors within the center, the experience of the large volume is preserved.

- EXISTING STRUCTURE
- NEW STRUCTURE
- FLOOR SURFACE
- FLOOR SURFACE WITH TOP
- TOP VIEW VOLUME



ENTRANCE HALL

AXONOMETRY



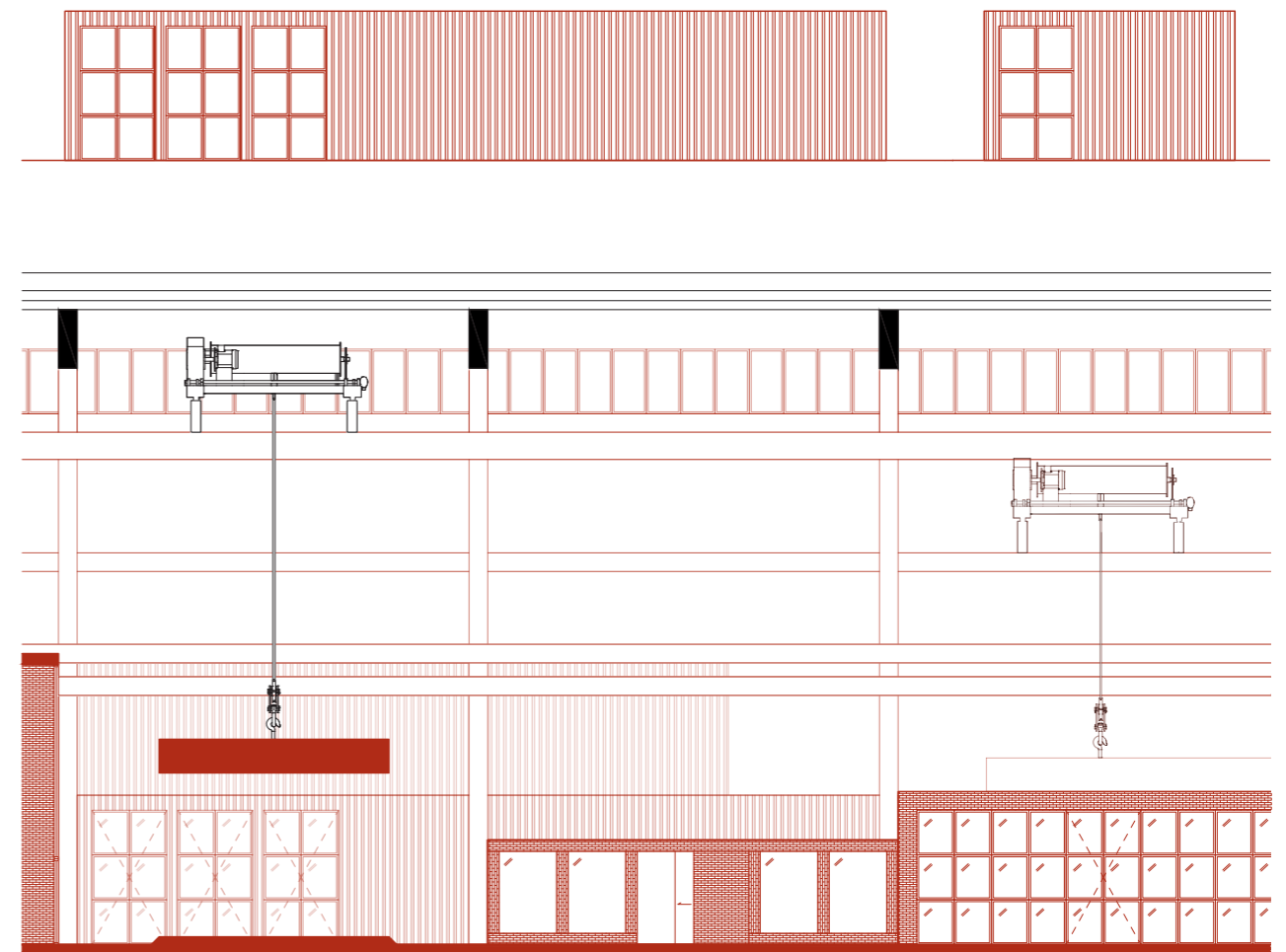
ILLUSTRATION



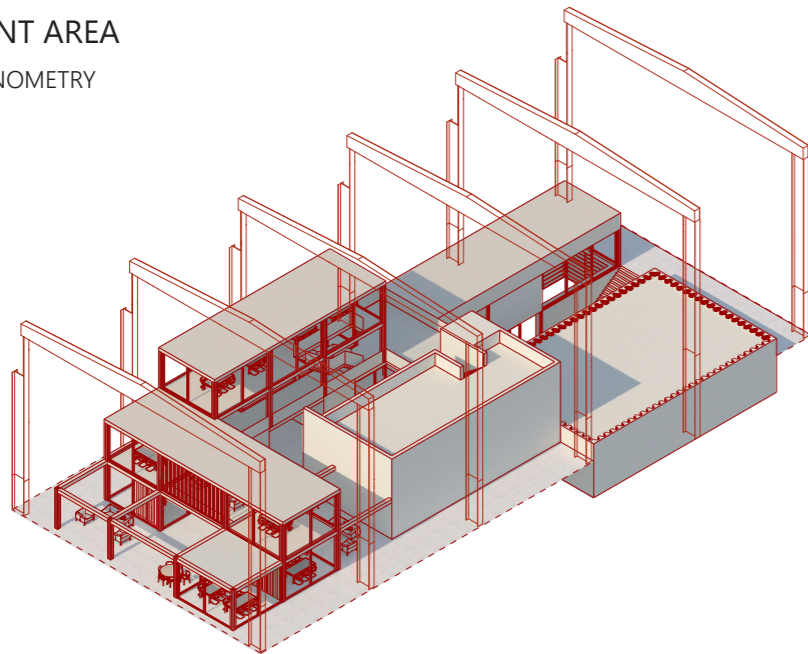
As you enter the building, you stumble upon the first exhibition area. To access the entire center, you follow the sight line which takes you past a lounge area, the second hand and the digital reuse bank before entering the second exhibition area. Reused bricks and clay dominate as materials here, even some of the recycled windows. The structure is clearly visible and the hanging textiles clarify the spacious volume further.

CARPENTRY WORKSHOP

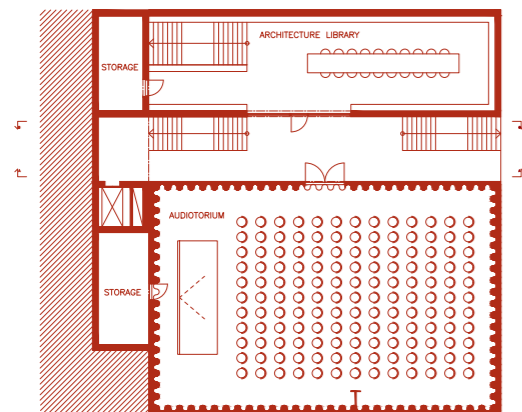
The Carpentry workshop, a place for the experienced carpenter to the one who has his own vision but lacks equipment and knowledge. The workshop is located between the entrance hall and the repair workshop and consists of an indoor climate volume with floor space outside. The volume is designed with the recycled sheet metal facade and the windows from the demolished parts of the selected building. Evening courses for adults and children can be held here.



EVENT AREA
AXONOMETRY



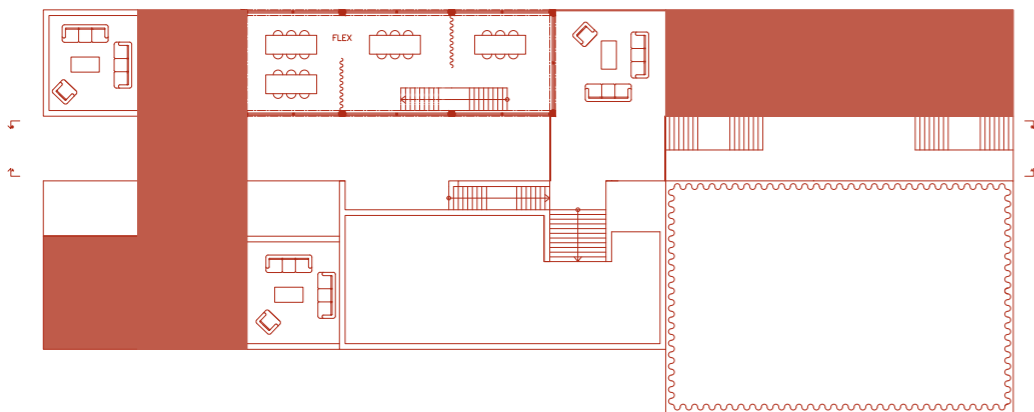
BASEMENT



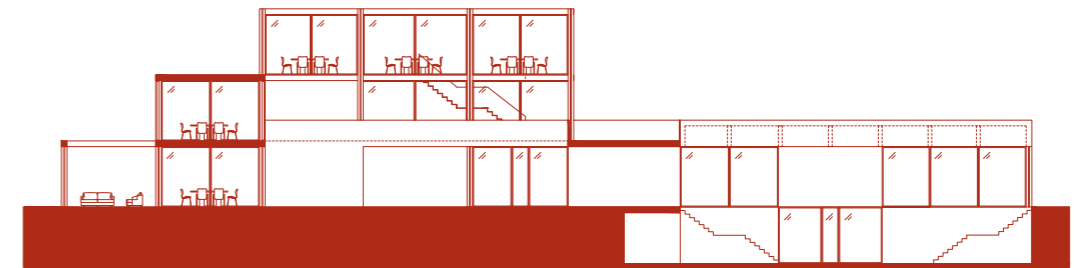
The event area is located above the existing basement. This is transformed into an auditorium and represent a part of the Architecture library. Also, in this area you can enter a third floor. From here you have a great view over the entire center.

- NEW STRUCTURE
- TOP VIEW VOLUME

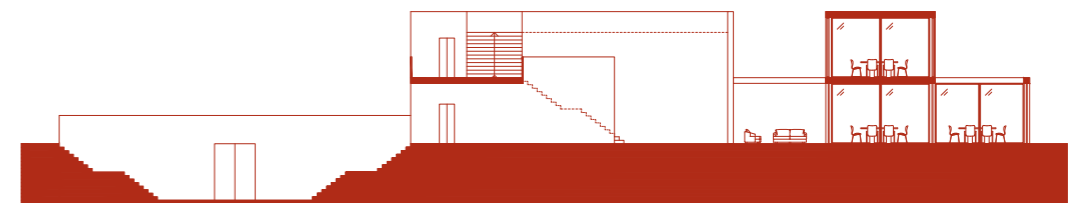
THIRD FLOOR



SECTION A-A

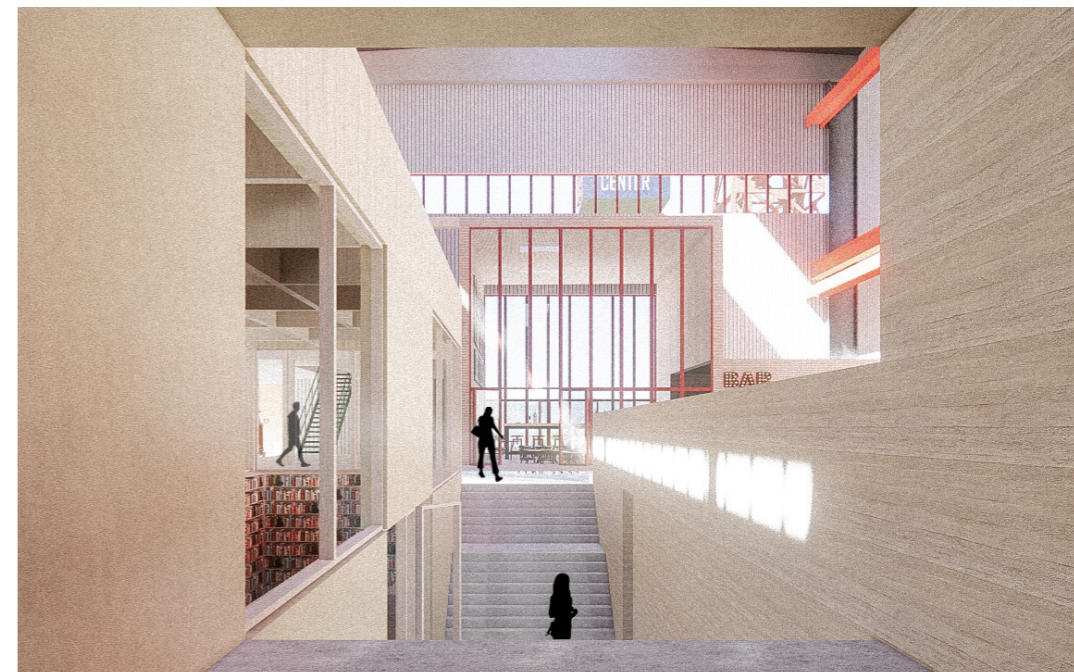


SECTION B-B



The sections clarify the height differences within the event area that the visitor can explore. From the third floor you can experience the entire center from a different perspective. The illustration shows the event area's beautiful contrast between rammed earth, mud plaster and timber. This creates a calm expression compared to the reused brick in the dining area. By playing with different materials in an industrial large volume, a unique atmosphere is created.

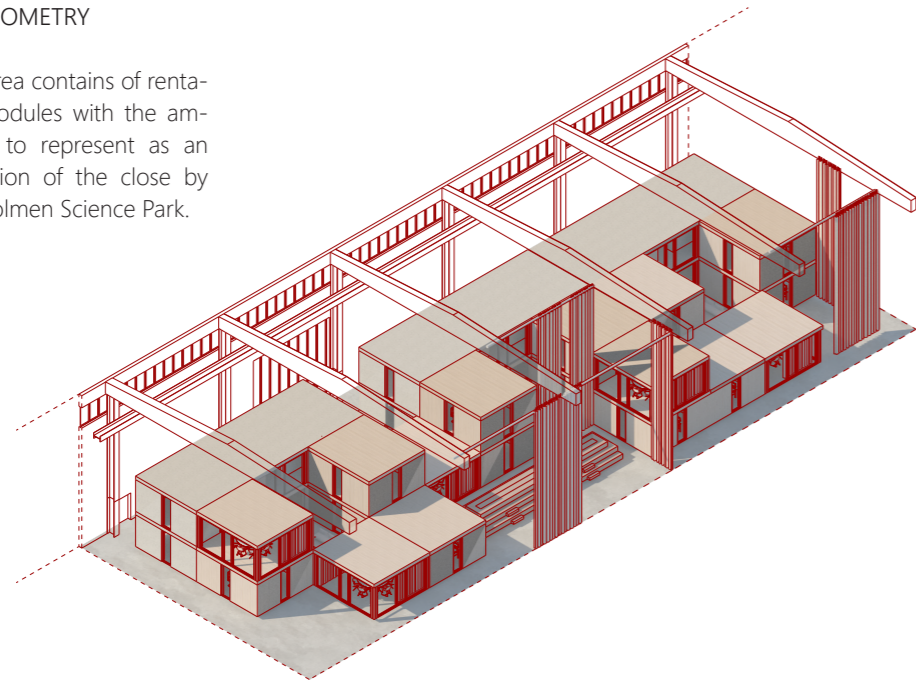
ILLUSTRATION



CO-WORKING SCIENCE PARK

AXONOMETRY

This area contains of rentable modules with the ambition to represent as an extension of the close by Lindholmen Science Park.



ILLUSTRATION

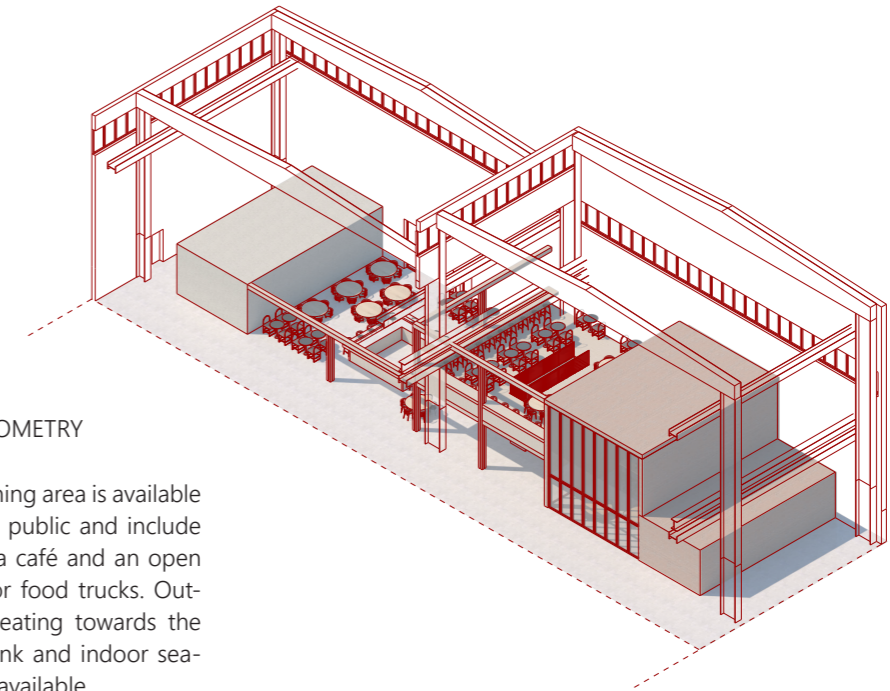
The illustration clarifies the sight line and main pathway between the event area and the co-working science park. The seating stairs can be seen behind the curtains. Smaller seminars or presentations can be held here but it can also be used for relaxing or studying for instance.



DINING AREA

AXONOMETRY

The dining area is available for the public and include a bar, a café and an open area for food trucks. Outdoor seating towards the riverbank and indoor seating is available.

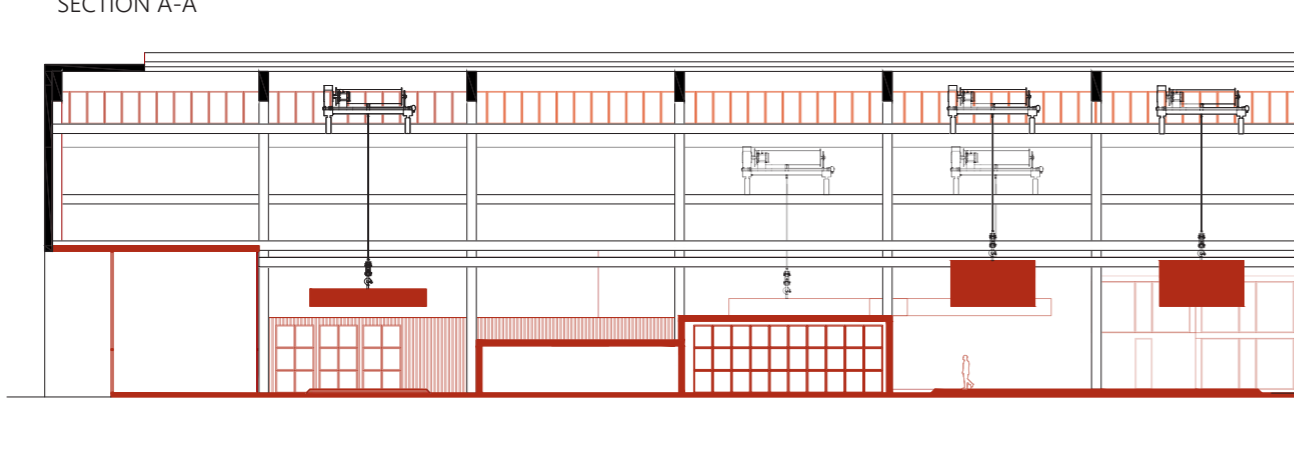


ILLUSTRATION

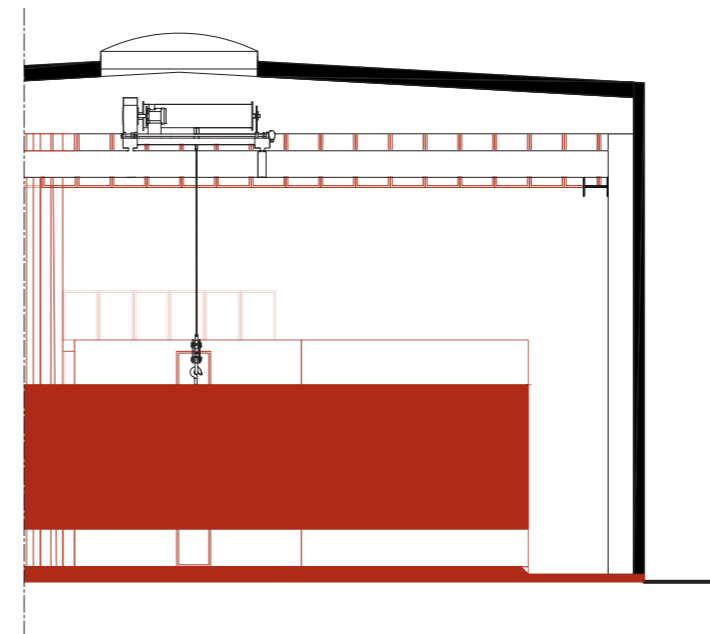
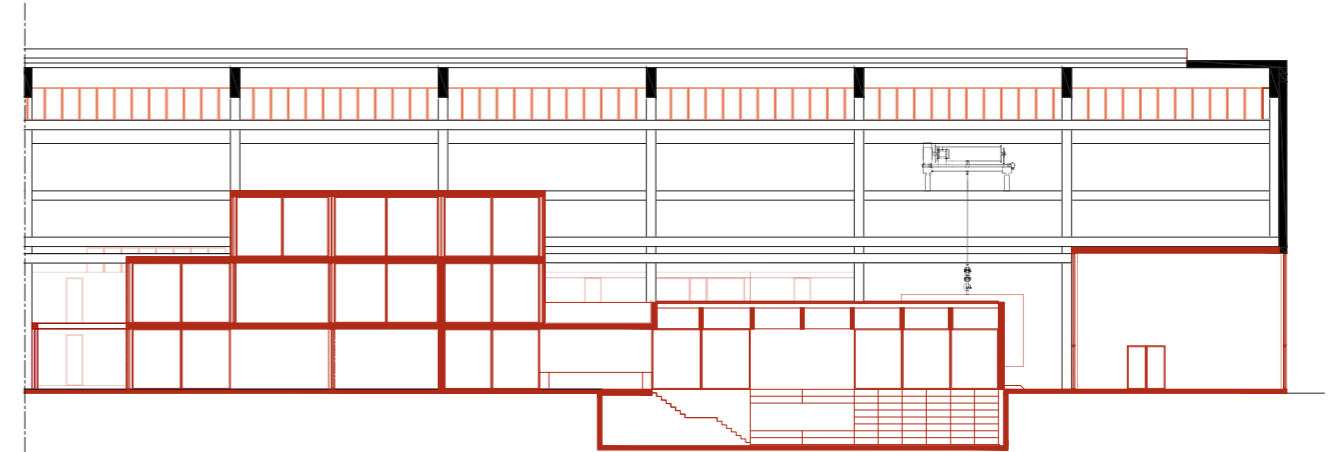
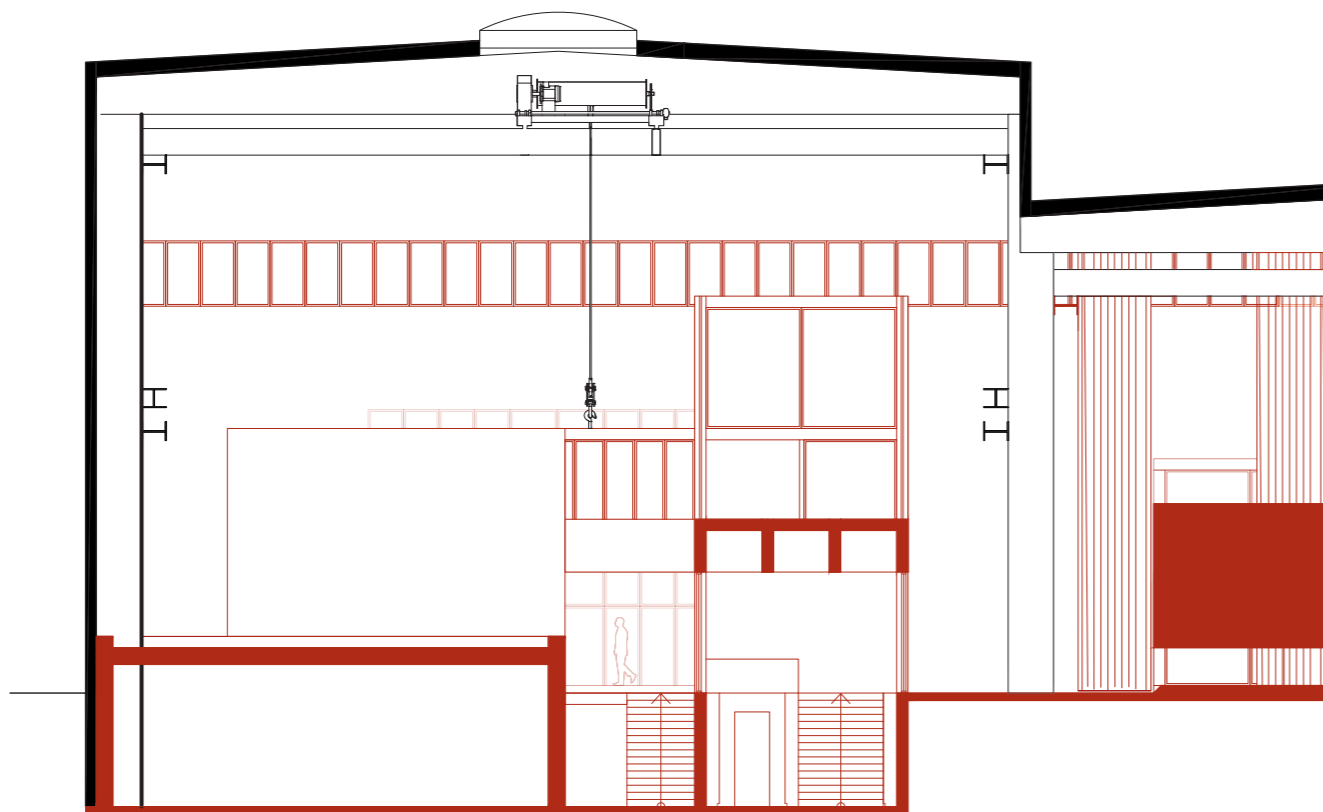
The interior perspective shows the relationship between the event area and the dining area. In the foreground one of the smaller exhibitions can be seen. By placing the auditorium close to the bar, hosted events can use the bar as an extension of the event area.



SECTION A-A



SECTION B-B



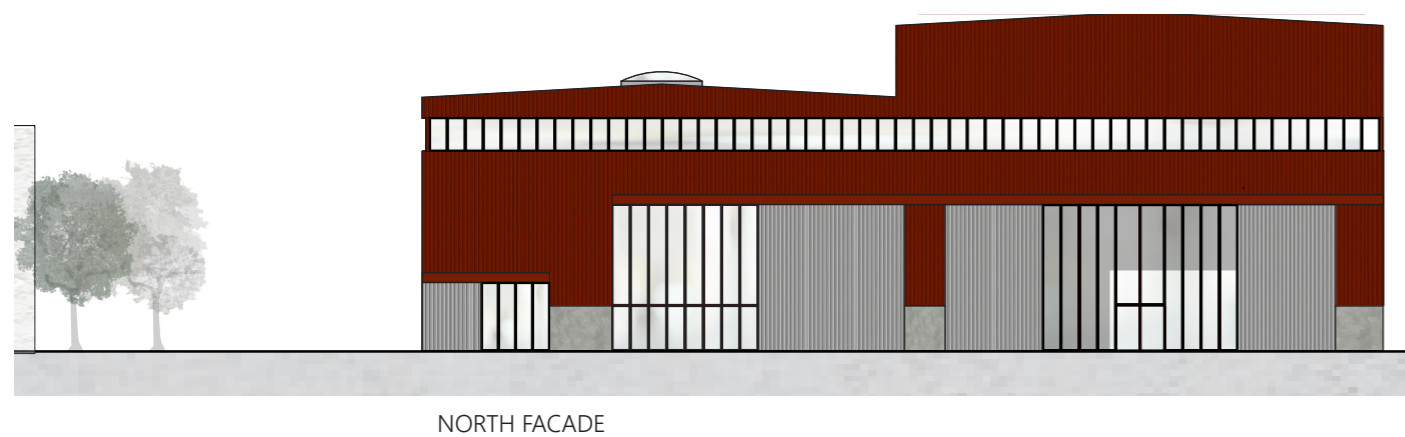
- EXISTING
- NEW

The sections clarify the variation of the added volumes height and size which contributes to a playfulness and exciting atmosphere. Hanging textiles from the building's existing structure contribute to better emergency access and further increase flexibility by creating the possibility to design temporary rooms. The used cranes above the exhibition areas have the possibility to vary in height depending on the wishes of the exhibition. It has been important in the project to utilize the ceiling height of the volume but at the same time dare to maintain the spacious feeling. Therefore, volumes have been carefully placed vertically.

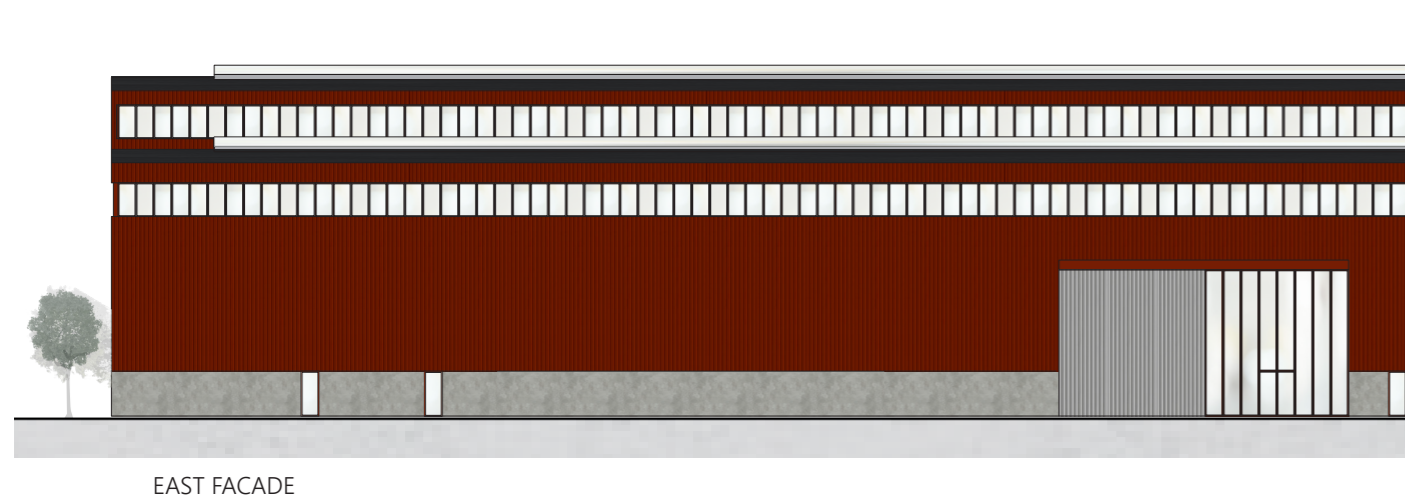


NEW FACADES

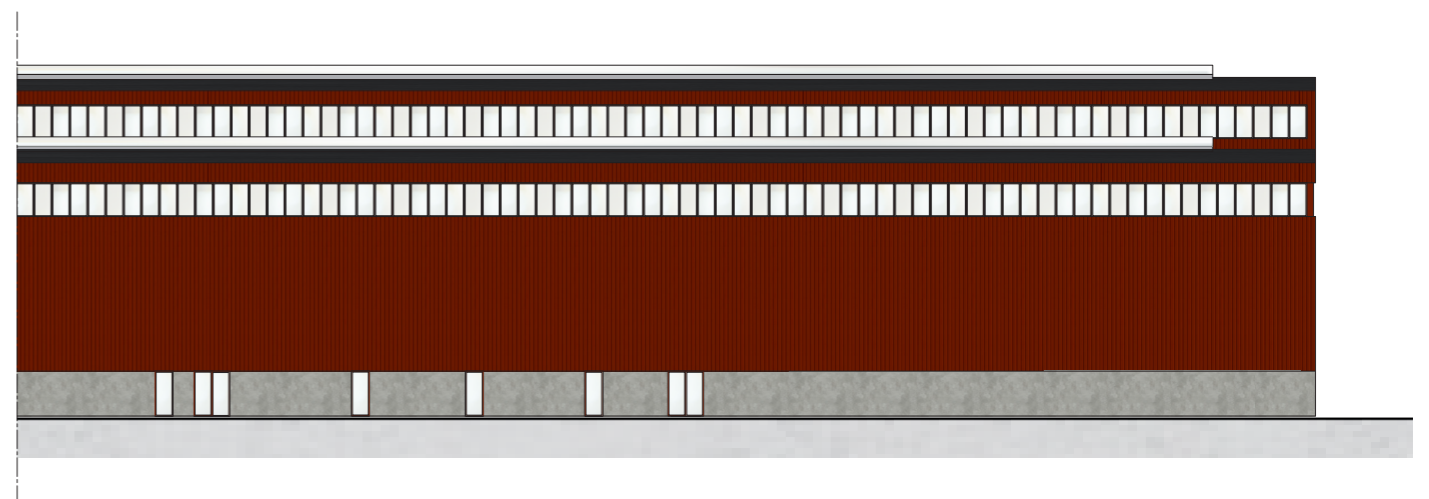
The new facades preserve the original expression but are being upgraded. The red facade color is retained and the same color is used on the window frames. All windows are replaced due to poor condition. The gates are preserved but get a new purpose. These will be used for street art, in other words the new facade will consist of six works of art. The idea is that these may vary over time depending on exhibitions. In this way, the facade gets a new expression at regular intervals. Together with the outdoor environments, the place will be well visible from the other side of town and arouse curiosity.

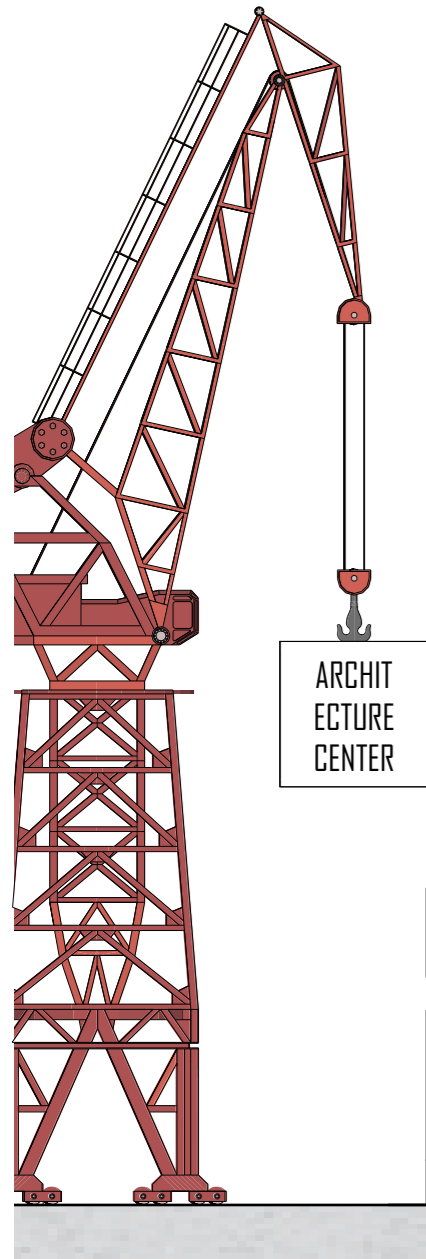


NORTH FACADE



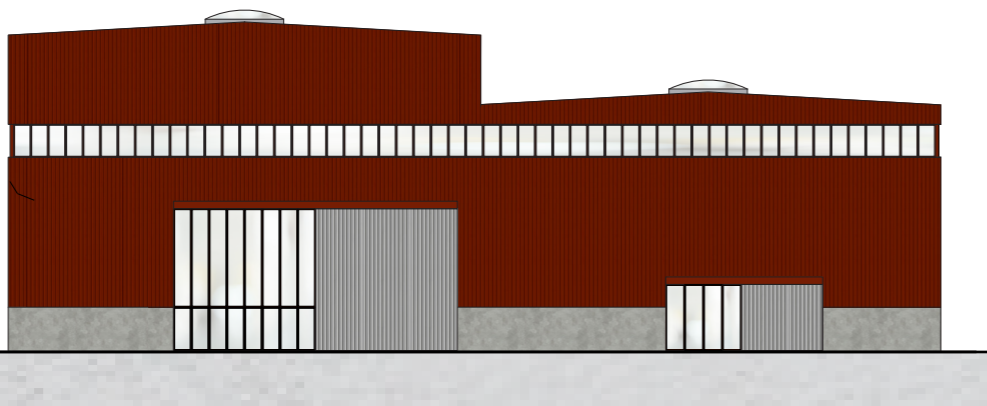
EAST FACADE



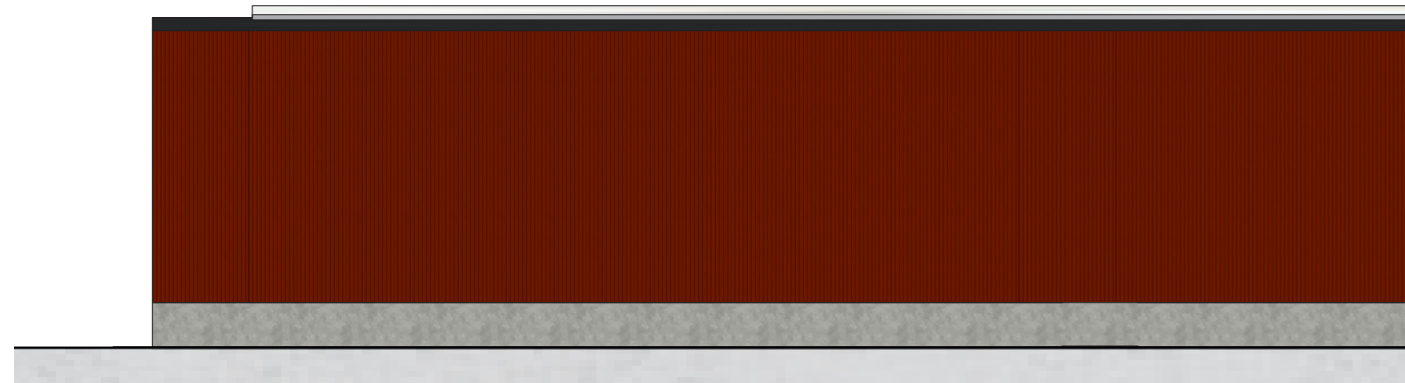


THE PORT CRANE

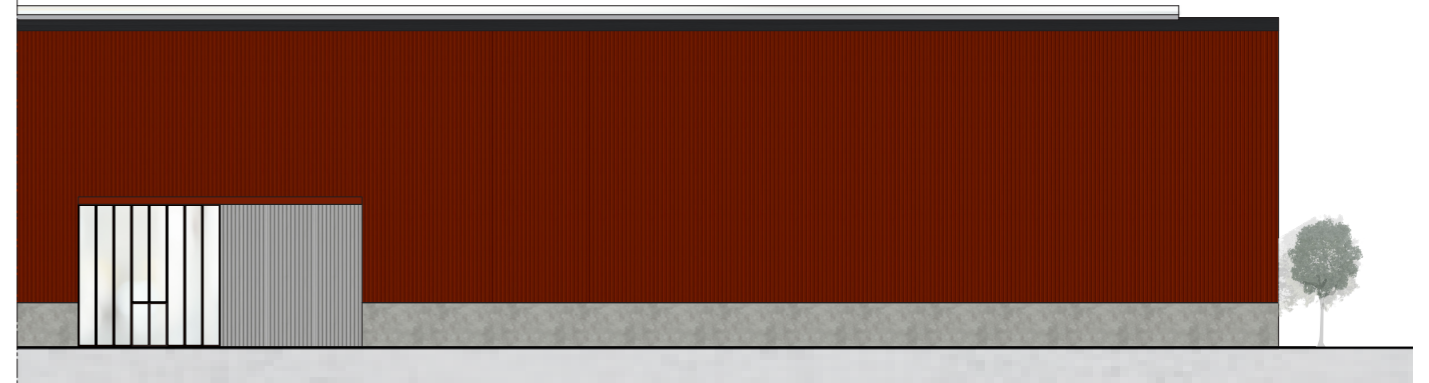
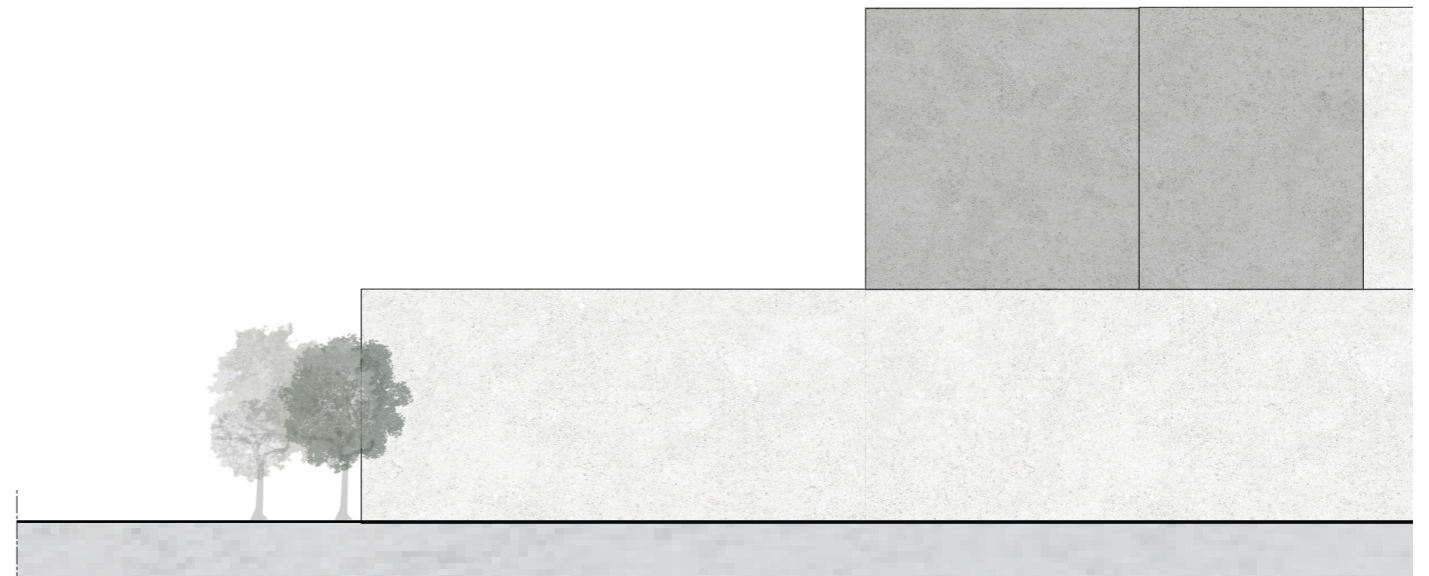
The project uses one of the existing harbor cranes. By moving the nearest one and placing it within one of the long identified sight lines, a completely new outdoor environment is created in front of the building. In the port crane hangs a lighttable cube that can be identified as the centre's sign.



SOUTH FACADE 1:400

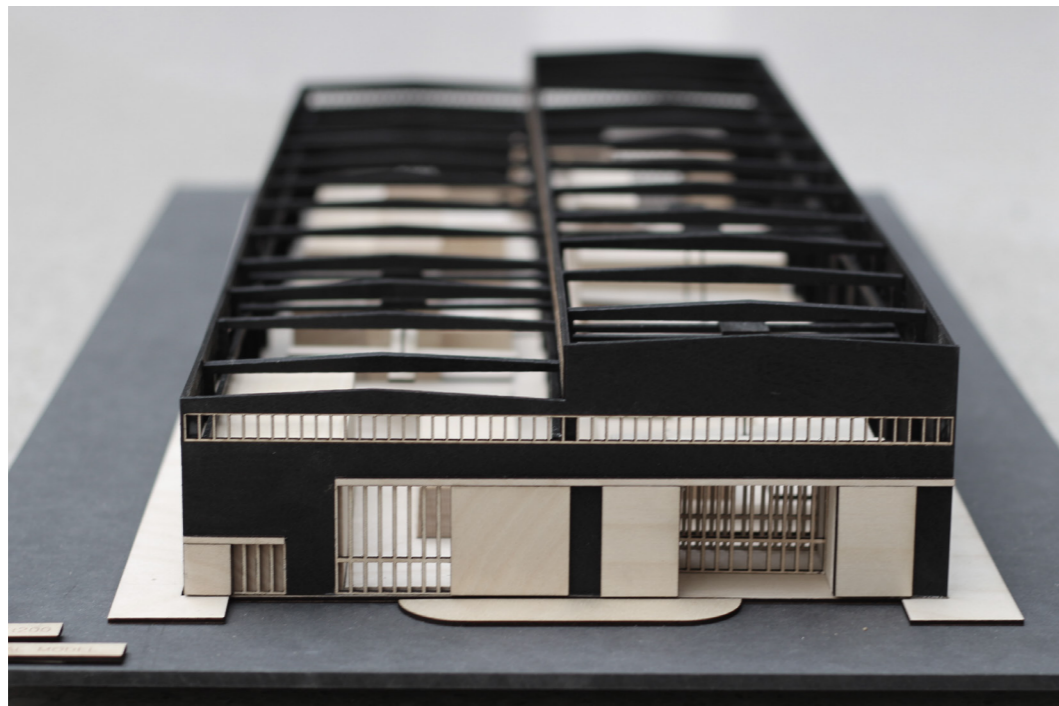
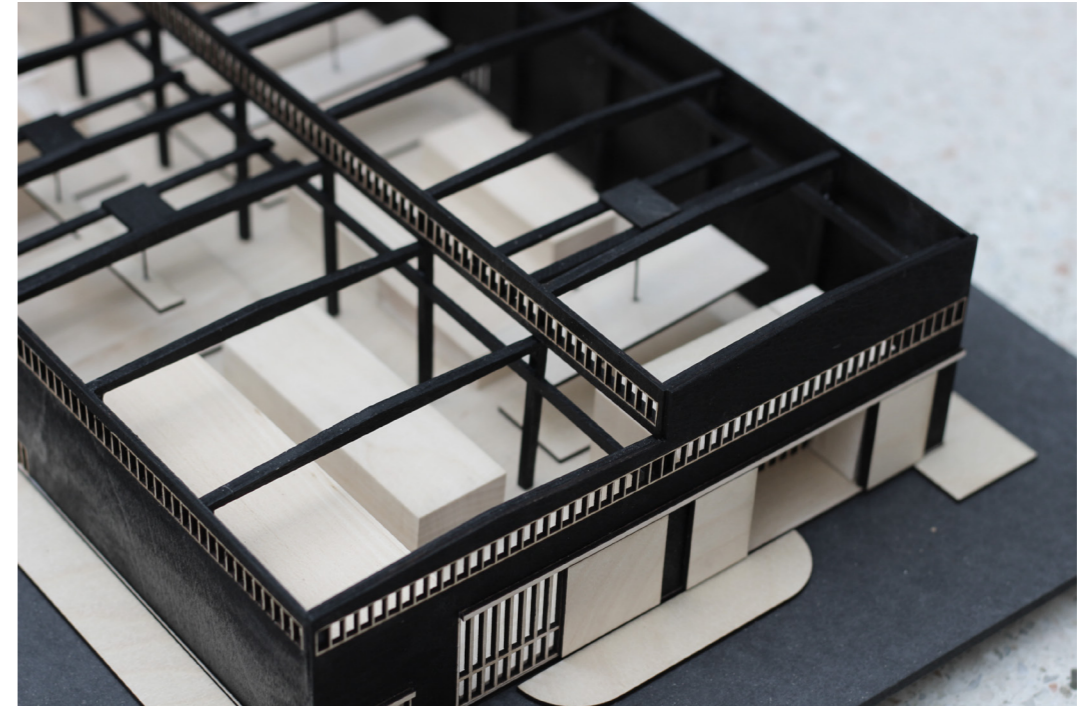
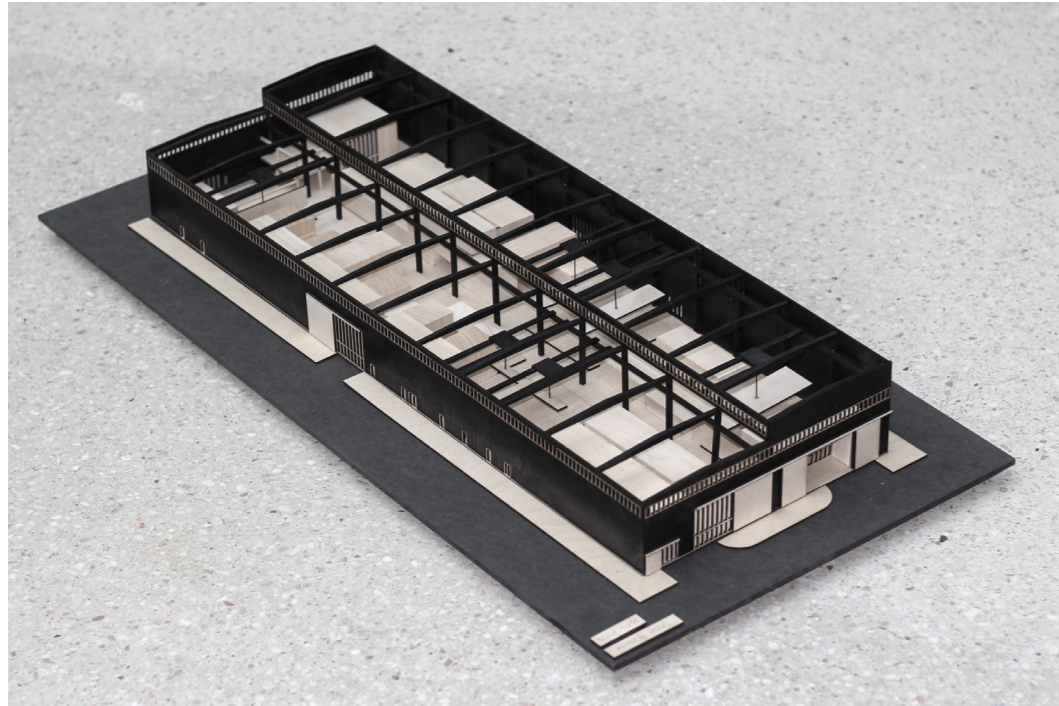


WEST FACADE



PHYSICAL MODEL

SCALE 1:200



FINAL CONCLUSION

The aim with this thesis was to transform an existing building into an architecture center where architectural knowledge and inspiration could be shared. But also, use this function to inspire the construction industry to transform existing buildings in a sustainable way. By using alternative building materials for additional parts and implement complemented functions within the center, that could be related to sustainability, within for instance reuse, this was achieved.

The Architecture Center represents a sustainable transformation, due to the carefully selected design strategies and concepts, which respect the building's heritage and history. The design proposal presents an interactive program with interesting activities that can be linked to sustainability. Functions and activities for different types of people at different times of the day which create a constant flow to the center. This provides good conditions for increasing knowledge about architecture. By placing the exhibition areas in a special place in the center, under the existing cranes, good conditions are provided for creating unique and different exhibitions.

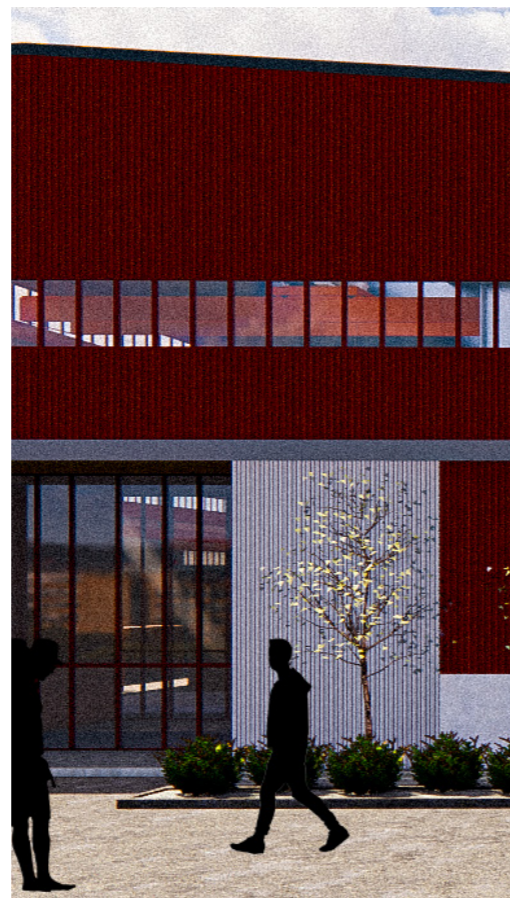
One aspect that was mapped in the investigation was how children should be included. The design proposal represents a playful environment where exhibitions for children can be designed, this to include them in architecture at an early age.

The focus of the thesis was the transformation of the building, but due to the results of the investigation, parts of the outdoor environment is also taken care of in the design proposal. The outdoor environment is a potential continuation of the thesis due to its importance. The same applies to future water levels because of the building's location near the water.

Future high rising water levels are a major threat, as mapped on page 20. The Architecture Center is an appropriate place to show how this can be taken care of. This has been done illustratively in the design proposal via a water tank placed on the river. But it would have been interesting to work more on this.

Regarding economic sustainability. How the center is to be financed has not been considered in the thesis due to the need to define the size of the work. Funding is a decisive factor for the center to be built and is an important continuation of the thesis.

The final result answers the research questions well and creates new interesting follow-up questions.



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- Figure 27-31: Photographs by author
- Architectural drawings and illustrations made by author

APPENDIX

Anette Vejen Tellevi | Architect at Älvstranden Utveckling AB

"The site is very polluted. Both in the ground and the water. The river is one of the most polluted rivers in Europe."

"It is very toxic when they dig out the ground. Otherwise, it is not dangerous."

"Who is going to pay for the sanitation? Volvo, the old owner, or the municipality? It is an important but infected discussion."

"The Yard, a project which will bring the smaller companies and start ups here. As an extension of Lindholmen Science Park. The idea is to use the site for events, co-working and develop a system where you can be a member and rent some space."

"The site is an expansive tech area where big companies already have established."

"Karlstaden is a decisive project from an urban development point of view. It will increase the safety in the area since a lot of residences will be a part in the investment."

"The Reparationsverkstaden is not suitable for residential buildings because of the pollution."

"A new ferry stop will be built just around the corner this summer."

"Älvstranden will own the area in about 30 more years, then it will possibly be sold."

"The building is not heated. It is completely uninsulated."

"You will probably need to build buildings within the building in order to achieve an in-

door climate."

"Frihamen harbor might be filled up. The plan is to develop residential buildings in 15-20 years."

"Älvstranden owns the port cranes. They have no cultural value like Eriksbergskranen but we do not have permission to demolish them."

"Dare to explore and be creative within your project."

"What type of functions can take place in this type of hall?"

"Varvstaden in Malmö is a beautiful example of how an old shipyard has been taken care of."

Kika Krista Kjærside | Head of Program at The Danish Design Center

"We all come into contact with architecture and design every day. But not all of us are aware of the enormous impact they both have on us. By creating knowledge, experiences and debate about how architecture and design can contribute to solving many of the world's biggest challenges in the UN's sustainable development goals. It is our job as a national architecture center and international cultural attraction: to share knowledge about the sustainable development of our physical framework for life through exhibitions, tours, events, learning and in-person and digital networks"



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AN ARCHITECTURE CENTER WITHIN OUR HERITAGE
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MASTER'S PROGRAM OF ARCHITECTURE AND URBAN DESIGN (MPARC)
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