

WASTE SITE STORY

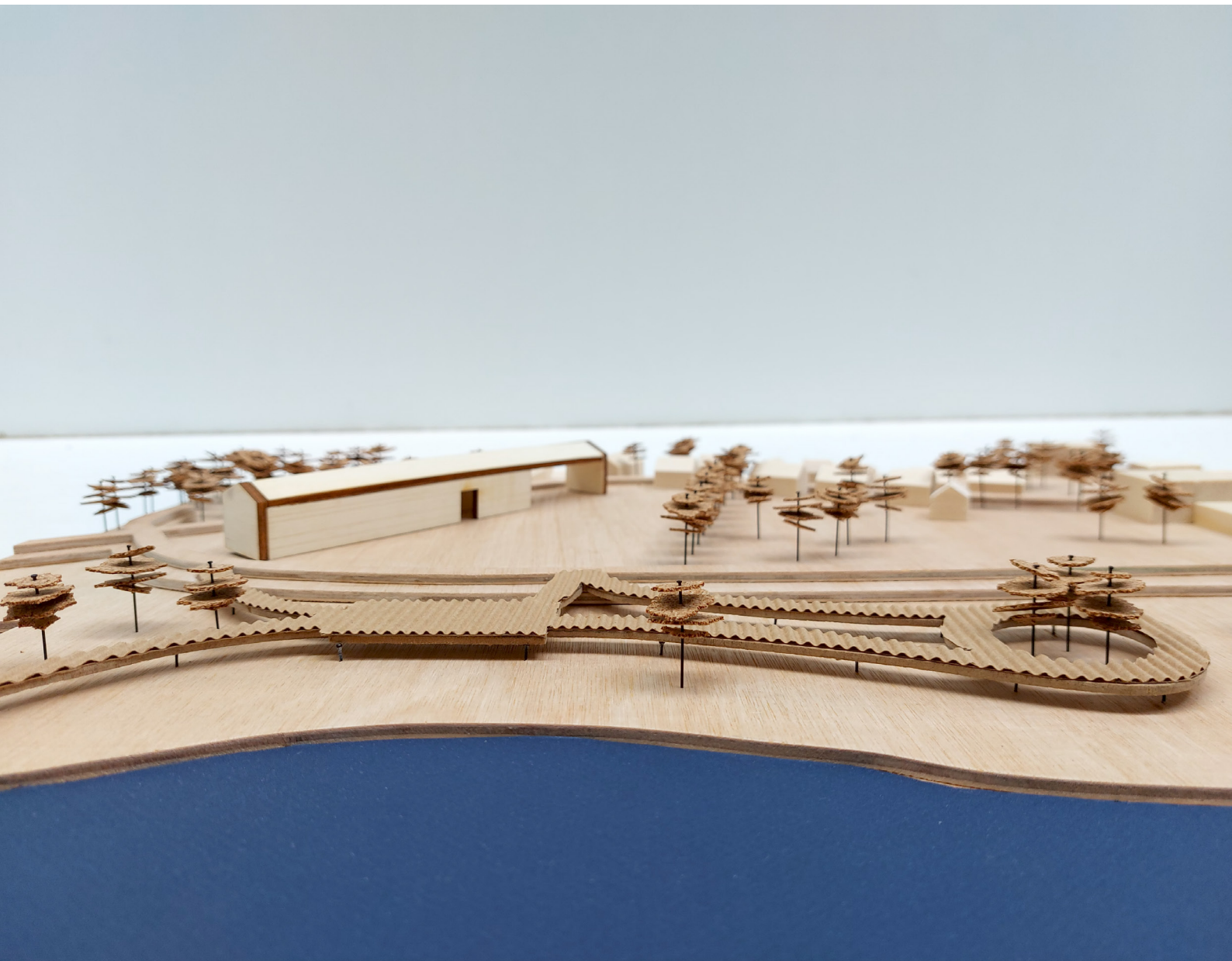
The Narrative of Waste in Architecture

AR3AH115 Graduation
Revitalising Heritage

July 2025

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PREFACE

In front of you is my graduation project that marks the completion of my master's degree in Architecture at the TU Delft. This research and design focuses on the use of waste within architecture and thereby decreasing the amount of generated waste.

I would like to thank my first tutor Lidy Meijers for guiding my design process and motivating me during every meeting, my second mentor Koen Mulder for guiding me through the technical details of the project and stimulating me to critically look at smaller sections of the design and my third tutor Wido Quist who helped me with my research and introduced new perspectives to my research. Furthermore, I would like to thank my fellow students from the graduation studio who have become my friends over the past year and who have helped, inspired and motivated me. Lastly I would like to thank my friends, roommates and family who have kept up with me during the stressful times of the graduation.

Working on this project has had its ups and downs. While there might have been one or two setbacks, I have gained a lot of new knowledge to the subject matter and have developed new skills in designing a transformation project.

I hope this project will create useful insights on a new way of architecture, enjoy!

July 2025, Delft
Merel Schouten

CONTENT

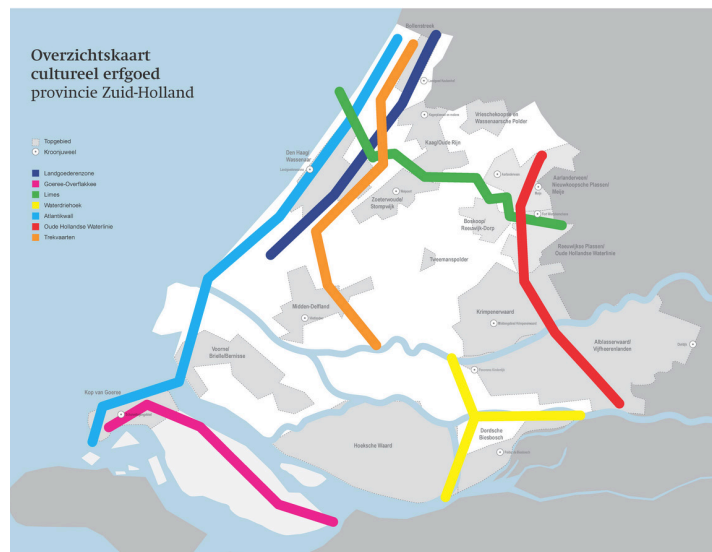
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INTRODUCTION

The past year I have been working on my graduation project for the master program of Architecture in the field of Industrial Maritime Heritage. The graduation project had to be located within the Waterdriehoek in South Holland.

The Waterdriehoek is an area appointed by the province of South Holland and includes one of the seven heritage lines: 'Maritieme Industrie'. It is the area in which Kinderdijk, the Biesbosch and the Drechtsteden are connected by the large waterways Beneden Merwede, Noord, and Dordtse Kil (yellow line). These waterways used to be the main form of transport towards the inland, which means that a lot of settlements and industries were placed along those rivers. In order to protect the settlements and industries from flooding, landscape structures like dykes, canals and harbours were built. By appointing this area as a heritage line, the province of South Holland wants to preserve those structures. Furthermore, the province of South Holland desires to make the main attractions of the area more accessible and pleasant while also informing the visitors of its past.

The graduation assignments uses this as a starting point (see next page).



Overview of heritage lines in South Holland. By Rijksdienst voor het Cultureel Erfgoed.

GRADUATION ASSIGNMENT



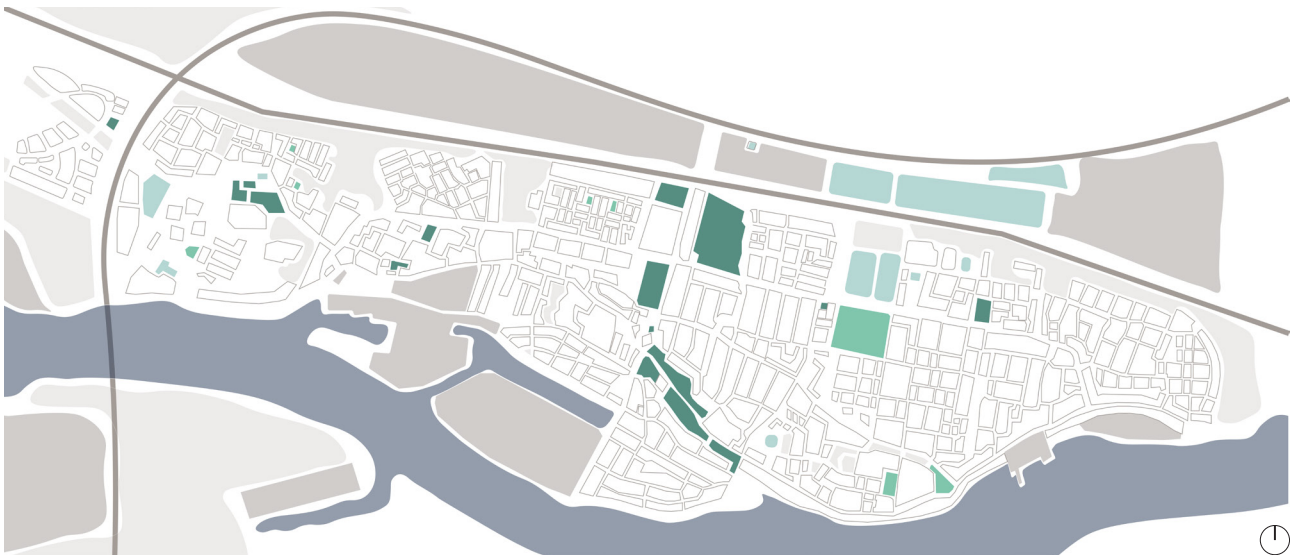
Location Waterdriehoek.

Maritime Heritage is part of the Dutch cultural historical identity, which has played a significant role in shaping the country's relationship with water. Waterways existed in our lands before passable roads. However, the maritime heritage on the riverbanks has gradually evolved over time, due to changes in socio-economic and cultural significance. The collection of landscape structures and buildings, such as dykes and canals, harbours and quays, shipyards, wharfs, storage, and trade facilities, reflect the history and current situation. The preservation and adaptive reuse of these structures is important for future generations to understand and appreciate the regional maritime past and is regarded as an opportunity for novel developments in the area. What is the future of Maritime Heritage? What are the attributes and values of these built and unbuilt structures, what is the significance for the stakeholders, for the industrial landscapes and urban life? What are the future needs for the region in order to redesign this collection?

For this design assignment I have chosen a site in Sliedrecht. At Baanhoek 22 there is an old building that was previously used as a ship wharf. Currently, it is being used for metallurgy and the connection that it used to have with the water is lost. At the moment, the waterfront is mostly covered by industry because of the easy access, but Sliedrecht is trying to move the industry that do not require access to the water to the north in order to create spaces at the waterside for people.

To revitalise this area, I am trying to restore the connection of the people of Sliedrecht (and neighbouring areas) and the building to the water. Different functions will be added to the place as well as a continuation of the green structure that runs through Sliedrecht and will now continue towards the waterside. The renovation of this project contains another aspects, namely the use of waste. As much of the currently produced waste is generated in the built environment, a lot could be done by rethinking the way an architect designs their project. Within this project I want to reuse as much of the original material as possible and if any additional material is needed, this should be reused from another place.

The end goal of this project is to revitalise the site by renovating the current building and site in a way that it restores the values of the place and improving the conditions in order for people to enjoy the waterside and experience the heritage building.



Sliedrecht analysis.

CONTEXT ANALYSIS

To create an understanding of the context of my project, I first did an analysis on the heritage line and Sliedrecht. During the first site visit I found out that a lot of industrial maritime elements can be found throughout the area like bridges, windmills, cranes and buoys. These elements contribute to the great views of the area.



However, the heritage line also knows less pretty industrial maritime heritage elements. Along the waterways a lot of industries were placed in the past. Currently, a lot of those industries moved away and the big wharfs or halls are now vacant and/or abandoned. These buildings took my attention and made me think about what would be done with these buildings. The easiest and most used option would be to demolish and remove the buildings as they are mostly seen as a pile of waste.

My curiosity on the other side went out to the question: What can be done with these structures and how can these impressive, large buildings be used as a starting point instead of starting a design from scratch?



Delta Shipyard Sliedrecht. By Van der Cammen. (2024)



Dalm Oude Metalen. By Druckenbrod. (2016)

PROBLEM STATEMENT

This led to my research in which I investigated what could be done with waste in architecture and resulted into the following research question:

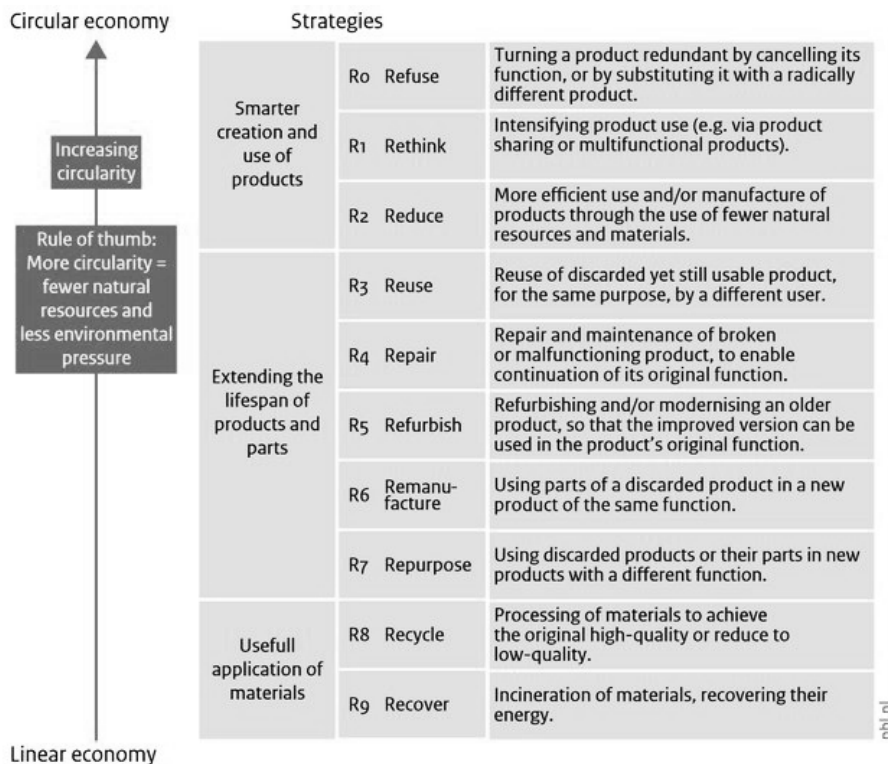
**“How can designing with waste
reduce the generated waste within
the built environment?”**

I soon learned that 30% of the total amount of generated waste is produced by the built environment, so changing anything in this field will have a big contribution to the total waste stock. By starting with literary research, some information was gained about the possibilities of reuse of materials were in order to create a new design. Afterwards, I looked into some case studies to get an idea from existing projects on how waste could be reused within architecture. In the end I took the findings from my research and tried to implement this into the design of my graduation project.

RESEARCH

When talking about reuse of material, the circular economy is a reoccurring topic in which the R-strategy ladder is often a leading figure. It shows the different stages of reuse from the most circular option untill the R-strategy that forms a more linear economy, which means that the product or material in question cannot be reused and therefore generates waste. From this figure it would be most obvious to limit the R-strategies, used to design, to the top three. However, this is easier said than done, as most of the current building stock is not built with the intention to reuse parts of the building in the future. This is why R-strategies are required that are lower onto the strategy ladder.

The figure below shows the R-strategy ladder that is kept in mind during the whole process of research as well as design.



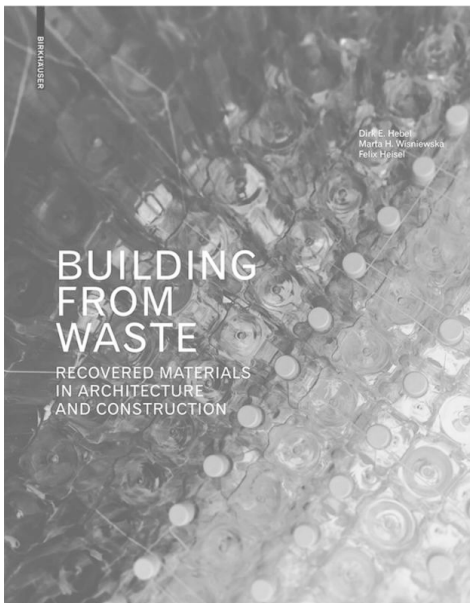
R-strategy ladder. By Potting et al. (2017).

Besides the literary research, case studies were used to investigate what is already done with waste in architecture. The case studies were all taken from the book *Building From Waste*. This book shows different approaches at different scales of reuse of material and from that I have made a selection of three examples at different levels of reuse.

The first one is *Tuff roof*. From recycled carton drink packages, roof sheets were created by shredding it into pieces and moulding it into the correct shape. While these roof sheets have great characteristics, reformation is needed of the drink cartons which means that a lot of processing is needed and still generates quite a lot of waste (in the form of energy).

Secondly, the paper house in Germany is made out of paper and cardboard waste turned into densified bales that contain compressive strength. For this project not a lot of processing was needed, but the project was only a temporary option.

Lastly, *WasteBasedBricks* is a company that uses old stones and bricks to create new bricks. By this, the amount of bricks turned into waste is reduced, but similarly to *Tuff roof*, a lot of processing is needed to create the new product.



Book: Building From Waste. Hebel et al. (2014)



Tuff roof from carton drink packages. Heisel. (n.d.)



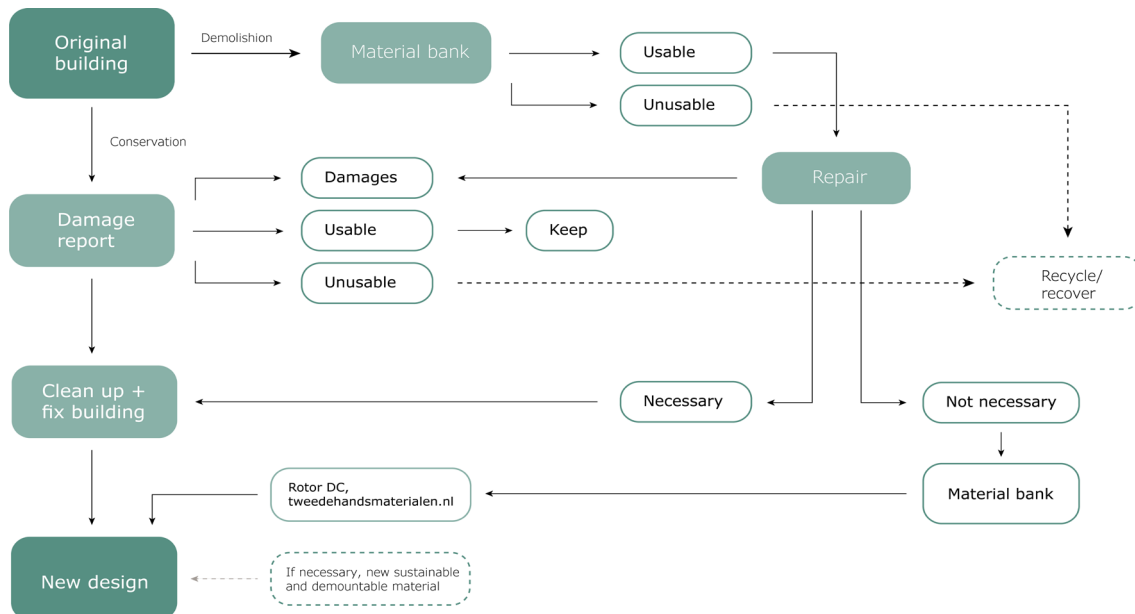
Papierhouse on the world heritage Zollverein. Dratz&Dratz architekten. (2010)



WasteBasedBricks. FRONT (n.d.)

To conclude, various approaches of reuse could be implemented at different scales. For example at a building scale within its own site, or on the other side a whole country could implement symbiosis of material at a bigger scale that requires and contains less specific materials. Additionally, different scenarios require different approaches from the R-ladder because some R-strategies simply do not comply in some situations as the products and buildings that have been built in the past did not take into account the idea of reusing the materials in a later stadium. It is therefore important to look at what is possible per project and maybe later on, when buildings that were built with demountability factor included within the design, R-strategies higher on the R-ladder could be implemented. The solution to reducing the amount of generated waste is on the one side using waste products for new material, but on the other side tackle the problem of waste production at an earlier stage, by adjusting material production and keeping the reuse element (for the future) in mind while designing new things.

To bring this to my graduation project, a scheme was created which includes the different strategies that can be used at different stages of the design. Per project the intensity of used strategies will vary but can all be brought back to this scheme.



Design strategy. By Schouten, M. (2025).

SITE ANALYSIS

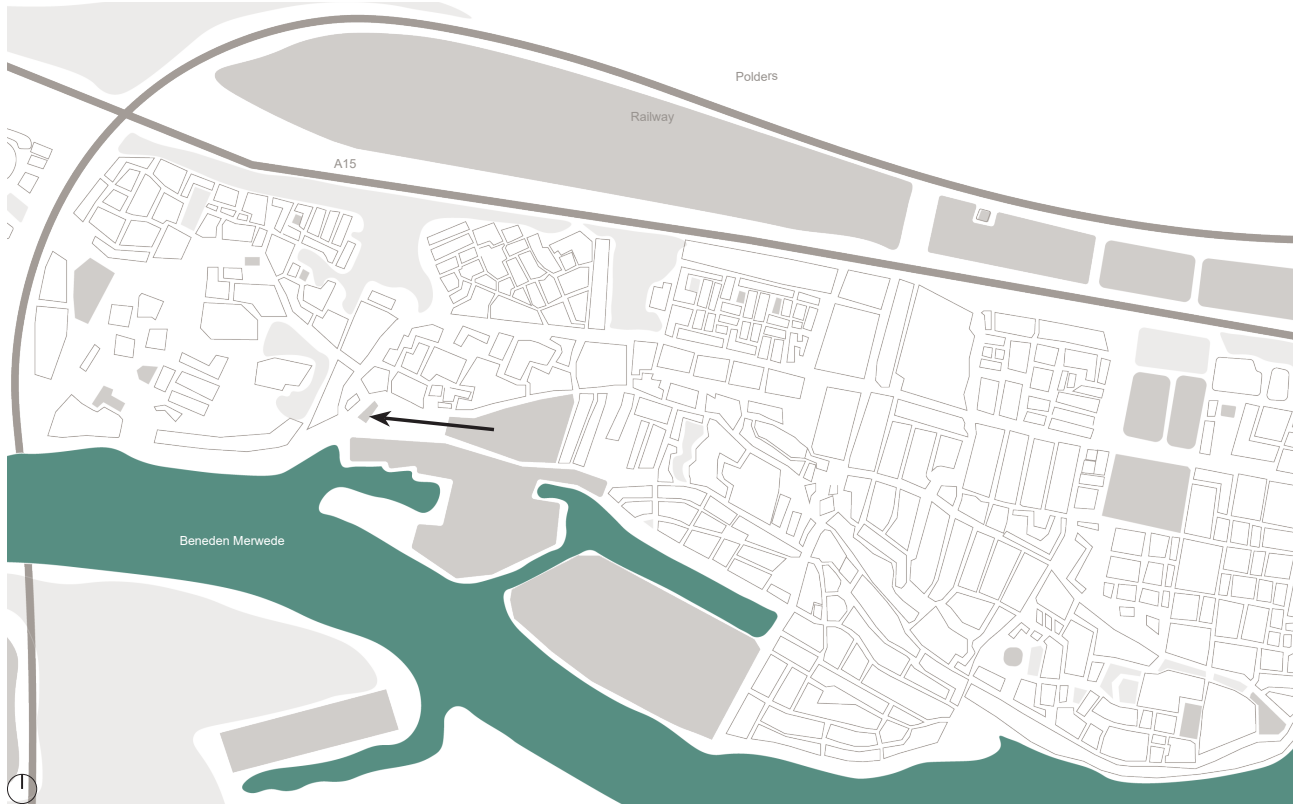
With the research in mind, I started to analyse the village in which my graduation project is situated: Sliedrecht. Sliedrecht is one of the Drechtsteden along the Beneden Merwede river.



Location Sliedrecht.

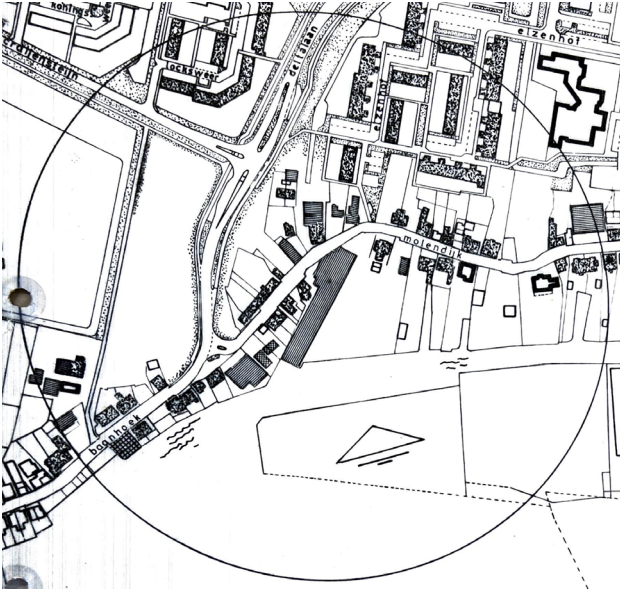


Currently, Sliedrecht is built up in the following way. At the northern side the polders are cut off of Sliedrecht by the railway and highway that pass through. Industries are placed at the waterside and dwellings in between. The sports facilities are mostly placed at the northeastern part of Sliedrecht and the center contains the most restaurants and cafe's. While looking at the more western part of Sliedrecht there are little facilities and the amount of green decreases when moving more and more towards the waterside.



Site within Sliedrecht.

The industries that are located along the waterside used to need the connection to the water because of transport or the maritime industries. However, nowadays this connection to the water is most of the time not necessary. This is also the case for the industry at the site of this graduation project: Rotterdam Steel Works. The site used to house a shipwharf which is why the direct connection to the water was necessary in order to be able to launch the ships into the water. However, some years ago a new company took over the wharf and introduced a metallurgy company to the site. This industry does not require the direct connection to the waterside and could be placed elsewhere so the waterside can be turned into a pleasant leisure place for the public.



Original site with addition from Archive



Launching ship from ship wharf (Fotoarchief Sliedrecht, nd)

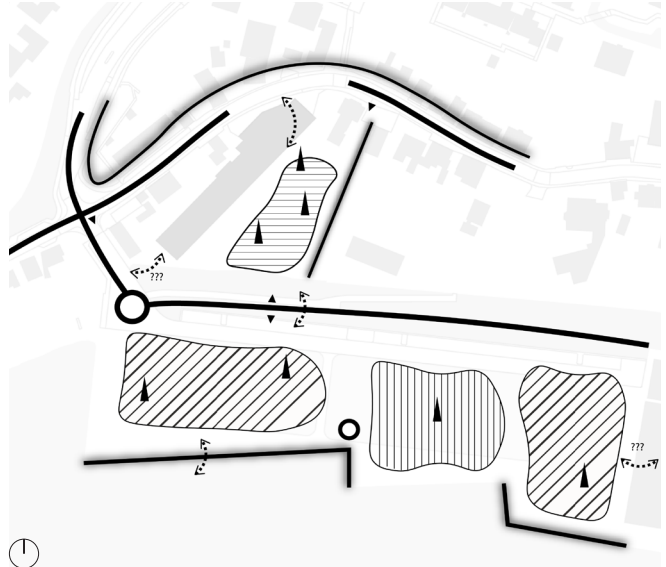


Aerial view (SERC, nd)

As previously mentioned, the former shipwharf was directly connected to the water in order to be able to launch large ships. It was a wharf built to prevent rain and wind from entering while building the ships. In 1976 an addition was made at the northside of the building which added 35 meters to build even bigger ships. Because of the length and the placement of the building, it is sort of a barrier between Sliedrecht and the waterside.



Existing site plan



Kevin Lynch analysis with indication of barriers



New dyke towards Rotterdam Steel Works site



Rotterdam Steel Works. By Schouten, M. (2024).

In 2005 a new dyke was built south of the wharf to relieve some stress from the Molendijk. This also meant that there is now a barrier between the site and the waterside and thereby the connection with the water is lost.



During the site visit at the Rotterdam Steel Works these were some parts of the building that interested me. For example the colourful façade panels, the old door that still uses the mechanism from the 60s, the height and space of the building and some of the materials produced by the current user of the building.

To some, these materials can be seen as waste, but I believe that these materials can still be used.

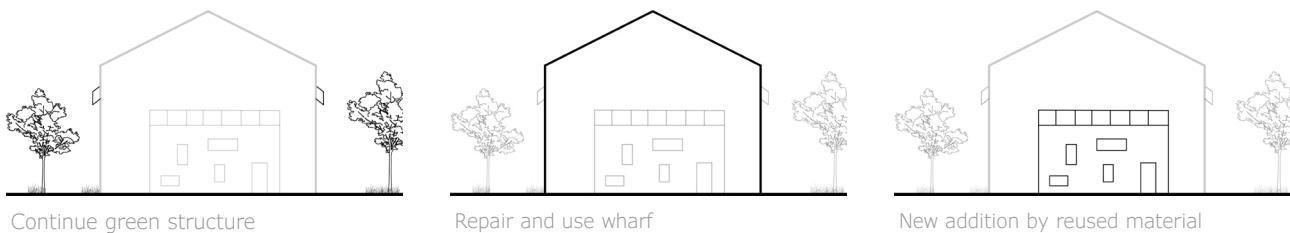
KEY POINTS

From the analysis, research and the vision of the municipality of Sliedrecht I have created some key points to take into consideration during the complete process. The municipality of Sliedrecht has made a vision for different parts of Sliedrecht. For the site of Rotterdam Steel Works this means no more dwellings, preserve the green structure and public space, retain space for activities and great possibilities for green and blue structures.



Vision on improving Sliedrecht. By municipality of sliedrecht. (2021).



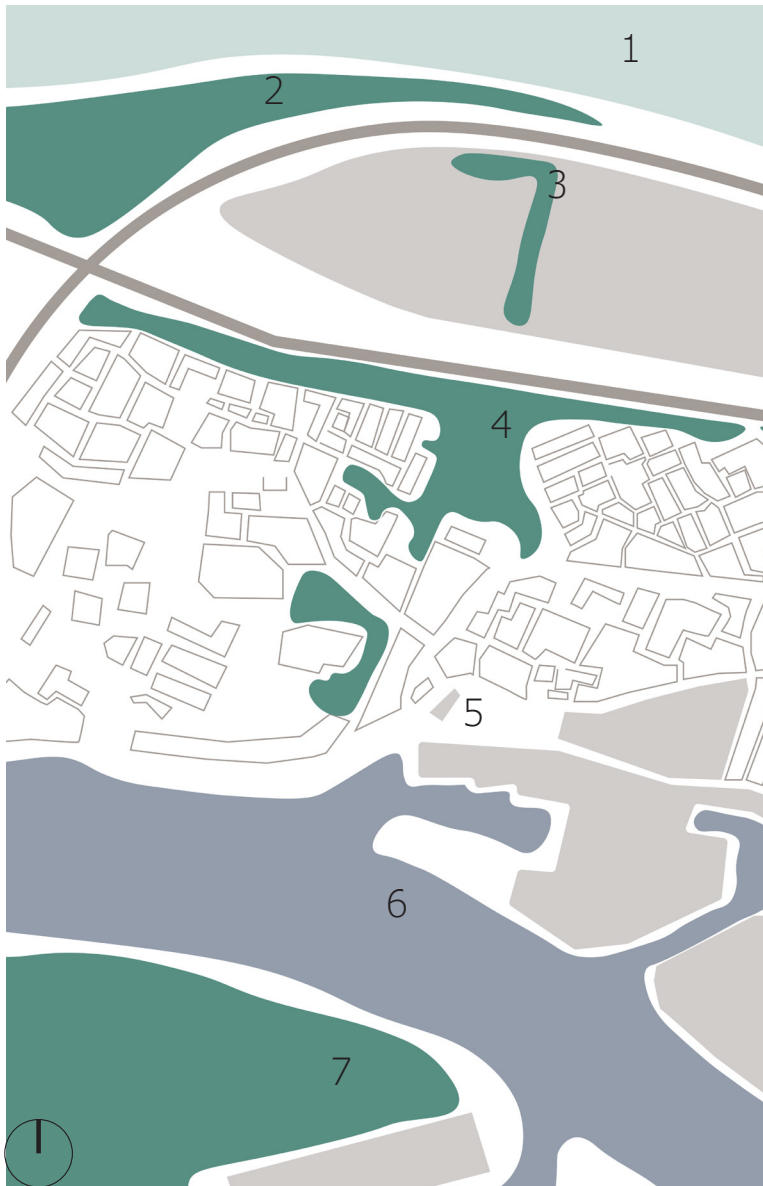


From the analysis I found out that the place could use some space for leisure and something to attract the public to the place by for example placing a restaurant or cafe at the site. Together with the vision of Sliedrecht's municipality, the place could be a great space to improve and combine the green and blue structures.

This together with the results on my research will lead to a transformation of the site and building that will house a multifunctional program that includes recreation, activity and reuse of materials.

These key points can be subdivided into three parts of the building that this book will guide you through by taking the reader along a Waste Site Story that shows all elements of the design.

SITE DESIGN



Green structures in Slidrecht from north to south

The municipality of Slidrecht is trying to continue the green structure from the north to the south. However, the industrial sites along the Beneden Merwede interrupt this. Therefore it is of importance in my design to continue the green structure at the Rotterdam Steel works site as well.

The figure on the left shows the different green structures from north to south towards the Beneden Merwede.



1. The polder at the north side of the railway.



4. Park



2. The green structure between the polder and railway/highway.



5. Project site



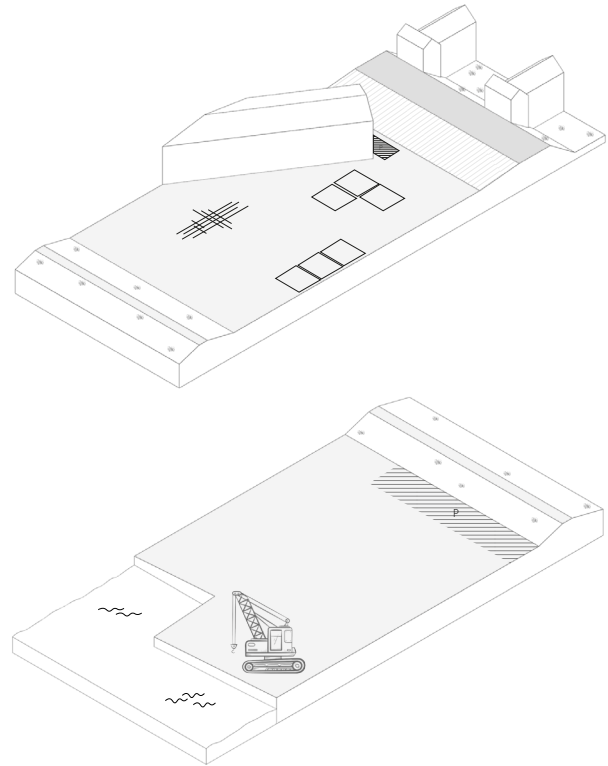
3. Green strip



7. Other side of the Beneden Merwede



Current site situation plan



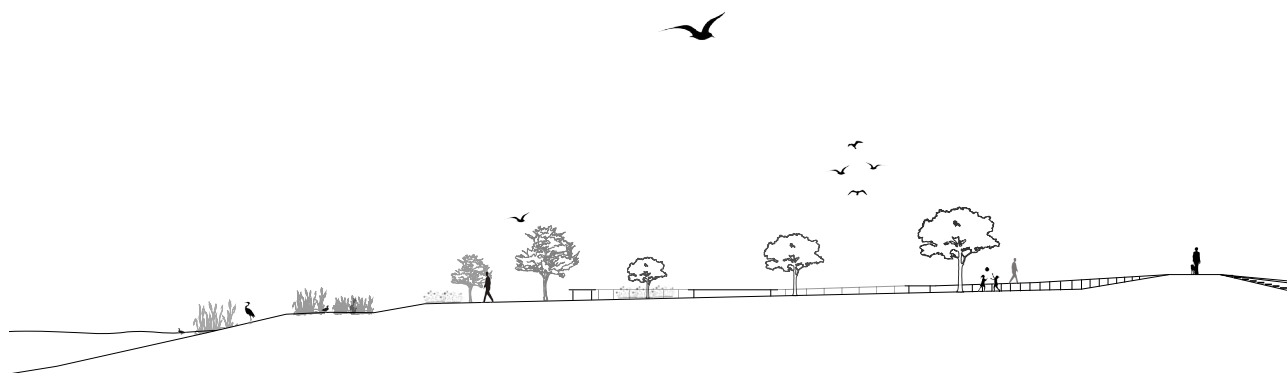
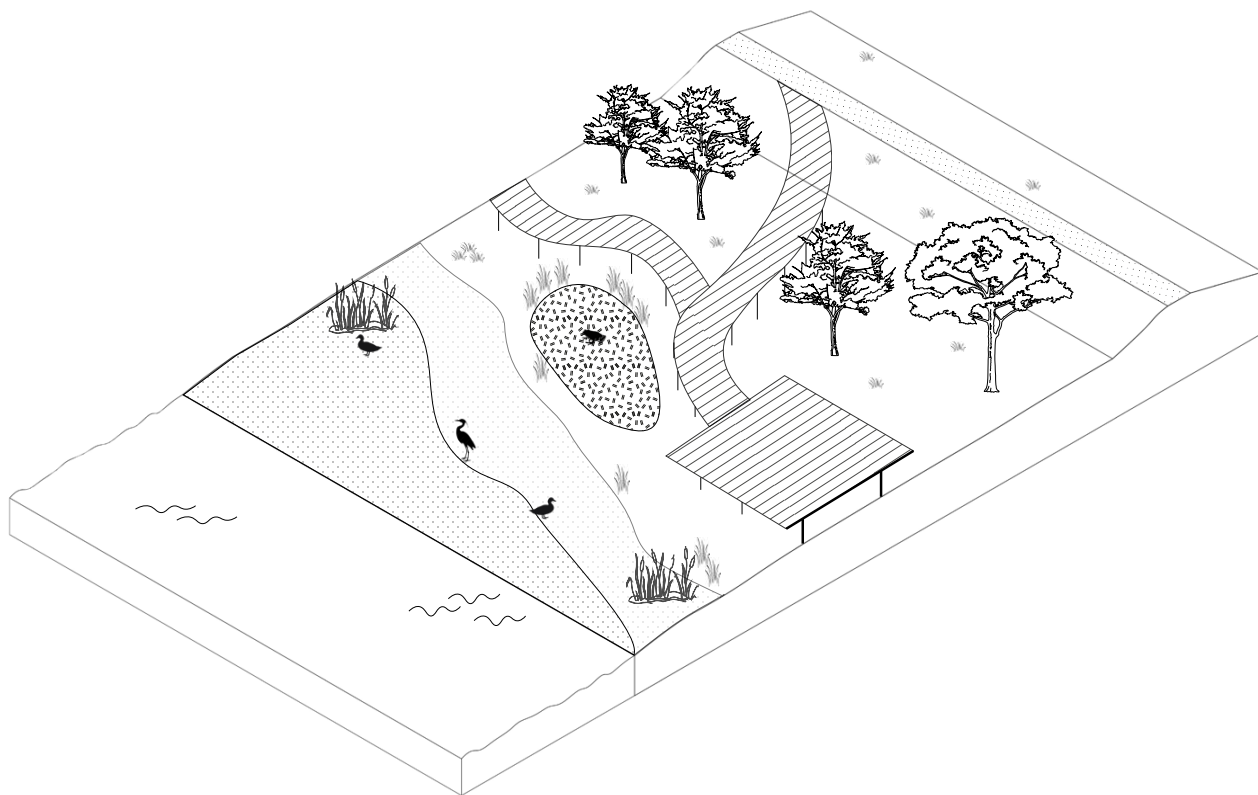
Current site situation isometric view

Currently, there is only one entrance and this entrance will be used to continue the green structure throughout the site. The current situation of the site is that everything is covered by brick or concrete except for the additional dyke. Furthermore, the waterside is very abrupt and the water is not accessible for visitors other than people from the industry.

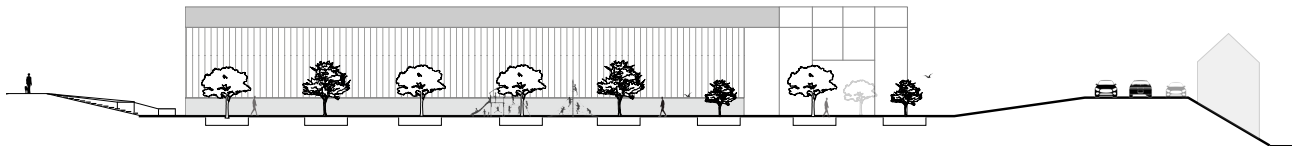
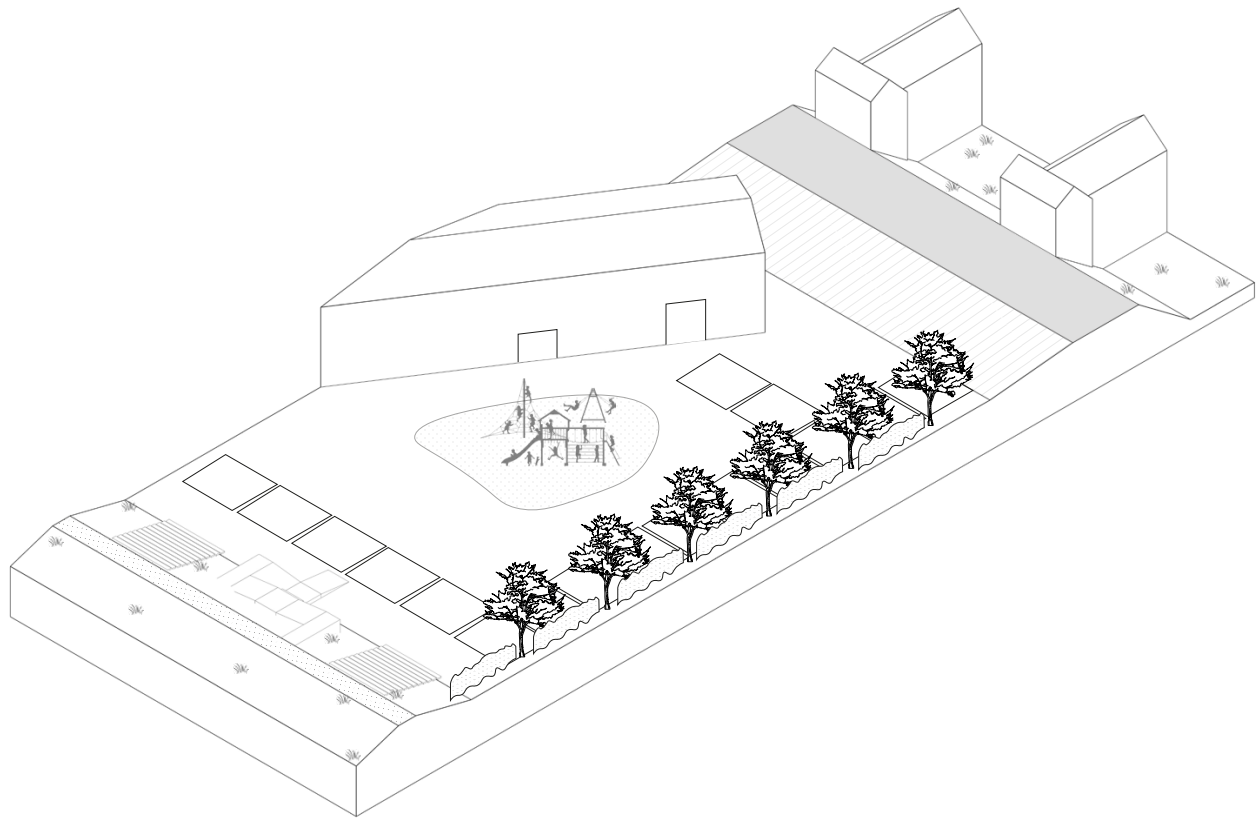


New Masterplan

In the new site plan, the 'plaatje' at the south side of the new dyke is deconstructed and turned into a tidal park. Instead of the harsh quay, the tidal park makes sure there is a gradual transition from land into water. This benefits the biodiversity of the place, is safer when it comes to different water heights and will make sure the site is more accessible and pleasant to access for visitors as the nature will create a calming experience.



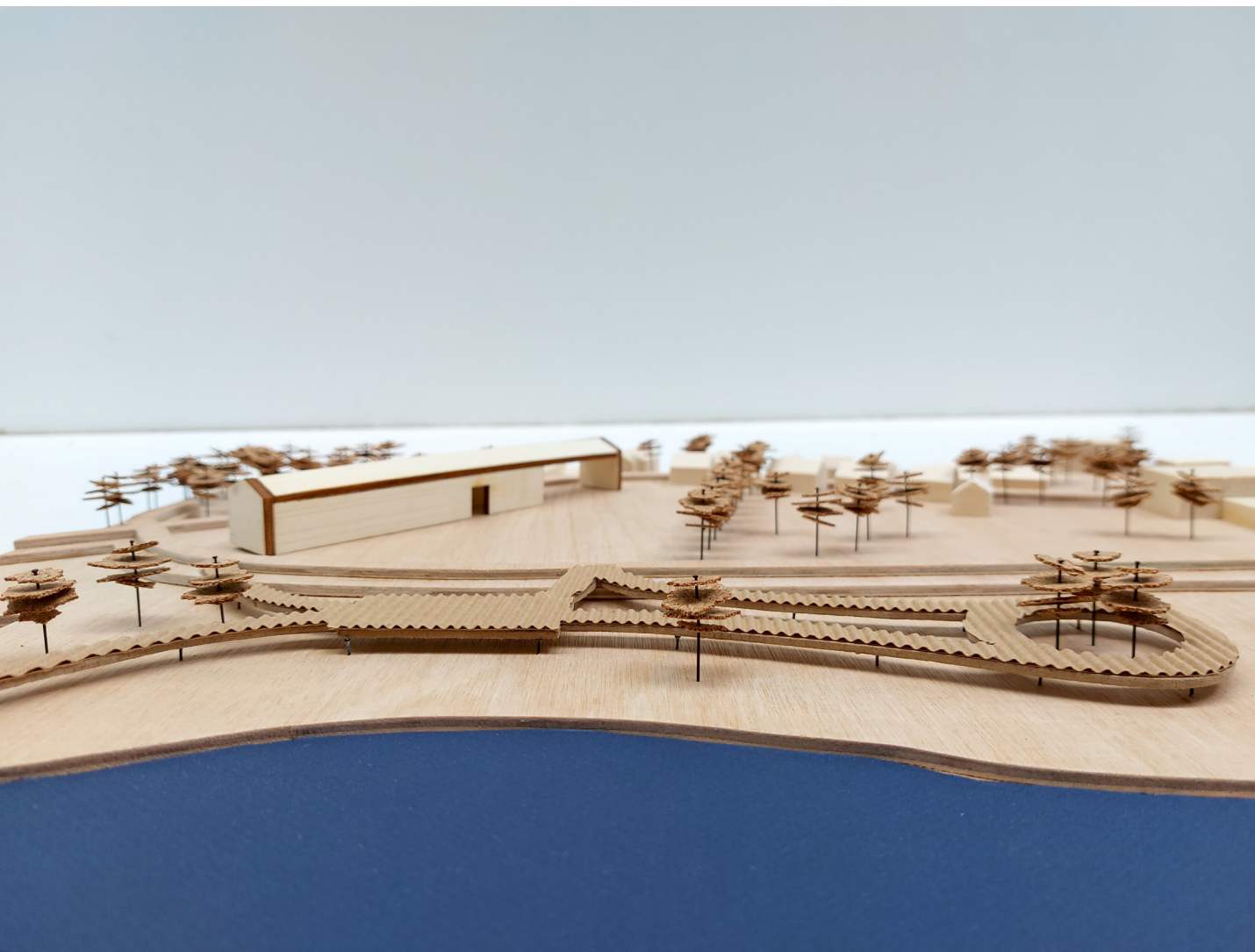
Section 1



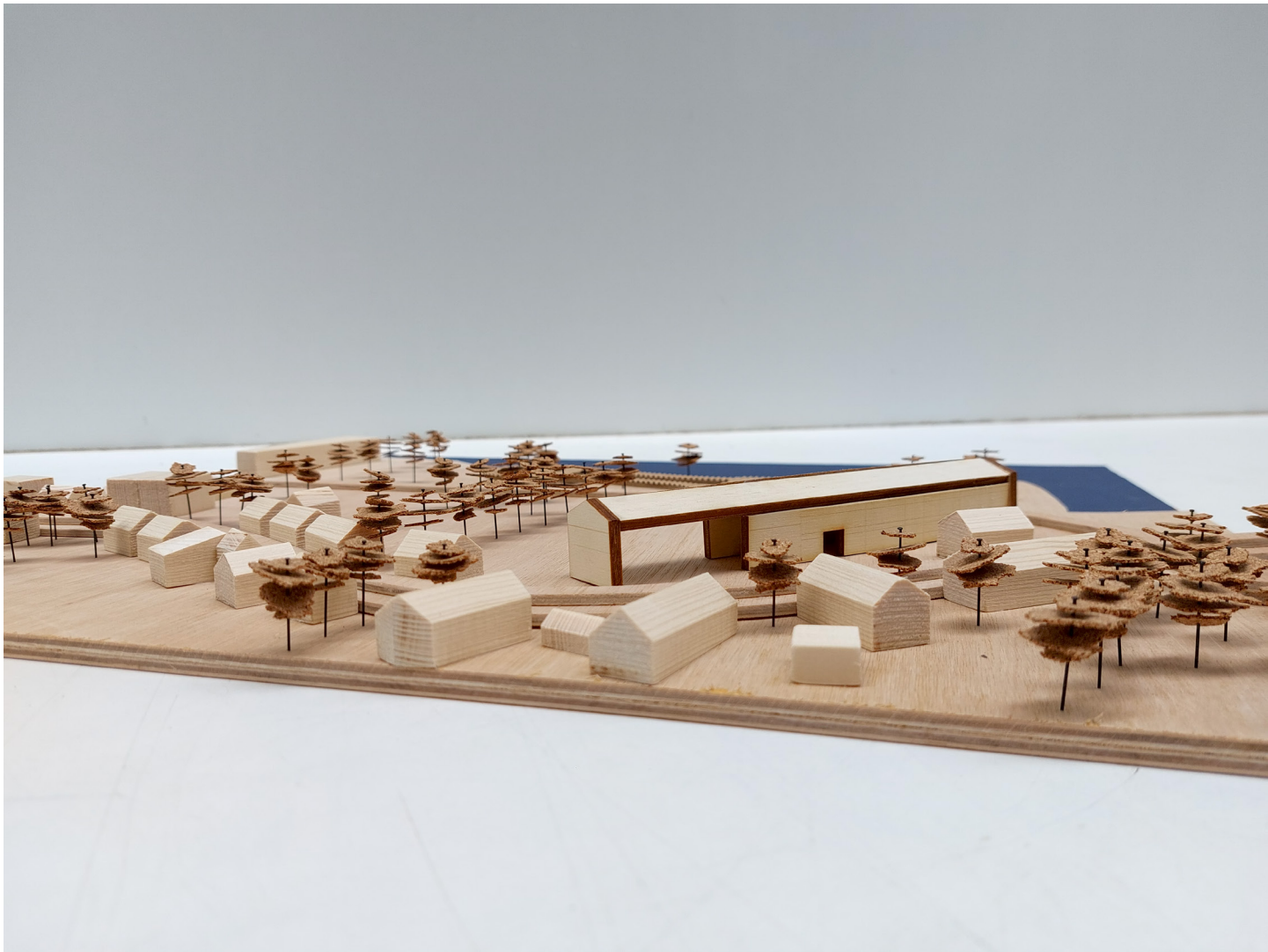
Section 2

The remains of the concrete will be incorporated within the design at the other side of the dyke. At that side there will more of a city park. In order to pass over the dyke, stairs and slopes will be constructed from the concrete that's gained from deconstructing the 'plaatje'. While the city park will remain its bricks, an ecological corridor along the original entrance of the site will make sure the green structure is continued towards the Molendijk. The ecological corridor does not solely mean that the green structure is continued, the structure ensures a safe way to enlarge the range of habitats for animals.

The reason for the conservation of the bricks and concrete structures is because this material is still very much fulfilling its purpose and removing it, would mean generating waste which is something I try to reduce as much as possible. Additionally, the difference in material on both sides of the dyke implicates different functions and will make the waterside a more diverse place. The northern side could function as a museum park with playground (the only area where concrete and stones are removed) that is connected to the functions within the hall, whereas the south side of the site functions as a natural tidal park that stands on its own and brings another demographic towards the place.



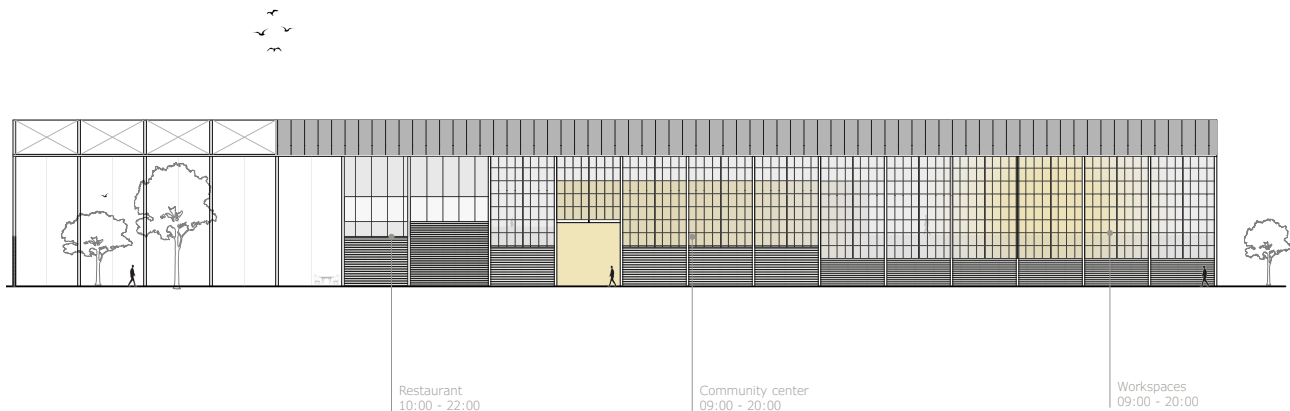
Model new masterplan from waterside 1:500



Model new masterplan from Molendijk 1:500



Model new masterplan from Molendijk, west facade highlighted.



East facade with opening hours

From the Molendijk, passing citizens or visitors can see which part of the building is opened, by looking at which part of the building lights up. The hall includes a restaurant to attract people to the site a community center to bring people together and lastly workspaces for woodworking and metallurgy to refer to the history of the maritime industries that used to be located along the waterside.

The figure above could for be an example of an early morning when the restaurant is not yet opened, but the community center in the middle and the workspaces on the right are.



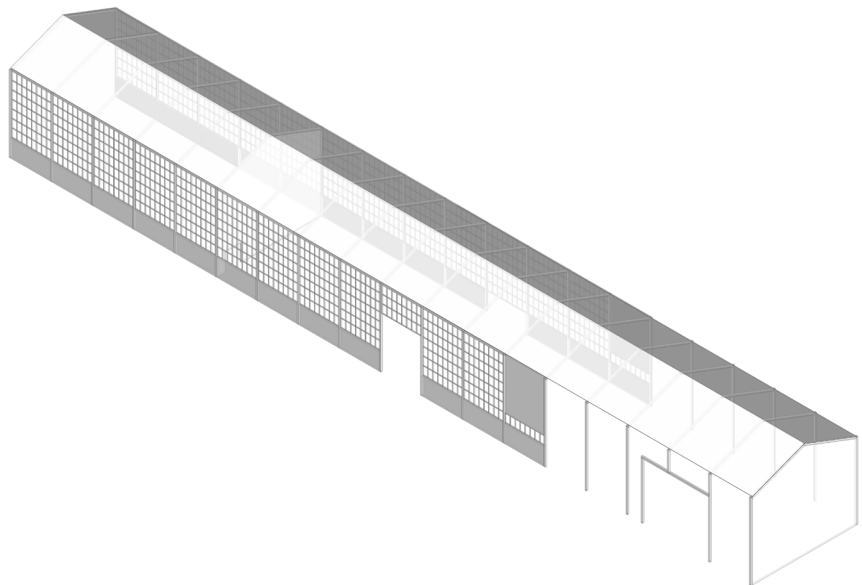
Masterplan northern part with accessibility

ACCESSIBILITY

The site of Rotterdam Steel Works used to be an industrial area that could only be accessed by people working at the company as fences shielded the place from visitors entering. Now, the industry will be relocated towards the north of Sliedrecht making the place accessible for the public. Visitors can park their car along the Molendijk or place their bikes at multiple bicycle stands to access the tidal park that will only be accessible for pedestrians. New entrances are created and the waterside area is opened up so it can be used for leisure/recreation. The addition made in 1976 will be partly deconstructed to create a new entrance to the site.

Why not remove the complete deteriorated structure?

The existing structure was built to keep wind and rain out from the working spaces. Until this day, it still fulfills its function, which is why I use the structure to create covered outside spaces before entering the new building that is placed inside. By using the structure, the history of the location will remain and no unnecessary waste is generated as we are working with what is present at the site.



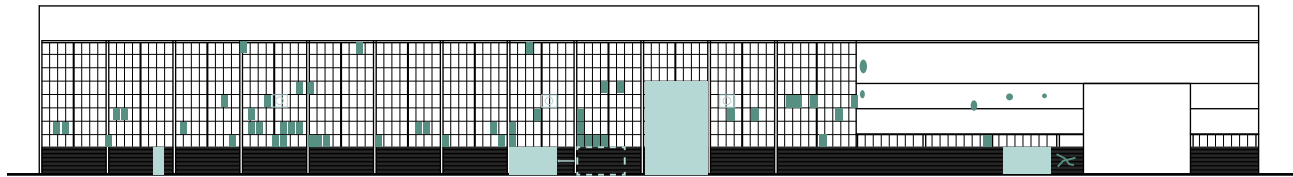
Wharf facades as umbrella



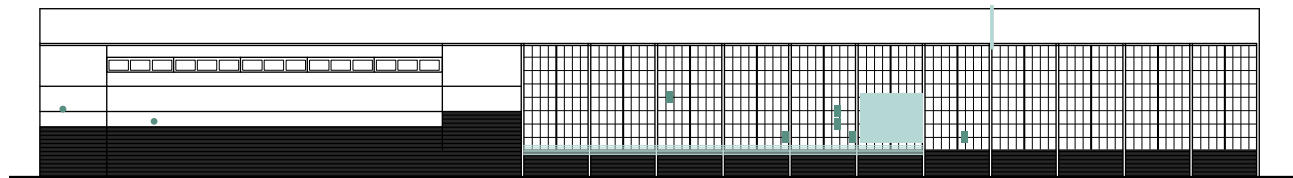
Model east entrance 1:200

HALL DESIGN

Like stated before, the former wharf will be used within the new design. The only thing that will be done is cleaning and reparations. For this, a damage report was made which is seen below.



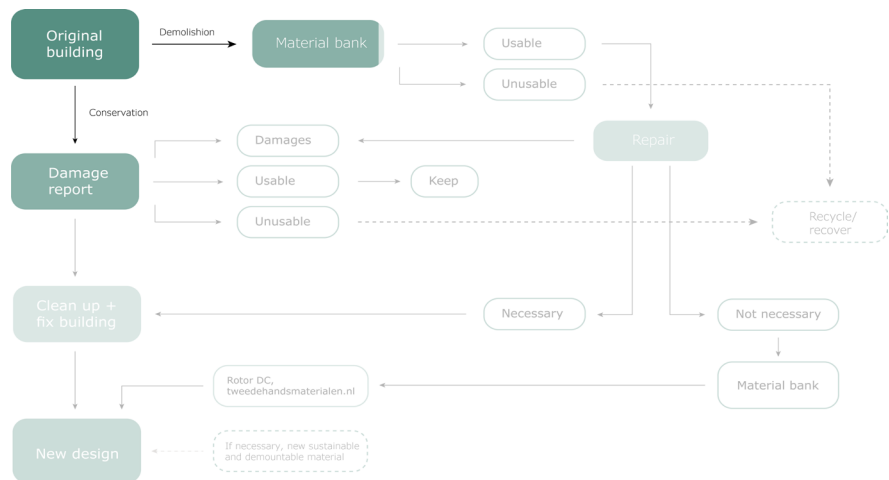
East facade



West facade

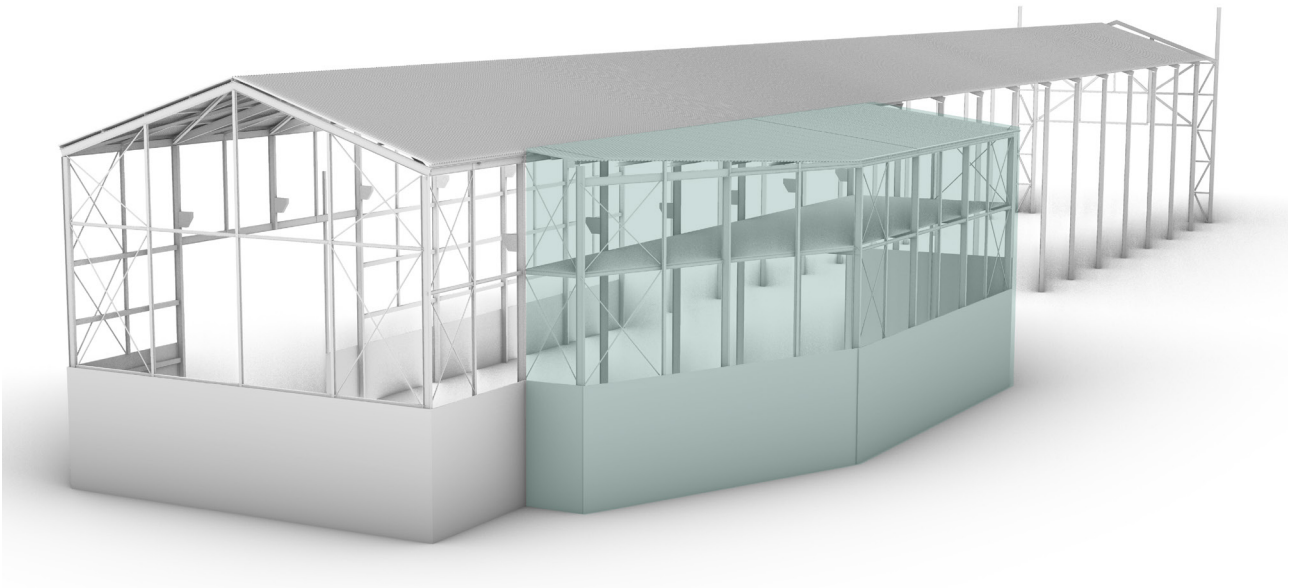
Necessary repairs

57 broken windows
7 broken selchim panels
4 m² broken brick

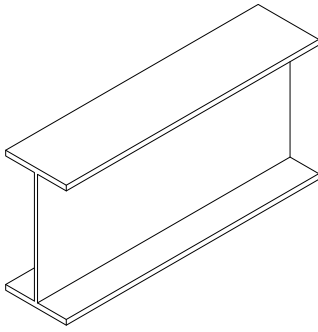


Because the wharf is quite old, there are quite some damages: 57 broken windows, 7 broken panels and some broken brick. However, some of these damages are located at the part of the building that will be deconstructed to create an opening towards the site. These damages do not have to be repaired and the materials gained from this, can be used to repair the rest of the building.

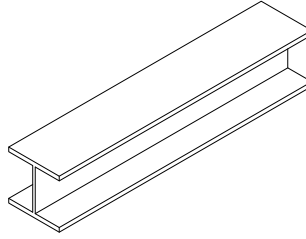
The materials gained from deconstructing part of the building will be put into a material bank. This material bank (and others) will be used in the design process to create the new design. The remaining part of the building will be repaired and used to house the new functions that will be introduced.



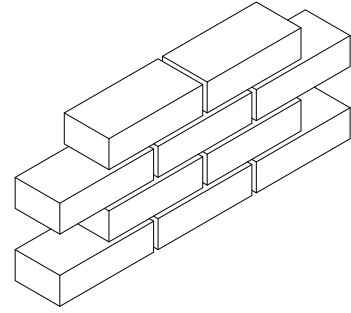
Part of the addition that is demolished



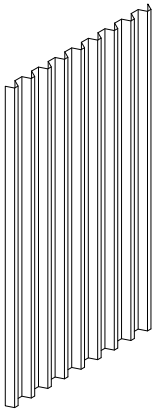
IPE240 (column) 6x 9.6m
(beam) 5x 6.5m



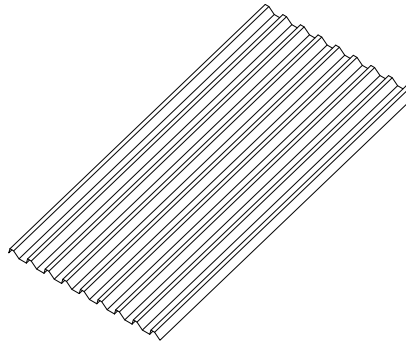
HEA100 (column) 6x 9.6m
(beam) 50x 5m



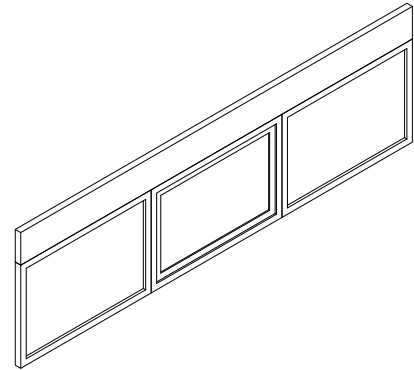
Brick 130m²



Selchim panel 1270x300mm
739 green
482 transparent



Roof panels 1800x1000mm
288x



Window frames 5000x1250mm

Material bank of gained material from addition

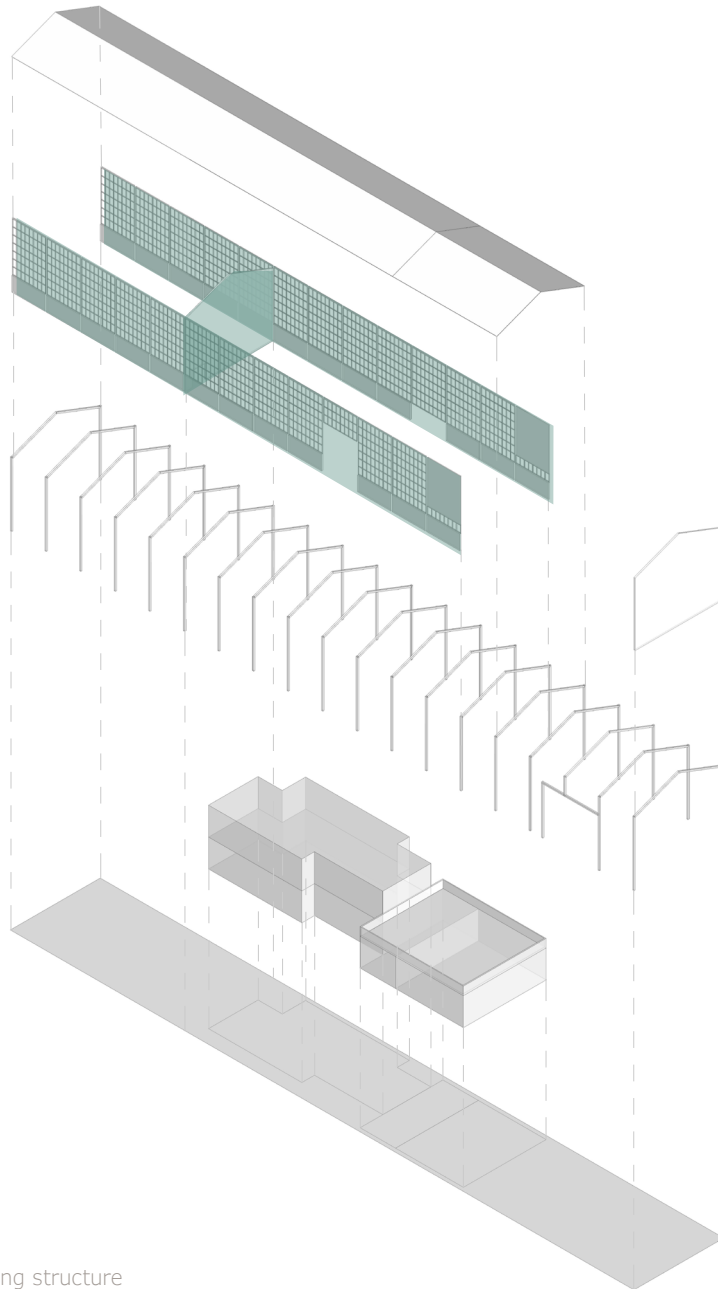
While quite a lot of material could be retrieved from the addition, not enough windows can be retrieved from the wharf itself to repair the whole lot. Luckily, there is a storage shed at the site that uses the same materials as the wharf. By deconstructing this shed, there is more room for the ecological corridor and the materials can be used to repair the wharf.

From this storage shed, 59 windows can be retrieved and with the 23 from the demolition of the addition there are 82 windows that can be used to repair the wharf.

The gained corrugated panels from the deconstruction, can be used to construct a partition wall within the skin around the new design. This wall will separate the workshops on the one side and the community center with the restaurant at the other side (see next page).



Storage shed with same material as wharf

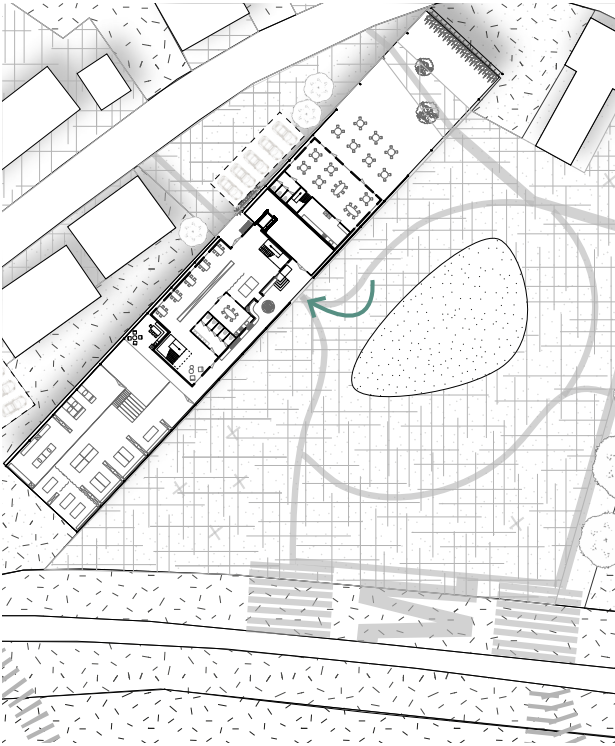


Axonometric view on building structure

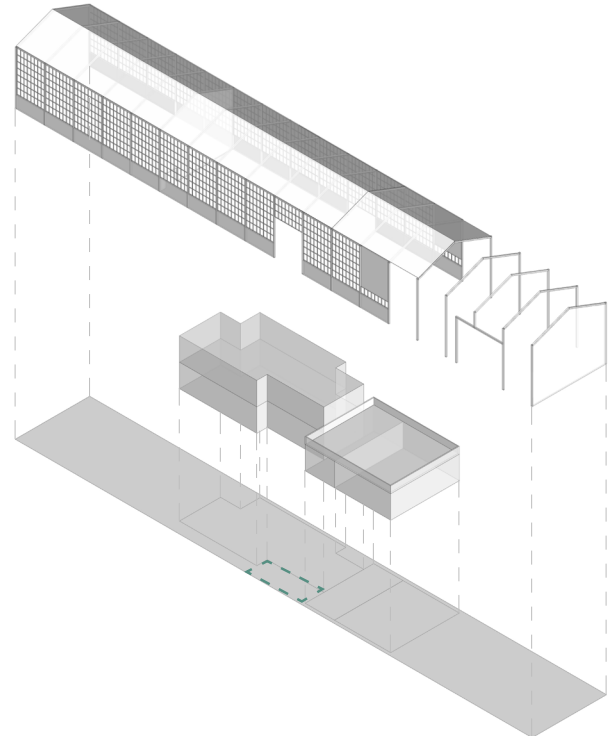


The construction parts of the wharf will remain and now the skin of the hall indicated in green (in the previous figure) is repaired and transformed. This hall will function as an umbrella around the new functions introduced within. These functions will be a restaurant at the right side and additional entrance to attract people to the site, and a community center will be placed in the middle to function as a meeting space and a connector between the visitors and the workshop spaces.

INTERSPACES



Entrance from city park



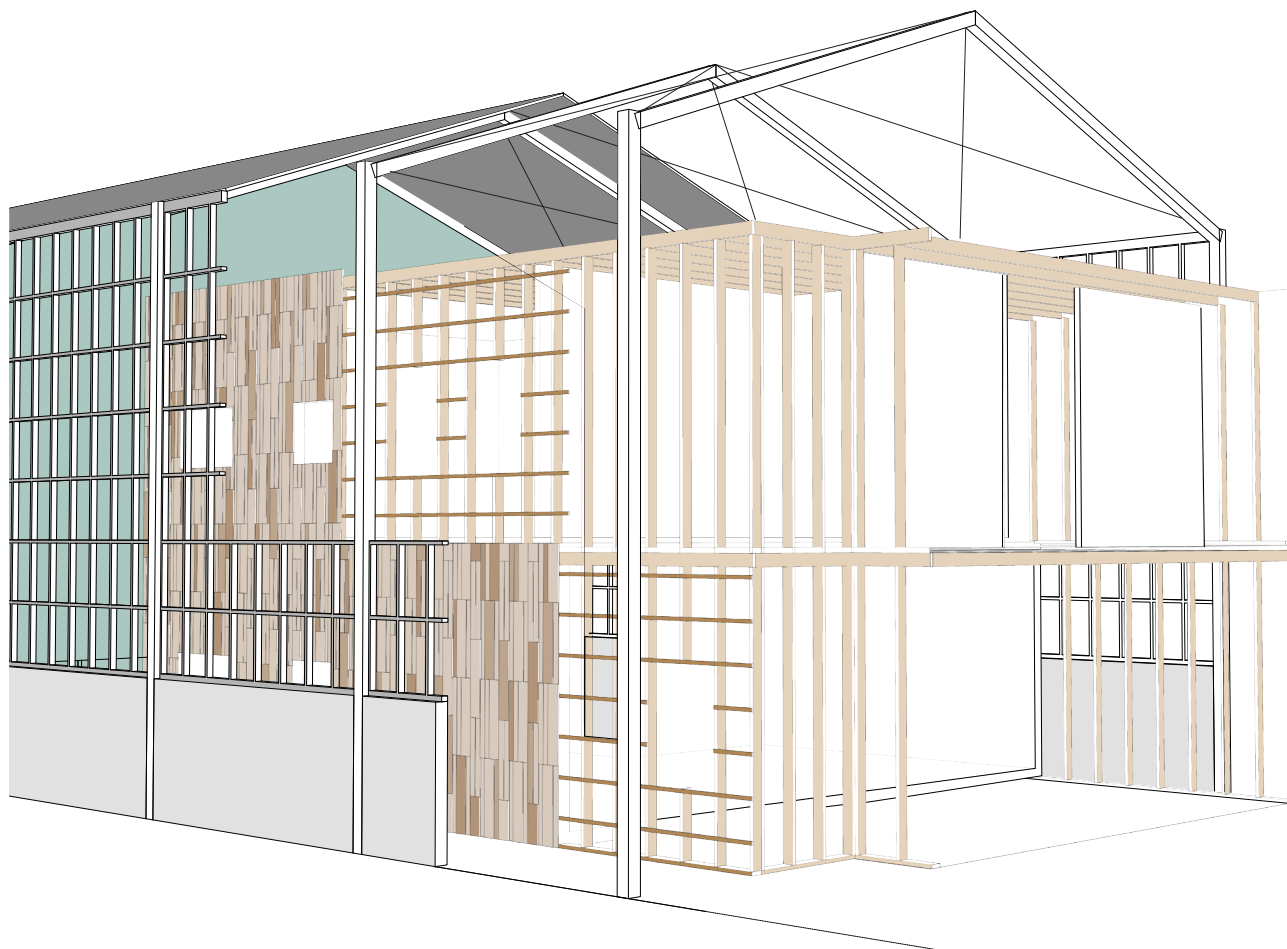
Entrance are from city park isometric view

The shape of the new design that is placed within the hall, creates different interspaces. Different shapes of those place indicate different use; circulation spaces, entrances or places to stay. First we will take a look at the entrance space from the city park.



Impression entrance from city park

From the outside it looks like the picture above. At the different interspaces, people can meet each other. Have a seat at the covered outside space, while watching their children play at the playground in front of the community center.



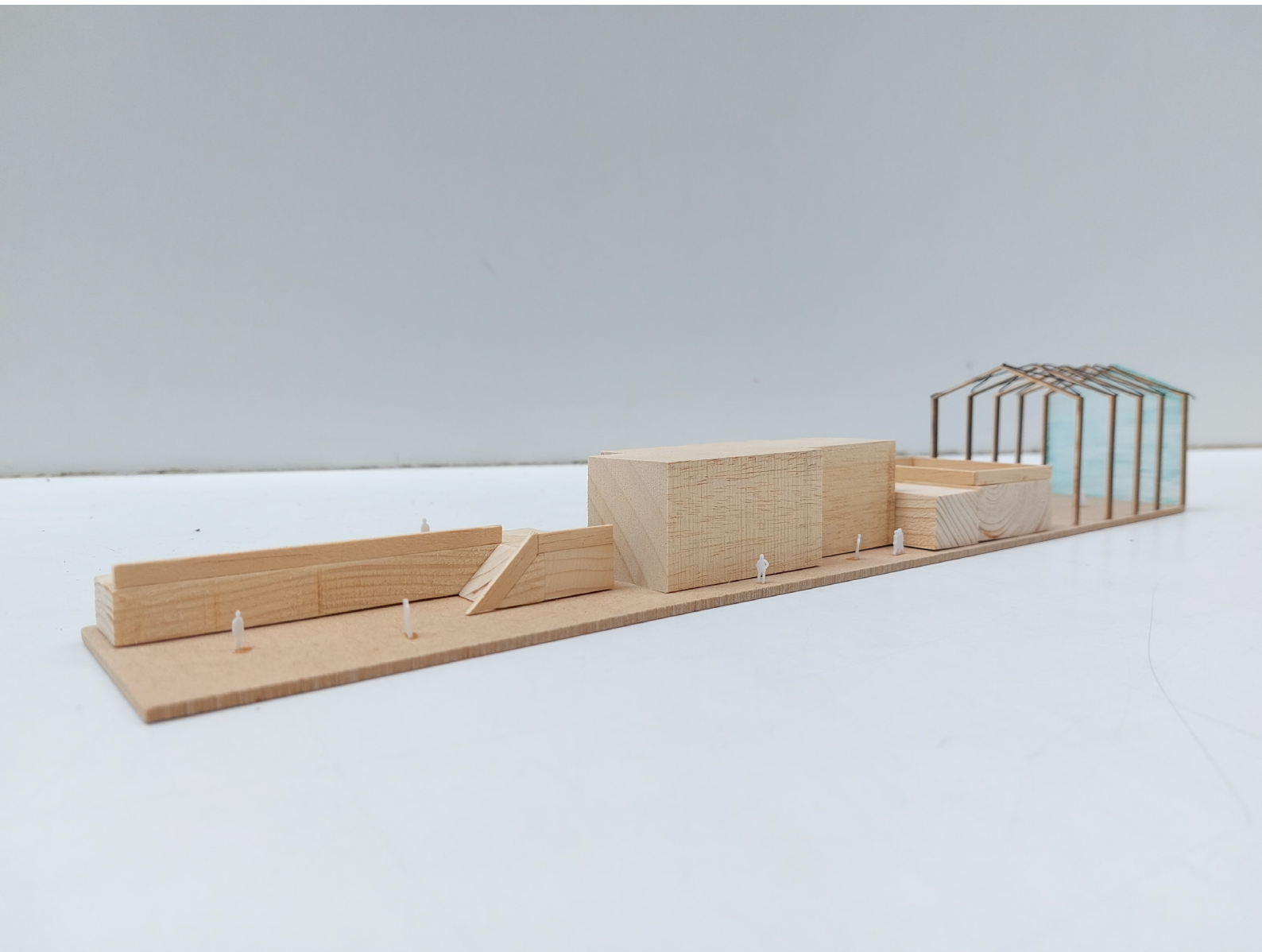
Facade layers



Model building design 1:200. West facade.



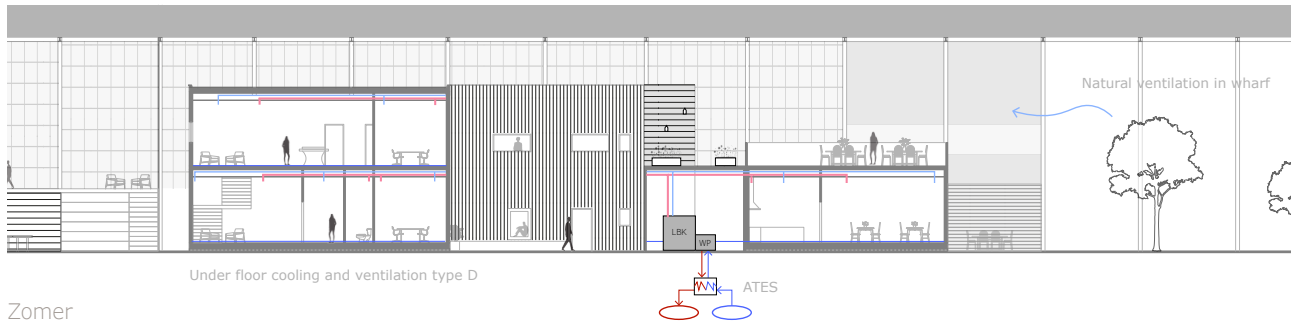
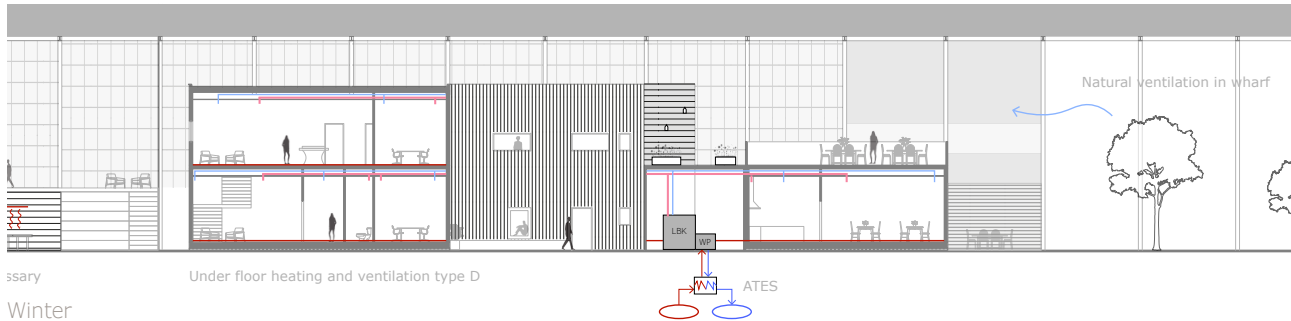
Model building design 1:200. East facade.



Model building design 1:200. West facade without hall as umbrella.



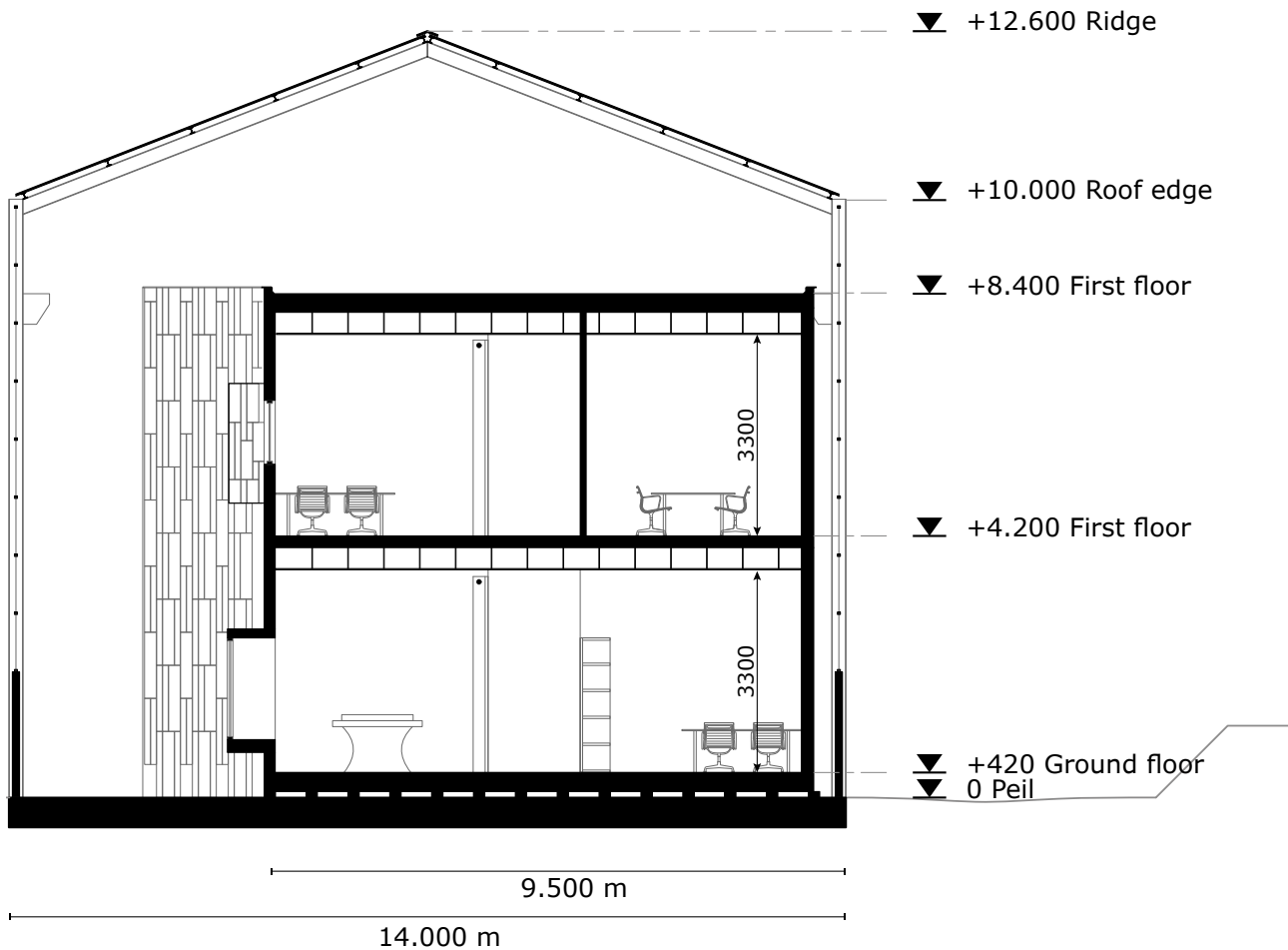
Model building design 1:200. East facade without hall as umbrella.



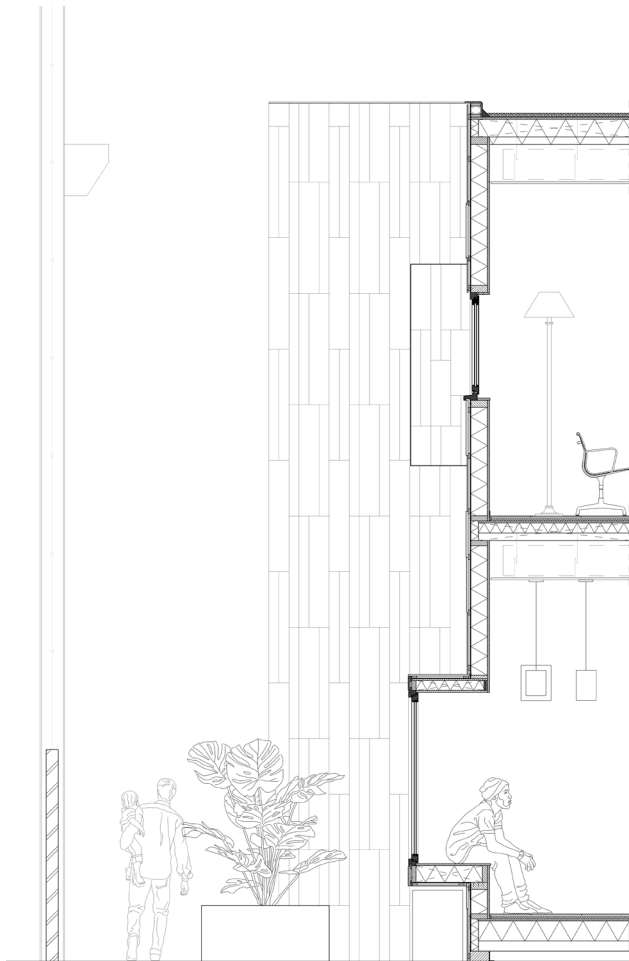
In contrast to the wharf, this part is fully regulated. There is demountable under floor heating and cooling and ventilation type D is implemented. Even though it is located within another structure, the new design is designed to be self-contained in case the roof of the wharf breaks down or needs to be deconstructed.

While I made it a criterium that the new design should be self contained, this means that a lot of new material was needed. This does not fully comply with my strategy, but the new materials that are added need to be demountable and sustainable so in the future the materials and parts can be reused easily.

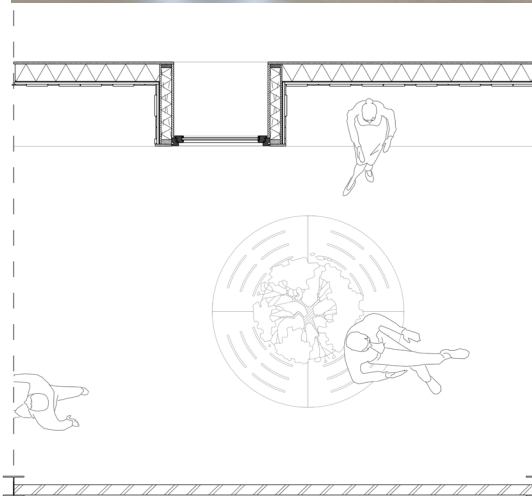
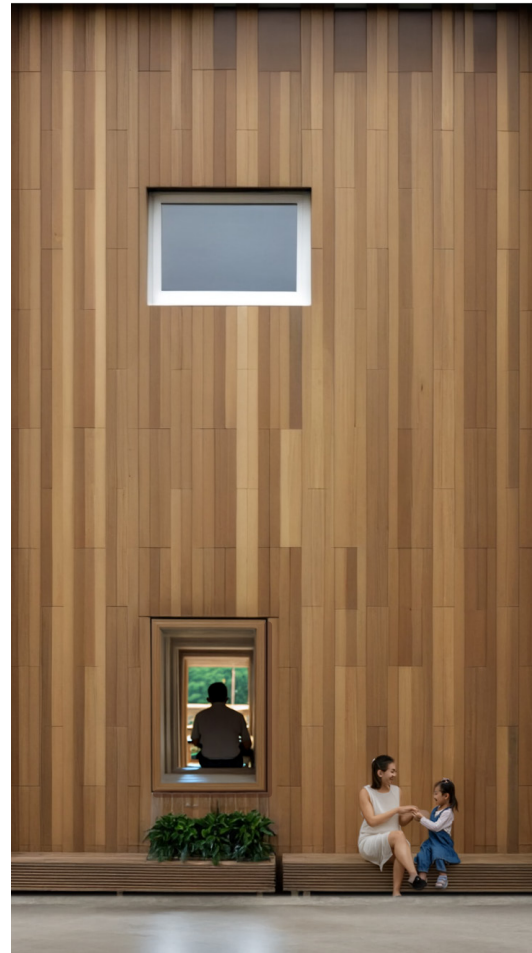
The volume that is placed within the hall is a little over 8 meters high to match the height of the crane lane. However, the hall itself is 12.6 meters so will still be much higher. This height is tangible while travelling in the interspaces, but once you enter the community center, you step into another world in which the human scale is taken into account.

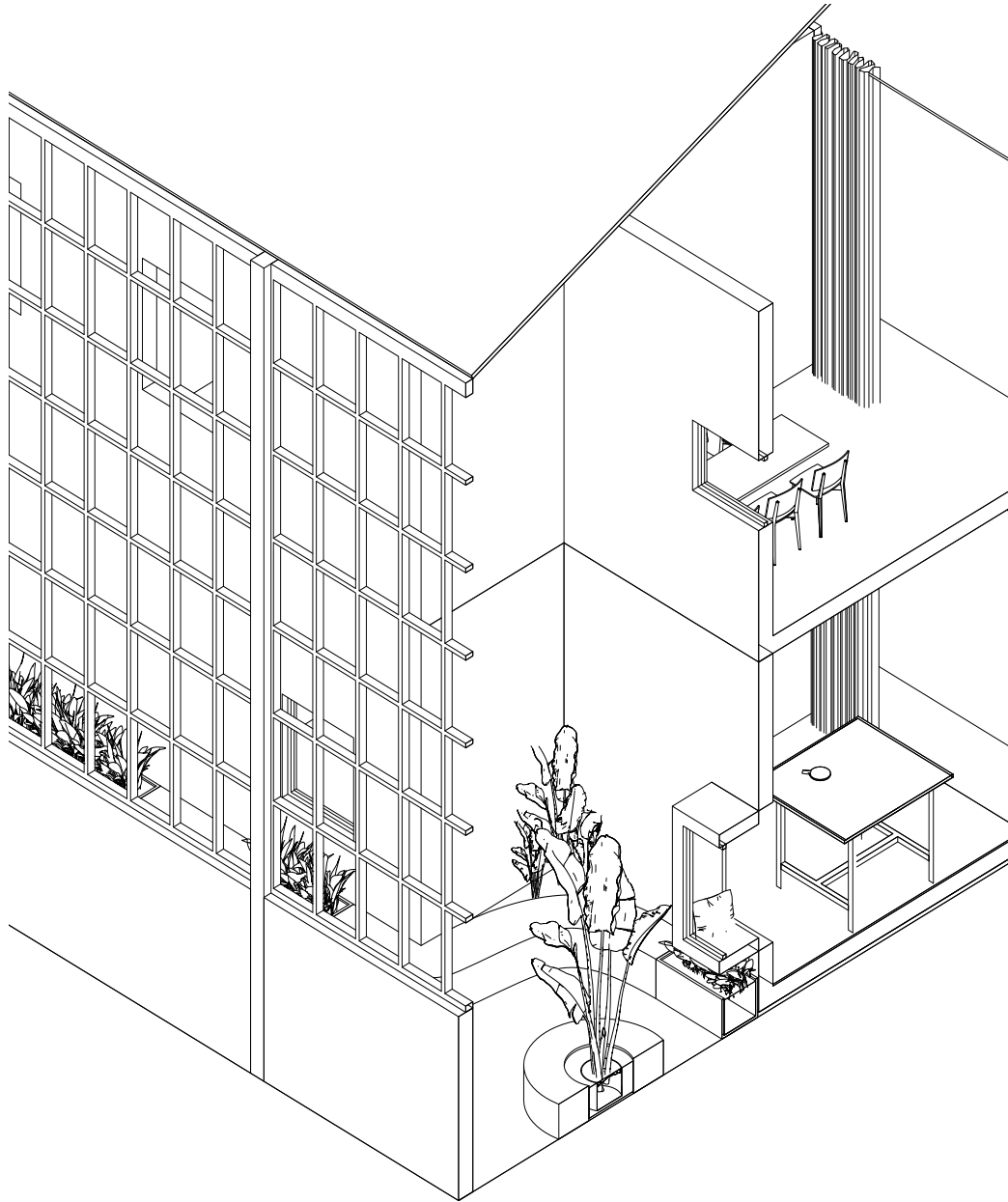


Technical section



Facade fragment. Vertical section, elevation and horizontal section.





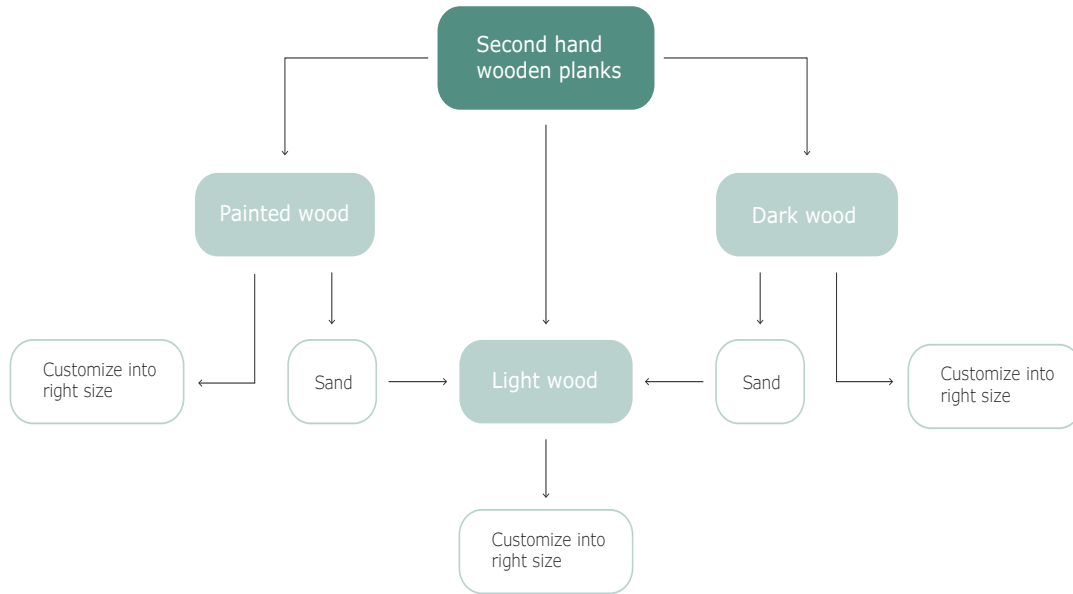
Isometric view of interspace with inside space



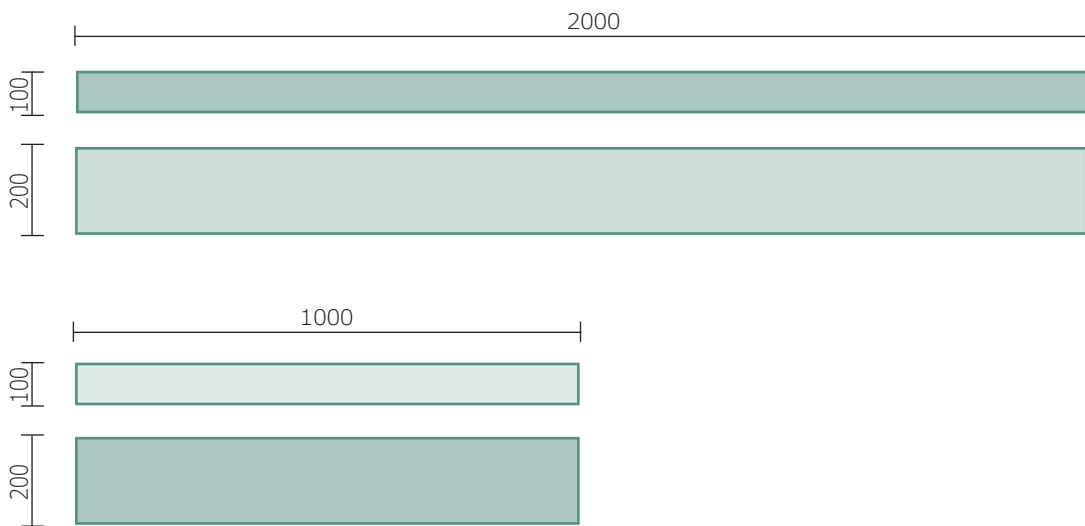
Impression entrance from city park



Impression circulation space south side



Material strategy



Measurements of second hand wooden planks

The outside of the community center is made from second hand wooden planks which create a softer and warmer feeling, compared to the harsh material of the former ship wharf. Of course, all of the second hand wood has different characteristics. Some might contain paint residue, one plank is thinner or longer than the other. To create some guidelines for the design, I created some criteria and a strategy. The wooden boards need to fit a certain size (thickness can vary, which creates depth into the facade) and the boards need to be sanded to create a coherent overview. Lastly, the boards are organised into different shades. the darker shades are used in the spots where more daylight breaks through and the lighter material is used in the darker spots.



Configuration of second hand wooden boards



Based on the orientation of the facade and the function of the facade, I have made a scheme on what colour boards will be placed where, and in what orientation they will be placed. Like said before, dark wood in places that are lighter and to create a more secluded space. Besides the sizes of the boards the differences of vertical and horizontal placement also plays a role. The horizontally placed boards along the restaurant will function as a rustic guideline towards the park on the other side of the building. Most of the other boards will be placed vertically to emphasize the height of the wharf.



In these interspaces, the height and harsh materials of the wharf are tangible, but on the other side the warmer and softer community center creates an inviting place. The sitting windows break the facade and connects the inside with the outside as it almost pulls you inside the community center.



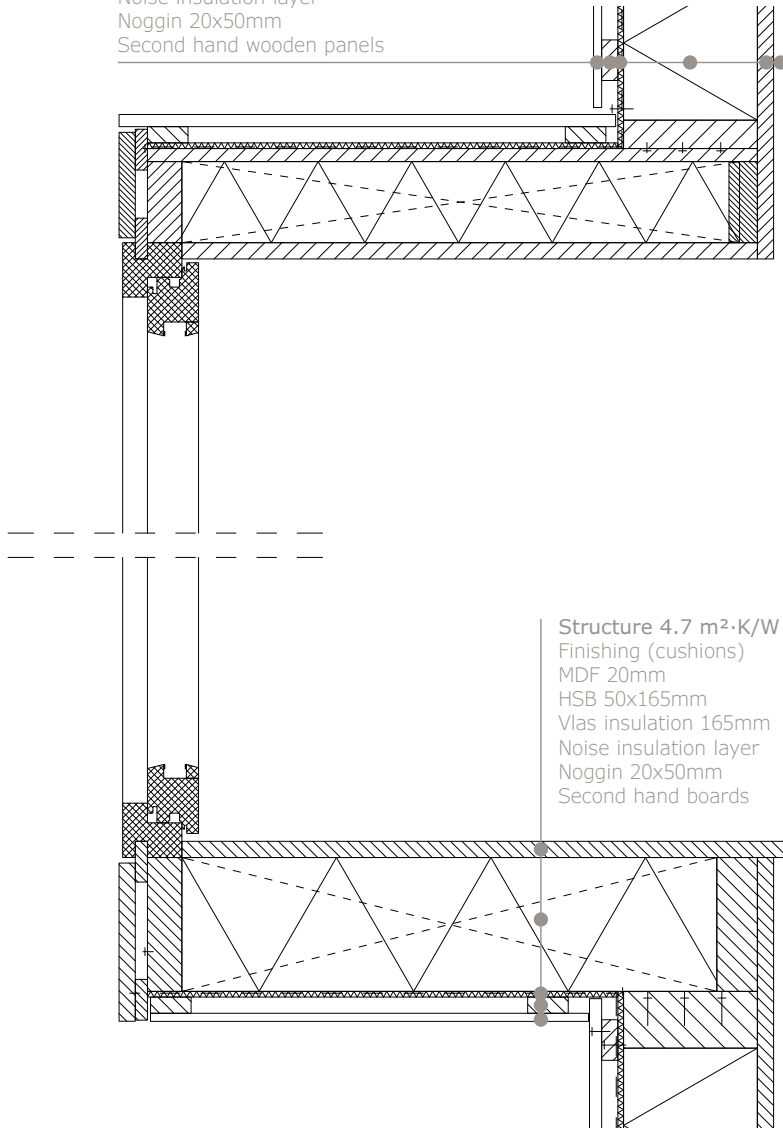
Horizontally placed wooden boards at the restaurant



Seating window in interspaces

Wall structure 4,7 m²·K/W

Finishing felt tiles
MDF 20mm
Studs 50x165mm
Vlas insulation 165mm
Water repellent foil
Noise insulation layer
Noggin 20x50mm
Second hand wooden panels



To prevent the space within the hall from echoing, a noise absorption layer is added to the skin of the community center. In this detail you can also see how the second hand wooden boards are attached to the grid of noggins every half a meter.



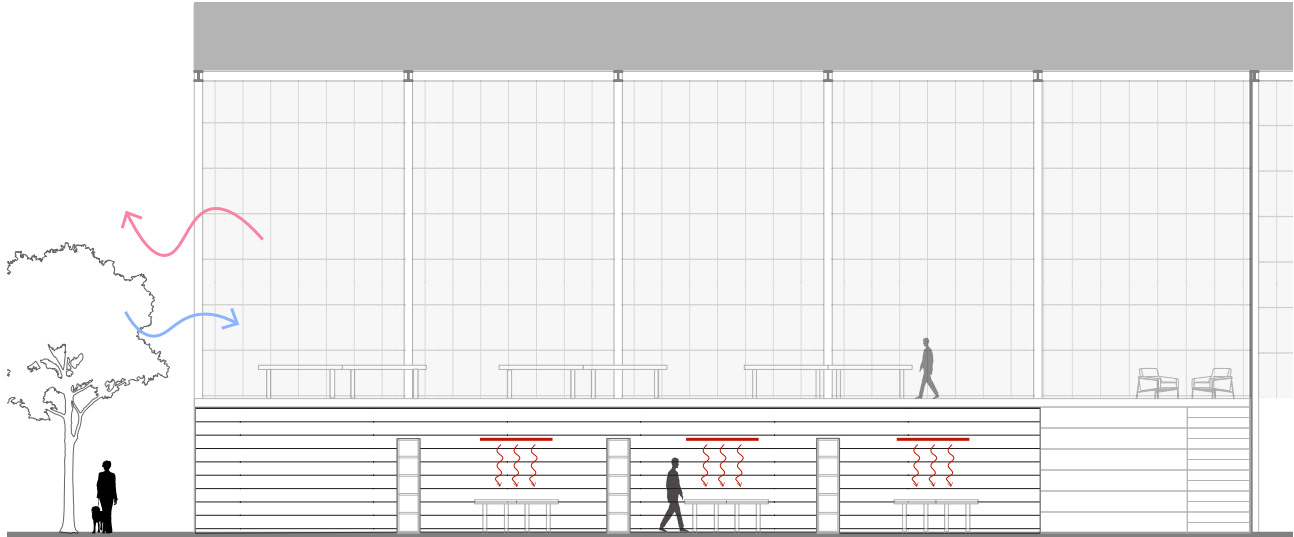
Impression of circulation space towards the workspaces

The next stop of the Waste Site Story is at the end of the circulation space indicated by the green separation wall made from the facade panels that were deconstructed from the addition in the beginning. At the other side of that wall are the workshop spaces for woodworking, metallurgy or any other project that the inhabitants of Sliedrecht and surroundings might want to make.

WORKSPACES

The workspaces are placed directly within in the hall and is only shielded against rain and wind. This means that the temperature in this place is not regulated. During the summer it might get a little warm in the hall and then the original large door at the end of the building can be opened up. On the other side, in the winter it can get a little cold. While the machines generate some heat and one can wear an extra sweater, local heat panels will be placed so when it is really too cold, these can be turned on.

In this area the original building is visible and experienced in every way. The industrial steel construction, glass and plastic panels that used to be a simple way to keep the wind and rain out can now be an inspiration for the projects made in the workspaces while still continuing its original function. Now accessible for the inhabitants of Sliedrecht instead of it solely being accessible for large industries.



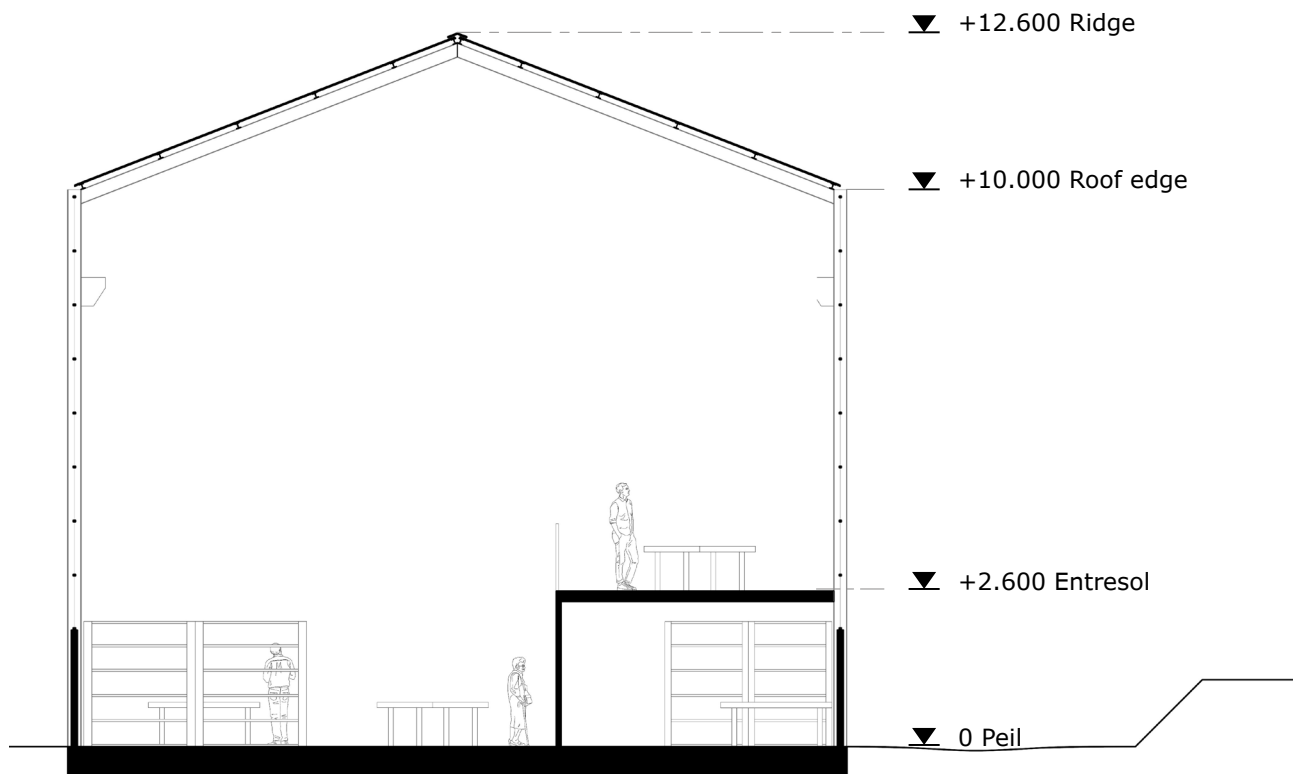
Climate within the workspaces



Impression sawmill

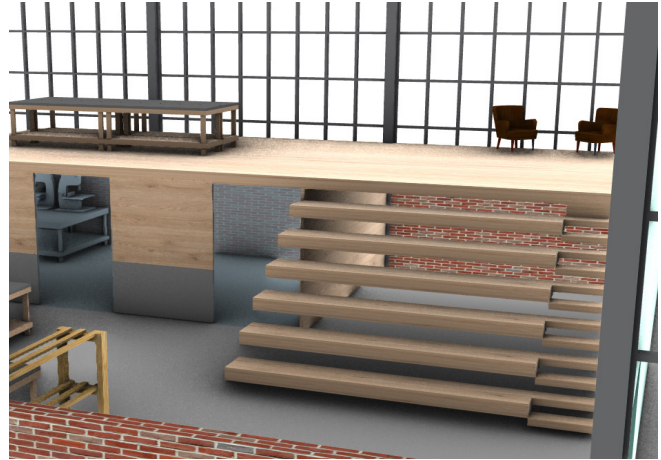
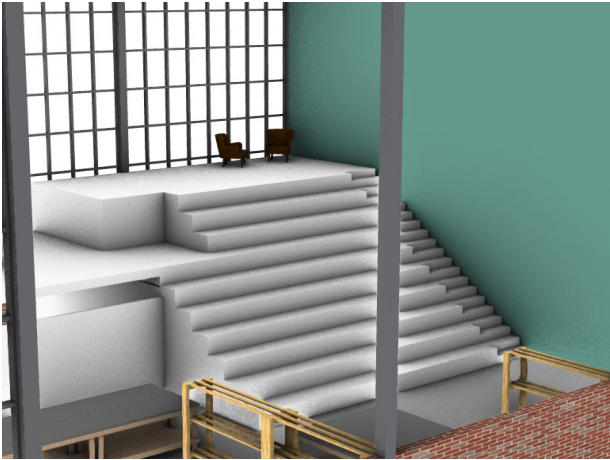


Impression workspaces



Section workspaces

Even at the entresol that's 2.6 meters high, the height of the hall is still tangible. The entresol can be accessed by the stairs that has a double function as a tribune where interaction can take place and one can have a look at what everybody is doing with their project or lectures can be held.



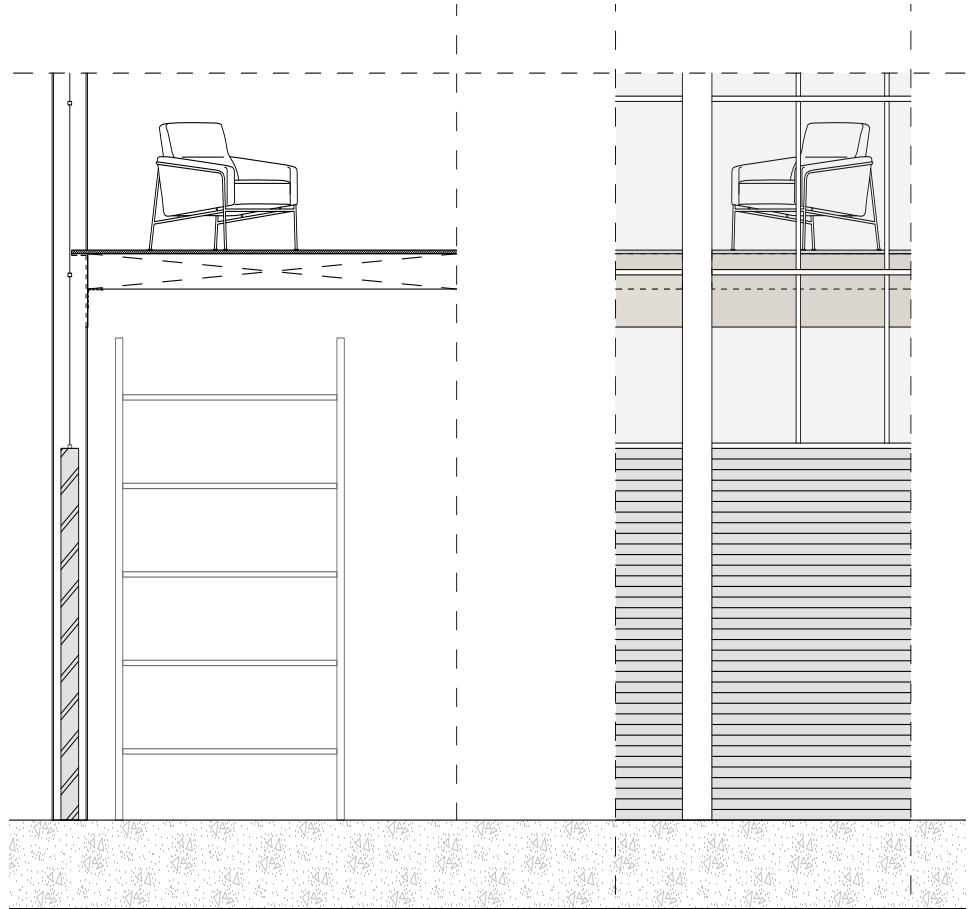
Initial concept tribune

To make the tribune, the first concept was a massive stair made of a big volume. This did not comply with my design strategy in which I want to reduce waste and in that sense material. By creating a lighter and smaller structure, less material would be required. Underneath the tribune is a storage which means that no insulation is needed, openings can be filled up with fabric like felt or reused jeans to catch the wood and dust particles.



Impression tribune

In the end, the tribune was turned 90 degrees so when sitting on the tribune, visitors can have a look through the hall and a lecture could be given. The height of the entresol is higher than the brick existing structure, which means the floor will need to be attached to the windows. Of course this has to be connected to the construction which causes an opening between the window and new construction. The top flooring will be expanded to fill up the gap and some vilt or used jeans will be used to prevent dust particles from passing through.



facade fragment. Elevation, vertical section and horizontal section

CONCLUSION

Looking back to the research question: *How can designing with waste reduce the generated waste within the built environment?* My conclusion is that initially it is important to work with the waste that is available. However, to make reuse possible, reuse has to be kept in mind earlier on in the process. In the past, designers did not think about the idea that the material might be reused when the building gets broken down. Many materials are glued together or poured when wet and dried up.

The necessity lies in turning around the process that generates the waste and try to design in a way that reuse is integrated within architecture so in the future this can be implemented at a much bigger scale.

Integrating waste in architecture is the future of building. Make do with what is available!

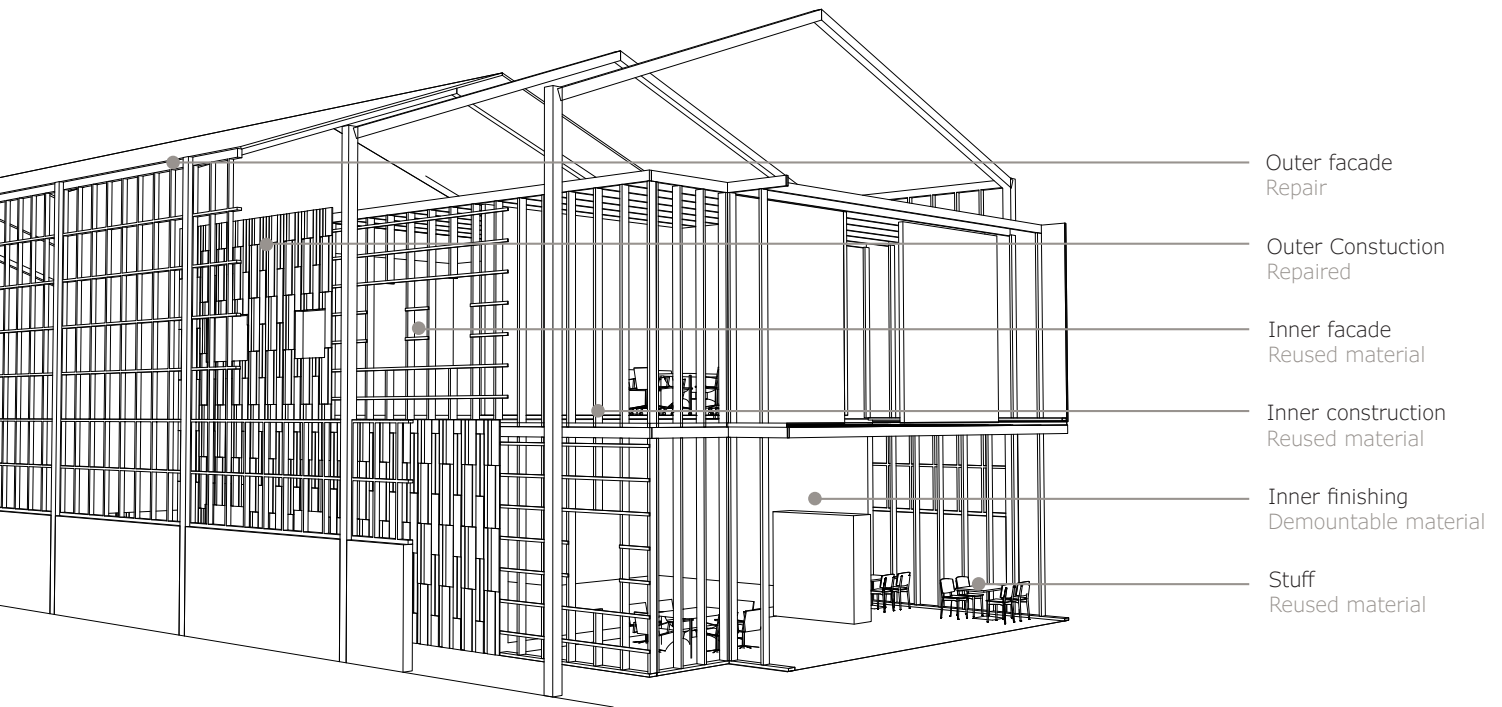
REFLECTION

This year has had its ups and downs and while I really enjoyed this year, some difficult points in the design process arose. After the P2 I stagnated a little, because I started zooming in to the smaller elements of the project like the materialisation and the precise layout of the floor plan, because that were some concrete parts of a project that I am familiar doing. However, I might have started off too zoomed in into particular things like insulation material and the thicknesses needed for this. Now I know that it would have been more beneficial to first look at the bigger picture, formulate some criteria and use this to base the choices on I make during the design process. I think the reason for the stagnation after the P2 was, because I did not know where to start and therefor started with something very specific. Later, I realised that I first needed to zoom out a little bit before I could move on. Luckily my tutors and fellow students helped me to get out of the stagnation and Rotterdam Steel Works as an umbrella was introduced by Lidy and Koen. To be able to use the existing structure, I made a damage overview in which I indicated where the damages are and where reparation is necessary. For this, I went on another site visit to the former ship wharf where the owners son guided me. He could tell me about the roof and some other interesting parts and he introduced me to the storage shed that is also located at the site. Using the materials from that shed would solve my window problem as there were too many broken ones to be repaired with only the materials from the ship wharf. This umbrella idea gave me a better understanding of how to continue the project and afterwards new ideas arose.

The next stagnation point in the process between P3 and P4: how to design and sell the atmosphere I envision. By introducing a strategy and roadmap my vision for the overall design became more clear to myself and afterwards this could be better transferred into the details of the design.

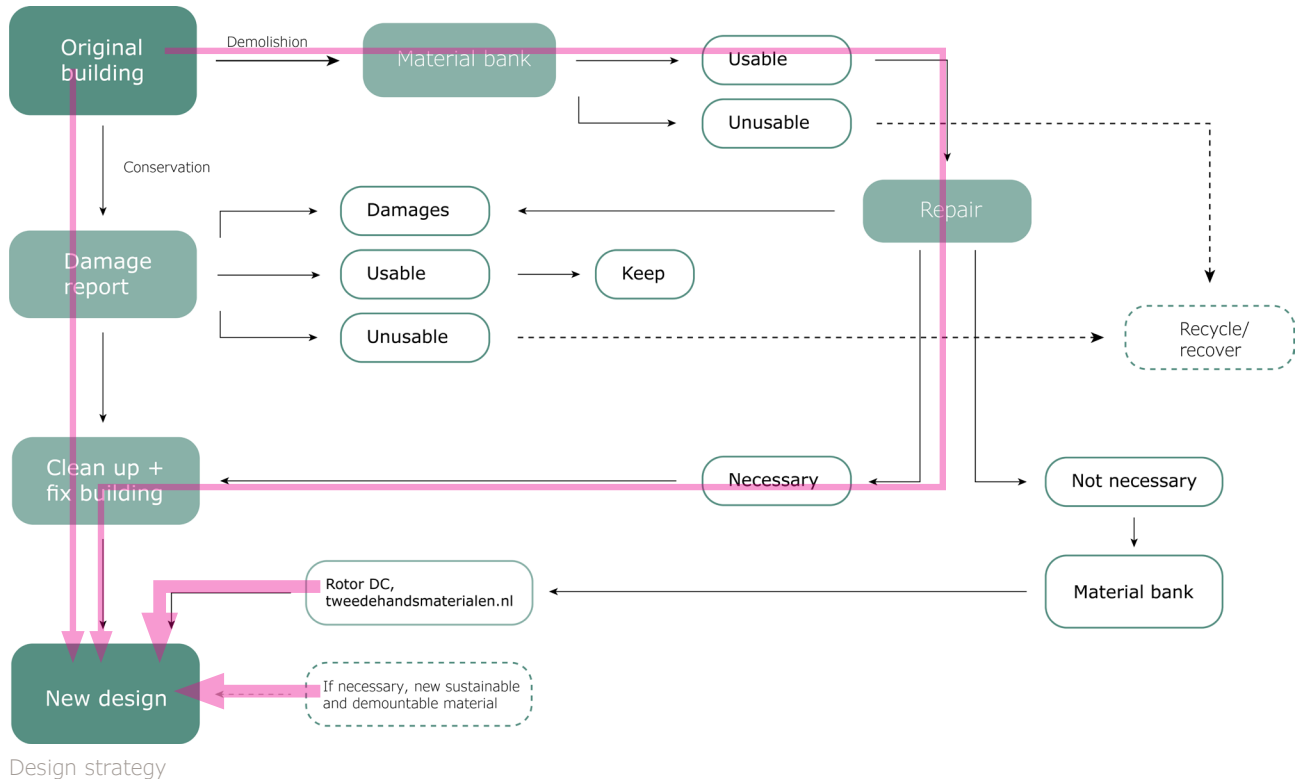
And last but not least, after P4 my motivation was hard to find as the green light meant that I had sort of graduated already. The only thing left to do is to present to your friends and family, which is something I dread. After talking with the student counselor, I decided to only do the things I enjoy most and see where that brings me. From that moment on, I actually enjoyed the last few weeks of the graduation project!

The rest of the reflection show something I struggled with, some things I learned and what will be the next step to follow up on this research and design.



Reuse layers

By shifting through the layers during the design process I found out that within one layer it is easier the reuse material than in the other layer. Construction elements have a long life span and can therefor easily be reused. Climate systems however have a much shorter life span, which makes them harder to reuse. A sustainable solution would then be to make these climate installations demountable so in the future they can easily be deconstructed and either reused if possible or recycled effectively.



Each project has its own challenges and initial state, but I believe the strategy I created can also be implemented at other sites. Old wharfs or large buildings could be repaired instead of demolished and a new regulated design can be placed within. Besides the implementation of the umbrella in other places, making additions to an existing structure by using reused materials could also be implemented at other places as well as the reuse of material that might be deconstructed from the existing building.

The only thing that will change per project is the intensity of a particular route that is used from the scheme. At a site with a lot of material, the material bank route will be used more intensely, while a project with little present material, the route along the external material bank will be used more intensely.

While the topic of waste in architecture is an important and a contemporary issue, it brings along some difficult challenges. What are the most important parts of the process? What are the limits? Which guideline do you follow during the design?

These questions are reoccurring along the whole process, because what will you do when a material that you need is not there? One can choose to turn around the design, work with another material or wait until it is available to build. This makes it difficult to design with reused material, because you do not know what is available and every material will probably contain traces of use. To me this made it difficult to look deeper into the design and what creative ways can be used to create something great. This will be a point to take into consideration for a next designer if this project is ever continued and hopefully we will change the approach on architecture in a way that materials are reused.

With this reflection I am completing my graduation project. I look back to an educational and fun process that challenged me both content-related and personally. I am curious to find out what the future will bring for this subject in architecture.

Graduation Project
WasteSiteStory

Merel Schouten



Technische Universiteit Delft