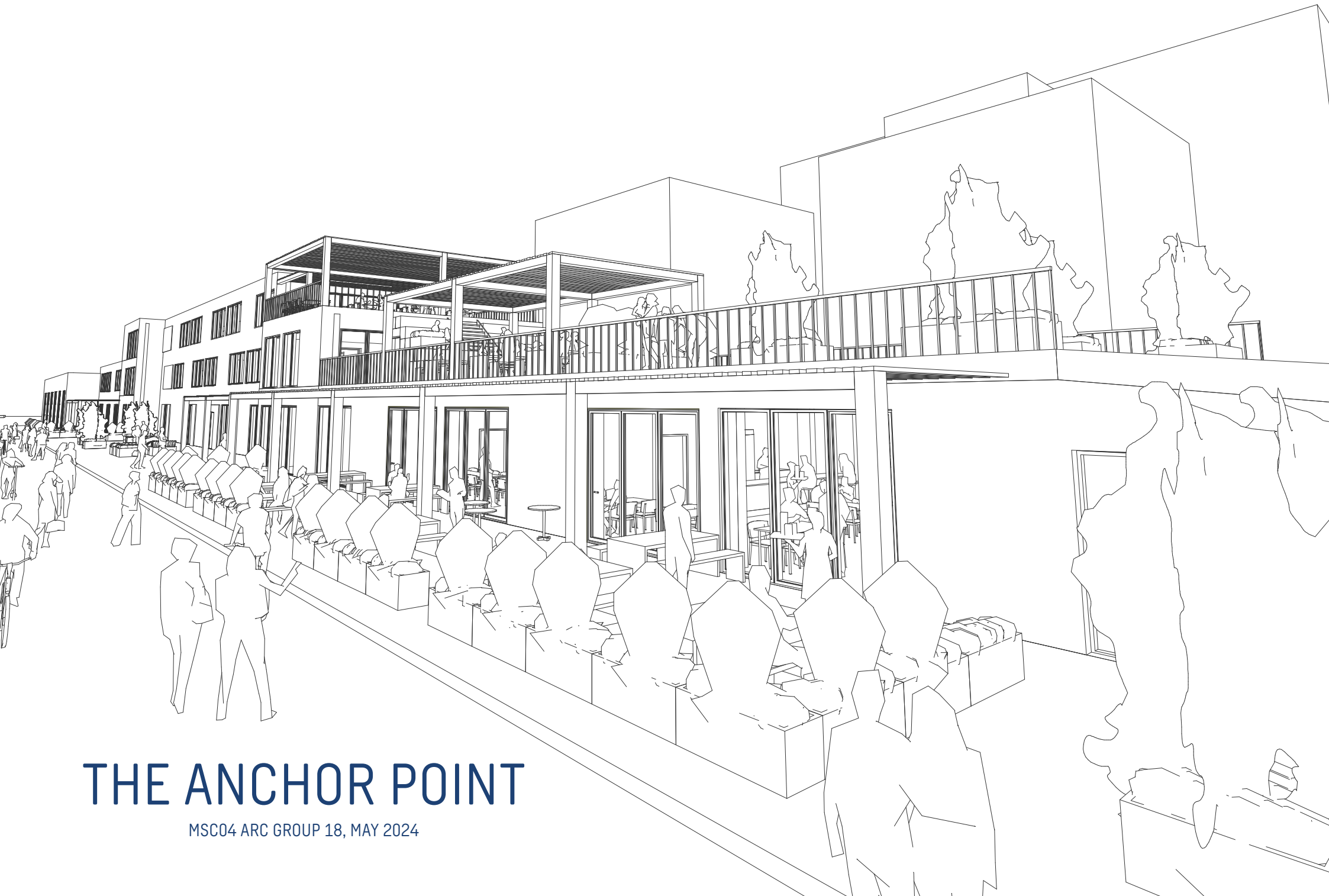

THE ANCHOR POINT

MSC04 ARC GROUP 18, MAY 2024

Title page

Title	The Anchor Point
Projekt	Master theis
Institut	Aalborg Universitet - Department of Architecture, Design and Media Technology
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Jonathan Aagaard Larsen

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Ill 1 - Aarhus Ø

Abstract

English

The project entails a design proposal for a new anchor point at Aarhus Ø, focusing on creating a space where both existing and new associations can have a gathering place, as well as establishing a communal area for residents and visitors. This report “shows” the journey from the initial ideas to the design proposal, including justifications for the choices made along the way and the processes those choices entailed.

The report explores how the design and layout of the building impact the people who use and move around it. Additionally, it delves into the history of and around Aarhus Harbor and Aarhus Ø, as well as what residents and users of Aarhus Ø feel is currently lacking in existing and future buildings and areas. Investigations in and around the site aim to gain a better understanding of the deficiencies described by the residents, as well as an understanding of the microclimatic conditions and their significance. Case studies were conducted on Lanternen in Esbjerg, Kulturværftet in Helsingør, and Havnehuset in Nordhavnen (design proposal) due to their locations in harbor areas and their hybrid functions.

This has led to a design proposal for “The Anchor Point,” which serves as a gathering place for local associations and includes a shop, bar, and restaurant, providing both locals and visitors with places to stay. The open ground floor features a bar, shop, workshop, and work hall where sailing club members can work on their boats. The first-floor houses association and classroom spaces, and the second floor hosts a restaurant with views over the harbor. A green connection between the ground floor and first floor is created in the form of “Ø Parken” with an inviting staircase leading up to the restaurant.

Dansk

Projektet omhandler et designforslag af et nyt anker punkt på Aarhus Ø, med fokus på at skabe plads til både nuværende og nye foreninger kan få et samlingssted, samt skabe et fællessted for borger og besøgene. Denne rapport ”viser” vejen fra de første tanket til designforslaget med begrundelser for valgene taget undervejs og de processer som de forskellige valg har medført.

I rapporten undersøges der hvordan bygningernes design og udformning påvirker de mennesker som bruger og bevæger sig ved siden af den. Derudover undersøges der historien i og omkring Aarhus havn og Aarhus Ø, samt hvad borger og bruger af Aarhus Ø mener mangler både til nuværende og til fremtidige bygninger og områder. Undersøgelser i og omkring sitet, for at få en bedre forståelse af de mangler som beskrevet af borgerne samt forståelse af de mikroklimatiske forhold og deres betydning. Der er lavet casestudier på Lanternen i Esbjerg, Kulturværftet i Helsingør og Havnehuset i Nordhavnen (design forslag) grundet deres lokation på havneområder og deres hybride funktion.

Dette har ført til en design forslag af ”The Anchor point” som er et samlingspunkt for de lokale foreninger og har butik, bar samt en restaurant som giver de lokale og besøgene steder at ophold. Med den åbne stueetage hvor der er bar, butik, en workshop og en arbejdshal, hvor sejlklubberne kan arbejde på deres både. Første salen er der foreningen og undervisningslokaler og på anden sal er restauranten med udsigt ud over havnen. Der er skabt en grøn forbindelse mellem stueetagen og første sal i form af ”Ø Parken” med en inviterende trappe op til restauranten.

Readers guide

The Integrated Design Process is used as the overarching structure for the report, divided into five sections, and presented as a linear process, even though the process is iterative and moves in and out between the different phases. The report is divided into nine parts: the Prologue, Introduction (where methods are described), Theory, Analysis, Design Brief, Design Process, Presentation, and Epilogue.

The design process has been an iterative process and the different design elements have influenced each other. The design process in this report is structured according to the different elements to provide an easier understanding of the choices made about the design elements. For this reason, there will be parts of the design that are shown several times and elements that are only explained at a later point in time.
Throughout the design process, various icons representing design criteria are shown to indicate which parts of the design they have influenced.

The report includes several sections where sources are used to broaden the knowledge base, and the Harvard referencing style is used to cite these sources.

Ill 2 - Aarhus Marina

Table of Contents

Introduction to the Project

The project is located at the pier in the existing marina at the heart of Aarhus, where two of the six yacht clubs, Aarhus Sejlklub and Bugten, have their clubhouses, along with a restaurant (Luna Bar and Restaurant). The intention is to create a new anchor point and building for the entire Aarhus Ø, a place where people can meet whether they are passersby, residents needing a venue for various activities, or sailors wanting to gather and discuss their day's sailing experiences.

The project aims to bring together the individuals who use Aarhus Ø and unite people around the activities taking place at the harbor. While there are new sailing centers for professionals, there is a need for a place where locals can gather for smaller regattas, outings, or simply to socialize and seek assistance with their boats. It should also provide spaces for club activities, catering to members of both clubs and other visitors in the area who may want to learn more.

By bridging the gap between the sailing community and the expanding user base of the harbor, the project seeks to create a hub that attracts people from Aarhus Ø and beyond. The building should accommodate various facilities catering to different user needs, whether they are working on sailboats, going for walks, or seeking a place to relax on a warm summer day.

Additionally, by offering opportunities to host events that serve as meeting points for the area's residents and users, the building can foster a sense of community. The facilities should support this purpose and offer amenities to meet the diverse needs of the community, with a particular focus on the sailing community.

The building should be designed as a hybrid structure, with space for at least the two sailing clubs and a restaurant. It should also accommodate various other functions such as lecture halls, meeting rooms, shops, restaurants, cafes, or a workshop with space for four large boats, or five to six small ones.

Motivation

Knowledge about the area

Due to spending many hours at Aarhus Harbor since I was a child, as sailing has been something my family and I have been involved in for most of my life, I have gained a unique insight and experienced the history of the area. Additionally, being born and raised in Aarhus has allowed me to follow the city's development for over 20 years. Over the last 20 years, the city has grown significantly, with many new and exciting things happening, including the expansion of Aarhus Ø, which I have had the opportunity to closely follow due to my upbringing at Aarhus Marina. This has provided me with a unique insight and knowledge about the area.

The Ideas' start

The idea has been underway for several years as it was one of the first architectural projects that I had in mind. It was a project where the initial ideas were developed after visiting the clubhouses at Aarhus Marina to explore the area and go sailing. During the visit, the condition of the clubhouses was observed, and later discussions were held with other sailors about their quality and condition. The houses were not in the best condition and lacked facilities for both local sailors and visiting sailors, such as a larger workshop and new bathing and toilet facilities.

My motivation

Due to the knowledge and history, I have with both Aarhus Marina, Aarhus Ø, and the project, I have had a desire to recreate the project from both an architectural and engineering perspective. The project will have significant importance for the area in terms of the people who use it daily, whether it's for walking or tending to their boats.

Intro

The site

The site is situated on the edge of the existing marina, nestled between the water and the new buildings on the edge of the Aarhus Ø district in the heart of Aarhus. Currently, the site hosts two clubhouses for the Aarhus Sailing Club and Bugten, restaurant Luna, and a toilet/ shower building for guest sailors. Between the buildings, there are small green areas and places where club members can sit and enjoy the weather. The site is also popular in the summer, attracting many visitors for walks, but in winter, there are fewer visitors due to the lack of places to stay warm outdoors.

In the local context of Aarhus Ø, there are not many other options for the numerous associations to cultivate their communities or venues where they can meet either with each other or across groups. There are only a few spaces where something similar is possible, and these spaces are often dedicated to a single club or association. Additionally, it's challenging to find green areas where one can sit and relax without feeling monitored by local residents.

The buildings in the context mainly consist of residential and office spaces, with commercial areas on the ground floor, which doesn't provide many opportunities for places to stay, either for long or short periods. The same applies to the site, as the existing buildings do not invite entry, as their purpose is to provide a space for the associations that use them. Shops are scarce in the context or on the site, especially those offering equipment for the many sports enthusiasts in the area, whether for leisure or professional use. Water sports enthusiasts in the area often have to travel far to find shops where they can purchase equipment, making it difficult to pursue their sport and less attractive for visitors to the area.

Ill 3 - Denmark

Ill 4 - Sejlkluben Bugten


Ill 6 - Marina front - Guest toilets on the right

Ill 5 - The marina


Ill 7 - Small road on the back

Aarhus Ø

The History of Aarhus Ø

For a long time, Aarhus Ø was primarily reserved for harbor and industrial activities, rather than being suitable for residential or recreational purposes, aside from the sailors who used a small part of the harbor areas. In 1997, the Aarhus City Council decided to adopt a master plan for the old container port to transform it into a new and more attractive urban area. An idea competition was launched in 1999 to create a new urban plan for Aarhus Ø, resulting in around 150 different proposals being submitted. Architects Knud Fladeland Nielsen and Peer Teglgaard Jeppesen won the first prize with their idea. With the winning proposal as a basis, a comprehensive plan was developed and aprooved by the city council in 2003. Subsequently, Aarhus Municipality took over the first pier ,Pier 4 in 2007, and the first residents moved in by 2012 (Aarhus Kommune, 2023).

The vision was to create a new and attractive urban area in the heart of Aarhus for the city's residents, which could serve as the new framework for a modern and future city area, something the citizens could be proud of. The basis for the first phase was the old container terminal, where the old container cranes were dismissed, and the first buildings began to emerge. There was a focus on creating a synergy between functions, relationships, and architecture from the old part of Aarhus to the new part of the city on the harbor. Additionally, efforts were made to create some strongholds, such as Dokk 1 and Navitas, which would help recreate the waterfront edge (Aarhus Kommune and Aarhus Havn, 2003).
Since the first buildings were erected in 2012, primarily residential units have been constructed in the area, but there have also been developments for other commercial purposes. A visit to Aarhus Ø reveals some buildings where there is a primary focus on commercial used, such as Pakhusne, and others like Nikolinehus, where there are commercial spaces on the ground floor and residential units on the upper floors.

Ill 8 - Aarhus harbor 1990


Ill 9 - Aarhus marina

The History of the Harbor and Marina

There has been maritime activity in Aarhus since its founding in the Viking Age when the Aarhus River was used as an anchorage for their ships. From the Viking Age to the early 1900s, the anchorage gradually moved further south due to the city's expansion, and in the 1400s-1500s, a new city district was created on the southern side of the river. Small piers and quays began to be built where ships could dock, and over time, industries also began to emerge in the city. In the 1840s, it was decided to establish a modern harbor along the coast to accommodate the growing import industry. With the increased industrial activity and import of goods, more and more merchants began building warehouses and mansions by the new harbor, and in 1898, Aarhus' new customs duty house, designed by Hack Kampmann, was built as the outermost bastion against the waterfront.

The old container terminal was constructed in 1966 and remained in use until it was closed and relocated further south in 1998, and the area eventually became what is now Aarhus Ø (Aarhus University, 2024). Since the harbor has been a part of Aarhus' history since the Viking Age, it has always held significance, a tradition carried on by the sailing community found by the harbor.

An official sailing club, Aarhusbugtens Sejlklub, was established on July 26, 1880, but sailors had been gathering since July 1874 when a sailing event took place from Aarhus Harbor to Bellevue Beach. In 1877, an association focused on recreational sailing was founded. The modern marina was developed and expanded, with its inauguration in 1933, and has since been the home for Aarhus' recreational sailors, both young and old, with a focus on leisure or competitive sailing (AARHUS STADSARKIV, 2024).

Ill 10 - Aarhus marina 1935


Ill 11 - Aarhus customs building

The harbor has been an integral part of Aarhus for most of its existence and has played an important role in the city's development, serving as both an industrial and recreational harbor. As a result, investments have been made in the new harbor areas with the development of Aarhus Ø and the new Sailing Sports Center. The aim is to create a good place for young sailors while also being a venue for major events held at the harbor. Events such as the World Championships for all Olympic boat classes have been hosted there (SAILING AARHUS, 2024). Furthermore, the city also shows interest in water sports with initiatives like "Den Blå Skole" (SAILING AARHUS, 2020), where Aarhus schoolchildren can learn about sailing and other water activities.

Summary

There are shortcomings in the design of the new developments in part 1 of Aarhus Ø, as there is not enough public space and facilities for activities. There is a lack of places where people can take breaks, go for walks, and participate in various activities. There are also insufficient meeting places where residents, workers, and visitors can gather and build relationships. The lack of such gathering points has made it difficult to create a strong sense of community among users, as there are no central places where this can occur.

Method

The Integrated Design Process

The Integrated Design Process (IDP) is a method used to establish the framework for the approach used in a project, outlining the overall structure of the project. It is divided into five phases, including problem/idea, analysis, sketching, synthesis, and presentation phases.

These 5 phases guide the project, as each phase helps to delineate what the project's idea/problem is. Phase two involves analyses based on the delineation made earlier, while phase three takes the knowledge gained from phase two and transforms it into initial ideas/solutions. In this phase, questions are asked about the knowledge acquired and whether more may be needed. In phase four, the ideas and proposed solutions are tested and examined to see if they hold up. Sometimes, one may need to go back to the drawing board or gather more information to address a specific problem with one of the ideas. Phase five is where the ideas and solutions are presented.

This method is used as a guide for architects, outlining the complex process involved in modern construction projects. As building design has become more complex, it is essential to ensure that there are sufficient resources to guarantee the quality of the design. The method demonstrates how there is a back-and-forth movement between the phases, ensuring that any questions, issues, or gaps in knowledge can be investigated and resolved.

Emergent Thinking

The IDP method is used as an overall design approach to keep track of the project, but it does not describe how to work. Instead, it outlines how the project is structured. A method is developed based on Emergent Thinking (LEON, C., 2020), and it illustrates how problems are identified and addressed, whether they lead to other challenges or solutions. During the project, questions and challenges will arise that need to be addressed, shaping the project, and challenging the choices that have been made. Answering one question or solving one challenge will lead to other questions and challenges, which can either be set aside or addressed later in the process.

The method is divided into four sections, with each section becoming smaller as the process progresses. In the first section, there will be many questions and answers to find, so analyses, investigations, and models need to be created, which must be evaluated to determine if they provide usable answers. As the process advances, a clear direction will be created based on the answers obtained earlier until arriving at the solution/idea that one wishes to present.

Ill 13 shows that each section has three phases, where phase one involves the problem or question that needs to be investigated. Phase two is where the analyses and investigations are molded, and in phase three, one begins to sift through the answers obtained to a conclusion.

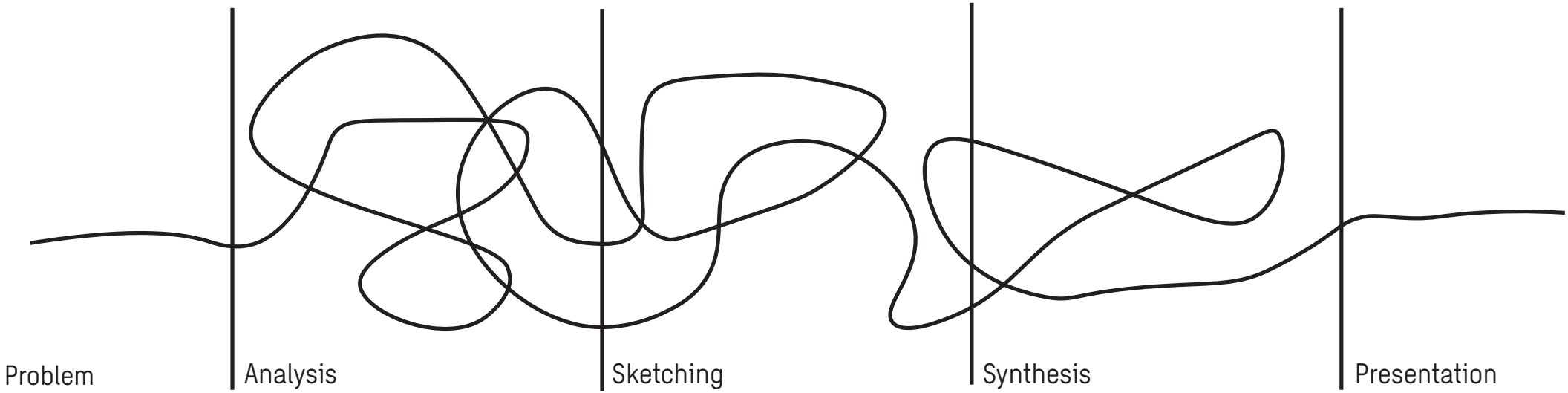
Tools

Different tools are used in the various processes of the entire project, and some tools are used ons and others are used in various phases and processes from beginning to end.

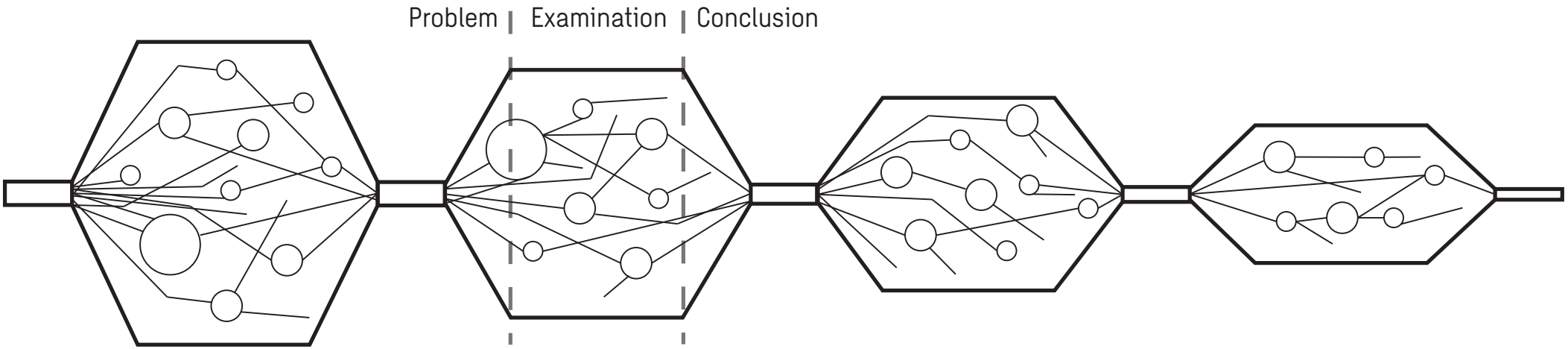
In the analysis phase, the tools used are desktop analysis, field studies, interviews, and theoretical studies.

In the sketching and synthesis phase of the project, sketching, 3D studies, using BE18 for energy calculations, Grasshopper for solar analyses, and 3D modeling programs Revit and Rhino are the tools that are used.

In the presentation phase, the 3D modeling program Revit, energy calculation from BE18, Velux daylight visualizer for lighting analyses, and Encape for visualization are used.



Ill 12 - Integrated Design Process



Ill 13 - Emergent Thinking

Teori

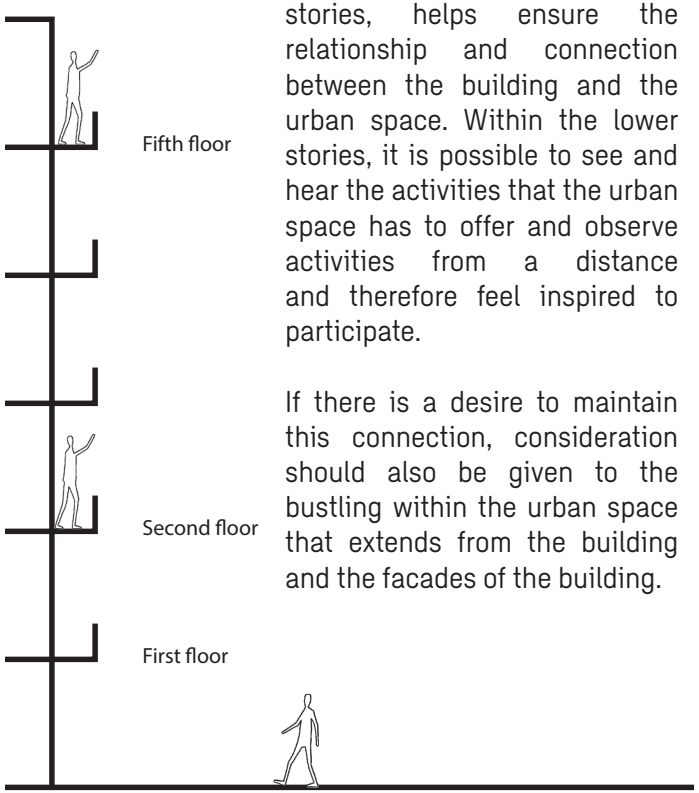
City and Buildings in Human Scale

Vertical Distance

The Vertical distance within a building plays a significant role in how it is perceived by those standing beside it and how communication occurs with individuals, whether one is inside the building or walking alongside it. If there is a desire to maintain a connection between the building's users and the use of the street, the maximum height should be limited to about five stories, beyond this height, this connection is lost. Moreover, if there are more stories, this connection between the building and the street gradually disappears. (Gehl, Jan, 2010).

A building under five stories, preferably two to three stories, helps ensure the relationship and connection between the building and the urban space. Within the lower stories, it is possible to see and hear the activities that the urban space has to offer and observe activities from a distance and therefore feel inspired to participate.

If there is a desire to maintain this connection, consideration should also be given to the bustling within the urban space that extends from the building and the facades of the building.



Ill 14 - Diagram of the building's height

Horizontal Distance

We use our sense of sight to both orient ourselves and explore, evaluate, and recognize our surroundings. This helps us get a sense of which areas are suitable for the activities we are engaged in or about to engage in. But we also use it to recognize individuals, and it is essential to know at what distance we can perceive specific details.

At distances between 500 to 300 meters, one can begin to distinguish people from the background, although that depends on the lighting conditions and environment. At 100 meters, the movement becomes noticeable, along with how individuals execute that movement, whether they are walking, running, or swinging their arms. As the person approaches, more and more details become discernible. At distances between 70 and 50 meters, an individual can begin to be recognized, and more attributes, such as their body language, become apparent (Gehl, Jan, 2010).

At 25 meters, it becomes possible to read their facial expressions and discern the person's emotional state. It is only when the person is within 10 meters that smaller details can be observed (Gehl, Jan, 2010).

Sound Distance

There is a difference between the distance, at which we can see and hear. It is essential to know how far and at what distance one can begin to see each other, but also how close one must be to communicate effectively.

From 70 to 50 meters, it is possible to shout at each other, for example, you can call for help, but not hold a conversation, and it is also the distance at which one can begin to recognize other individuals. At 35 meters, it is possible to provide information, albeit only through one-way communication, and this is often the distance used in theaters and churches, such as the distance between the preacher and the congregation (Gehl, Jan 2010). At a distance of 25 meters, it is possible to hold a brief conversation by shouting at each other, which may be disruptive to others. Distance of 20 meters, there is an optimal distance between a lecturer and the audience, such as in a theater or lecture hall (Gehl, Jan, 2010).

Individuals need to be within 7 meters of each other to hold a simple conversation involving two or more people, although the closer the distance, the more private the talk will be.

Ill 15 - Distance - 10, 20 and 50 meters

Speed

The speed at which we move affects how many details we can perceive. When studying cities and urban spaces, it is important to consider the traffic flow and the speed at which people move. Traveling at higher speeds requires fewer distractions and simpler details while traveling at lower speeds allows for the observation of more details. At speeds around 60 km/h, there should be more open spaces with fewer details, and the details that are retained should be more prominent yet simpler. This is also true at higher speeds because the faster the speed, the less there is to distract the observer, and the information the observer needs should be larger and easier to see (Gehl, Jan, 2010).

At lower speeds, such as walking (5 km/h), running (10-12 km/h), or cycling (15-20 km/h) (Gehl, Jan, 2010), it is easier to perceive more details and have more time to process the information presented. For example, when walking at 5 km/h and noticing either a significant detail or recognizing someone familiar,
it will take 60-70 seconds before encountering that particular object or person. This allows time to decide how to react at that moment (Gehl, Jan, 2010). Examples of this can be seen in the contrast between the Latin Quarter in Aarhus and the strets of Dubai.

The Latin Quarter is an old district in Aarhus with narrow streets designed for walking, whereas Dubai is designed for high-speed car traffic, resulting in simpler buildings so they can be enjoyed even at speeds of 100 km/h. A prominent example in Aarhus is Åboulevarden, a street that has served both car traffic and pedestrian traffic.

The design of the old houses includes more details, while the buildings constructed when Åboulevarden was a road feature fewer details due to the limited time available for observation.

Ill 16 - Latinerkvateret


Ill 17 - Dubai


Ill 18 - Åbulevarden

Attraction of People

One of the essential aspects of ensuring life in urban spaces is attracting people and providing activities that can engage and entertain those who come. People are naturally drawn to other people and activities, whether indoors or outdoors, such as craftsmen on a construction site, street artists, or people in shops/cafes.

As seen in many cafes, the chairs are often oriented towards the "busy" areas where there are activities or simply where it is possible to sit and observe people. This is again evident when a street artist begins to prepare to create their art. People may not stop to see what they are doing, but as soon as they start creating, a crowd often gathers around them (Gehl, Jan, 2017).

When designing public spaces, it is important to ensure there are areas where one can sit both in a more secluded setting and in a more open area with more activity. However, it is crucial to remember that users must feel safe in their surroundings, otherwise, they will leave. For example, when placing benches, it is advantageous to place them in areas with activity rather than in quiet spots. Benches near architectural features are used more frequently than those placed in quieter locations (Gehl, Jan, 2017).

Jan Gehl mentions in his book "Livet mellem husene" that "Life between buildings is both more engaging and more interesting to look at in the long run than colored concrete and staggered building masses" (Gehl, Jan, 2017).

When designing buildings intended to foster activity, it is essential to create spaces where people feel safe and comfortable to spend time. By providing gathering spaces for both short and long stays, architecture can contribute more to creating better urban spaces and consequently, a better city. This also helps elevate the quality and function of architecture and buildings by ensuring they are used year-round.

When designing buildings and urban spaces, attention should be paid to how meeting spaces are designed to facilitate movement and encourage people to stay. It is important to create connections both from inside to outside and from outside to inside, as this helps create better connections and, in turn, attracts people to the spaces (Gehl, Jan, 2017).

Ill 19 - Latinerkvateret summer


Ill 20 - Hamburg chrismes marked

Ill 21 - Aarhus Ø

Summary

A crucial consideration is to limit the height of buildings to a maximum of 3 stories to maintain the connection to the public spaces in front of the building. This ensures a connection between the building's users and those using the public space or passing by.

In the same public spaces, it is important to consider the types of users and the speed at which they move through the area. Designing urban spaces for pedestrians and cyclists involves different challenges and solutions compared to spaces with passing traffic and parked cars. Ensuring there are quality public spaces helps maintain vibrancy and external activity. These areas should attract both new and existing users while avoiding monotony and blandness in design.

Building facades play a crucial role in fostering a positive relationship between indoor and outdoor spaces. They contribute to creating activities and enhancing public spaces. Varied facades with dynamic details provide visual interest for pedestrians. Facades can also indicate areas inviting interaction and those offering privacy, with some featuring private outdoor spaces linked to specific functions.

Investigation of Aarhus Ø

Introduction

A comprehensive study and site analysis were conducted on Aarhus Ø by the Aarhus Municipality with assistance from Aaen Engineering. This involved meetings, workshops, and discussions with many of the residents, users, and visitors to the harbor. (Opsamling på borger- og brugerinddragelse på Aarhus Ø, 2023), (AARHUS KOMMUNE and AAEN ENGINEERING, 2023)

The report “Opsamling på borger- og brugerinddragelse på Aarhus Ø” focuses on the citizen and user involvement surveys conducted from 2022 to spring 2023. Workshops were held where teams were divided into two, with one focusing on the physical structures and their layout while the other focused on the current and potential activities in the area. From these workshops, nine recommendations were derived. Additionally, information was gathered from various children and youth groups, who provided their insights on what should be addressed. More information was collected from other citizens via an online portal where they could submit their suggestions and concerns regarding Aarhus Ø, resulting in 2 more recommendations, totaling 11 recommendations (Opsamling på borger- og brugerinddragelse på Aarhus Ø, 2023).

1. Preserve the maritime atmosphere
2. Create more green areas
3. Open up gently to the entire city
4. Strengthen associations and give them space
5. Lead in a sustainable transition in Aarhus Ø
6. Provide space for sports facilities
7. Embrace diversity and quirkiness
8. Enhance infrastructure safety
9. Establish a harbor promenade
10. Provide good conditions for visitors
11. Create space for events

(Opsamling på borger- og brugerinddragelse på Aarhus Ø, 2023).

Ill 22 - Aarhus Ø

Ill 23 - Aarhus Ø

Recommendations from byogvand.dk

During the workshops in late 2022, nine recommendations for improvements to the areas of Aarhus Ø were developed, with the first seven recommendations focusing on the entire area. Recommendation eight focuses on Aarhus Marina and number nine focuses on the new expansion of Pier 3 in the old ferry port area. (Opsamling på borger- og brugerinddragelse på Aarhus Ø, 2023)

Several of the recommendations have focused on preserving the maritime atmosphere and feeling due to the area's history and location. There is also an emphasis on ensuring that the water becomes integrated into the areas and that there is a connection between land and water for sailors, residents, users, and visitors alike. Efforts should be made to ensure that there are better access points to the water, accessible to all rather than restricted to specific user groups. Additionally, this integration should tie together all of Aarhus Ø culturally, atmospherically, and architecturally, providing opportunities for small and large events. This should support and preserve the DNA of the area, promoting the existing values. (Opsamling på borger- og brugerinddragelse på Aarhus Ø, 2023)

There has been a desire to create more places where communities can flourish, and new ones can be established. Given the current scale dominated by high-rise buildings, there is a wish to scale down to a more human scale. With a smaller scale, there can be efforts to create green oases and spaces for relaxation with offline and private zones. There is a desire to create a place where existing communities can flourish, and new ones can begin to thrive. With the increased focus on cultivating community, there is a need for a hub, be it a club, community center or another form of gathering space, for the many small and large communities. This space should be usable both for everyday activities, small and large events, and accessible to all of Aarhus Ø. (Opsamling på borger- og brugerinddragelse på Aarhus Ø, 2023)

To make Aarhus Ø better and more attractive, the efforts should be to improve traffic and access routes, making it safer and more enjoyable for pedestrians and cyclists. There should be the possibility to move from one place to another without feeling unsafe due to fast-moving cars or other transportation. Additionally, there should be public spaces where people can pause and relax from their activities, as well as multifunctional spaces catering to various needs. This should transform Aarhus Ø into an attractive neighborhood rather than just a modern residential area. (Opsamling på borger- og brugerinddragelse på Aarhus Ø, 2023)

Ill 24 - Aarhus Ø

The Marina

The studiy showed a desire to preserve and matain the atmosphere and activities in and around the marina. It is also relevant for community life to undergo modernization, providing the framework for new facilities and physical spaces. Just like elsewhere in Aarhus Ø, there should also be a focus on improving transportation around the marina to make it easier to move around the area. (Opsamling på borger- og brugerinddragelse på Aarhus Ø, 2023)

Recommendations from Aarhus ø mangler

In 2022, a website was created where city residents could suggest what they felt was lacking in Aarhus Ø. A lot of suggestions were received, with several mentioning the need for more sports and relaxation facilities on both water and land, as well as more green areas. Various proposals were collected for improving the suggestions received. Regarding water-based sports and relaxation facilities, there was a desire for a more permanent cable track and more opportunities for water sports. For land-based sports and green areas, there was a general request for more sports facilities and halls for practicing sports. Regarding green areas, there was a desire for parks and more green spaces. (Opsamling på borger- og brugerinddragelse på Aarhus Ø, 2023)

Ill 25 - Aarhus Ø

Ill 26 - Aarhus Ø

Recommendations from Associations

There is a large community association on Aarhus Ø, with 30 different local associations (AARHUS KOMMUNE and AAEN ENGINEERING, 2023) having a total of more than 16,000 members. Associations were surveyed and provided recommendations on how to improve Aarhus Ø for the use of the associations. One suggestion is to ensure a connection from land to water and improve access to the canals, as well as create more activities for both children and adults with a focus on water sports. Another focus point is to create better conditions for the associations already on Aarhus Ø and those that will come in the future. (Opsamling på borger- og brugerinddragelse på Aarhus Ø, 2023), (AARHUS KOMMUNE and AAEN ENGINEERING, 2023)

Ill 27 - Aarhus Ø

Summary

There were many recommendations on how to improve Aarhus Ø, although not all suggestions and ideas were included, and some may not be suitable for everyone. This diversity indicates the potential for broad communities to contribute to enhancing the area. However, some recommendations may be more relevant than others, benefiting only a few users while others could benefit a larger group. Therefore, it's important to also consider smaller-scale proposals that may offer opportunities for future expansion.

There should be a focus on creating better conditions for existing community activities and providing them with improved facilities. Additionally, there is a need for spaces where people can gather for various purposes such as sports, culture, or other activities. Enhancing the relationship with water and activities related to it is essential. Furthermore, there is a lack of small intimate spaces that can be utilized throughout the year, and it should be easier to navigate the area as a pedestrian.

Analysis

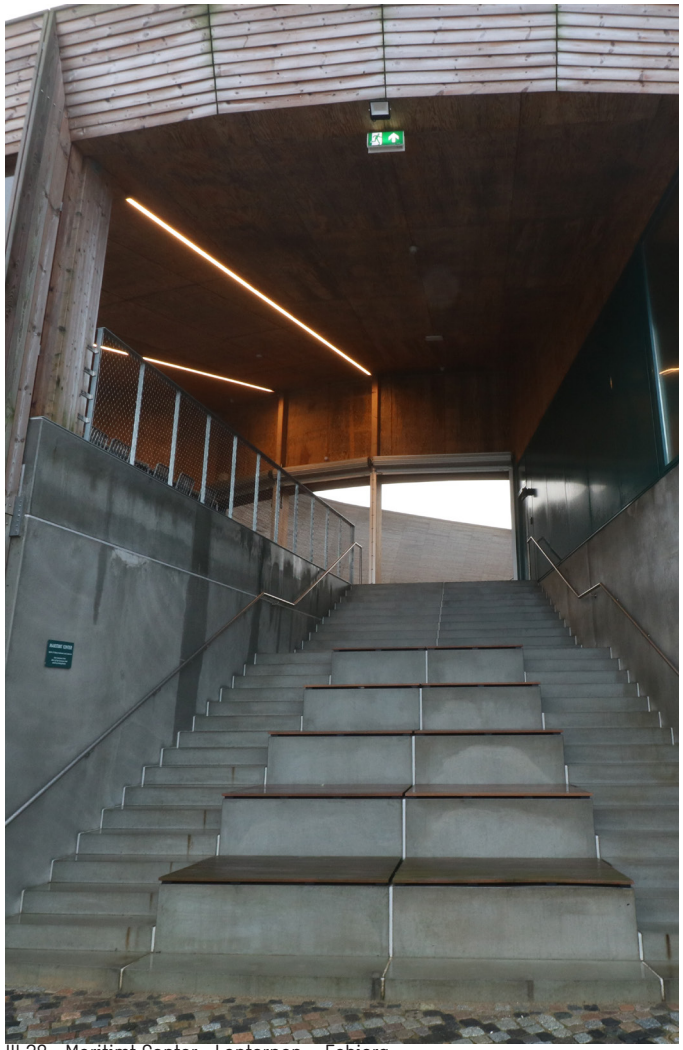
Case studies

Maritimt Center - Lanternen – Esbjerg

Location – Esbjerg Strand 10 - 6710 Esbjerg V
Status - Completed construction - Approved on January 21, 2023
Size - 4000 m^2 spread over two floors.

The Lantern, a maritime center, aims to bring together all maritime sports and activities under one roof. The building is located on a newly constructed part of Esbjerg harbor, intended for sailors, swimmers, and other water activities, where many already have relocated there. It is an open house housing eight different associations with a common focus on water sports, such as rowing clubs and diving clubs. (Esbjerg Kommune, 2023), (Oplev Esbjerg, 2023)

One of the key focuses for the architects was to create a place where the maritime community could thrive, catering to both experienced people and newcomers alike. One aspect that fosters community among the associations is their ability to share the facilities within the building, one of which is a space called ”Hallen” (WERK ARCHITECTS). Hallen is where the associations have their collective practical activities and can come together to work on boats or repair equipment. There are rums for each of the different associations such as a common room, workout room, and meeting rooms.



Ill 28 - Maritimt Center - Lanternen – Esbjerg

Ill 29 - Maritimt Center - Lanternen – Esbjerg

The maritime center is a 2-story building with facilities spread across the floors, with the lower floor based on a concrete structure, while the upper floor has a wooden structural system. The facade material chosen is wood, extending around the exterior of both floors, while the raw concrete is exposed on the lower floor but transitions back to wood on the upper floor. (OJ RÅDGIVENDE INGENIØRER, 2023) The decision to have concrete at the base was to ensure the building was protected against possible flooding and thus future-proofed. Additionally, the wooden facades are constructed to withstand the harsh weather conditions in the area. (WERK ARCHITECTS)

The building's design takes inspiration from boat construction, creating a connection to the maritime history that is part of Esbjerg's DNA. Both to bring in light and to provide a connection between the floors, two large holes have been formed in the floor decks, acting as skylights. (SNØHETTA) The building is designed so that there is no visible backside, ensuring that one cannot inadvertently stand outside the community. (WERK ARCHITECTS).

Ill 31 - Maritimt Center - Lanternen – Esbjerg

Ill 30 - Maritimt Center - Lanternen – Esbjerg

Summary

When arriving at the entrance to the building, one thing to notice is how the stairs are inviting to be just as a meeting/ gathering place for both users and visitors of the building. Upon reaching the first floor, it becomes possible to observe all the different areas where the associations are located and many of their activity rooms. There are designated indoor and outdoor areas where activities can take place, providing sample space for both keeping a distance if desired and also the opportunity to meet across groups. This is reinforced by the presence of smaller rooms for the individual associations and larger common areas that can be utilized by them, along with shared storage and workshops for their use.

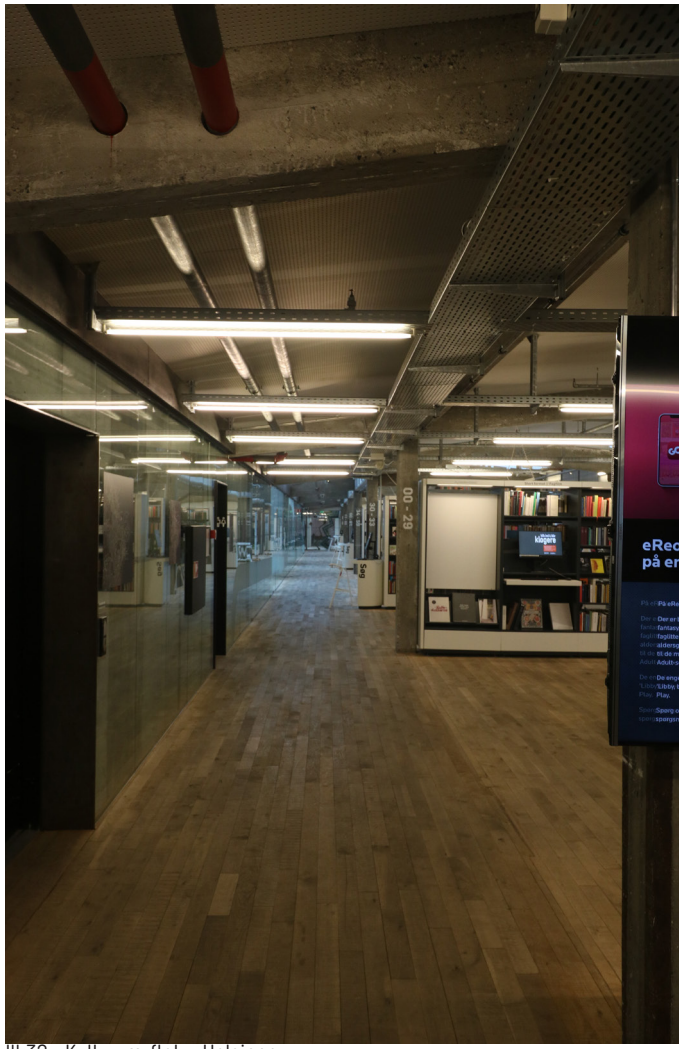
Kulturværftet – Helsingør

Location - Allegade 2, 3000 Helsingør
Status - Completed construction - Opened 2010
Size - 13,000 m^2

Kulturværftet has a long history, having been an old shipyard transformed into a cultural center with many functions under one roof, such as a cafe, library, and exhibition space. There has been a focus on preserving the function of the building and the maritime history of Helsingør as a whole. The facade has a crystalline expression inspired by traditional sails, yet Kulturværftet also presents a modern and angular appearance. Behind the new facade, one can find the old structure as well as cozy spaces to enjoy the sun even in winter. (AART, 2023)

By gathering multiple functions under one roof, it is possible to draw inspiration from each other and utilize the spaces of other functions when they are not in use. One of the functions housed in Kulturværftet is the Helsingør Library, spanning all 4 floors. On the ground floor, it is possible to return and borrow books, as well as purchase tickets for events held at Kulturværftet. Additionally, there are computers available for use with a view over the harbor, and the Spisehuset cafe can be found there. (HELSINGØR KOMMUNES BIBLIOTEKER, 2023)

The 1st floor is dedicated to children, with children's books and various activities tailored to children and their families. The 2nd floor is dedicated to fiction, while the 3rd floor is dedicated to non-fiction, but there are also other functions on these floors. On the 2nd floor, there are exhibitions by the Museums of Helsingør, as well as smaller events such as readings. On both the 2nd and 3rd floors, there are workspaces available for study or research, whether for students or tourists. (HELSINGØR KOMMUNES BIBLIOTEKER, 2023)



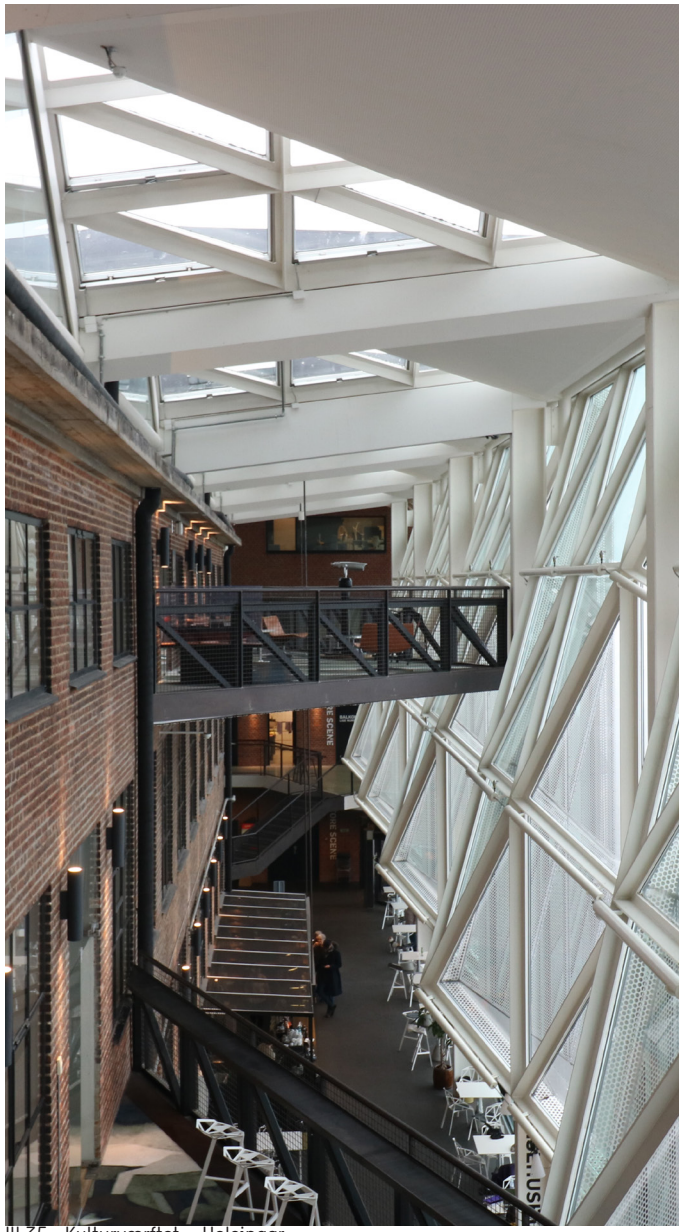
Ill 32 - Kulturværftet – Helsingør

Ill 33 - Kulturværftet – Helsingør

Throughout Kulturværftet, it is possible to participate in events for both children and adults, as there are opportunities for workshops, film screenings, concerts, and meetings. Additionally, there are various exhibitions within the building, including the history of Kulturværftet itself. (HELSINGØR KOMMUNES BIBLIOTEKER, 2023)

With its location in the heart of Helsingør, by the waterfront on the old docks, the building enjoys a fantastic location near other museums and historical buildings such as Kronborg Castle. It is also well-positioned for the many visitors to the area, both locals and tourists, as they want to attract visions out of Copenhagen to see other parts of Sjælland. This can be seen in the visitor numbers, which reach up to 1,000 visitors per day and over 700,000 in total. (HELSINGØR KOMMUNES BIBLIOTEKER, 2023), (AART, 2023)

Ill 34 - Kulturværftet – Helsingør


Ill 35 - Kulturværftet – Helsingør

Summary

The building has an industrial appearance but exudes a cozy and relaxed atmosphere when visiting the Kulturværftet. With a straightforward layout in the library section of Kulturværftet, it is easy to both locate materials you need and find places to engage with them, whether it be in open spaces or smaller enclosed work areas. By having various functions under the same roof, that thay can benefit from each other by attracting people who would not normally use those facilities.

By holding various events in a building with multiple functions under the same roof, it would be possible to utilize parts of the building outside of the regular opening hours of the facilities. This would increase the building's usage and contribute to strengthening the existing environment, creating spaces where new initiatives can flourish.

Havnehuset - Nordhavnen

Location - Nordhavnen, Copenhagen
Status - Competition proposal

Ill 36 - Havnehuset - Nordhavnen

Havnehuset is a sketch proposal for a new hybrid building to be constructed in Nordhavnen, developed by SWECO Architects.

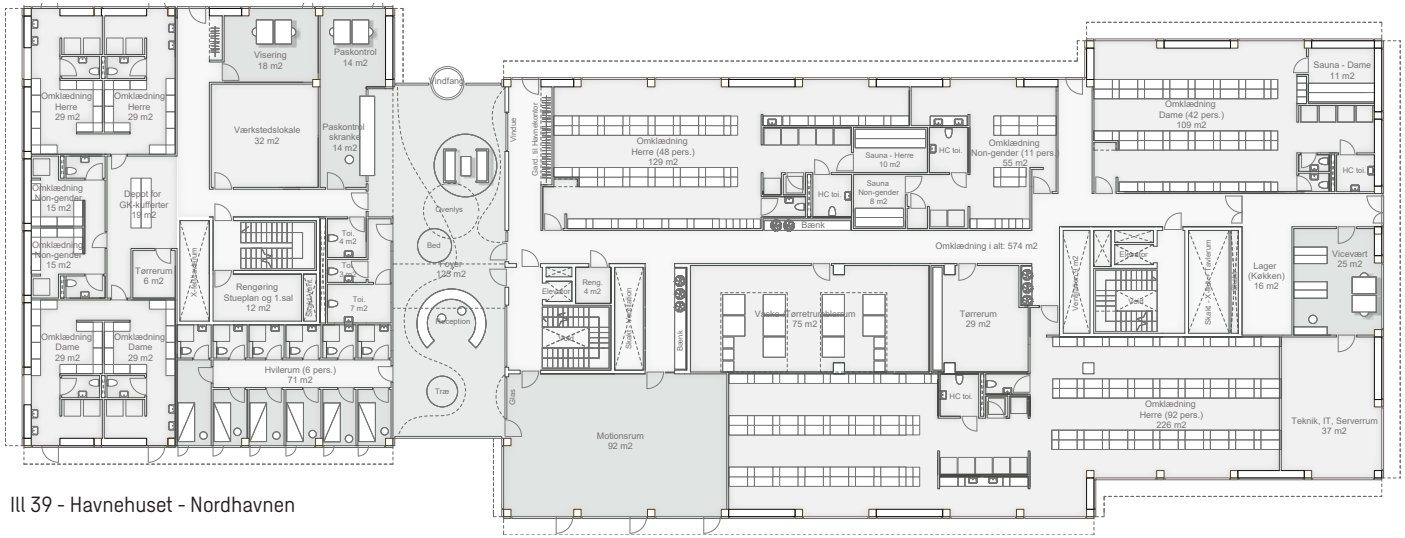
The facade is inspired by trees, with a trunk at the base resembling the highly visible columns on the ground floor, while the rest of the building is shaped like the green crown of the tree. This is evident as the columns grow up through the building, becoming less visible as they grow taller, although this is only apparent from the outside, as they are more pronounced from within.. (SWECO ARCHITECTS and NIRAS, 2023)

Inside, wood is the predominant material throughout the building, as evidenced by the visible timber columns that form part of the structure. Recycled wood is also used on the ground floor, where some of the panels have perforations to serve as acoustic panels. Elsewhere, there are søuld panels used as both wall material and acoustic-regulating material. (SWECO ARCHITECTS and NIRAS, 2023)

For the exterior facade, recycled aluminum in a green color is chosen, and there are several differently shaped panels used. Some areas feature fully open glass pieces, while others are more enclosed, and in some places, the panels are perforated to provide a semi-transparent view while maintaining some degree of enclosure. The use of recycled aluminum throughout the facade and on the roof gives the building a unique appearance with this green color, inspired by nature and trees. (SWECO ARCHITECTS and NIRAS, 2023)

Ill 37 - Havnehuset - Nordhavnen

Most of the facade construction consists of glued-laminated timber columns, but several of the internal load-bearing and stabilizing elements are made of concrete, while the entire roof structure is made of glued-laminated timber. The facade construction is made of lightweight timber elements, making it visible to further emphasize the idea of trees with their crowns. (SWECO ARCHITECTS and NIRAS, 2023)



Ill 39 - Havnehuset - Nordhavnen

Ill 38 - Havnehuset - Nordhavnen

Summary

The construction provides solid frameworks both for the building itself and for the history and concept it aims to convey. Having visible wooden pillars, is gives warmth to the rooms and also a clear sense of how the building is constructed. Additionally, there is a connection between the floors, even though it may not be visible or audible; one can sense how the trunk runs through the building, binding it together.

The choice of materials also contributes to telling the building's story and concept, while also offering the advantage of using strong and durable materials. When evaluating materials, considerations must also be made regarding how they handle the conditions they will be subjected to. This could include assessing the microclimates affecting the building, such as sunlight and rain, as well as its proximity to the sea and potential exposure to seawater.

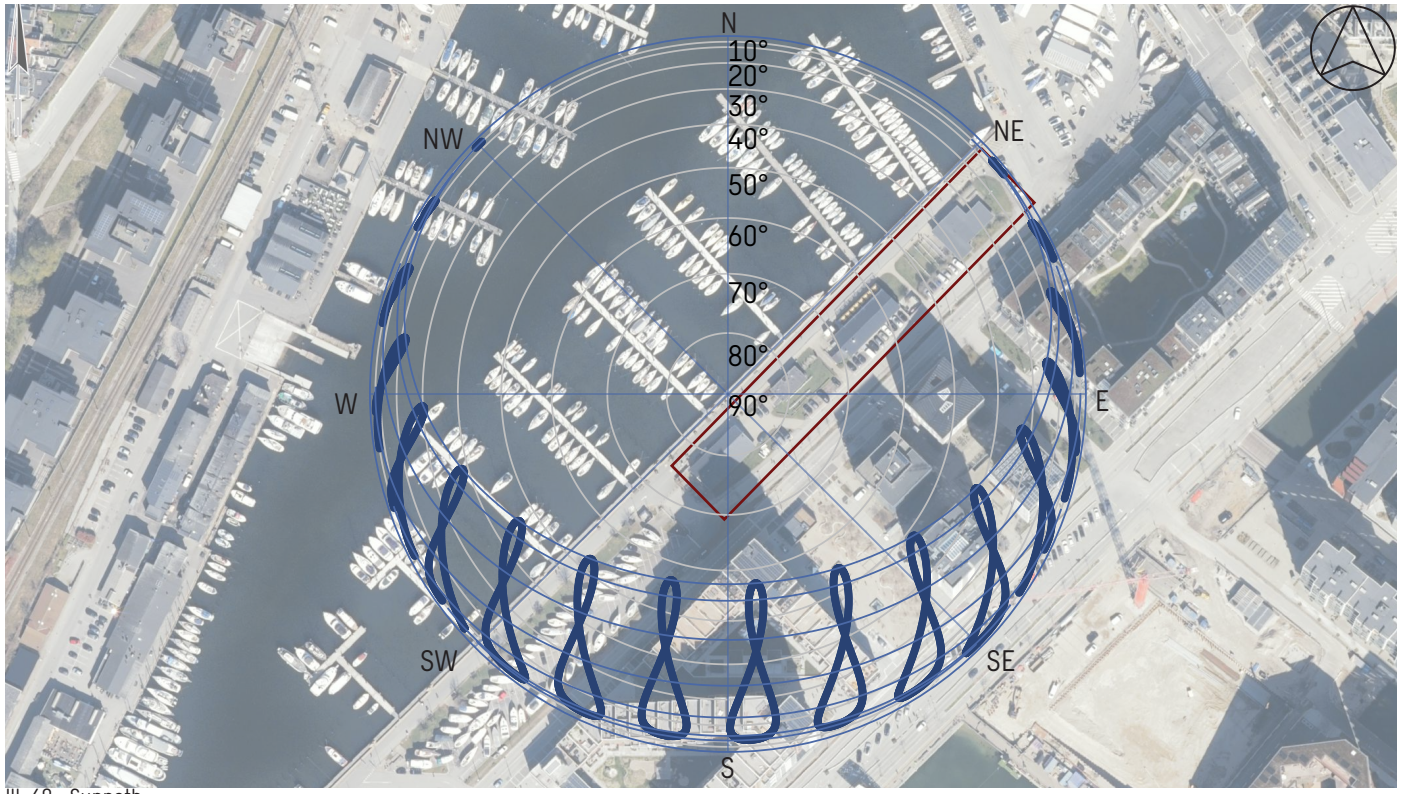
Site analysis

Sun

The sun path illustrates the trajectory of the sun throughout the year, showing the angle it follows, summer and winter at 57° and 11°, and how it affects the site. It can be assessed that there will be more sunlight in the afternoon and evening during summer, making it possible to utilize the waterfront area for outdoor activities.

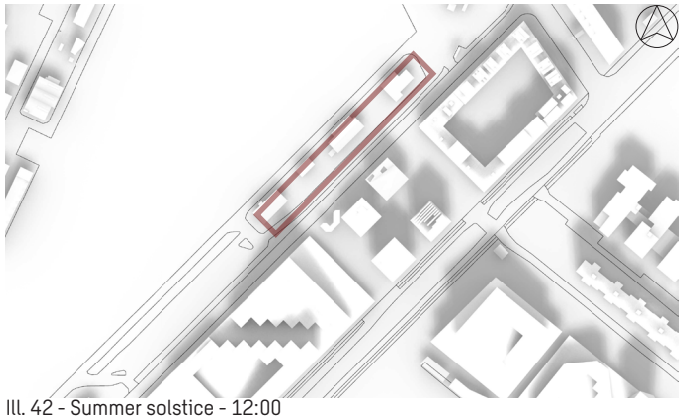
Shadow

The shadow analysis was conducted at 10 AM when a shop usually opens, at 12 PM during lunchtime, and at 4 PM when most people begin to get of work. As can be seen, there are almost no shadows during the summer solstice, while during the equinox, there will be shadows at 10 AM and some at 12 PM, while at 4 PM, it will be possible to enjoy the afternoon sun on the site. During the winter solstice, there will be shadows on the site for most of the day, with only a short period of sunlight before the sun sets.

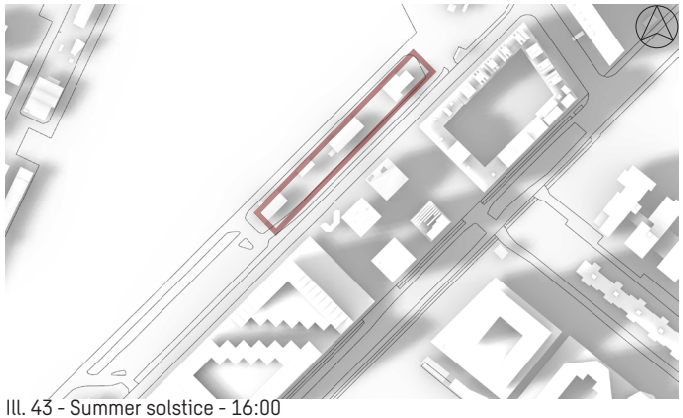


Ill. 40 - Sunpath

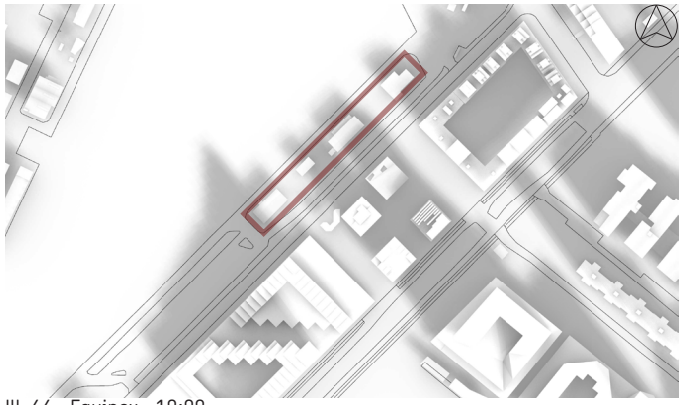
Ill. 41 - Summer solstice - 10:00



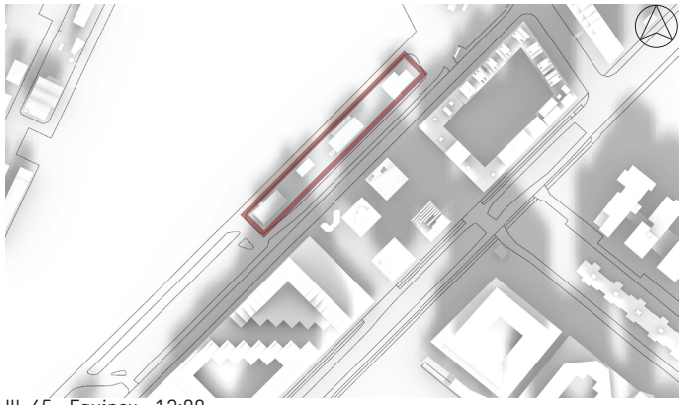
Ill. 42 - Summer solstice - 12:00



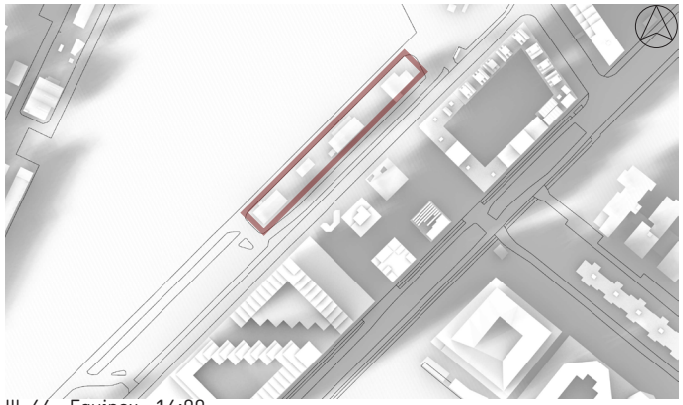
Ill. 43 - Summer solstice - 16:00



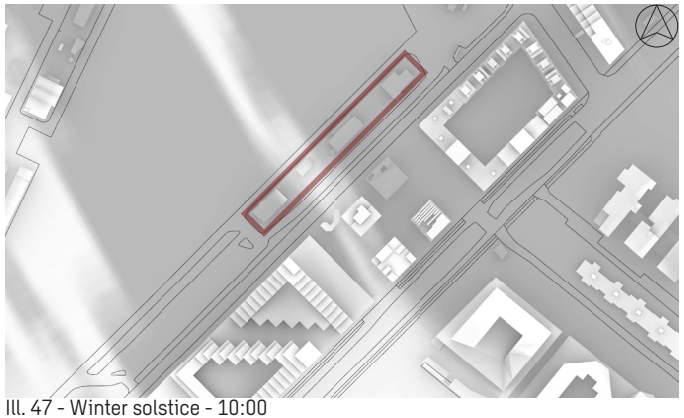
Ill. 44 - Equinox - 10:00



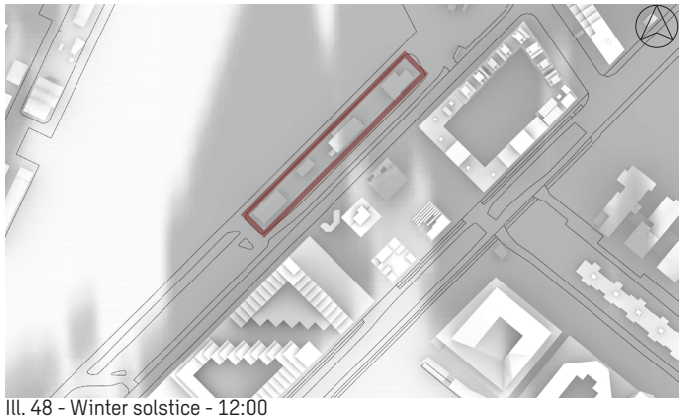
Ill. 45 - Equinox - 12:00



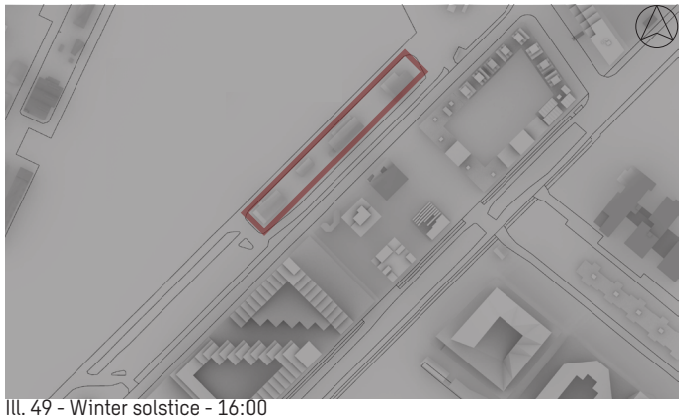
Ill. 46 - Equinox - 16:00



Ill. 47 - Winter solstice - 10:00



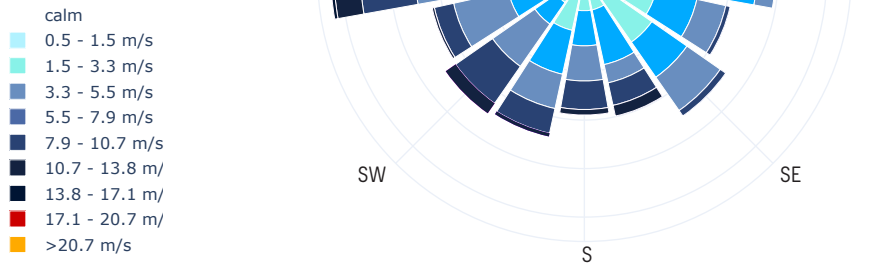
Ill. 48 - Winter solstice - 12:00



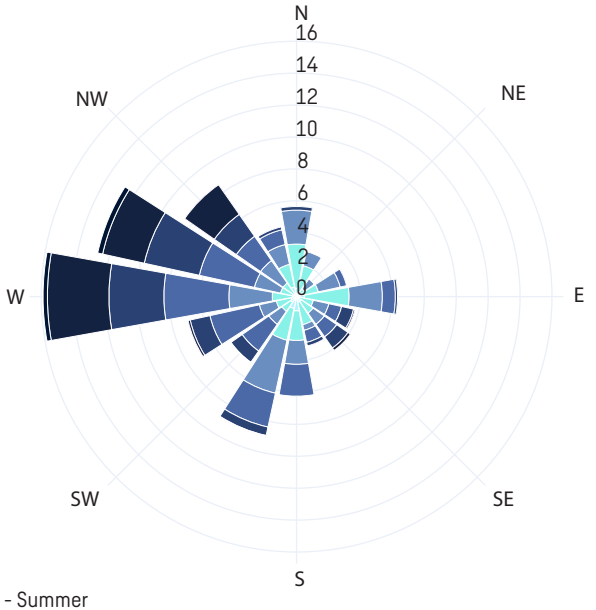
Ill. 49 - Winter solstice - 16:00

Wind

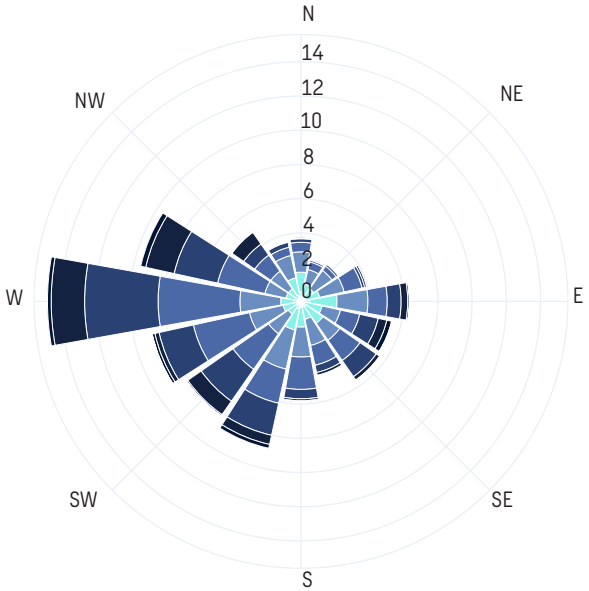
Since the site is close to the harbor and the sea, it is important to examine the wind conditions on the site. The analysis shows that the wind mostly comes from the west, according to the annual windrose. However, if we look at the seasonal wind roses, we can see that it varies slightly throughout the year. During the summer, the wind predominantly comes from the west-northwest, while in the autumn, it mostly comes from the west, and in the winter, it comes from the west-southwest. In the spring, the wind is more evenly distributed between the west, south, and east, although the strongest winds still come from the west.



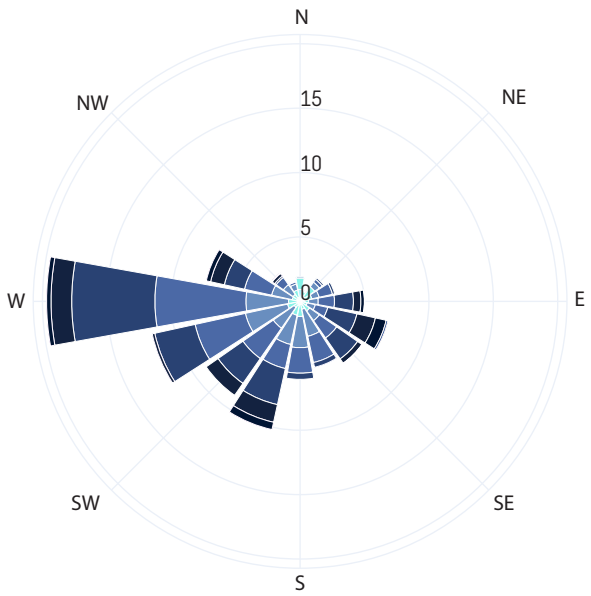
Ill. 51 - Spring



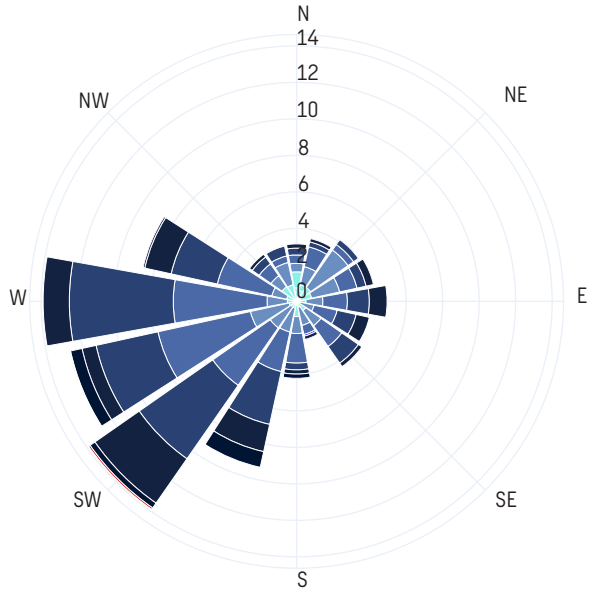
Ill. 53 - Summer



Ill. 50 - Annual



Ill. 52 - Autumn



Ill. 54 - Winter

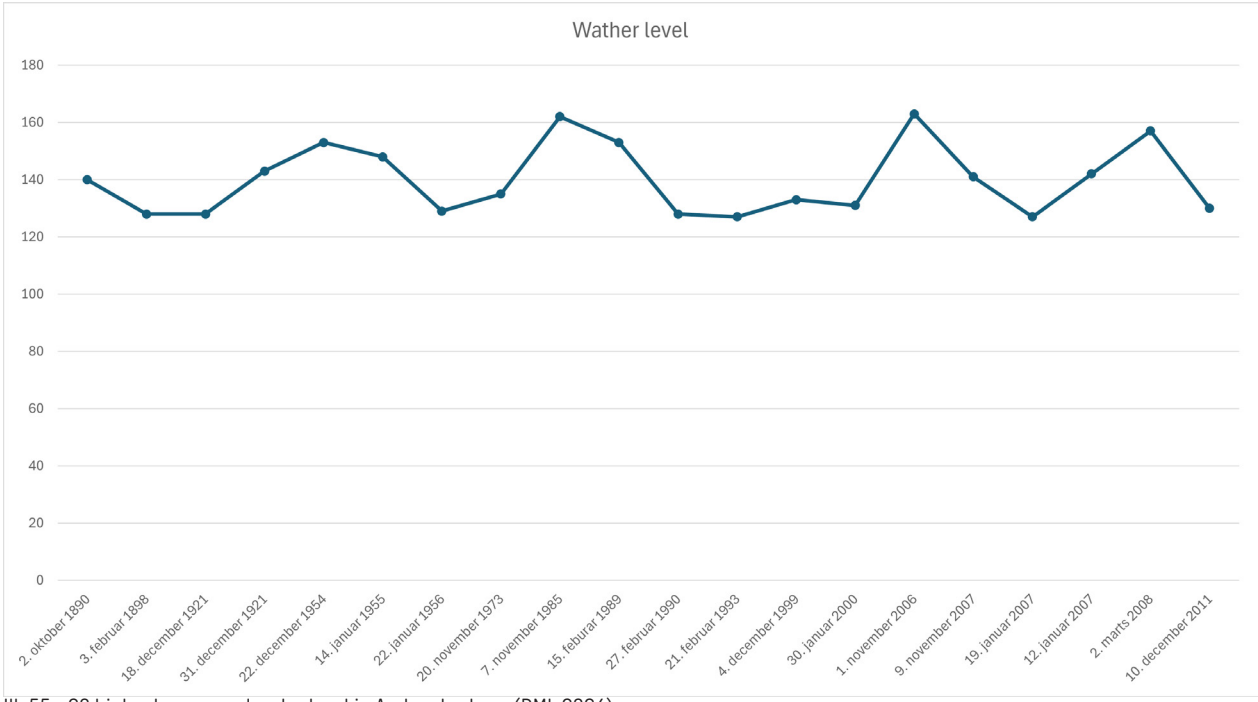
Water levels and Storms

Due to the site's proximity to the harbor, an investigation of the water level in Aarhus Marina and see how many storms there are and how strong they are, as well as to see if there was a connection between storms and the water level.

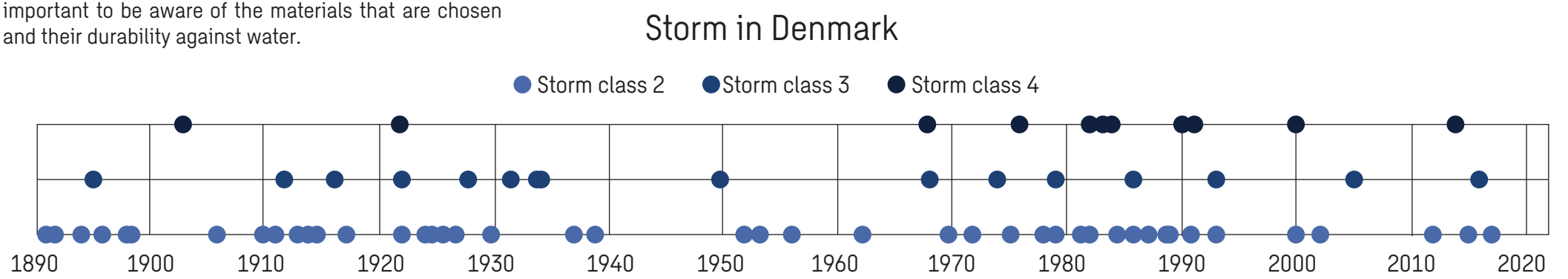
The graph (Ill 55) depicts the 20 highest water levels measured in Aarhus harbor, relative to average sea level, over a period from 1888 to 2017. The highest water level recorded was in November 2016, with 163 cm above average sea level. (Miljø og Fødevareministeriet, 2019)

The graph (Ill 56) illustrates the number of storms occurring in Denmark since 1890, divided into four categories. However, Category 1 storms are not included in the graph as they are classified as stormy weather rather than storms. On average, there is a 1.2-year interval between Category 1 storms, while Category 2 storms occur at intervals of 2.7 years. Category 3 storms have an average interval of 7.7 years, and Category 4 storms occur approximately every 10.1 years. (DMI, 2024)

The conclusion is that there is a connection between elevated water levels and storms, through which it is important to be aware of the materials that are chosen and their durability against water.



Ill. 55 - 20 highest measured water level in Aarhus harbour (DMI, 2024)



Ill. 56 - Storms in Denmark. (DMI, 2024)

Storm class 2 - 3.7 storms per 10 years.

Storm class 3 - 1.3 storms per 10 years.

Storm class 4 - 1.0 storm per 10 years.

Functions

The map (Ill. 63) depicts various amenities and their locations on Aarhus Ø and in Aarhus marina. The accompanying images (Ill. 57-62) showcase a selection of these amenities, including Vin Danmark, Street food, and the harbor bath.
This shows there is an abundance of activities in the area. However, there appears to be a lack of gathering spaces outside of restaurants or benches.


Ill. 57 - A - Harborbath

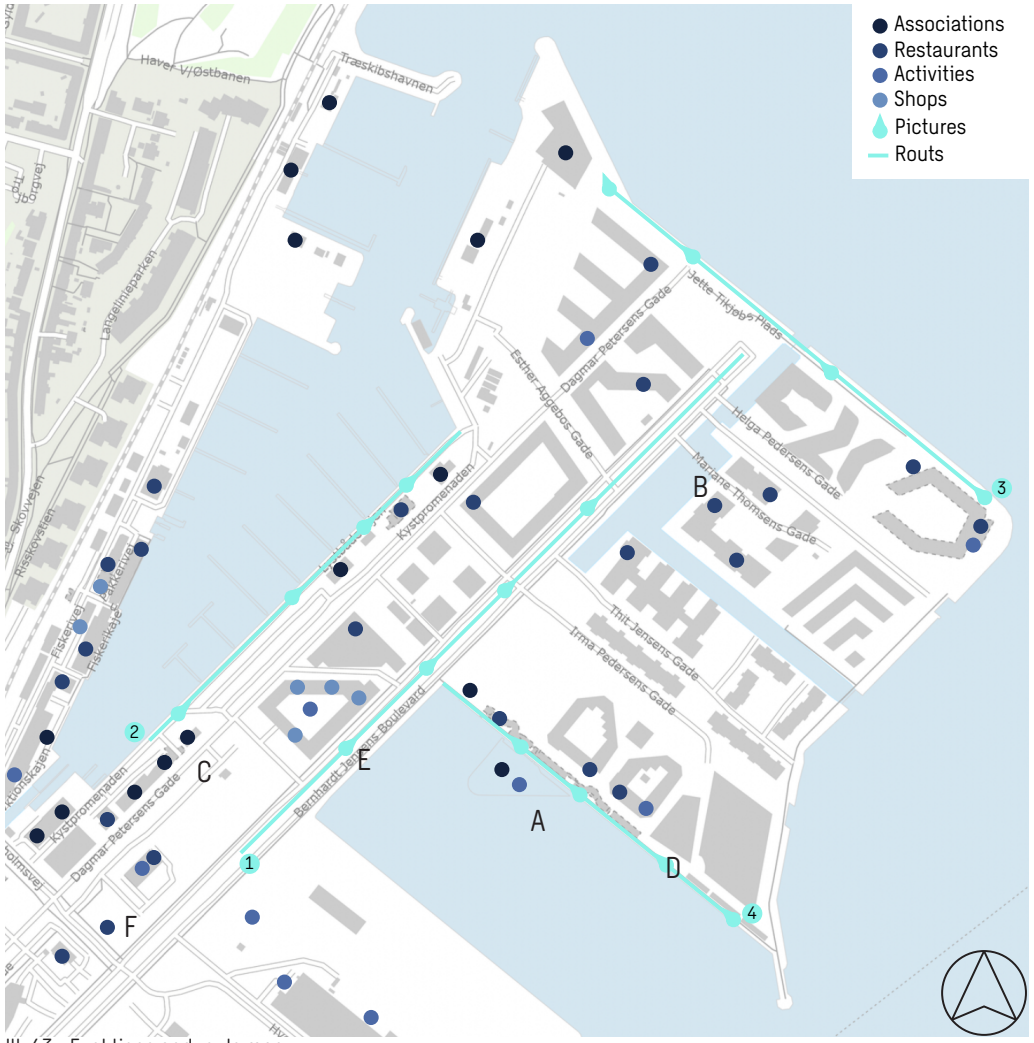

Ill. 60 - D - Theater


Ill. 58 - B - Cafe'


Ill. 61 - E - Smal park


Ill. 59 - C - Winebar


Ill. 62 - F - Streetfood



Ill. 63 - Funktions and routs map

Walking

Four routes have been selected and traversed to assess the architecture and pedestrian conditions on Aarhus Ø.

Route 1 follows the major road into Aarhus Ø, with some heavy traffic, that includes large vehicles associated with construction sites. The route can be overwhelming due to the high speed of passing cars, despite efforts such as a small park and road bends to control speed.

Route 2 passes by the site and yacht clubs, where few people are present, resulting in an empty atmosphere. The area primarily serves sailors, with limited amenities available. However, the route is pleasant due to lower vehicle speeds and the presence of low-rise buildings.

Route 3 follows the waterfront and is frequented by many pedestrians, but it offers a long, monotonous walk with little variety. Many buildings along this route have long, unbroken facades that appear closed off and lack inviting features.

Route 4 features the most amenities and attracts the highest number of people. The buildings along this route are more varied and inviting compared to other parts of Aarhus Ø, making it a more pleasant environment for pedestrians.

Route 1 and 3 are two routes that are not the most pleasant to walk, as they are close to cars and their high speed on route 1. Both routes have tall buildings, which makes one feel small and cramped. On the contrary, routes 2 and 4 have the opposite effect, as both routes have lower-height buildings and wide pedestrian paths where there are no nearby cars.

Ill. 64 - Route 1

Ill. 66 - Route 3

Ill. 65 - Route 2

Ill. 67 - Route 4

Design brief

Problem statement

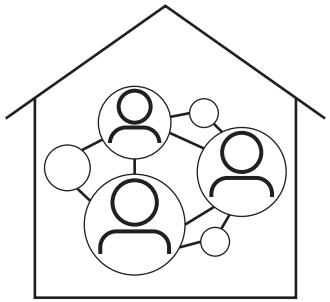
How can a building, while relating and respecting the history and context of the Haber, and the lack of gathering place, address local needs, blend new and old activities and communities, and uphold the quality of current environments?

The goal is to construct a building that prioritizes the provision of space for local community associations. The building should offer facilities that allow for expansion and act as a meeting place for locals to engage in activities and form new communities. This should be achieved without reducing the quality of existing activities and communities.

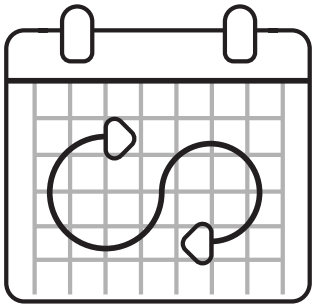
Vision

The vision is to create a new and modern meeting place for the city's sailors, users, and residents of Aarhus Ø, with facilities that foster a strong and stable community. The idea is to create a space that integrates existing functions found on the site, while also creating opportunities for additional ones. The space should be a focal point for Aarhus Ø's associations and activities, where new friendships, connections, and community can be forged. It should be universal enough to accommodate both play and learning, along with large and small activities such as festivals or sports events. Moreover, the building should help create a pleasant outdoor environment that attracts people who do not typically use the area, without compromising the quality of the existing facilities and activities.

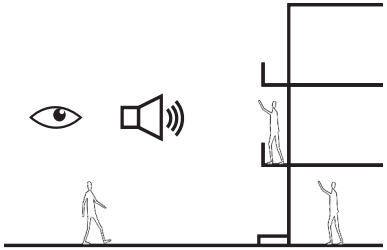
Design criteria



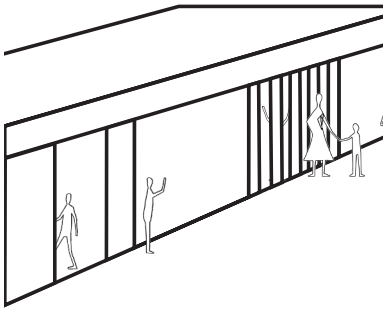
The building should provide a space where all users of Aarhus Ø can gather and engage in various activities, fostering a sense of community.



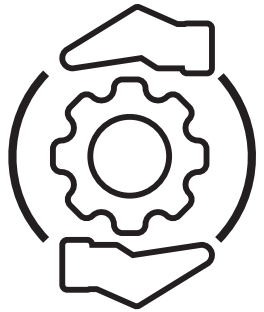
The spaces should be multi-functional, flexible, and accessible to multiple associations throughout the week to minimize overall vacancy.



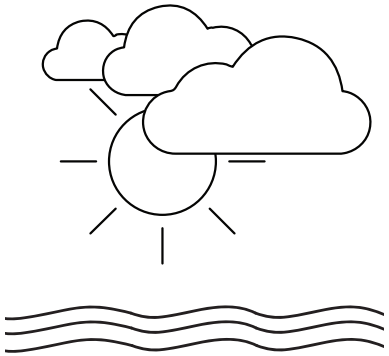
With a maximum of three stories, there should be a seamless integration between the building and its surroundings, establishing both visual and atmospheric connections between indoor and outdoor.



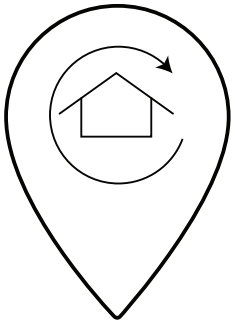
The facades should reflect the functions inside, offering both open and closed areas to provide places for relaxation in these areas.



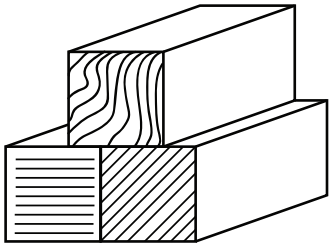
Existing functions on the site need to be preserved and given a new space, while also allowing room for new functions.



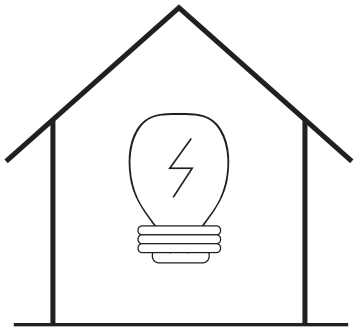
Take precautions for the microclimatic conditions, so there is a comfortable stay both inside and outside.



The building must use the sites and the surrounding context as a source of inspiration, as well as the history of the area.



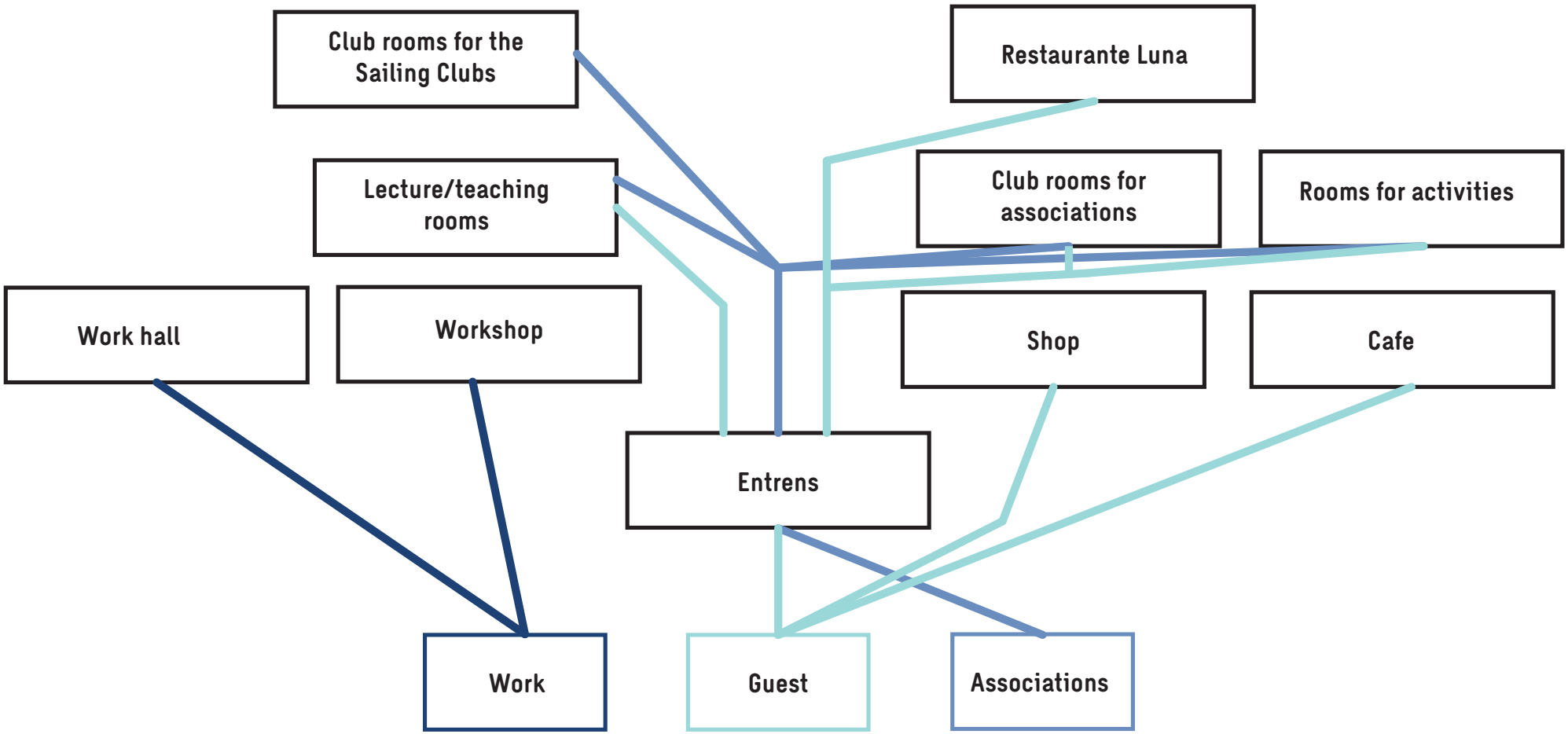
The building materials should reflect the historical context and withstand the local climatic conditions.



The building must be a low-energy building.

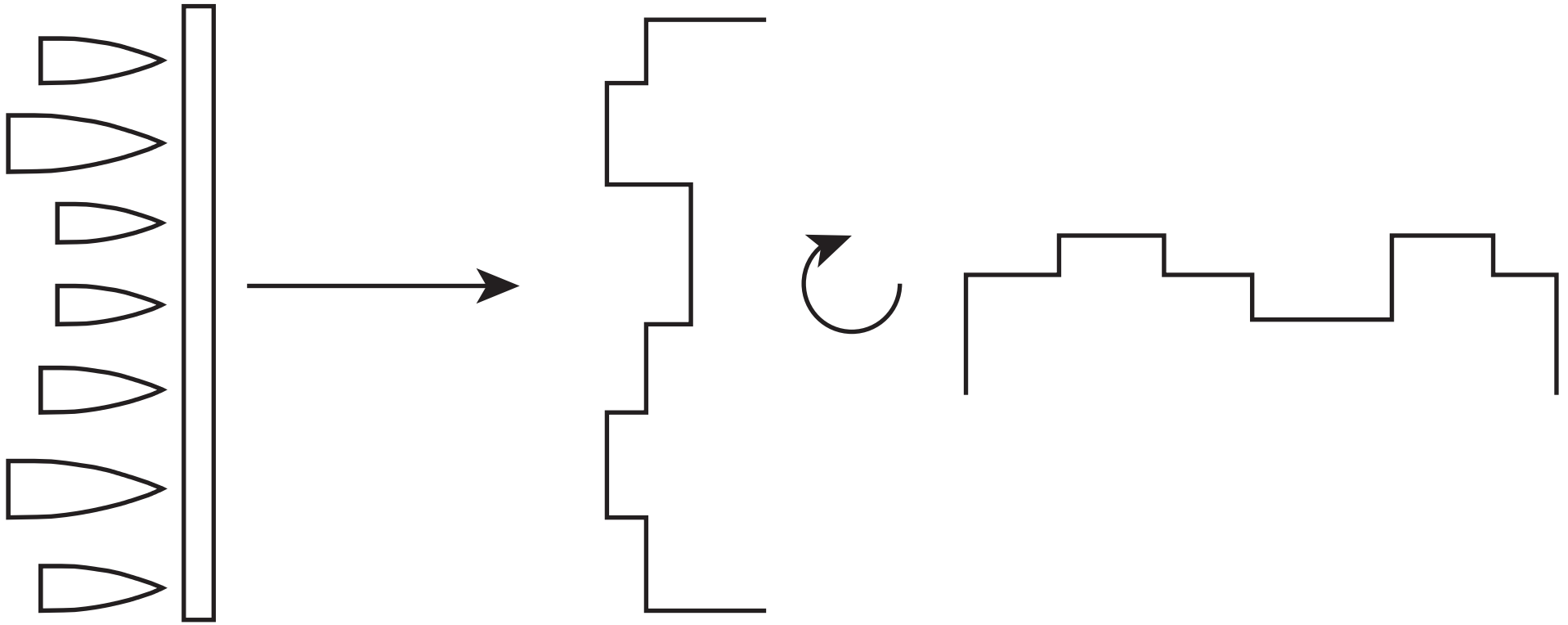
Ill. 68 - Design criteria

Functions diagram



Ill. 69 - Funktions diagram

Concept



Ill 70: Concept

Existing buildings

A - Aarhus Sailing Club - Kystpromenaden 7, 8000 Aarhus – 280 m²
B - LULA - Kystpromenaden 5, 8000 Aarhus – Built-up area 208 m² – commercial area 333 m²
C - Toilet building - No BBR - approx. 100 m²
D - Bugten - Kystpromenaden 1, 8000 Aarhus C – 258 m²

On the site, there are four standalone buildings housing two sailing clubs, a restaurant, and a bath and toilet facility used by guest sailors in the harbor. Some of the buildings are starting to deteriorate, especially the bath and toilet facility, which either needs renovation or the construction of an entirely new building. At the same time, only the two sailing clubs have club rooms, with no space for other associations, and the premises are not suitable for teaching school classes about water and water sports.

Some other deficiencies on the site and throughout Aarhus Ø include the lack of shops catering to specific water sports, not only for the sailing clubs on the site but for all the other athletes using the water around the district. Additionally, there is a shortage of green areas. While there are small green spaces around the buildings, they are not designed for enjoyment but rather to provide some green space in the area.

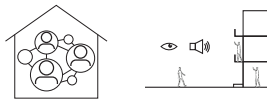
Ill 71: Existing buildings

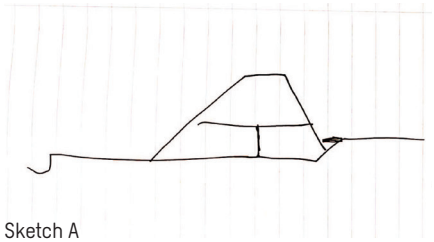
Design proces

Form

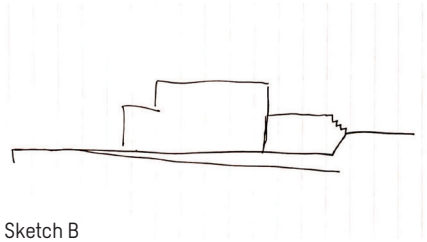
The initial ideas were developed with a focus on designing a form that would provide the best opportunities for both users and guests. Different concepts were explored, including shifted facades and floors, or sloping facades. One idea (Sketch B) was to create a bridge over the road to improve connectivity to the other side.

Additionally, ideas were developed regarding how a workshop should be designed and positioned to optimize the flow of boats and minimize shading in the more sunny areas.

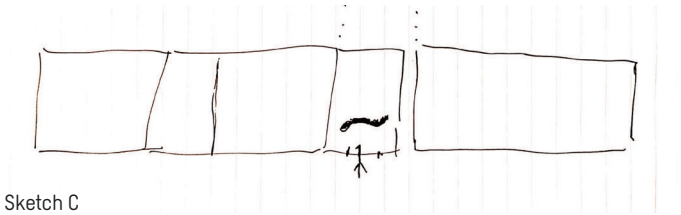




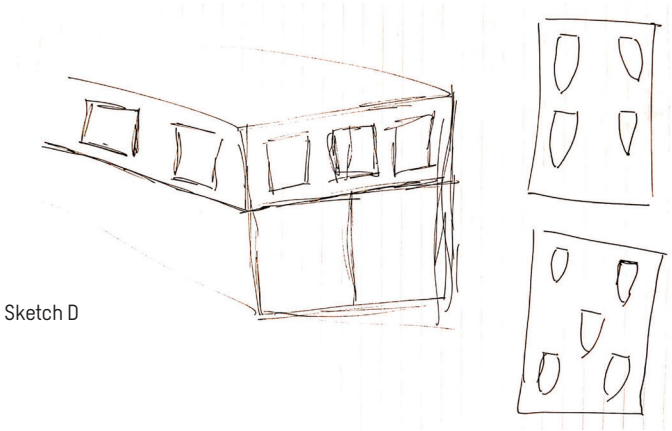
Sketch A



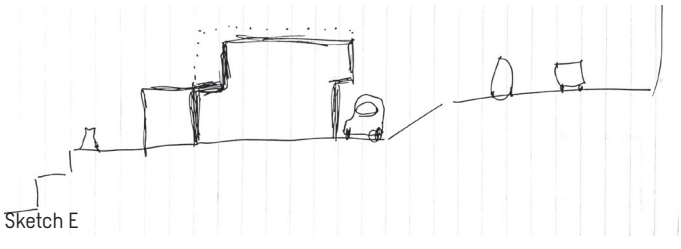
Sketch B



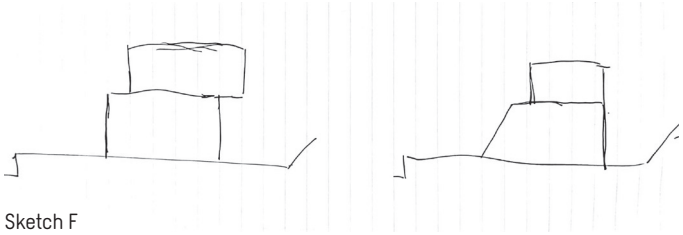
Sketch C



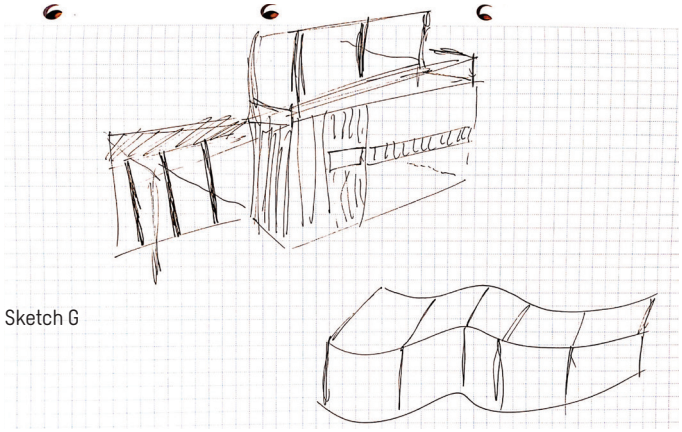
Sketch D



Sketch E



Sketch F



Sketch G

Ill 72: First sketches

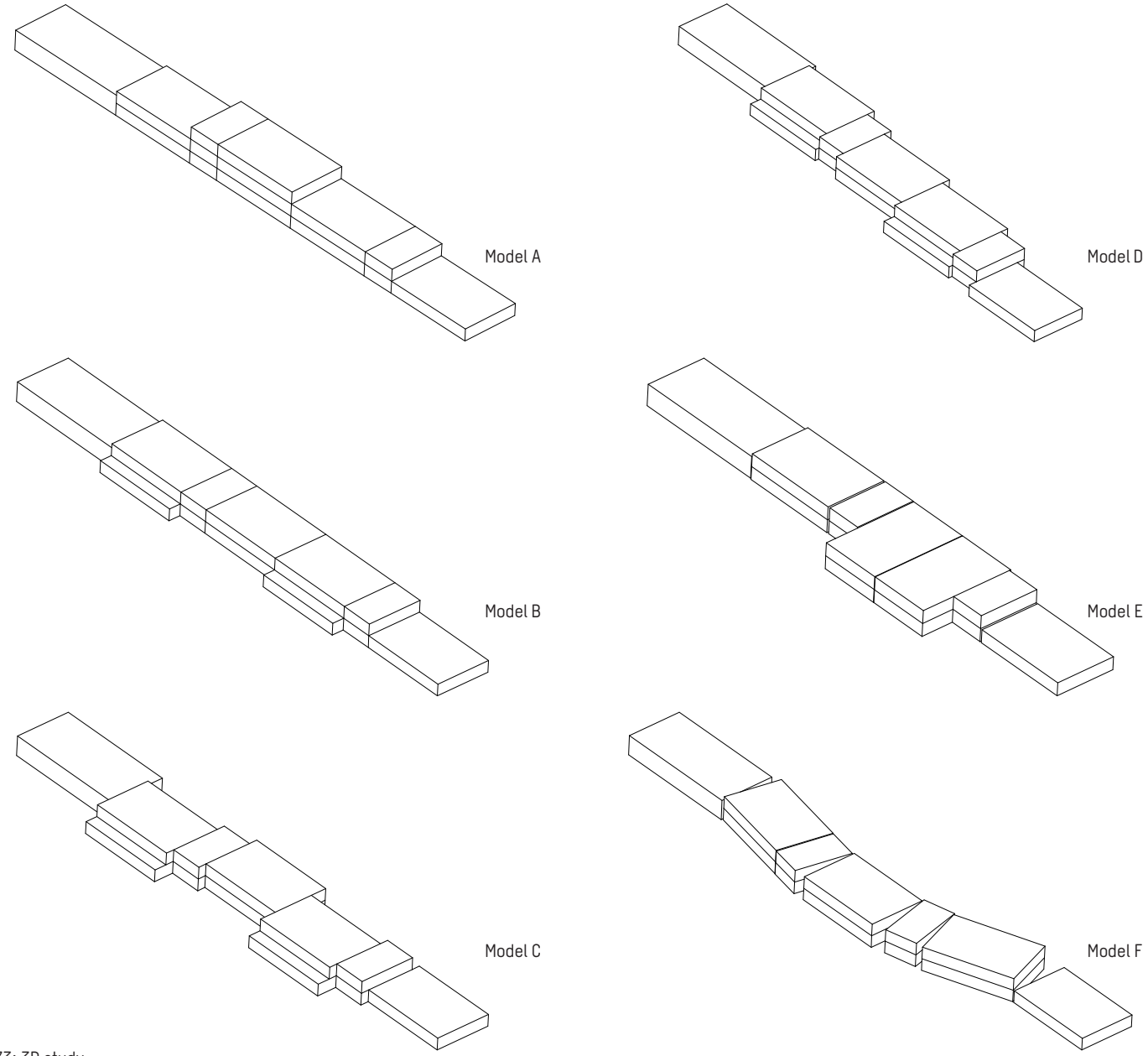
After the initial drawings and thoughts, 3D studies were completed to examine them in a 3D space. The various functions were given the shape of boxes so they could easily be moved and adjusted as needed.

Following the 3D study, the conclusion was that a new model that combines ideas from models A, B, and C. These models have features that would strengthen the building awhile the rest have features that would detract from and the experience it provides.

Model A:
- The possibility of large terraces facing west, where building users can enjoy the weather and the opportunity to use the top floor with a good view over the harbor.
- The taller part of the building is the smaller part, so there is no feeling of intimidation when passing under it. However, the facade is completely straight, so there are no areas where it would be pleasant to be outside the building.

Model B:
- The large terrace faces west and the smaller ones face northwest, which provides users with places to enjoy being outside and also the opportunity to interact with passersby.

Model C:
- The movable facade, adds life to the building and creates several small corners where a person can rest or enjoy the sun without worrying about the wind.

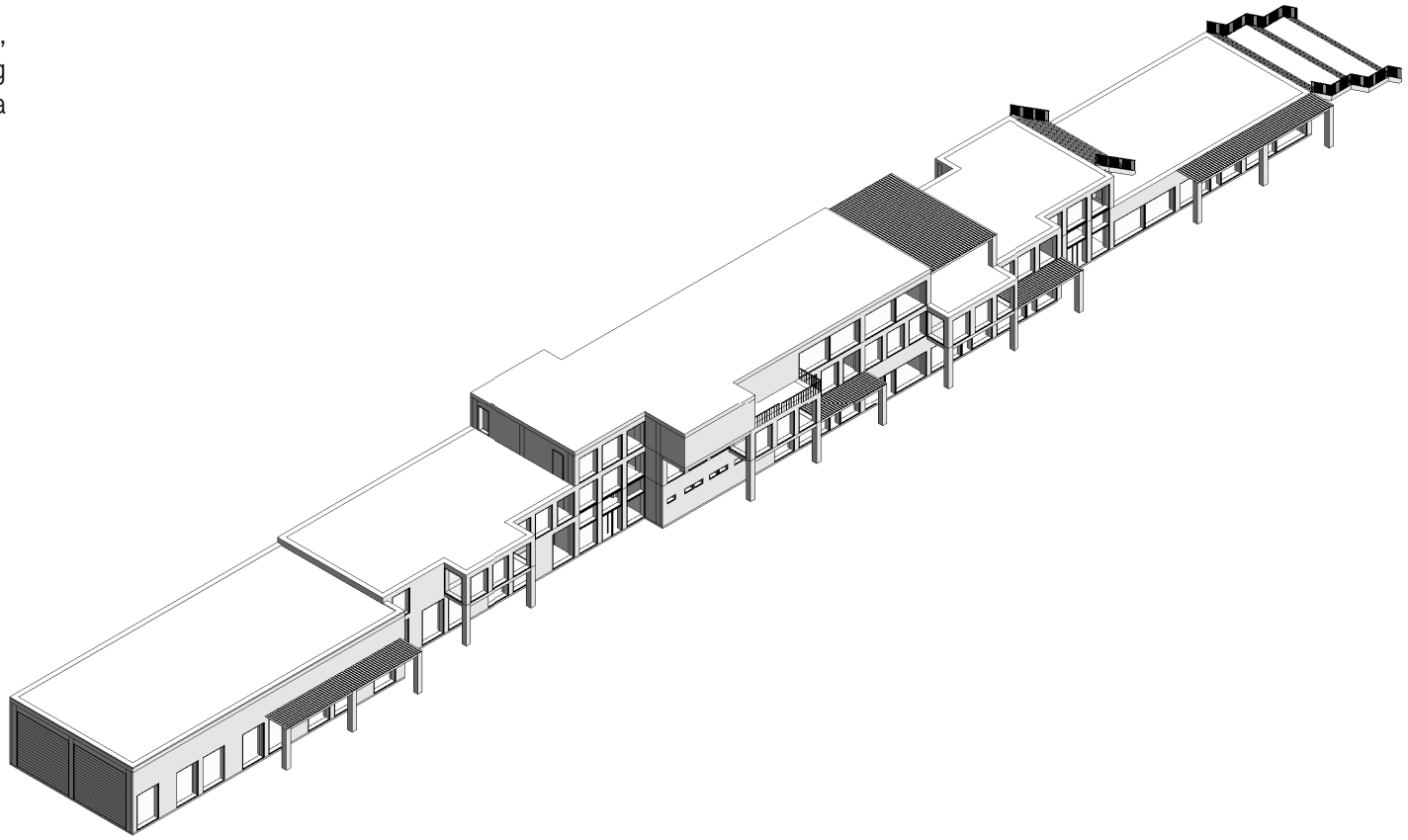


Ill 73: 3D study

A unified form was developed based on what was learned in the previous studies. The shape is an improvement upon model A, featuring three floors and terraces facing west, while facade offsets come from model C.

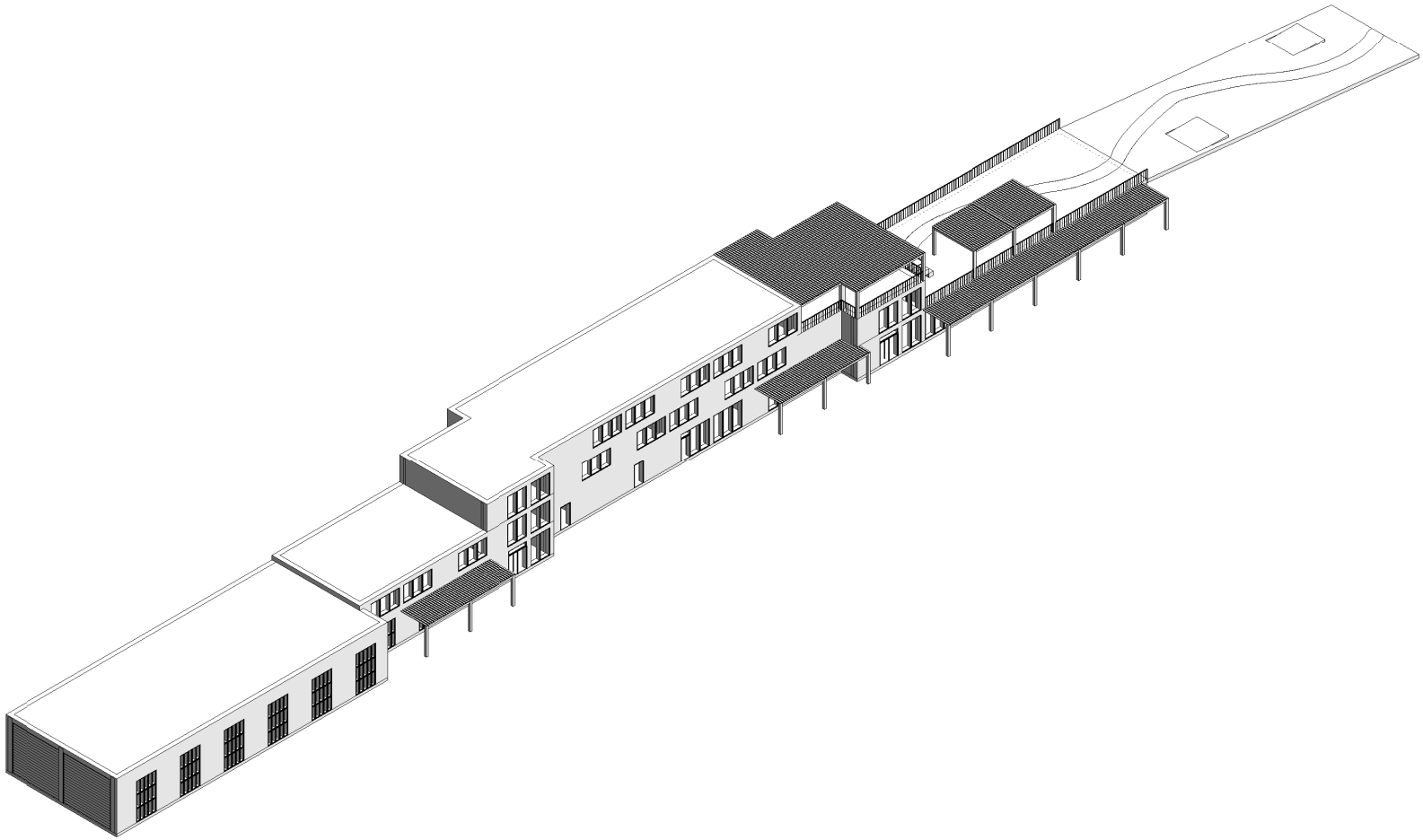
The offsets in the floors were not included because they made the flow inside the building difficult and would have made it troublesome to move around. Additionally, they would have created closed-off and dark corners on the other side and would not have been able to attract people from other parts of Aarhus Ø.

However, small boxes are incorporated into the building, serving the same function as the terraces by providing places where one can step out, and the boxes create a larger rhythm in the facade.



Ill 74: Model 1

After feedback from the midterm seminar, the sizes of the functions were reconsidered, and the form was adjusted accordingly. The small boxes were removed due to their minimal contribution to the building's functions.



Ill 75: Model 2

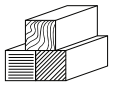
Construction

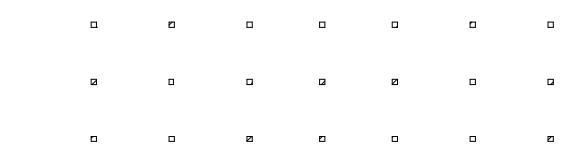
Early in the process, the decision was made to have a construction that would allow the facade not to be part of the load-bearing structure. Another reason for this was to incorporate some of the area's history, given the long history of the harbor and Aarhus's even longer history with sailing, as the construction symbolizes old wooden ship masts.

The materials for the pillars were chosen based on the idea of old wooden masts, as well as to clearly show a continuous material and give warmth to the rooms.

Several different models were developed to see what their impact would be and how they affected the spaces they were in before being applied to the entire building. After several investigations, such as the spacing between the columns, the placement of the columns (see model A to D), and the number of columns in the room, two of the studies were developed to be evaluated throughout the building(Model B and D).

The next consideration was between the two models to analyze how the construction would affect the building on all its levels. Then, they were assessed for their impact on the building, and model 2 was chosen.





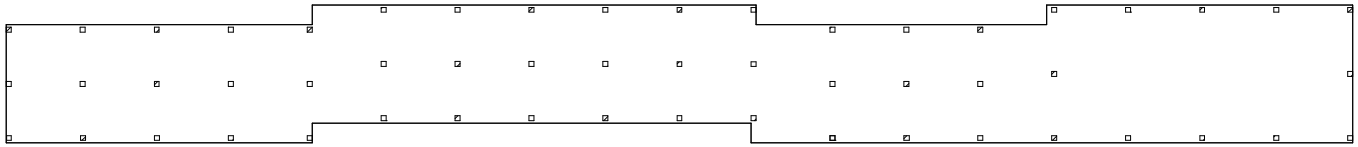
Construction model A

Construction model C

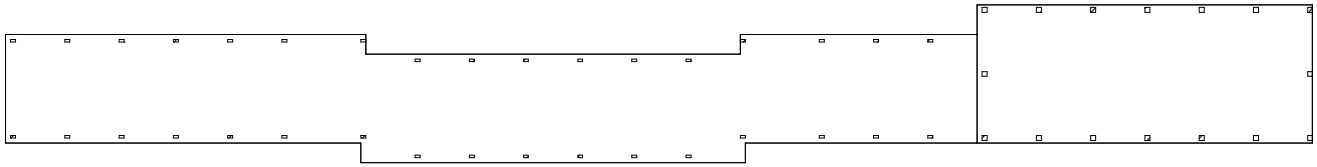
Construction model B

Construction model D

Ill 76: Construction study 1

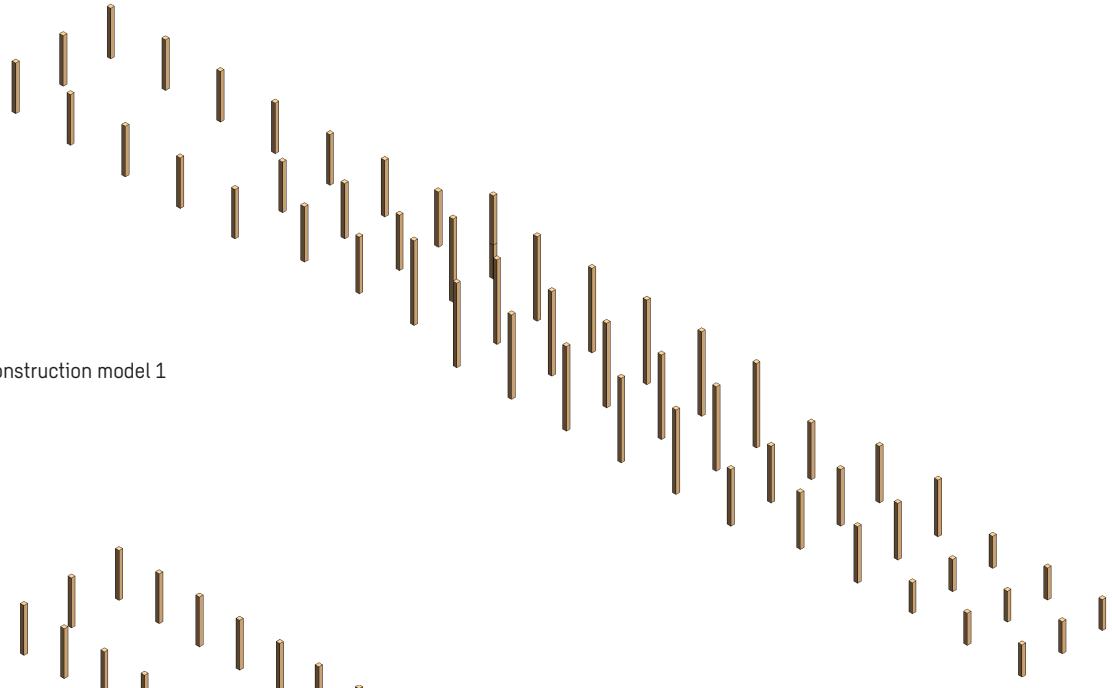


Construction model 1



Construction model 2

Ill 77: Construction study 2



Construction model 1

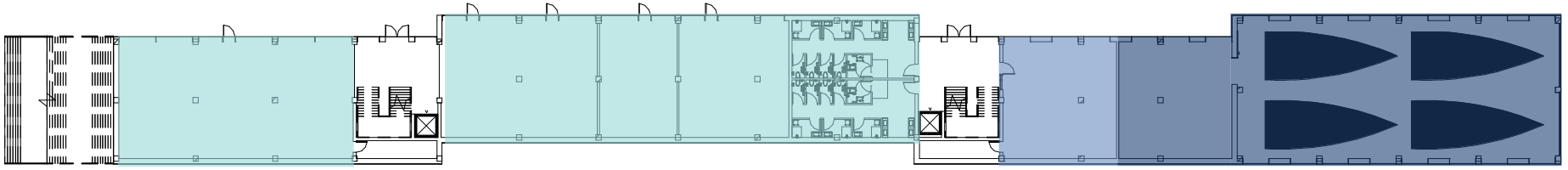
Construction model 2

Ill 78: Construction study 2

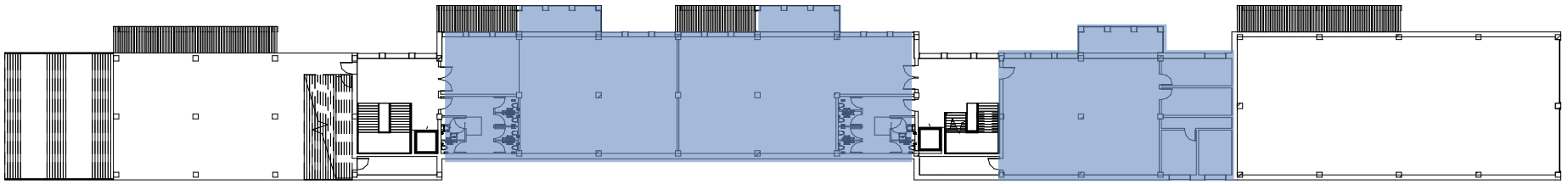
Interior layout

Throughout the design process, the interior layout has evolved, influencing other aspects of the design such as the placement and design of windows. Additionally, the views from the windows have impacted the interior design.

The interior layout has been influenced by the functions intended for the premises and the number of functions to be accommodated under one roof.

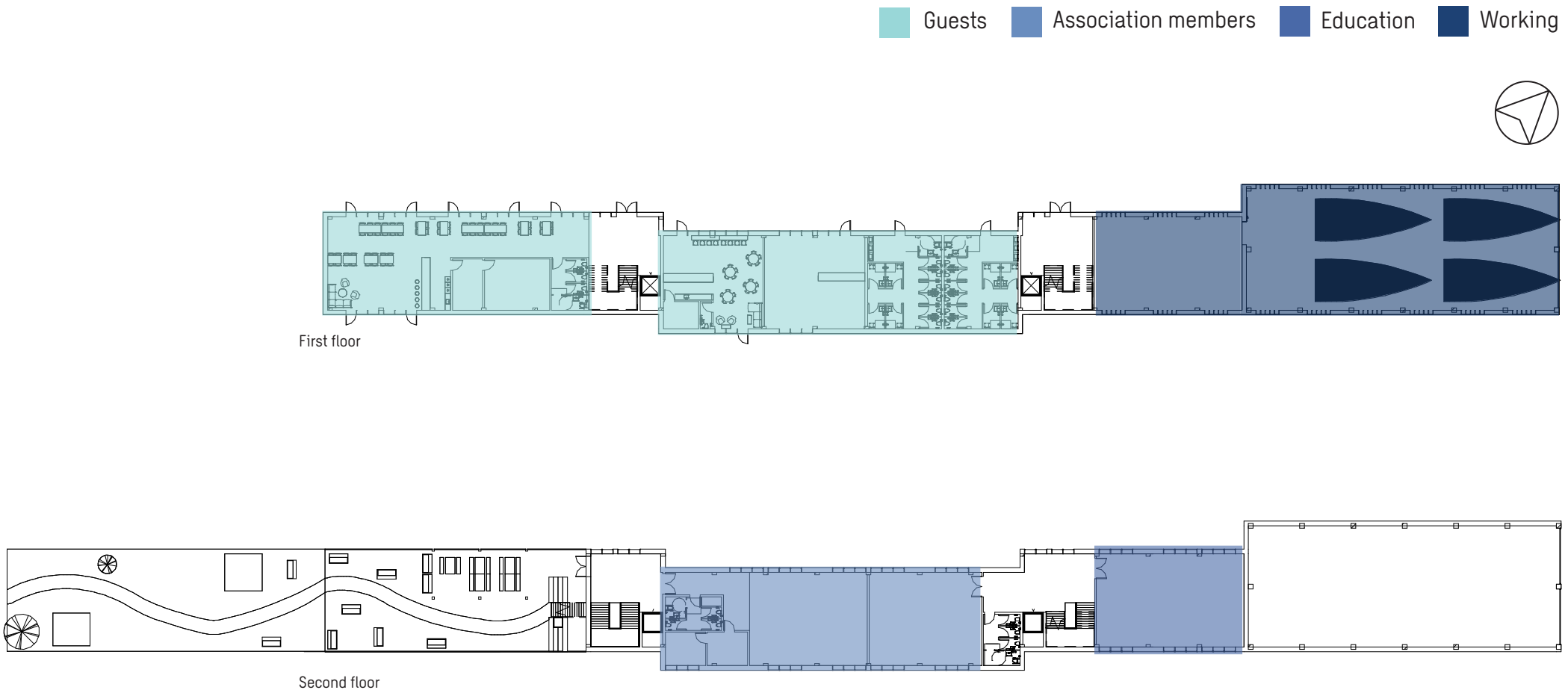


First floor



Second floor

Ill 79: Plan - Model 1

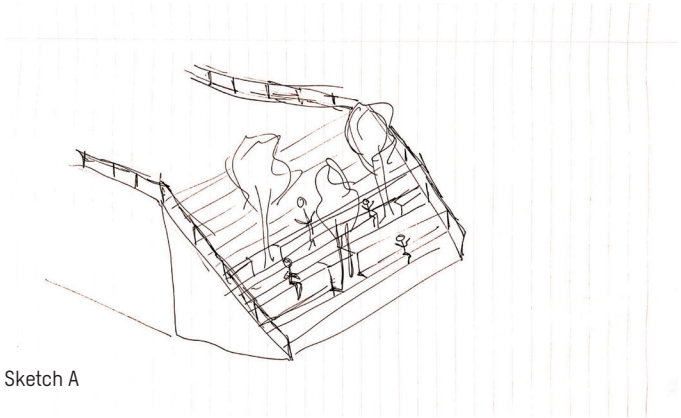


Ill 80: Plan - Model 2

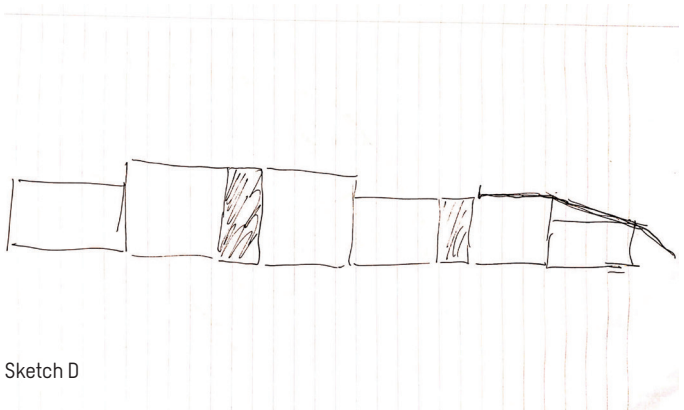
Park

The initial idea was to create a place where visitors could sit and enjoy the surroundings or relax. It was an idea to create a small park, both for the users and guests of the building. The initial drawings of Ø Parken helped generate ideas on how it could be designed. There were ideas to use the entire roof as a park and to create a ramp leading up to it, as well as an idea to build stairs to the first-floor roof and use it as a park. Further work was done on the idea of using the stairs and the first-floor park and adding stairs to the outdoor area for the restaurant.

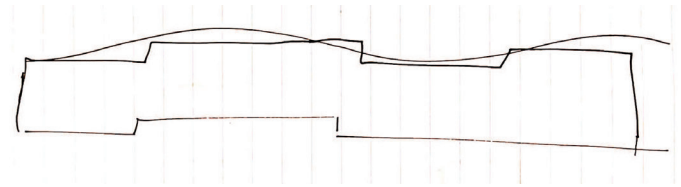
However, there were concerns that when a person uses stairs, it would be an active choice and therefore not as inviting to people who are not users of the area. For this reason, the idea was reconsidered, and the initial drawings were reviewed. One thought that was tested was to create a ramp up to the second floor and make that Ø Parken, but it would create an uncomfortable encounter with the users of the restaurant. So the new idea was to remove the bottom stairs and convert them into a ramp, which would remove this consideration of whether one was allowed to be there. But still, keep the stairs to the second floor to create a place where one would have to make an active choice if they wanted to go up to the restaurant.



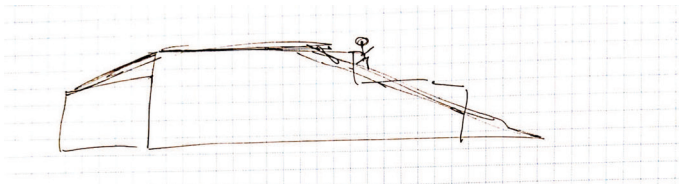
Sketch A



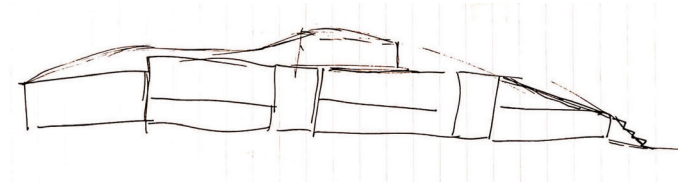
Sketch D



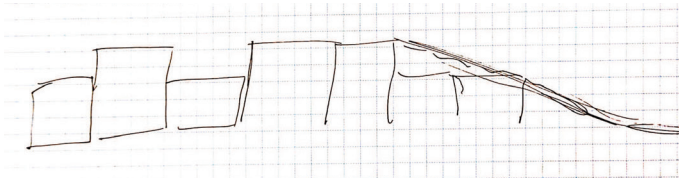
Sketch B



Sketch E

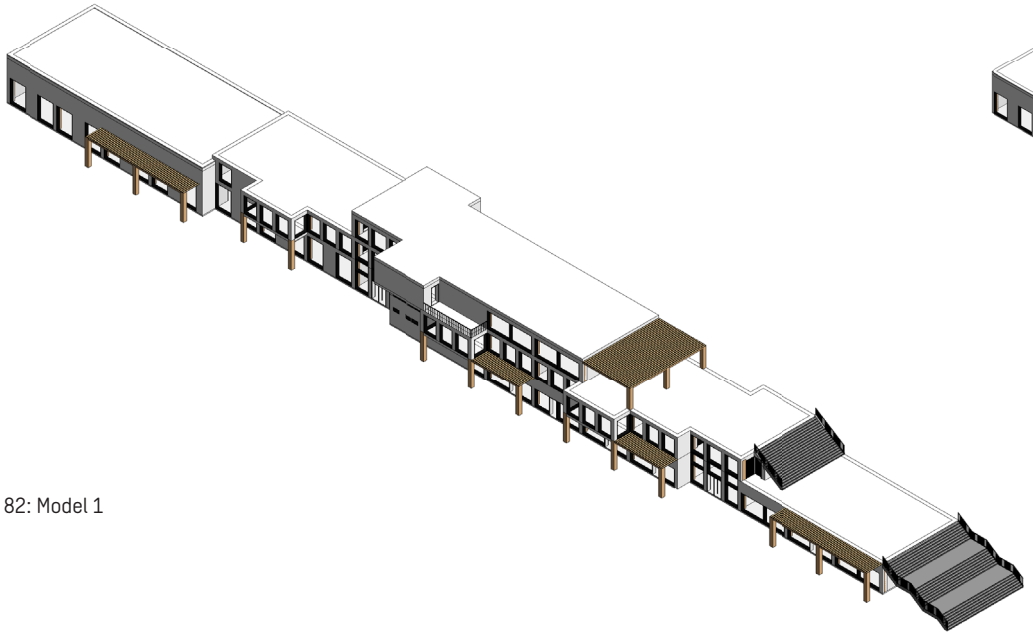


Sketch C

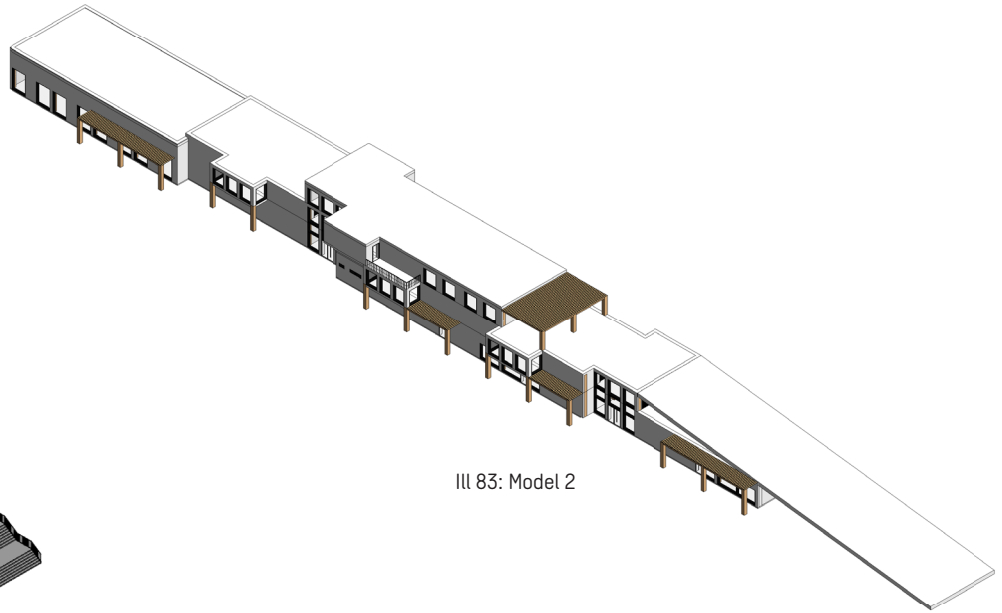


Sketch F

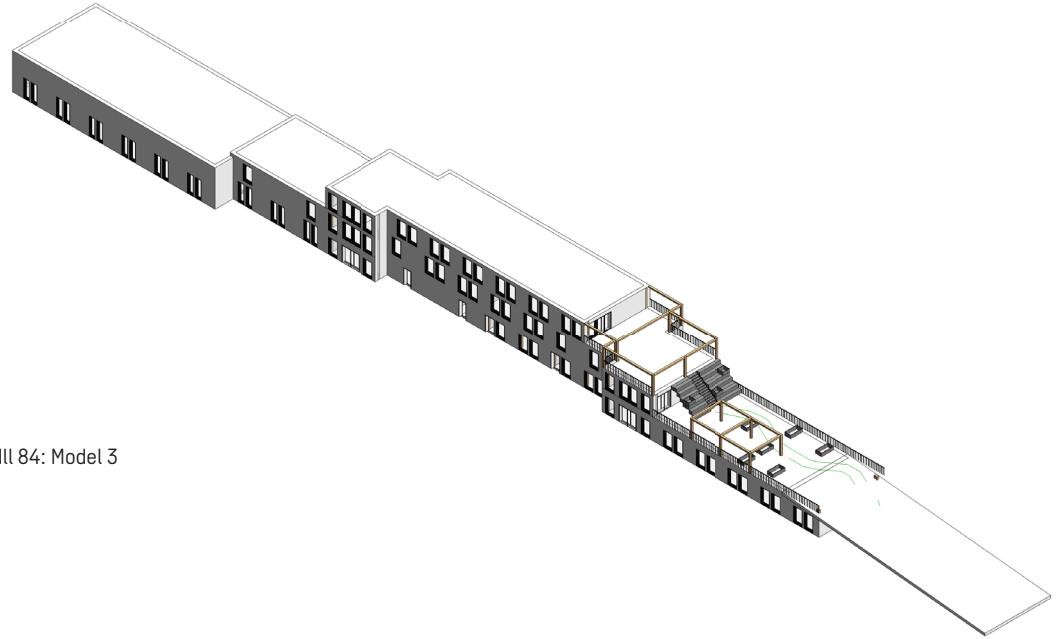
Ill 81: First sketches on Ø Parken



Ill 82: Model 1



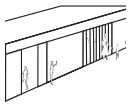
Ill 83: Model 2

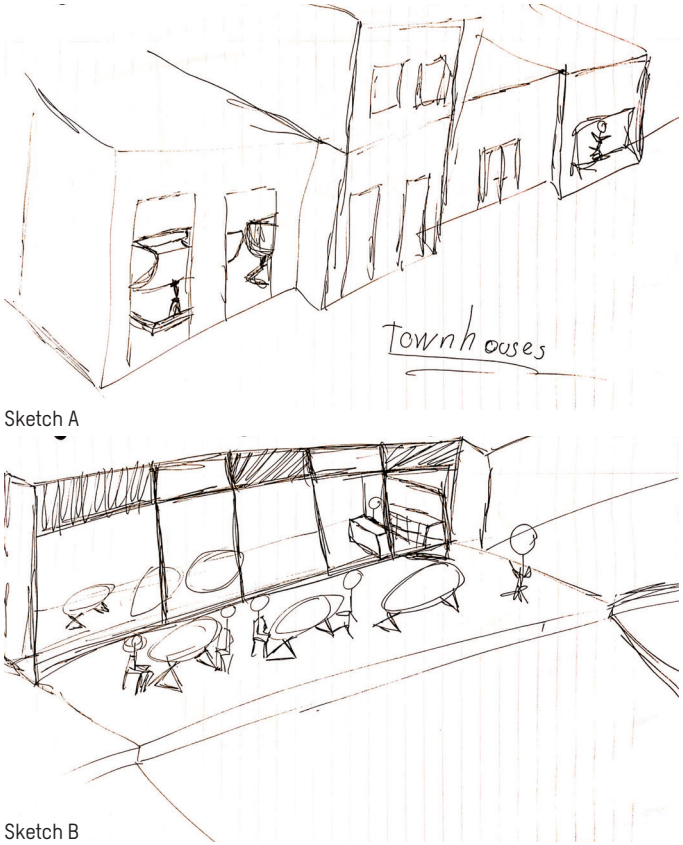


Ill 84: Model 3

Facades

The initial thoughts on the facades were to create small niches where it was possible to both have long and short stays, as well as to create places sheltered from the wind and shade from the sun. Additionally, the facade should also be diverse with openings, so it has both open and closed facades. In the open facades, functions that would attract people should have the opportunity to unfold, while the closed ones should be for more private functions.





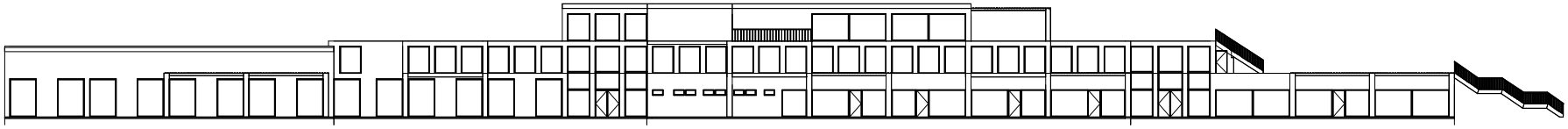
Ill 85: First sketches on the facade

Windows

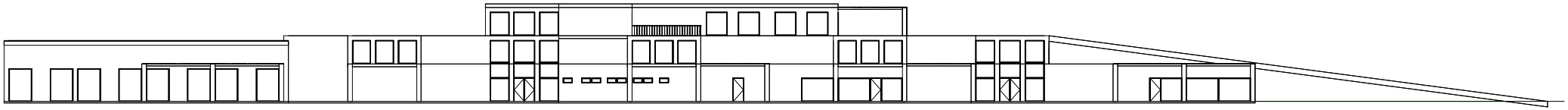
As the building began to take shape, efforts were made to ensure that the facade had the desired expression, whether it should be open or closed. At the same time, there was also a focus on bringing sufficient light into the rooms without the feeling of being in a greenhouse. Measures were taken to ensure adequate daylight through daylight analysis (see appendix xx) and to prevent overheating by conducting temperature calculations (see appendix 1).

On the ground floor, it was important for some of the rooms to have large windows covering most of the facade to create a smaller distance between indoors and outdoors, while other rooms should have views without disturbing the use.

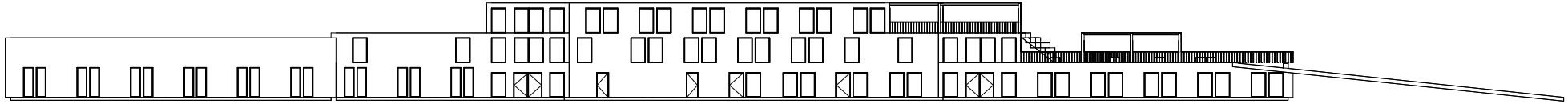
On the first and second floors, there was a slightly different approach regarding windows, as there shouldn't be a focus on the "between indoors and outdoors", but rather an emphasis on framing the views and using the window sills as sitting niche.



Ill 86: Model 1



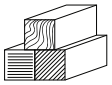
Ill 87: Model 2



Ill 88: Model 3

Materials

Since the facade materials aren't part of the structural support but rather serve to protect the building against outdoor elements, it's essential that they can withstand the conditions prevalent at the building's location, near the sea on a harbor. These materials should be chosen to ensure durability or ease of maintenance, repair, and replacement in case of damage or if longevity is not achieved.

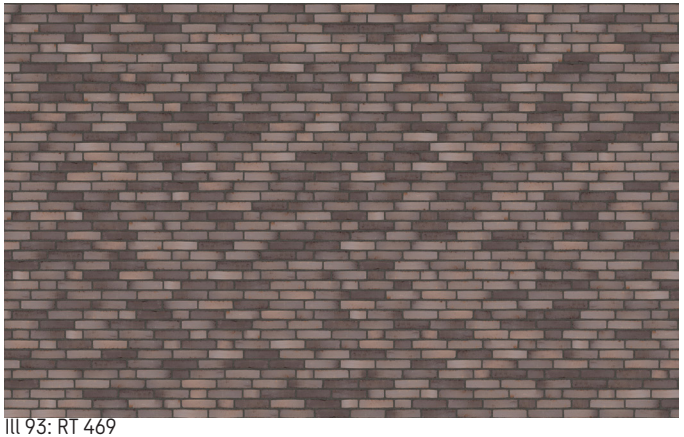


Lestegl

Lestegl, also known as perforated bricks, is a CO^2-saving solution where 15% of the material in the middle of the brick is removed. This results in a 15% CO^2 saving as it reduces the energy required to dry and fire the bricks. This contributes to a lower burden on non-recyclable materials while preserving the good quality known from traditional bricks. (EGERNSUND WIENERBERGER, 2021)

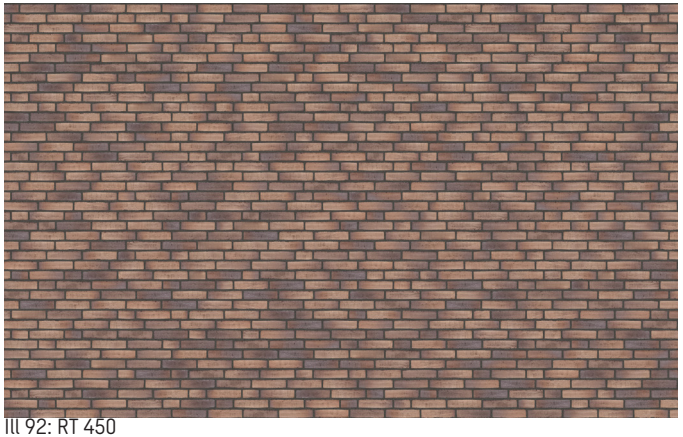
Ill 89: RT 150

Ill 91: RT 438

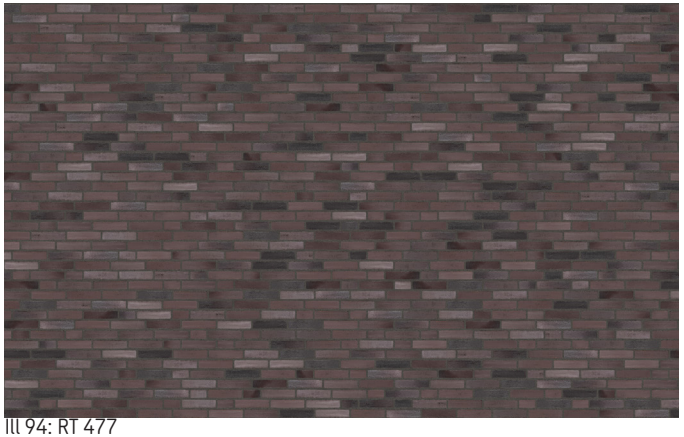


Ill 93: RT 469

Ill 90: RT 161



Ill 92: RT 450

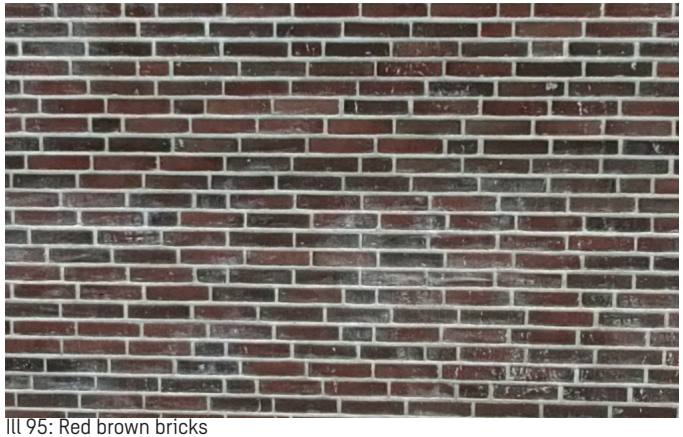


Ill 94: RT 477

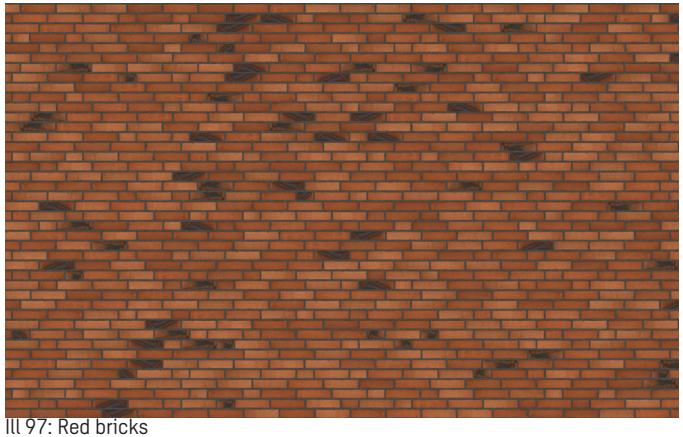
Why the use of bricks

The reason for choosing brick as the building material is to harmonize with the nearby contexts, consider the microclimatic conditions, adhere to the local plans for other buildings on Aarhus Ø, and evoke historical context. Many of the buildings in the nearby contexts on Aarhus Ø feature brick on their facades, in various shades of red, and gray. For example, Nicolinehus, located on the other side of Dagmar Petersens Gade, features a brick facade, as does the Kanalhusene, albeit in a sandy and grayish hue. Additionally, the Pakhusene utilizes a brownish hue of brick.

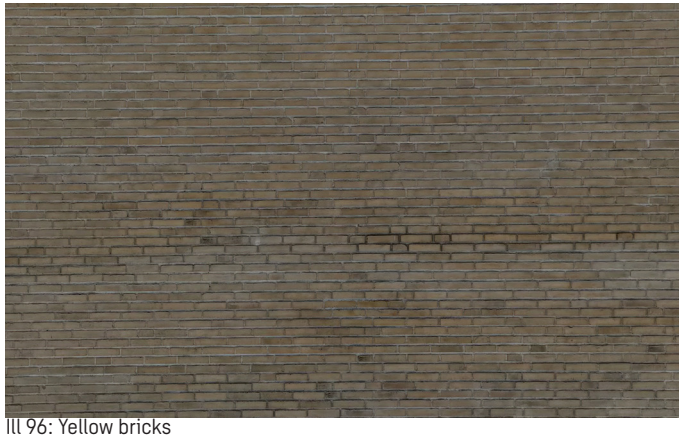
If we look at the old buildings by the harbor, such as the Toldbygningen and Wulffs palæ, they are also constructed of brick and have stood on the waterfront for between 120 and 150 years, proving their ability to withstand the climate they are exposed to. This historical precedent further supports the choice of brick as a durable and contextually appropriate material for the new building.



Ill 95: Red brown bricks



Ill 97: Red bricks



Ill 96: Yellow bricks

Ill 98: Brown bricks

Energy

While exploring how windows need to be positioned in the facade and the amount of daylight added to the building, energy calculations were calculated to determine whether the building would qualify as a low-energy building. Efforts were made to reduce energy consumption in the calculations. One approach was to assess which windows required shading, their size, and placement. The windows in Energy Calculation 1 correspond with Model 1 and in Energy Calculation 2 with Model 3 in the section Windows.

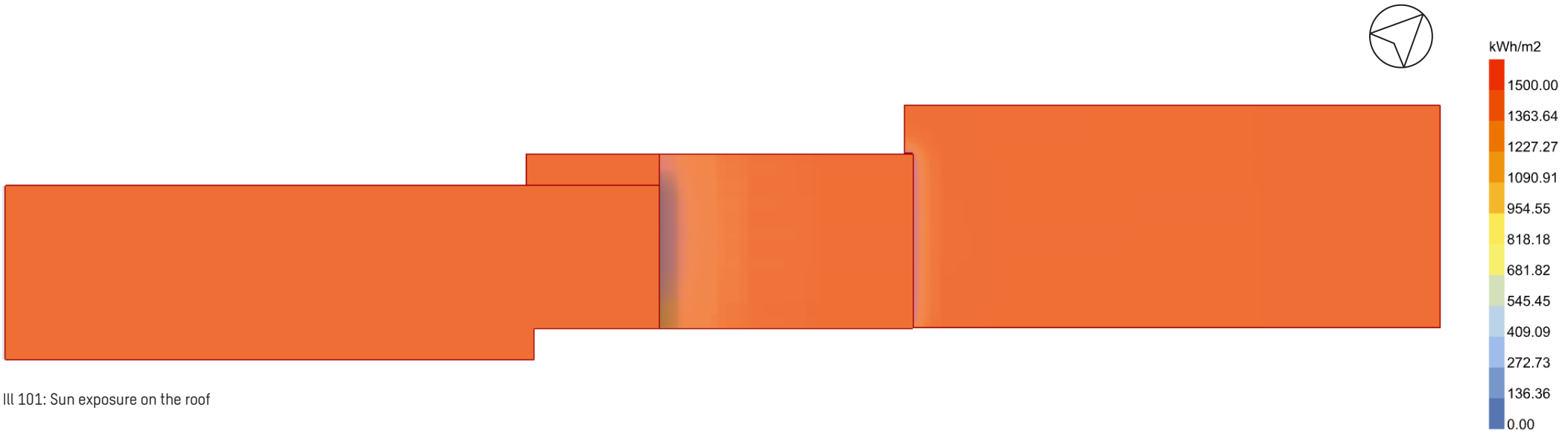
The U-values for the walls were also examined to find an optimal value without compromising too much on the wall's thickness. See Appendix 2 for the U-value calculations.

Ill 99: Energy calculation 1

Ill 100: Energy calculation 2

Sun exposure

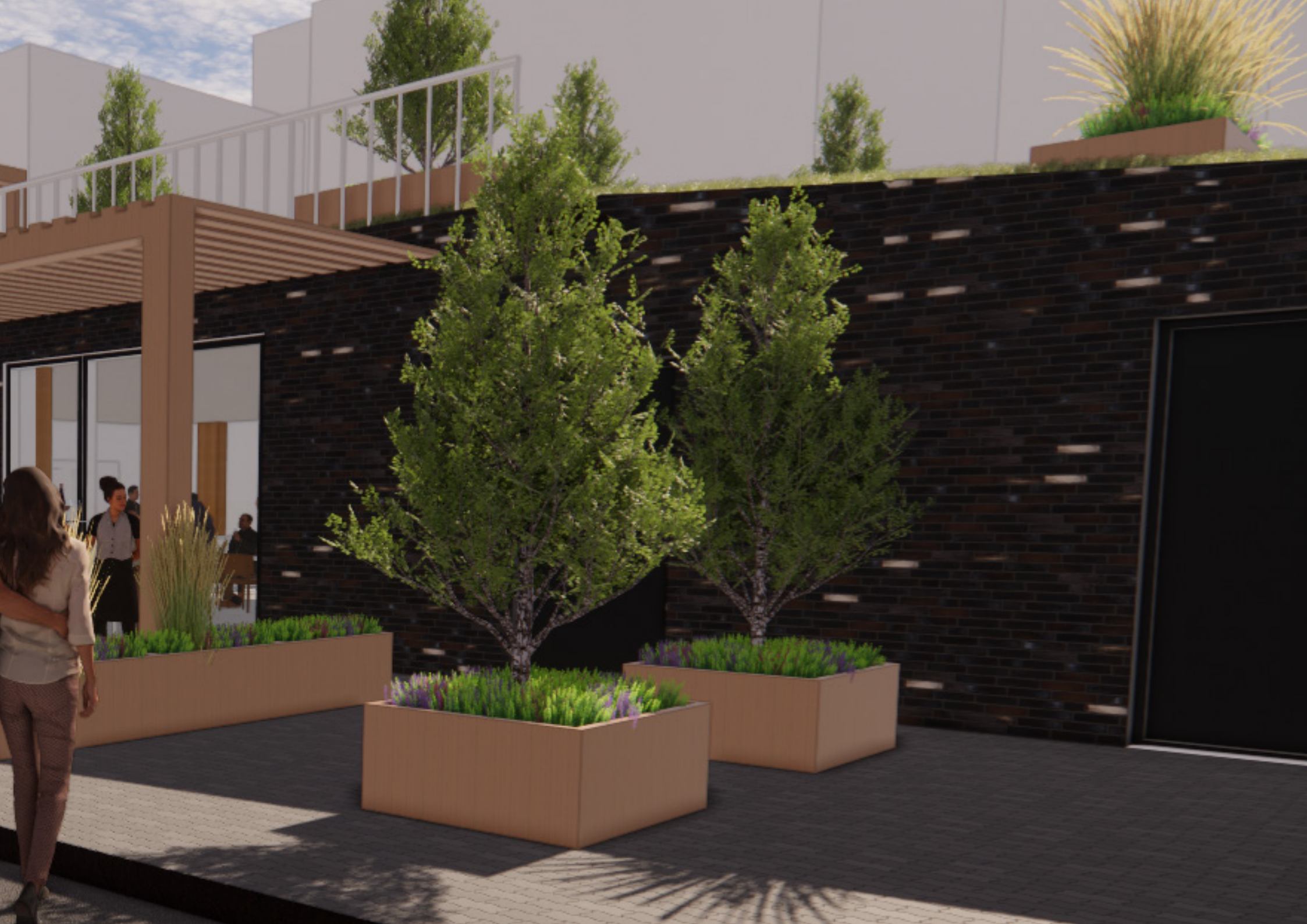
Since surrounding buildings have solar panels on their roofs, an investigation was conducted to determine if there was enough sun or if the local context would cast too much shadow for it to be impossible to install solar panels. The study assessed the amount of solar radiation received on the roof is 951 kWh/m^2/year, as well as proving that it is possible to place solar panels on the roof.



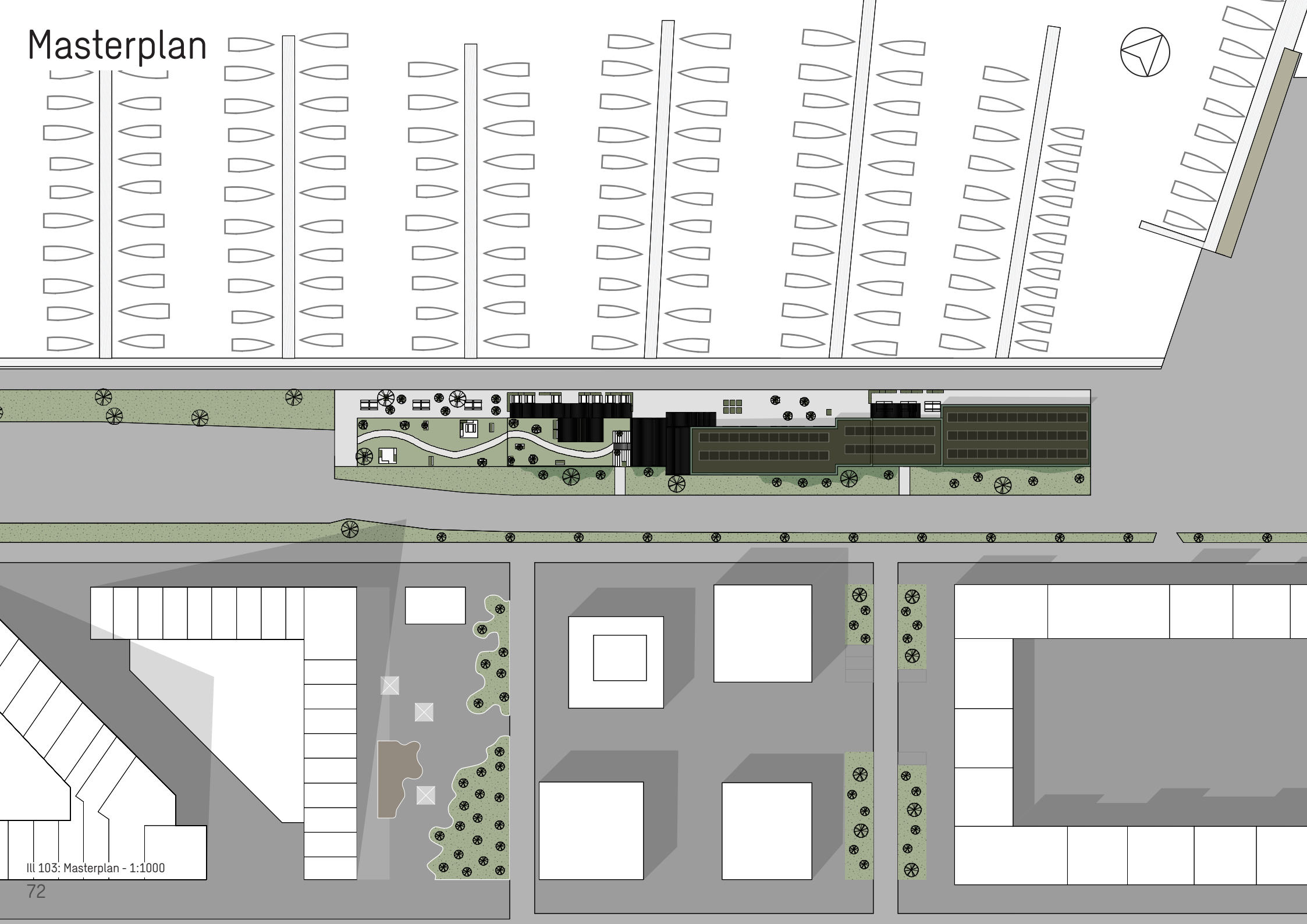
Ill 101: Sun exposure on the roof

Presentation

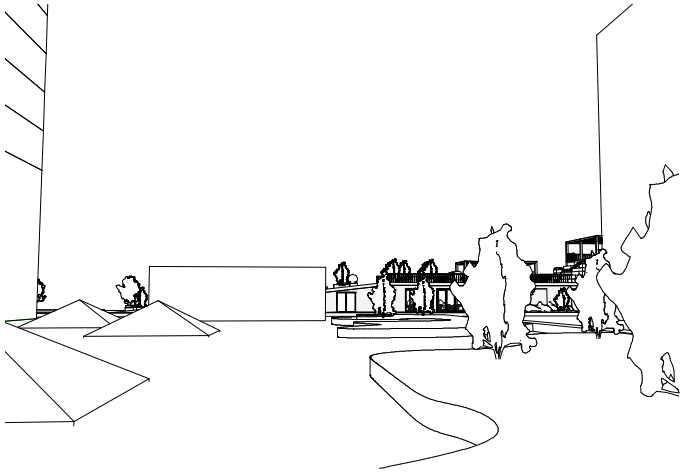
Ill 102: Render of the wine and coffee bar



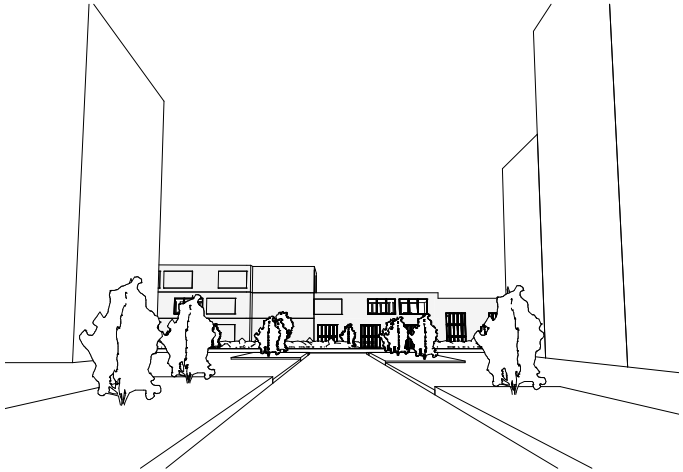
Masterplan



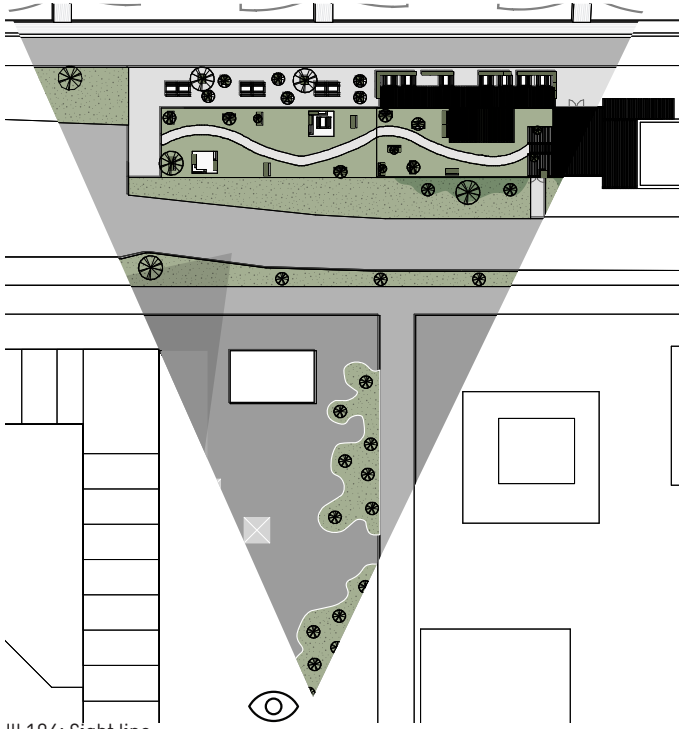
Ill 103: Masterplan - 1:1000



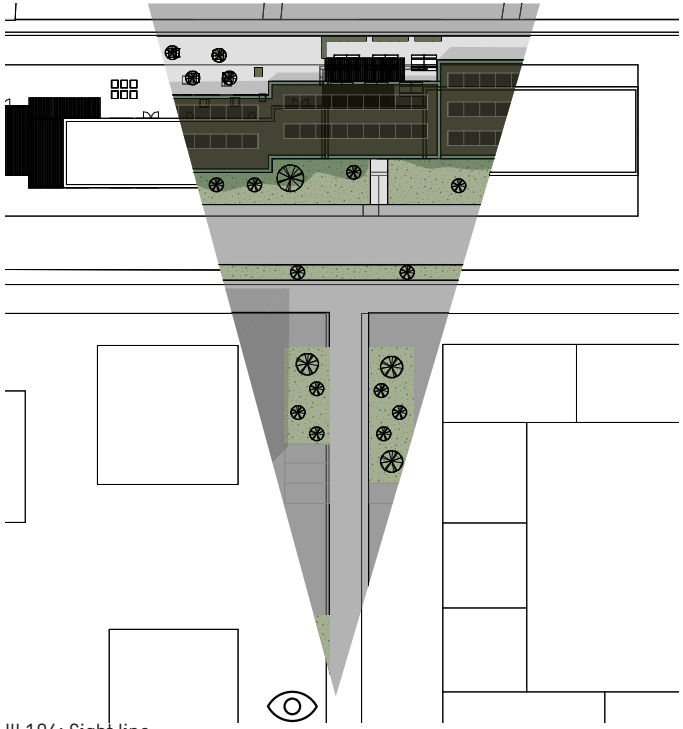
Ill 104: Sight line



Ill 105: Sight line



Ill 104: Sight line



Ill 106: Sight line

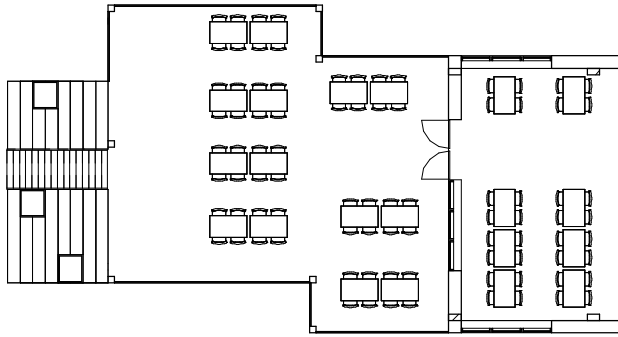
A focus on sightlines to enhance and ensure visibility of the building and its activities from a distance, thus pushing for more attraction.

The sightline between Nikolinahuse and the dorm buildings on Ill 104 shows both the wine and coffee bar, AFI(Shop), and Ø Parken, where people can be seen enjoying wine, coffee or just relaxing.

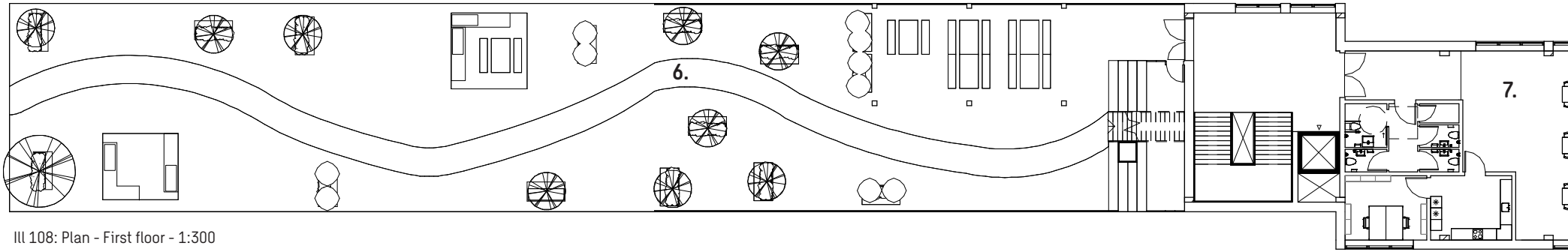
Between the dorm buildings and Kanalhusene on Ill 106, sightlines allow for views of the workshop and work hall, enabling observation of activities on the premises and thereby attracts people.

Plan

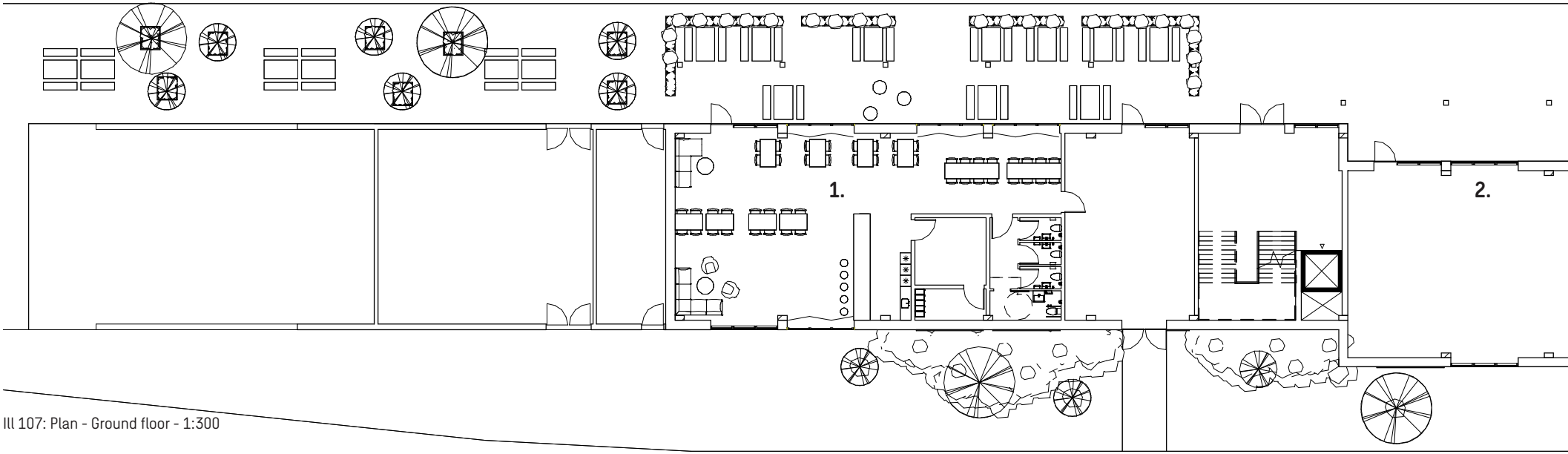
1. Wine and coffee bar
2. AFI (Shop)
3. Toilet and badge conditions
4. The workshop
5. Warkhall
6. Ø Parken
7. Clubroom 1
8. Clubroom 2
9. Lecture hall
10. LULA (Restaurant)



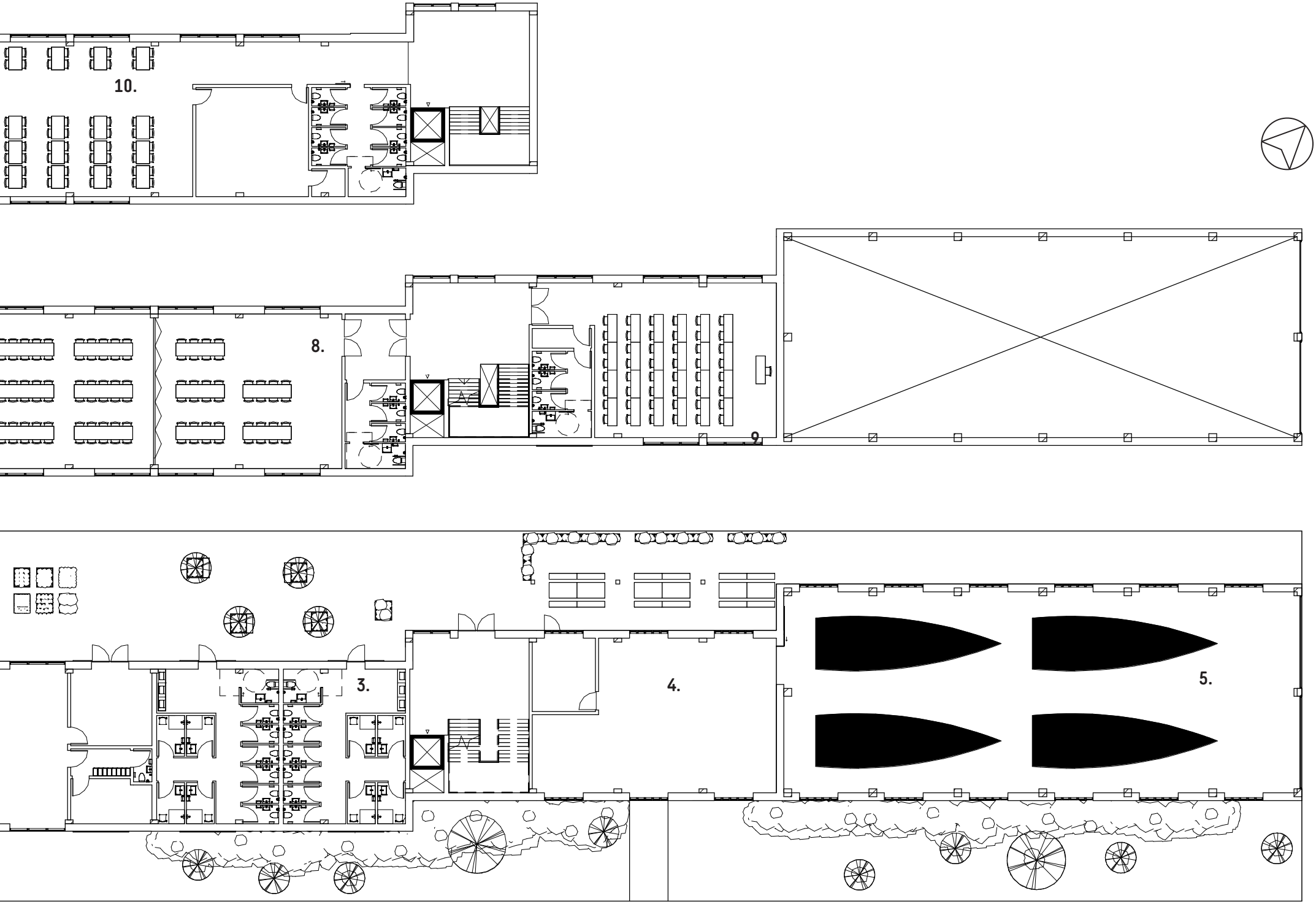
Ill 109: Plan - Second floor - 1:300



Ill 108: Plan - First floor - 1:300



Ill 107: Plan - Ground floor - 1:300

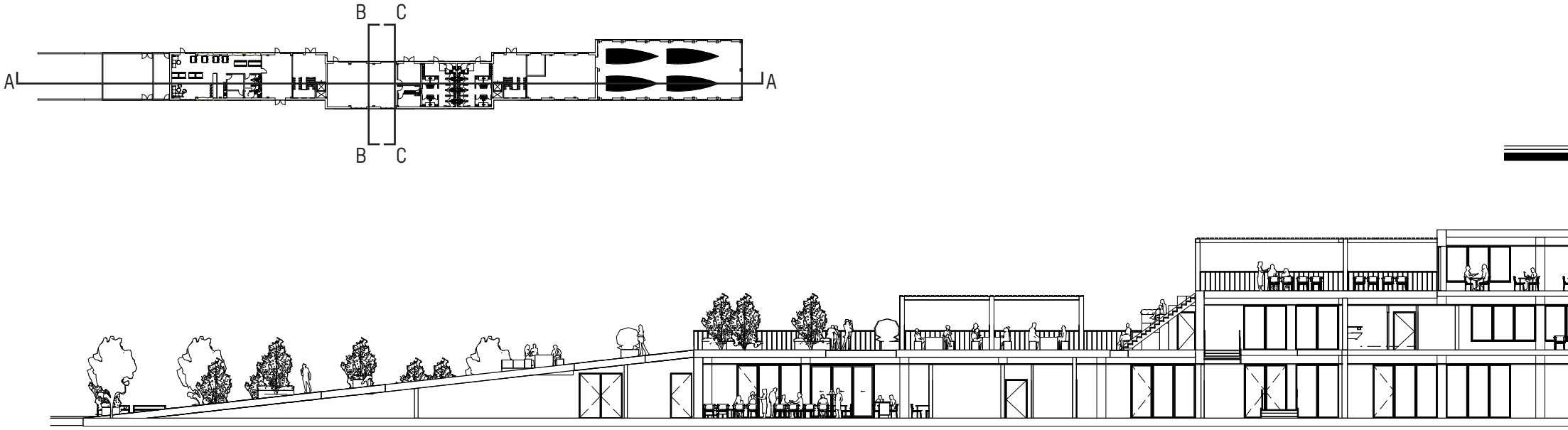

10.
8.
9
3.
4.
5.

Section

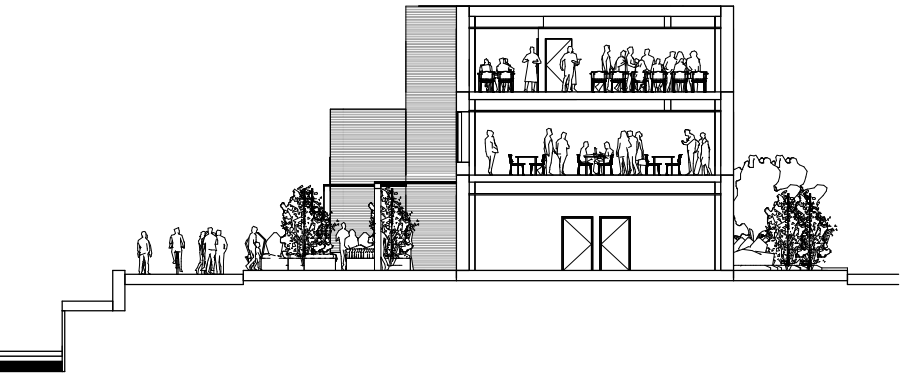
All floors have a suspended ceiling to conceal most of the installations. The only exceptions to the suspended ceiling are in the workshop and the workhall where the installations do not need to be hidden, and easily accessible when repairs are necessary.

In the workhall, the ceiling height is 6 meters to ensure that there is enough height for boats to enter the hall and for people to work on top of them.

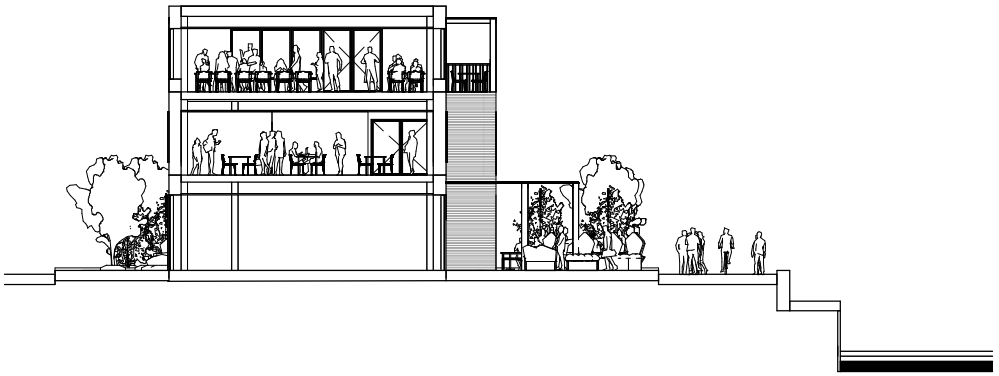
Ceiling Heights:
Ground Floor - 3 meters
First Floor - 2.5 meters
Second Floor - 2.5 meters



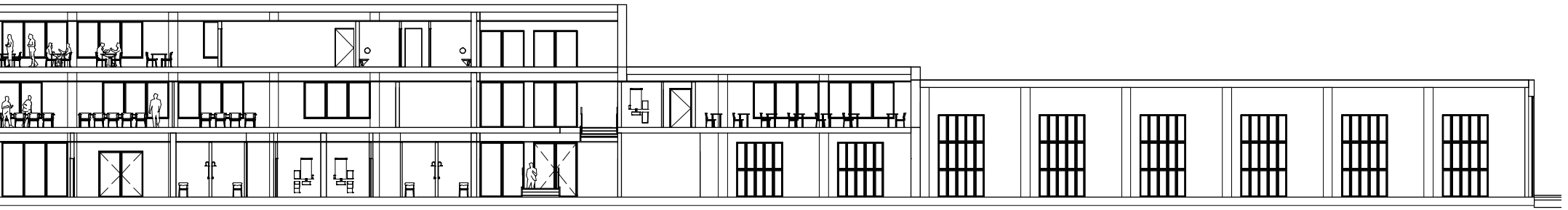
Ill 110: Section AA - West to East - 1:300



Ill 111: Section BB - North to South - 1:300



Ill 112: Section CC - South to North - 1:300



Elevations

Elevation Northwest faces the water, and there is a well-used path infornt of the building that is frequented throughout the year. Therefore, the facade of the building has several openings to attract more users. Additionally, there are places along the facade where people can linger, whether it's at the wine and coffee bar or on the edge of one of the many planters.

Elevation Southwest faces the road and the other buildings in the area, so it is more closed off. However, there are several openings and open facades at various sightlines to enjoy the view while also ensuring that the building appears active and welcoming.

Ill 114: Elevation Northwest - 1:300

Ill 113: Elevation Southwest - 1:300

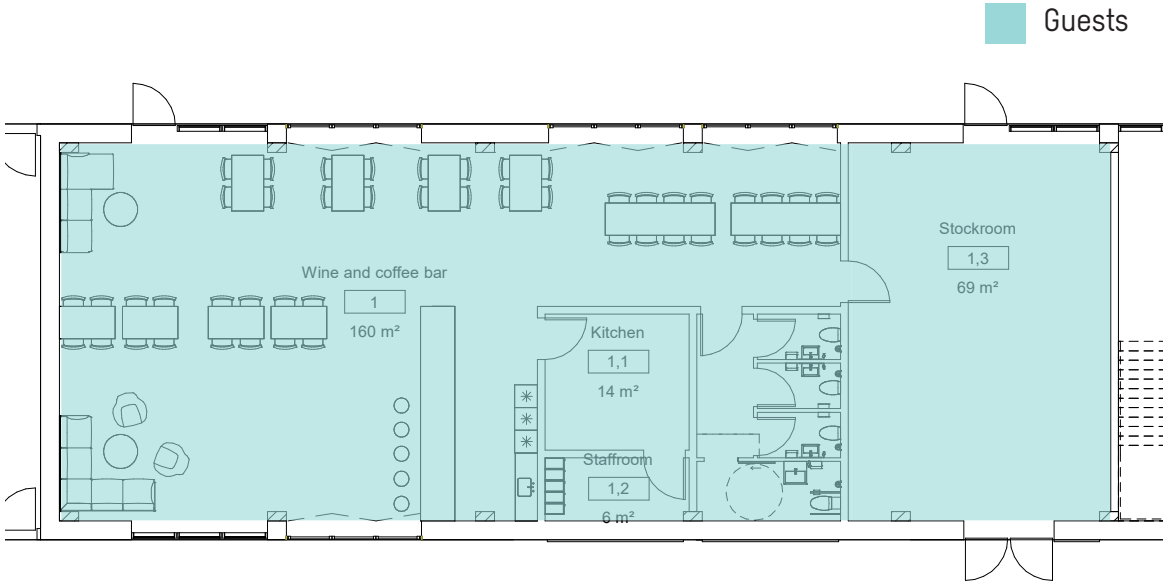
Ill 115: Elevation West - 1:300

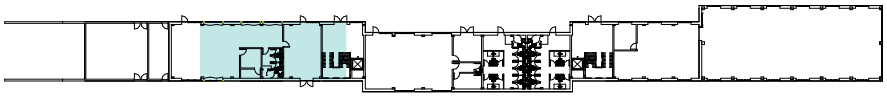
Facilities

Wine and coffee bar

A wine and coffee bar is open to create a new gathering place where guests can sit and enjoy a glass of wine, whether in or outdoors. There will be indoor seating available for colder days, while outdoor seating options will include areas under a canopy or in the open air, such as in Ø Parken.

This Wine and coffee bar will also contribute to creating a more relaxed atmosphere, particularly for those times when there is no desire to use the restaurant or similar facilities. The opening hours for the coffee bar will primarily focus on the mornings, while the wine bar will target early evenings to enhance activity throughout the day. Additionally, they can help generate foot traffic for those working in the Workhall or Workshop, providing them with options for coffee or light meals.



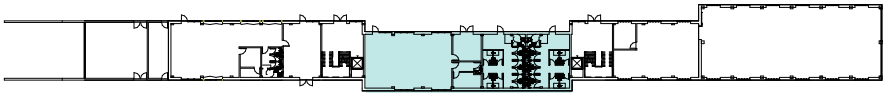


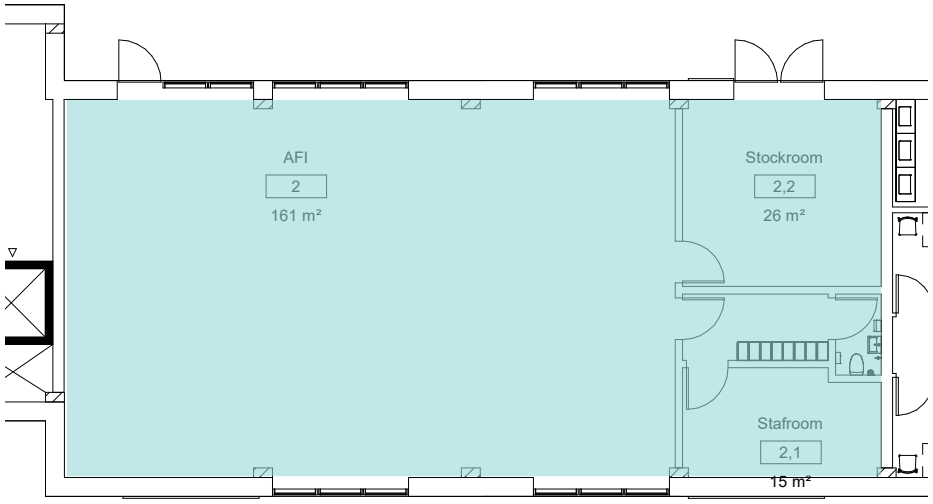
Ill 116: Wine and coffebar

Ill 117: Render of the wine and coffee bar

AFI (Shop)

The shop helps to create more life at the harbor, and it will be possible to purchase parts for repairs and maintenance of boats during the winter, as well as buy new parts for boats, kayaks, paddleboards, diving gear, sailing clothing, or other equipment for any water activity in the area.

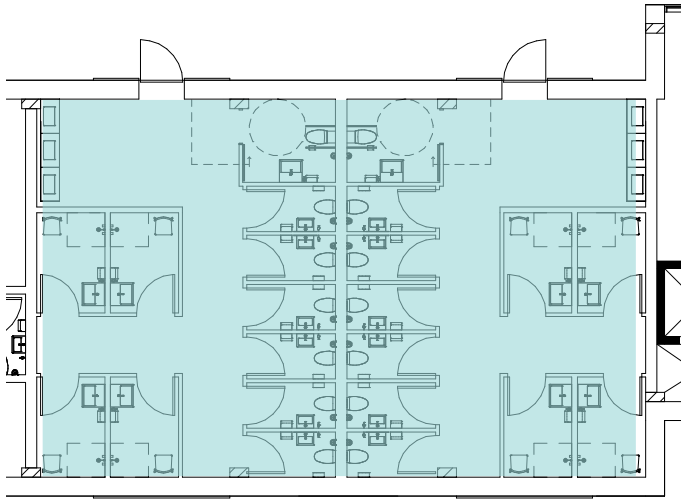




Ill 118: AFI

Sanitary facilities

There is a desire for new and better toilet and bathing facilities for the users of the haber and guest sailors. In addition, the facilities is also for the club members to use, either after a club evening or in connection with activities. Additionally, there is the option to open them up for use during events in the area so that there are proper toilet and shower facilities for guests or volunteers.



Ill 119: Toilet and bathing facilities

Guests

Ill 120: Render of outside

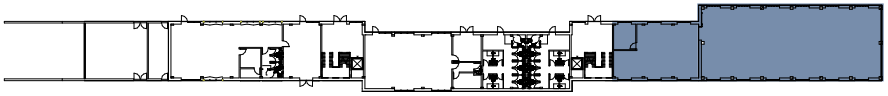
Workhall

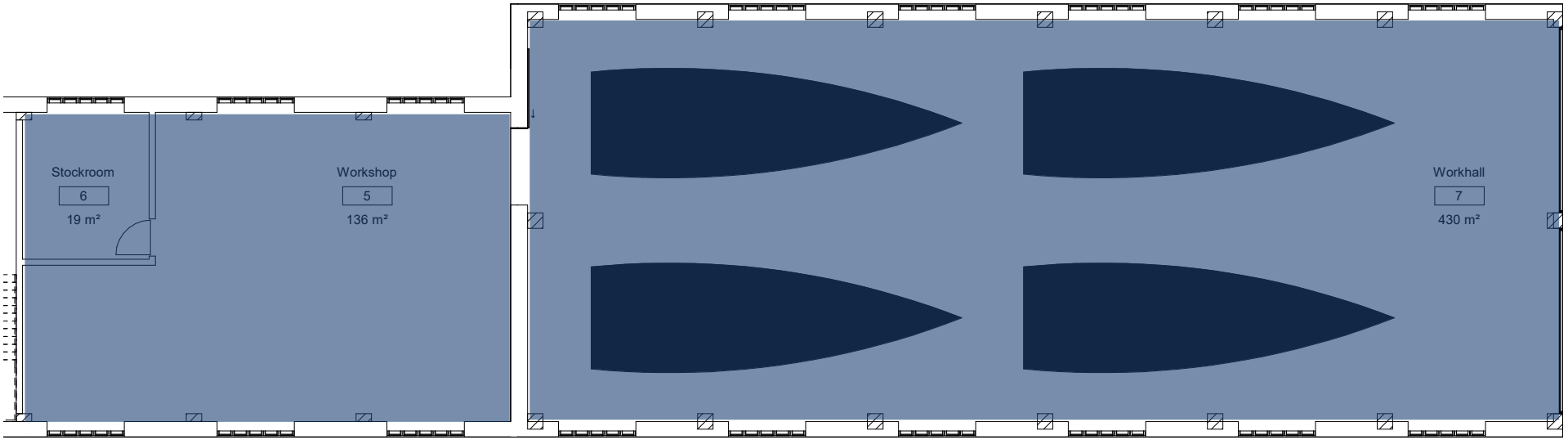
The Workhall is a space where it is possible to repair and prepare boats for the upcoming sailing season. Since a lot of the materials for preparing boats have temperature requirements to be used, it will be possible to start earlier and therefore be ready before or have more people who can use the hall. It will also be possible to bring boats into the hall during the summer to repair them if there are major damages.

The hall could also be used for other associations where there is a need for a larger working area for preparing equipment, such as if the nearby theater needs to build scenery or if there are events, they can be used for either storage of equipment or as a event hall.

Workshop

In an extension to the Workhall, a workshop is etableted, where it is possible to make minor repairs or work with smaller parts. There will be machines that will make it possible to perform these repairs and create or improve existing parts. It will also be possible to borrow the workshop as one of the residents on Aarhus Ø to make furniture or if there are machines that one wishes to use.





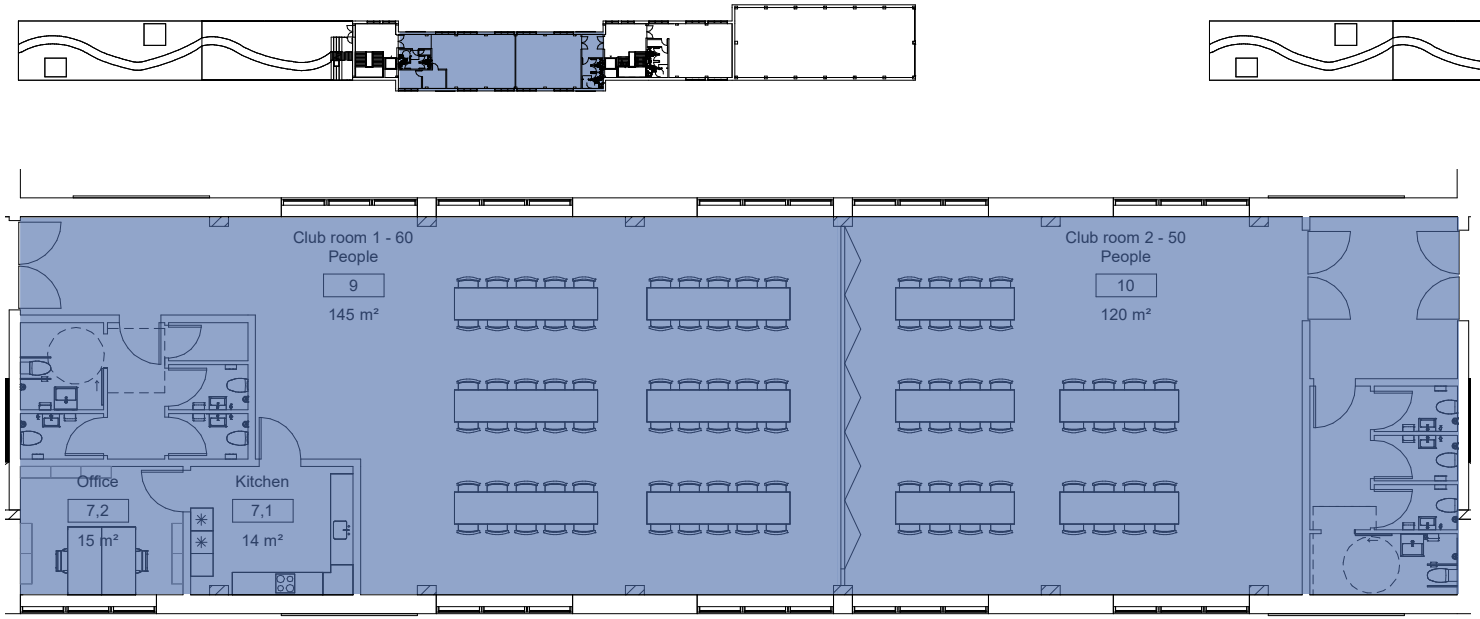
Ill 121: Workshop

Ill 122: Workhall

Clubroom 1 and 2

The clubrooms are designed in such a way that it's possible to hold two different gatherings without disturbing each other when they are in use. The two rooms can be used as one large space or two smaller ones, as there is a folding wall installed between them if a larger room is needed.

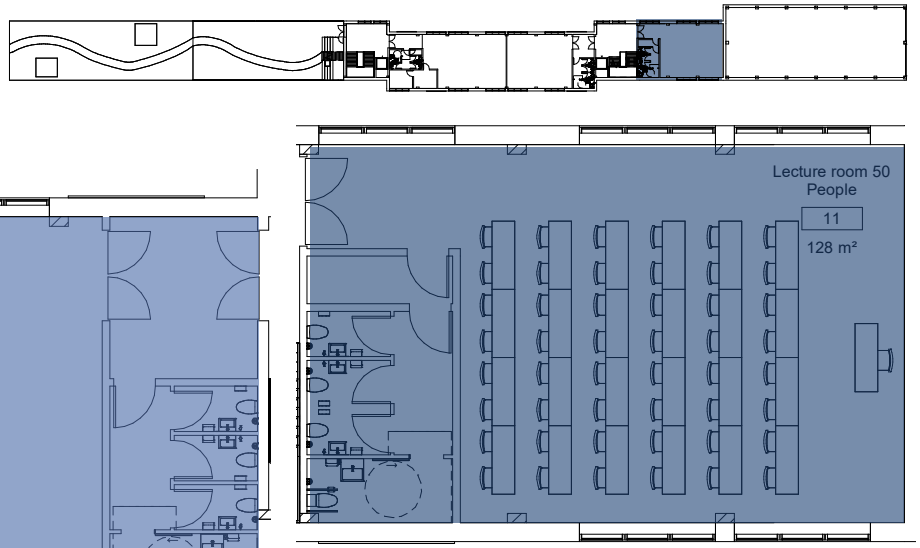
This provides multiple associations needing a club room the opportunity to share spaces, thereby creating a unified place where they can meet and learn about each other's associations or share their experiences. Additionally, the clubrooms provides a space with flexibility, where both large and small facilites can be made without major rearrangements.



Ill 123: Clubrooms

Lector room

A secondary room primarily intended for education, such as Den Blå Skole, or for training for proficiency certificates, can also be used if multiple activities are happening simultaneously in Clubrooms 1 and 2 are combined and an additional room is needed.



Ill 124: Lector room

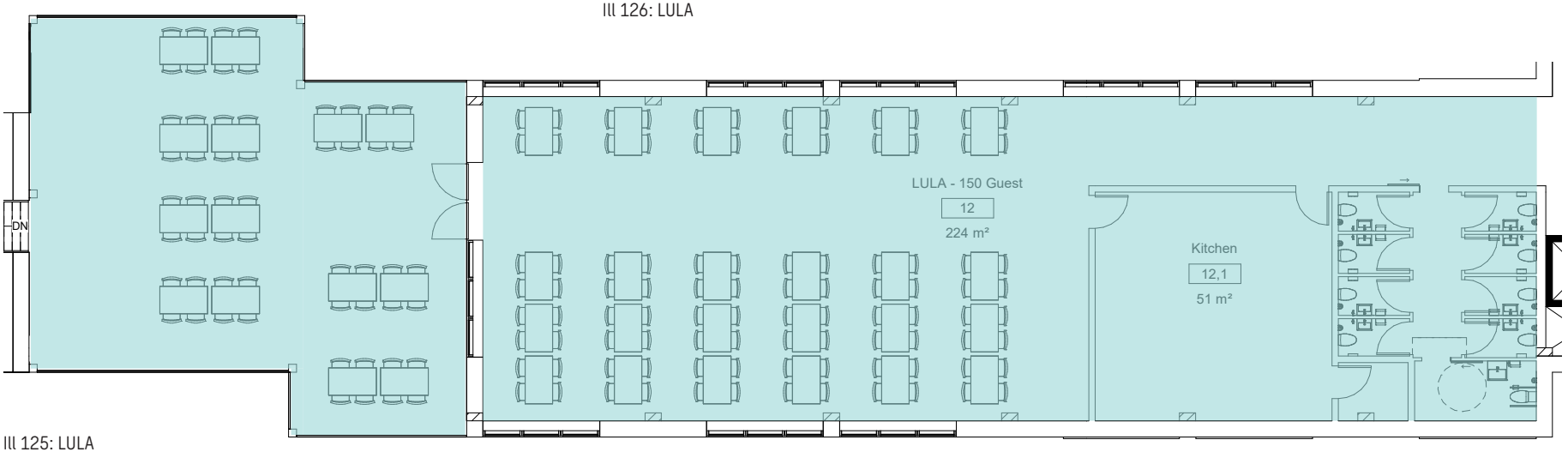
Association members Education Working

LULA (Restaurant)

A new location for the reastaurant LULA was created with a view overlooking the harbor, as well as a covered terrace with the opportunity to enjoy the evening sun while having dinner.

Guests

Ill 126: LULA



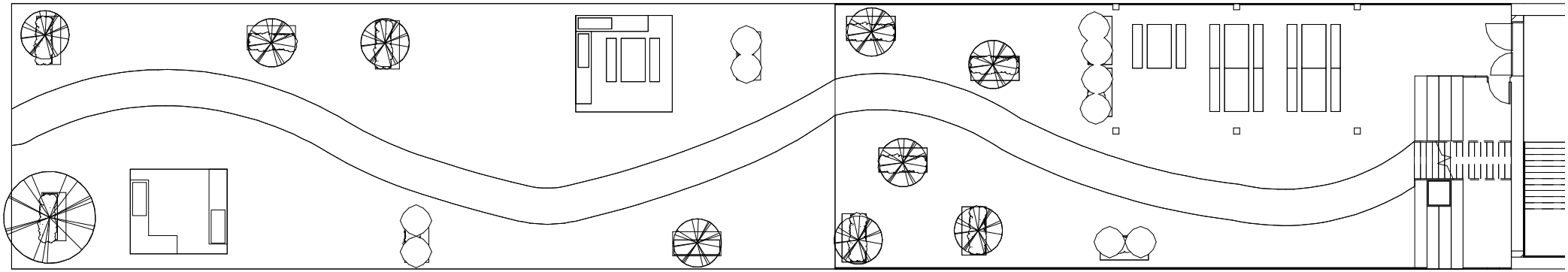
Ill 125: LULA

Ø Parken

Due to the limited green spaces, such as parks or lawns, on Aarhus Ø, there is an opportunity to create a place where people can gather, socialize, and make use of the facilities available in the area.

Ø Parken will also enhance the quality of activities, cafes, and the clubrooms that will be users of the building. Additionally, the green area will provide a resting place for passersby, where they can enjoy the sun on a warm summer evening or find shelter on a windy autumn day.

Ill 128: Ø Parken



Ill 127: Ø Parken

Pavilions

The pavilions contribute to creating areas of shelter and shade for the users of the building. They also serve as outdoor gathering spots, providing smaller areas where both the pavilions and the boulding can be utilized for shelter, aswell as breaking up the facade.

Ill 129: Pavilions

Windows

Gound floor windows

The window sections consist of 3 windows that are designed to open up the facarde, allowing individuals to have the feeling of sitting outside while still using the interior layout. They also provide natural ventilation to the rooms on hot summer days. In the retail area (AFI), the window sections have the same design and appearance but cannot open, as the shop does not have the same need for natural ventilation. This also allows for the creation of other interesting storefronts.

Size: Window section 3x 1200x3000 mm

Upper floor windows

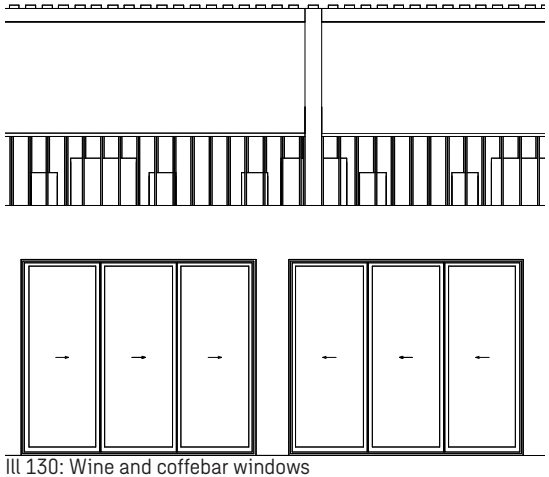
In the rooms on the first floor and the restaurant on the second floor, the window pairs are designed in the same style as on the ground floor but with a lower height. They are positioned 500 mm from the floor to provide a window-sill for seating. It is not possible to open the windows in the same way as in the wine and coffee bar, but but one section can be opened slightly to allow fresh and cool air when there are larger gatherings in the rooms.

Size: Window section 3x 1200x2000 mm

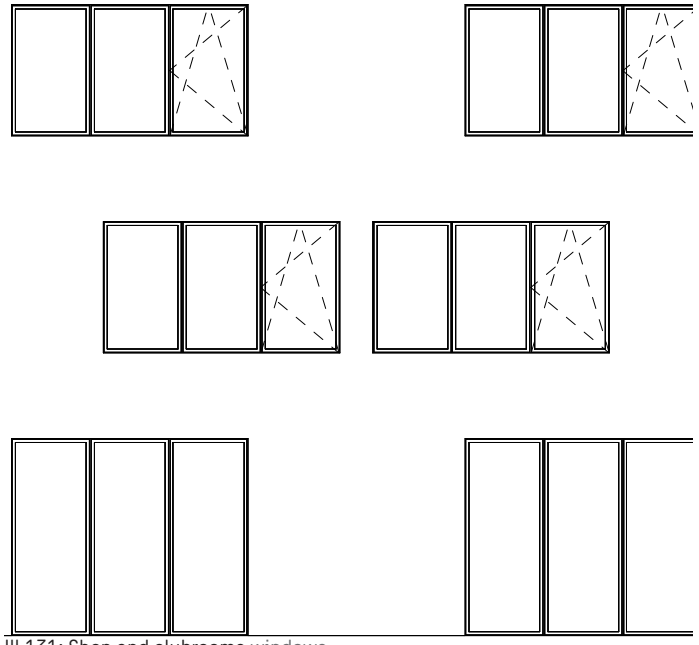
Staircase windows

The windows in the staircase are designed to resemble the doors and give the impression that there are two window sections, one section being being the door. They are also designed to match the other windows on the ground floor. On the other floors, they are designed in the same way but with a lower height to match the other windows on the floor.

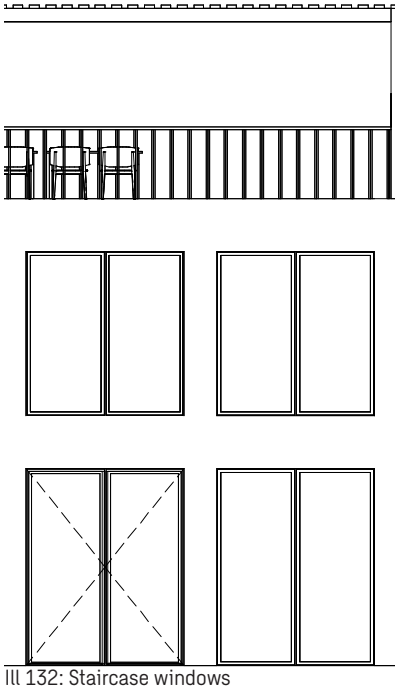
Size: Window section 2x 1200x3000 mm
Size: Window section 2x 1200x2500 mm



Ill 130: Wine and coffebar windows



Ill 131: Shop and clubrooms windows



Ill 132: Staircase windows

Workhall and Workshop windows

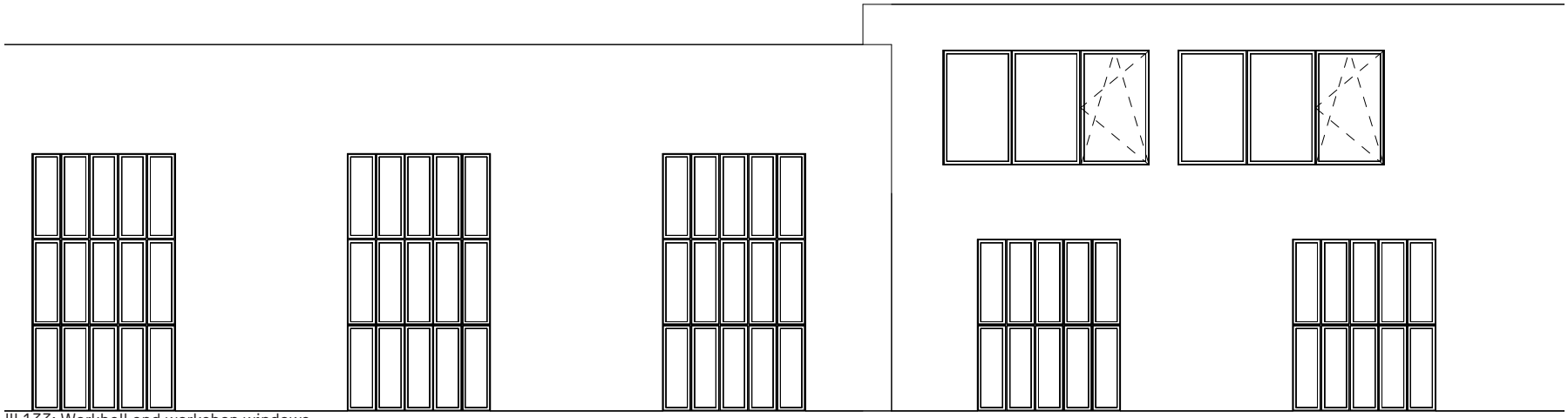
The windows in the workshop and workhall are designed with the idea of an old industrial building, reflecting the historical context of Aarhus Ø. Although there was no direct industry in the harbor, there was a significant influence of industry in Aarhus. Therefore, the windows are designed with this idea in mind.

Additionally, considering the physical work with machinery and large objects, there is a risk of windows breaking. Therefore, the smaller sizes within the larger window sections make it easy to replace individual windows if needed, without having to replace the entire window section.

The window sections for the workshop are 10x and for the workhall are 15x, each sized 500x1500 mm, reflecting the height difference between the two spaces.

Size: Individual window 500x1500 mm
Window section 2500x4500mm

Size: Individual window 500x1500 mm
Window section 2500x3000mm



Ill 133: Workhall and workshop windows

Materials

Brick
The bricks selected for the facade are RT 438, RT 450 for the staircase, and RT 477 for details. RT 438 is chosen to establish a connection to the local and historical context by using dark colors but standing out with the choice of brown bricks instead of the reddish ones found in other buildings.

RT 450 is chosen for the staircases to distinguish them from the main building and to symbolize entry points.

For the details in the brickwork, RT 477 is chosen for its distinct color notes compared to RT 438 while still maintaining the overall brownish hue.

Azobé wood
The choice of ironwood or Azobé wood, for the pavilions and planters, which is already in use, for the pier north of the building, is based on the need for it to withstand outdoor conditions throughout the year in a coastal climate, with minimal maintenance. The wood's natural durability against fungi, termites, and weather makes it an ideal choice for something that must endure harsh outdoor conditions year-round.

Sedum roof
The use of a sedum roof is based on both the surrounding buildings in the context and the local regulations they fall under, which call for a green roof. Additionally, it will contribute to giving the building a cohesive appearance when viewed from above, for example, from the rooftops of buildings like Nikolinehus.

Aluminum windowframes
Black aluminum frames have been chosen to withstand the microclimatic conditions due to the building placement at the harbor and coastal areas. Due to the high humidity and salt in the environment, aluminum frames are more durable than wooden frames over time and require less maintenance. The exterior will feature black aluminum frames, while on the inside black wooden frames are chosen where the frames will help to frame the views overlooking the harbor from the interior.

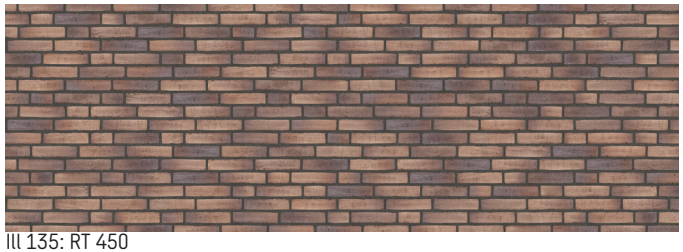
Floors
The ground floor features a polished concrete floor in the wine and coffee bar, AFI, toilet, and shower facilities, as well as in stairwells. This choice facilitates easy cleaning and protects against water. In the work hall and workshop, the floor is also concrete, as heavy materials are handled, posing a risk of damaging the floor. Therefore, it should be easy to repair without significant cost. On the other floors, the flooring will consist of wooden floorboards, to get a warm color that is also in the shells and thereby create a pleasant atmosphere.

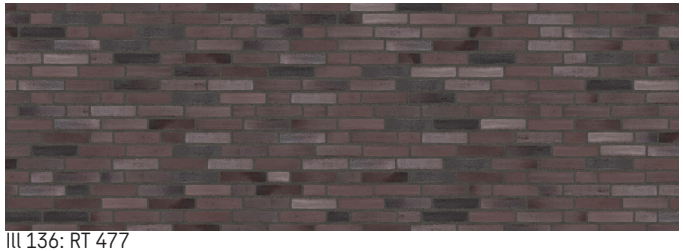
Ceiling
To ensure a proper indoor environment by addressing sound concerns, acoustic panels are installed on the ceiling and in some areas on the walls.

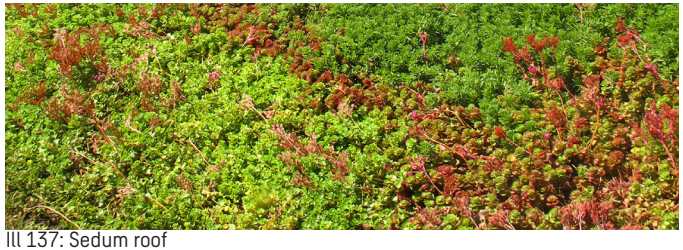
Wall
The walls are covered with gypsum so the timber columns will stand out and give visible stability to the rooms.

Exterior


Ill 134: RT 438

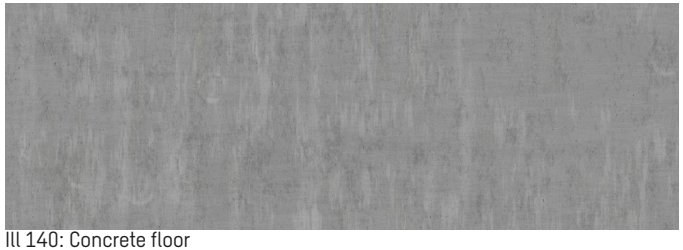

Ill 135: RT 450


Ill 136: RT 477

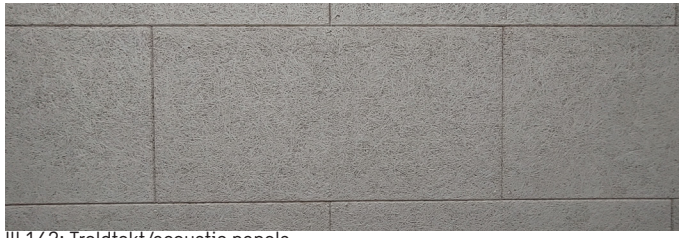

Ill 137: Sedum roof


Ill 138: Azobé wood


Ill 139: Aluminum frames

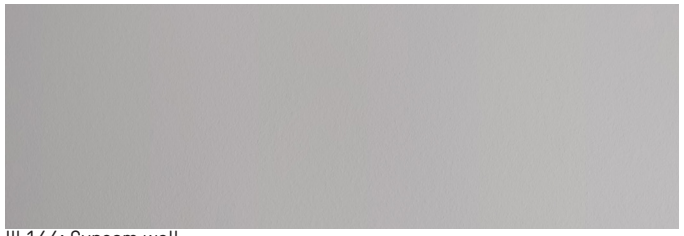

Ill 140: Concrete floor


Ill 141: Wooden floor


Ill 142: Troldtekt/acoustic panels

Interior


Ill 143: Glued laminated timber

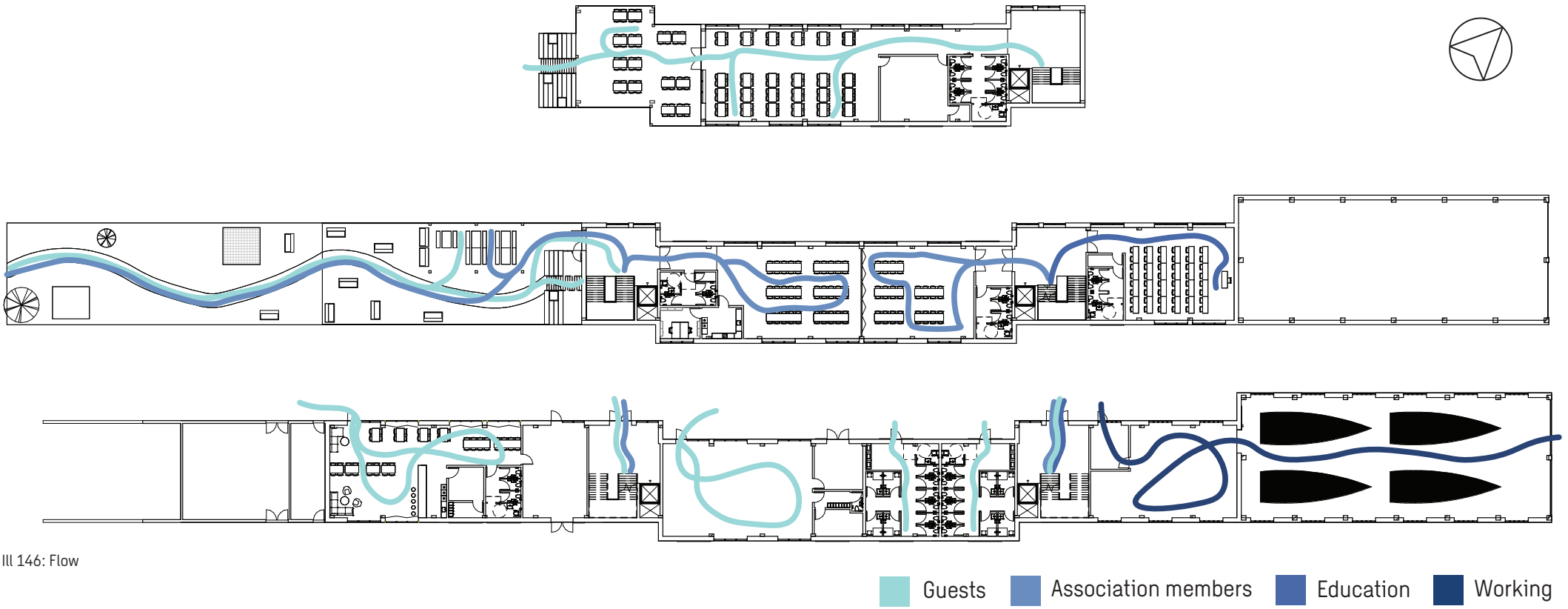

Ill 144: Gypsom wall


Ill 145: Acoustic panels

Flow

Flow

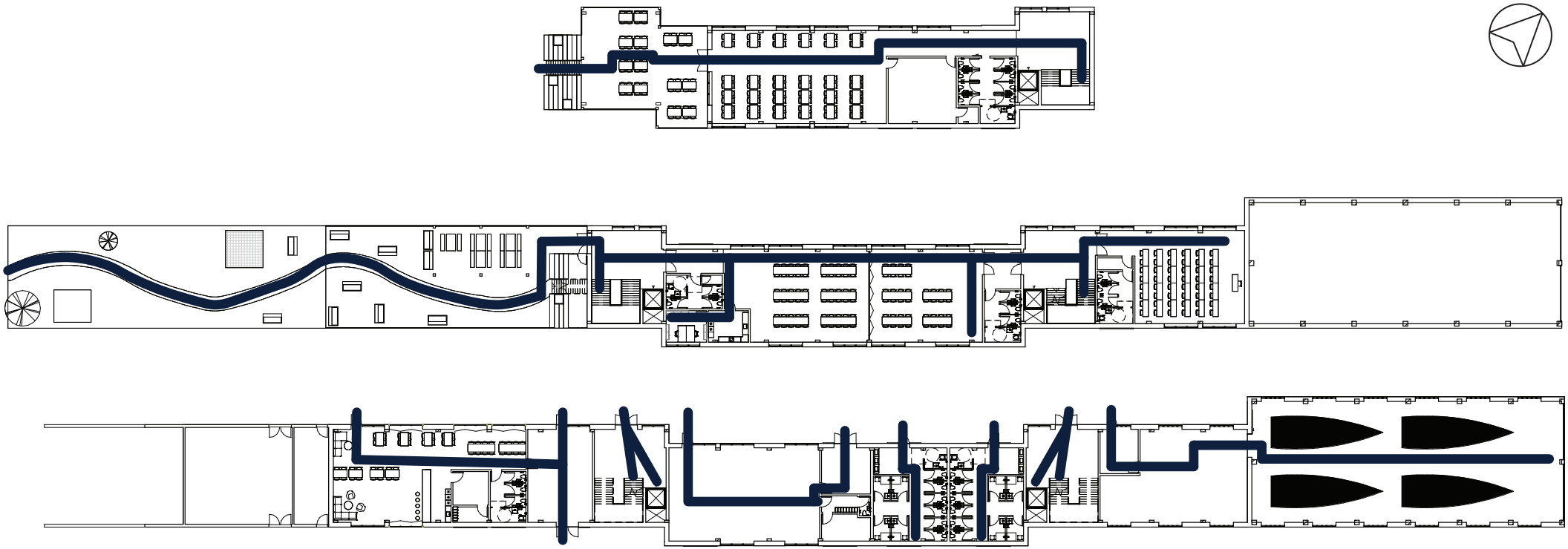
On Ill 145, the flow in the building, as well as the types of users who come and their movement in the building. It also shows how the different users will interact with each other and where can meet, where you can meet and interact with each other. Thus ensuring a larger interest in the various associations but also the facilities in the building.



Ill 146: Flow

Fire exits

Ill 146 shows the fire exits and fire escape in the building. It shows the building's ability to get the many users out in the event of a fire.



Ill 147: Fire exits

Time wheel

Day wheel

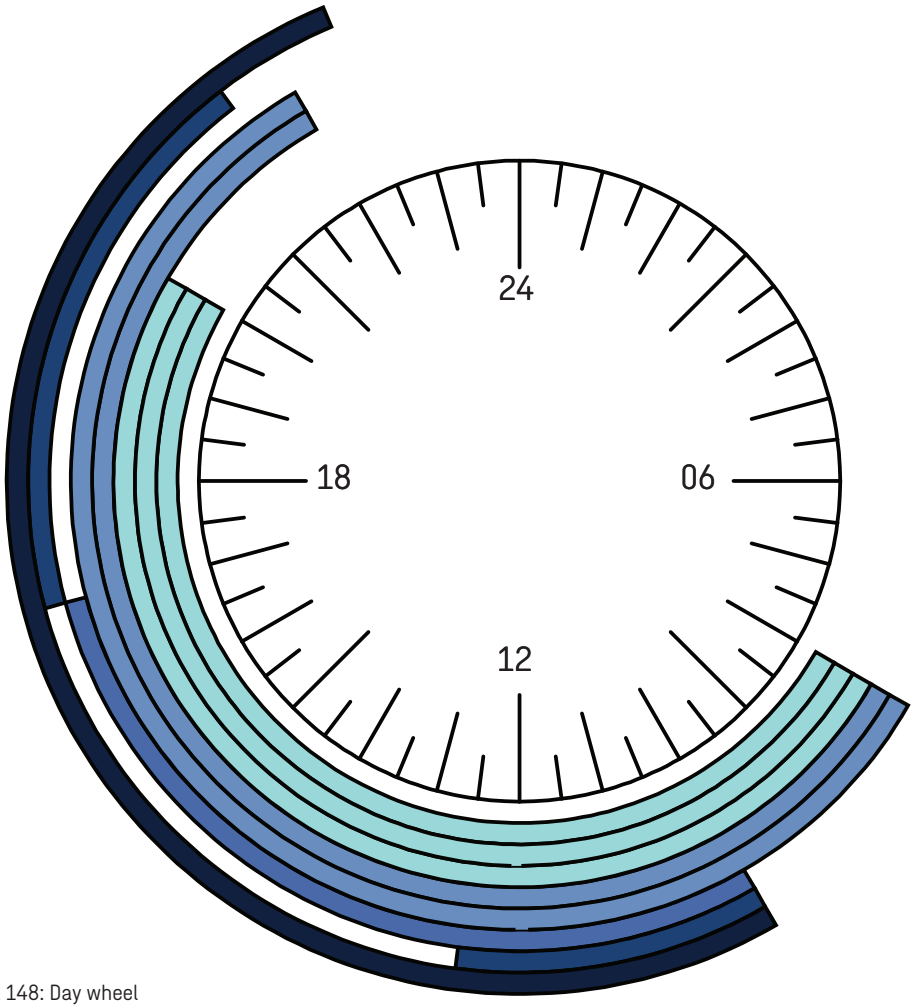
The day wheel shows the opening hours for various activities, restaurants, and stores, indicating when people can expect the building to be occupied. All spaces have designated opening hours, during which they can be used as long as they are not booked for other activities or events. Clubrooms, the Workshop, and the Workhall can be accessed by members of associated clubs or by arrangement with the building manager.

Week wheel

This wheel illustrates how the clubrooms and the classroom will be utilized every week, including the times of day they will be used. However, it is possible to use the clubrooms outside of their designated hours for private arrangements, by making a booking, as with the workshop and workhall. “Everyday activities” encompass the daily routines at the harbor, whether it’s people looking for a place to relax or have lunch, or committees meeting to discuss upcoming seasonal programs. “Events” refer to various activities held on weekends or occasionally on weekdays, requiring space for gathering, information sharing, or shelter from inclement weather.

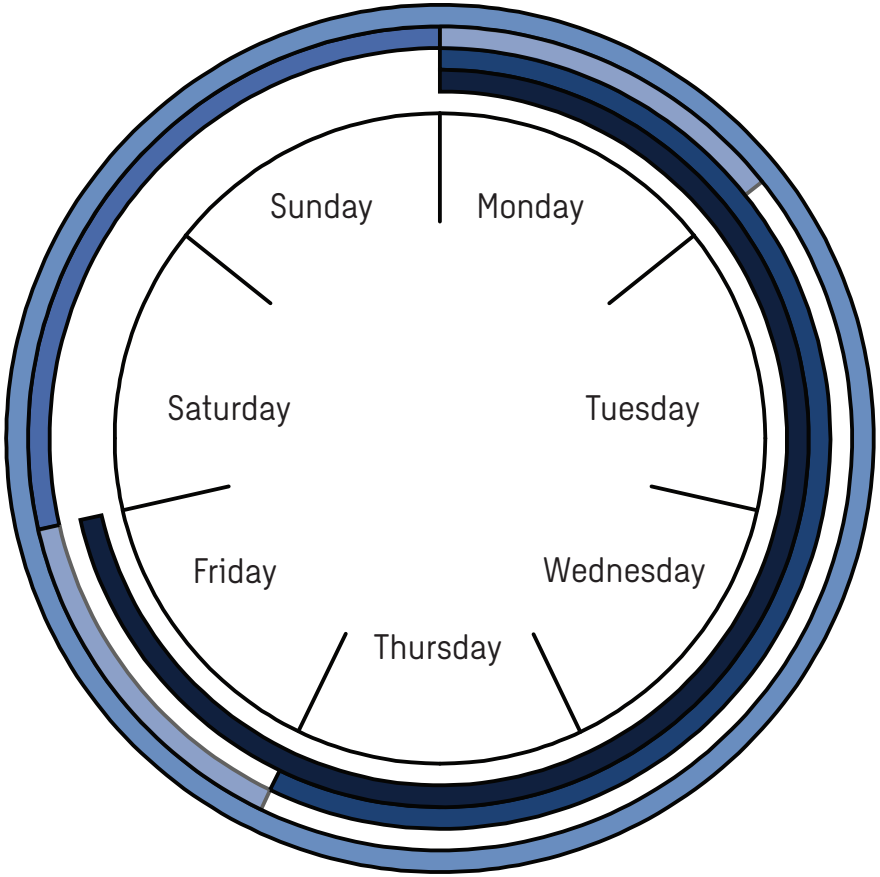
Annual wheel

The annual wheel displays how the workhall is utilized for different activities throughout the year. It is used for boat preparation in autumn and spring, with lighter use during winter. During summer and winter, the hall is available for major boat repairs and improvements. Additionally, the hall can be rented for various activities, such as larger construction projects, as long as it does not interfere with boat-related activities. It can also be used for events, such as sailing competitions.



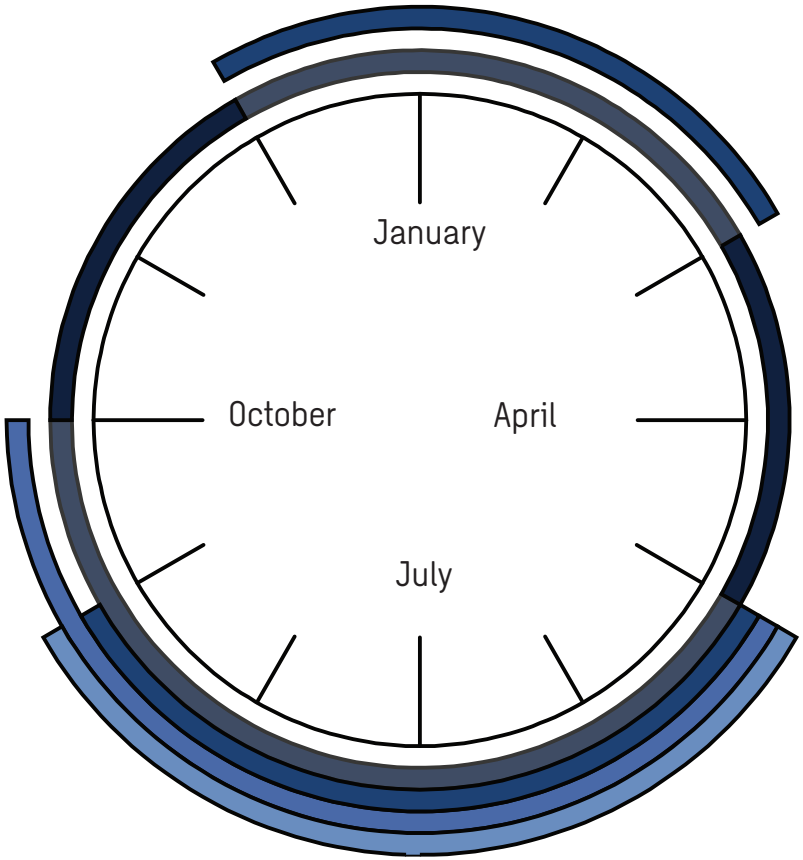
Ill 148: Day wheel

- Clube room 1 and 2 - 08:00 - 20:00
- Lecture room - 08:00 - 20:00
- Workhall - 08:00 - 22:00
- Workshop- 08:00 - 22:00
- AFI - 10:00 - 17:00
- LULA - 10:00 - 12:30 / 17:00 - 21:30
- Wine and coffee bar - 10:00 - 22:30



Ill 149: Week wheel for

- Teaching - Day
- Club activities - Afternoon/evening
- Events - All day
- Events - All day
- Everyday activities - All day



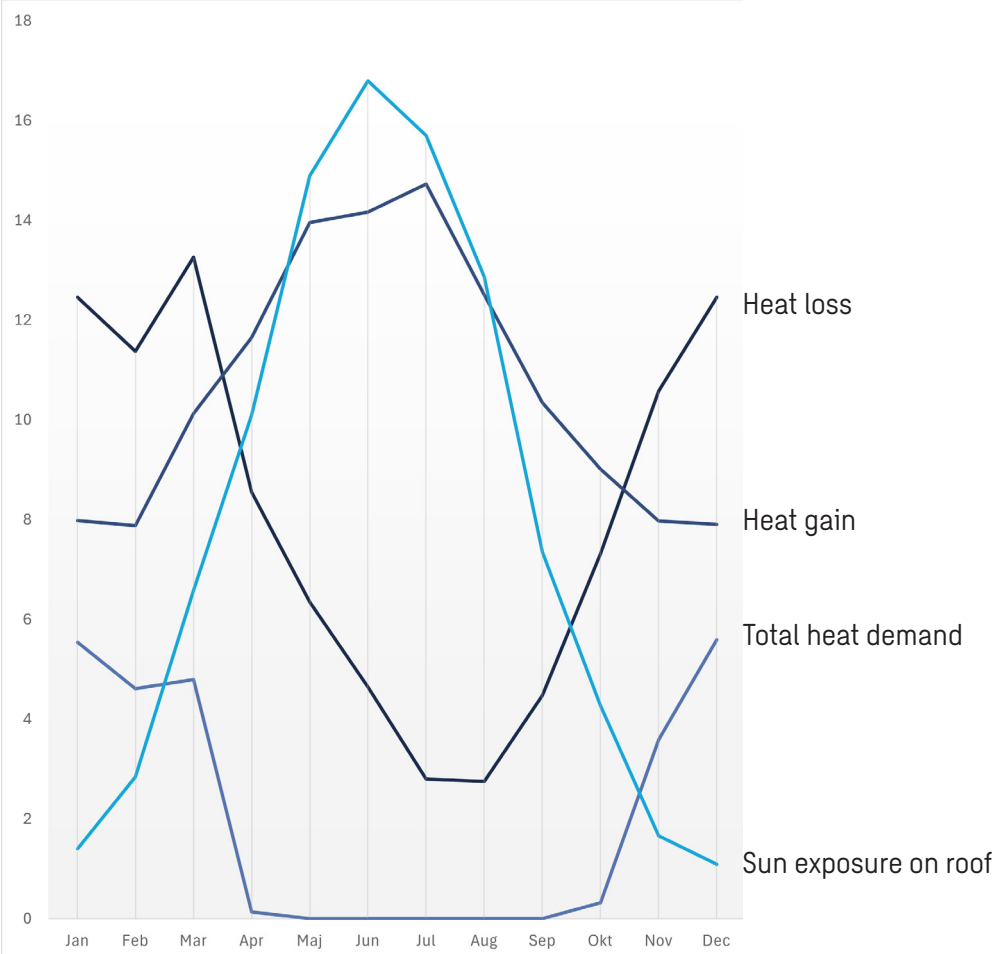
Ill 150: Annual wheel for the Workhall

- Winter and summer preparation of boats
- Boats half hall
- Lending the hall
- Events
- Rapations of boats/kayaks and rowing boats

Calculations

Energy

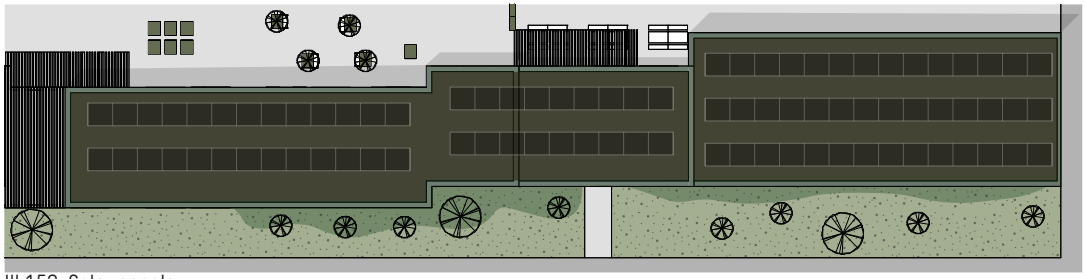
An energy calculation has been completed for the building to determine if it falls below the requirements for a low-energy building. With an energy consumption of 32,3 kWh/m^2, the building is both below the requirement of the building regulations at 41 kWh/m^2 and below the threshold for a low-energy building at 33 kWh/m^2.



Ill 151: Energy - Key numbers

Solar panels

The surrounding buildings in the local context, feature solar panels on parts of their roofs. Therefore solar panels have been chosen as part of the roof construction. A calculation has been made to see the number of solar cells that must be used, and 324 m2 of solar panels must be used. This will help reduce the operating costs of the building, and any surplus electricity generated from the 420 m^2 of solar panels can be fed back into the grid.



Ill 152: Solar panels

Based on an annual report on the energy usage of the building and the output of the 420 m^2 of solar panels, the building's total energy consumption would be 6,7 kWh/m^2.

Energiramme lavenergi

Uden tillæg	Tillæg for særlige betingelser	Samlet energiramme
33,0	0,0	33,0
Samlet energibehov		6,7

Bidrag til energibehovet

Varme	11,4
El til bygningsdrift	-2,4
Overtemp. i rum	1,7

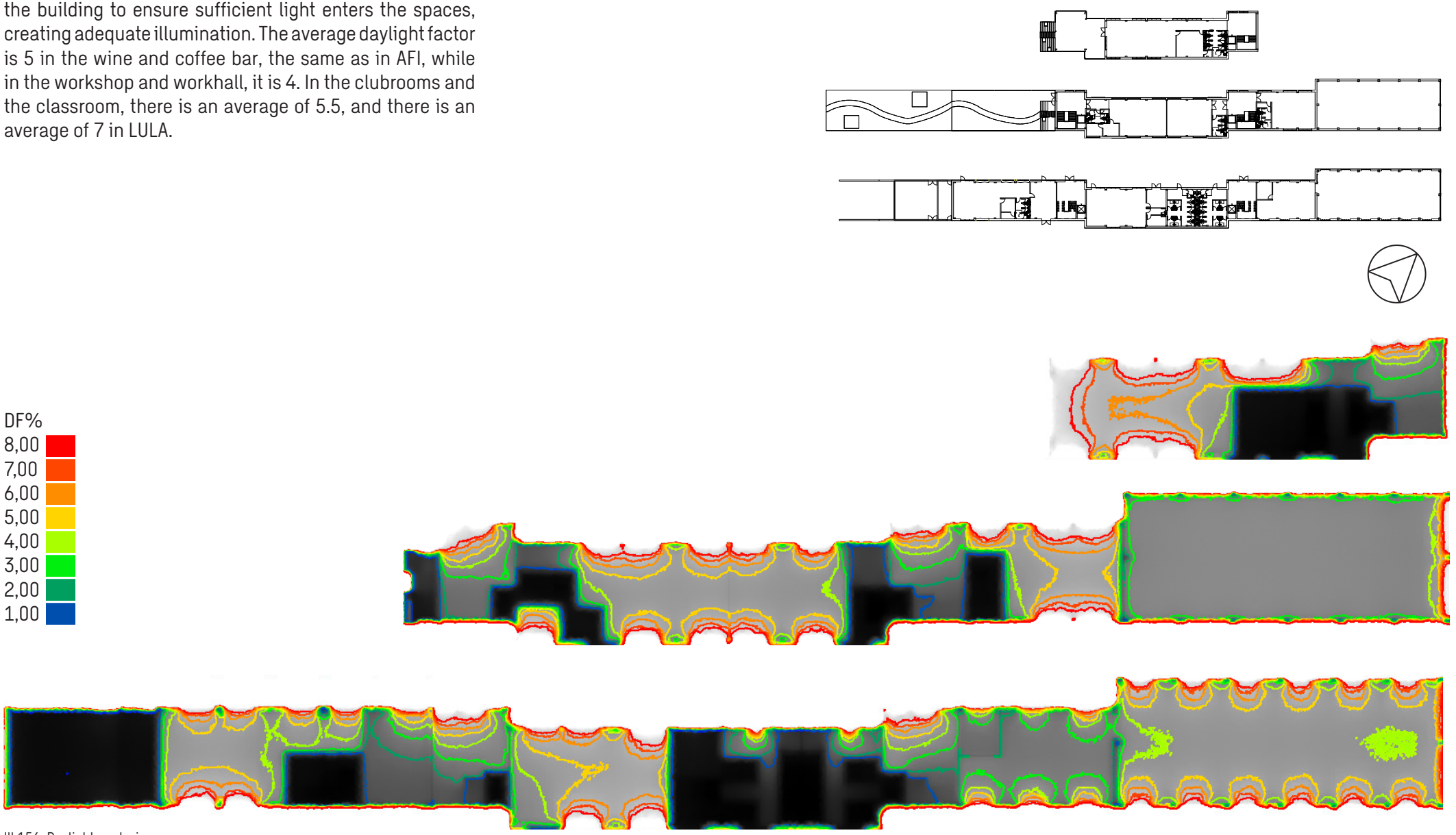
Netto behov

Rumopvarmning	11,4
Varmt brugsvand	5,3
Køling	0,0

Ill 153: Energy calculations with solar panels

Daylight

A daylight factor has been calculated for all rooms in the building to ensure sufficient light enters the spaces, creating adequate illumination. The average daylight factor is 5 in the wine and coffee bar, the same as in AFI, while in the workshop and workhall, it is 4. In the clubrooms and the classroom, there is an average of 5.5, and there is an average of 7 in LULA.

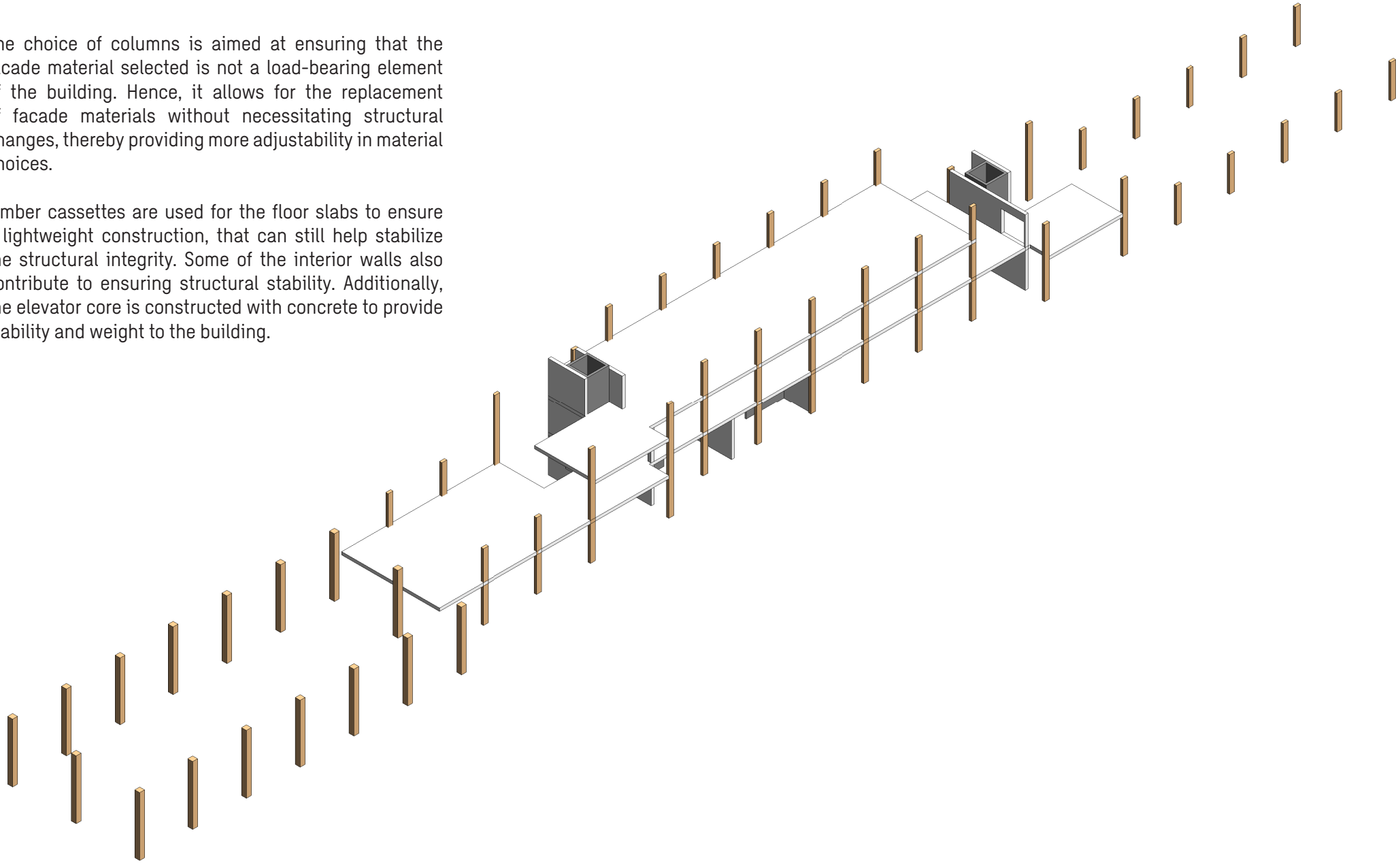


Ill 154: Daylight analysis

Construction

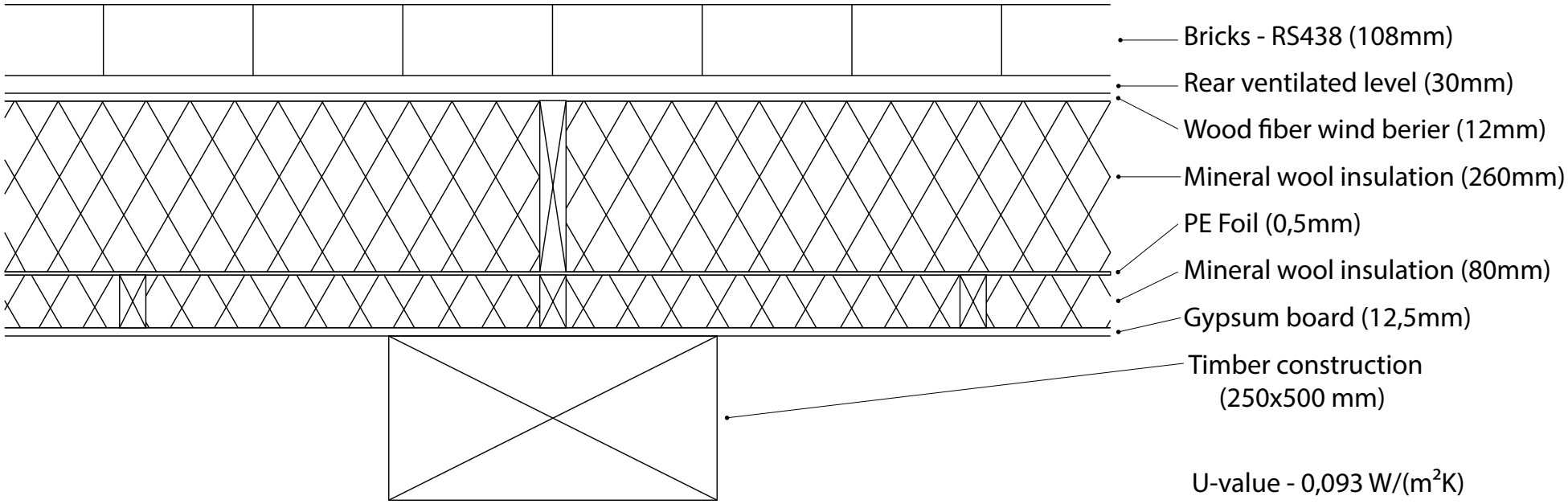
The choice of columns is aimed at ensuring that the facade material selected is not a load-bearing element of the building. Hence, it allows for the replacement of facade materials without necessitating structural changes, thereby providing more adjustability in material choices.

Timber cassettes are used for the floor slabs to ensure a lightweight construction, that can still help stabilize the structural integrity. Some of the interior walls also contribute to ensuring structural stability. Additionally, the elevator core is constructed with concrete to provide stability and weight to the building.



Ill 155: Construction diagram

Construction - Detail



Ill 156: Wall detail 1:10

Epilogue

Conclusion

The Anchor Point will help create a new and better gathering place for the many associations housed in Aarhus Ø. It provides a space where people can meet around activities that interest them, while simultaneously fostering new connections and a better understanding of other associations.

With its unique location right by the water and on a well-visited route around Aarhus Ø, the building is situated in a spot that will attract many visitors. The point that it is not located by any major roads, makes it pleasant for walking and cycling nearby, and its height ensures that the building does not feel overwhelming when standing next to it.

Having the store and bar, restaurant on the ground floor will create a steady flow of people to the area and the building. It also gives passersby a place to take a break, whether planned or spontaneous. The store, offering equipment for the various water sports practiced at the building and in the surrounding area, will help create a hub for these sports, making it easier to pursue them.

The new club rooms offer the sailing clubs at the harbor a new meeting place where they can hold club activities or relax after a day on the water. The size and division of the rooms also provide space for other associations and users to flourish, and if there is a need for a larger gathering, the rooms can be combined to ensure enough space.

The lecture room will be used to conduct lessons for school children in the “Den blå Skole” and to provide training for the associations, such as sailing certifications. Additionally, the space will be utilized for holding lectures and seminars.

Placing these rooms on the first floor gives the clubs and teaching rooms more privacy. At the same time, the staircase provides the opportunity to extend activities outside the building, thus attracting and welcoming visitors.

With workspaces like the work hall and workshop, it becomes easier for club members to maintain their equipment, thereby enhancing their enjoyment. It also offers the residents of Aarhus Ø a place to borrow equipment or work on their projects, as they can use the workshop. The Work Hall provides sailors with a place to repair and prepare their boats, as well as a space to strengthen the community.

The restaurant on the second floor offers a unique view of the harbor, attracting fewer spontaneous visitors. However, guests sitting outside will be visible to those looking up the Ø Parken.

The Ø Parken is a central part of the building, both tying it together and creating new spaces for the communities formed through the new building. It also creates a new green area where all the different associations and users of the building can share a common space, along with the many visitors the area attracts.

Reflection

Even with a good design, there are always things that the group wants to spend a little more time on or make different choices, whether due to time constraints or simply because they would have yielded different results.
A significant difference in this project was working alone, compared to previous projects where there were four or five people to tackle a project of a similar scale. It has been quite a shift to manage the entire project and all its processes alone, whereas previously, tasks could be distributed among team members.

It wasn't so much the increased workload, which was expected, but rather the lack of others to discuss and deliberate on the various processes throughout the project. It has also been a learning process to maintain a schedule alone while keeping enough oversight to manage the entire project. There was no opportunity to delve deeply into specific topics or processes for an extended time, as other areas would have been neglected.

Some topics and processes had to be sidelined due to a lack of manpower or time, such as conducting an LCA (Life Cycle Assessment) study or focusing more on the construction aspects. However, many processes were quicker since only one person was deciding the project's direction.

If the project were to continue, certain areas would be of particular interest, such as the LCA. Given that the building is over 1000 m², there are now requirements for an LCA analysis, making it interesting to conduct one and see how it influences the design. This would involve looking into alternative and modern materials and exploring current building methods.

Another possibility would be to aim for a net-zero energy building instead of a low-energy building, to see how the design could have been different or how it would have influenced the building's form.

If there were aspects that could have been done differently, it would have been to spend more time talking with the many associations at Aarhus Ø. This would include engaging more with the members to hear their opinions and what they feel is currently lacking, as well as identifying elements that should remain unchanged. Additionally, it would have been beneficial to have conversations with associations and members who are not currently using the site but might with the new building.

The site's long and narrow shape significantly influenced the building's design since the road behind could not be removed due to Ø Parkening lot and its use. Thus, the site's shape dictated much of the building's form, limiting the exploration of other forms that might have been interesting to investigate.

This fixed shape also influenced the initial drawings and ideas, resulting in a design that was quite set from the beginning and did not evolve much. Viewing this as a positive aspect, it provided specific constraints and challenges in the design process that might not have been present with a less compact building. It has been interesting to ensure that a long facade does not become monotonous and that it encourages people to linger rather than pass by quickly.

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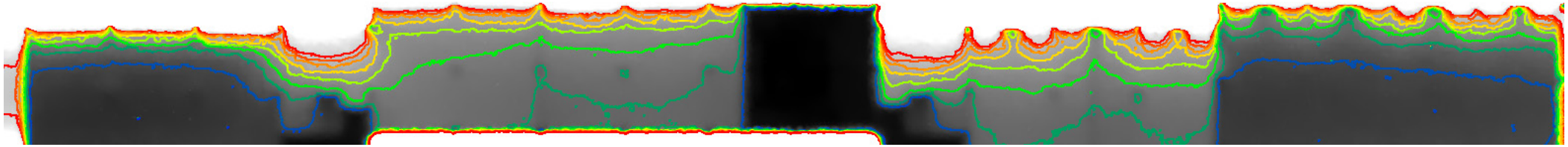
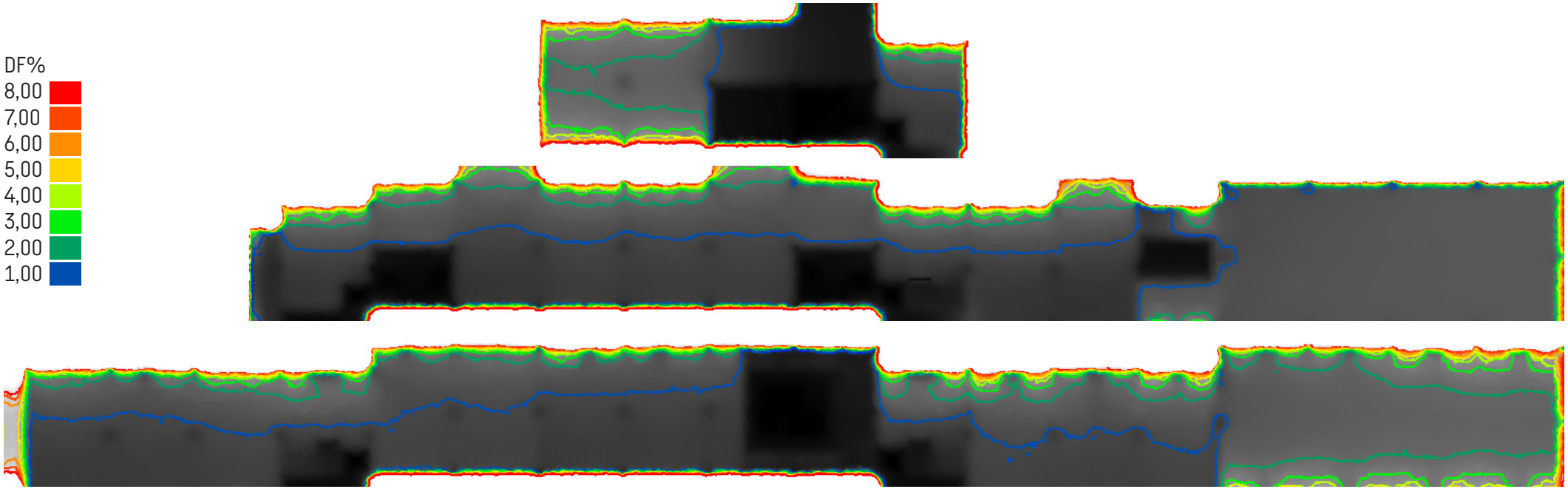
Illustrations list

Appendix 1

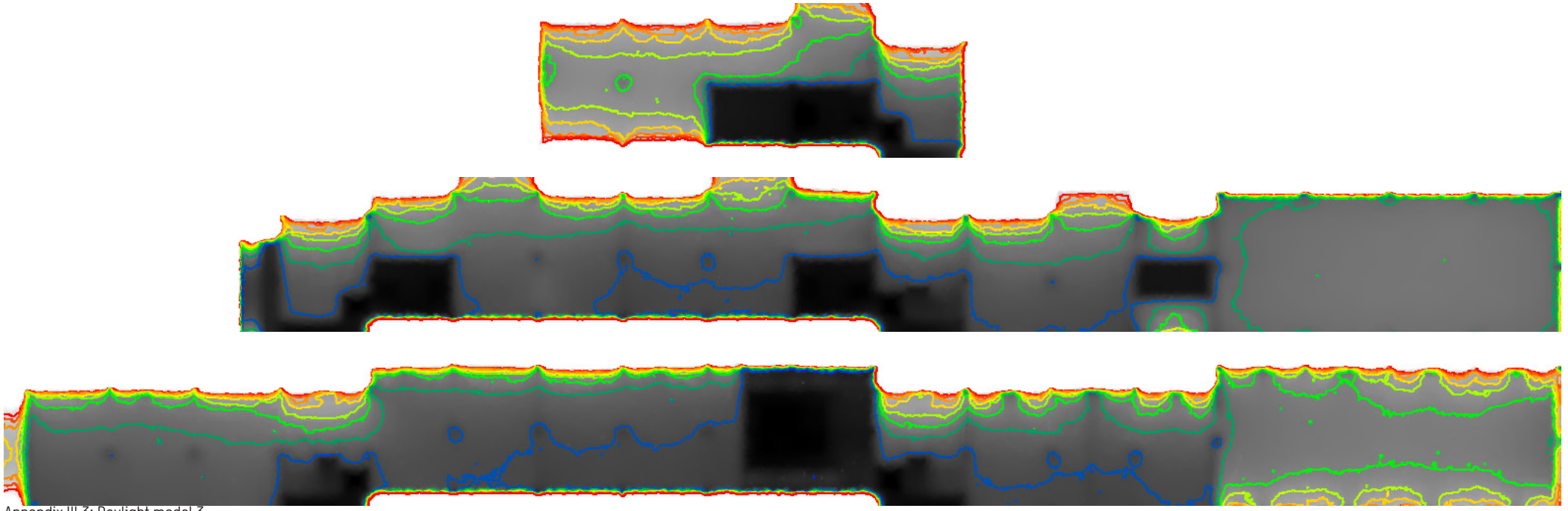
Daylight calculations at Velux daylight vusiliters



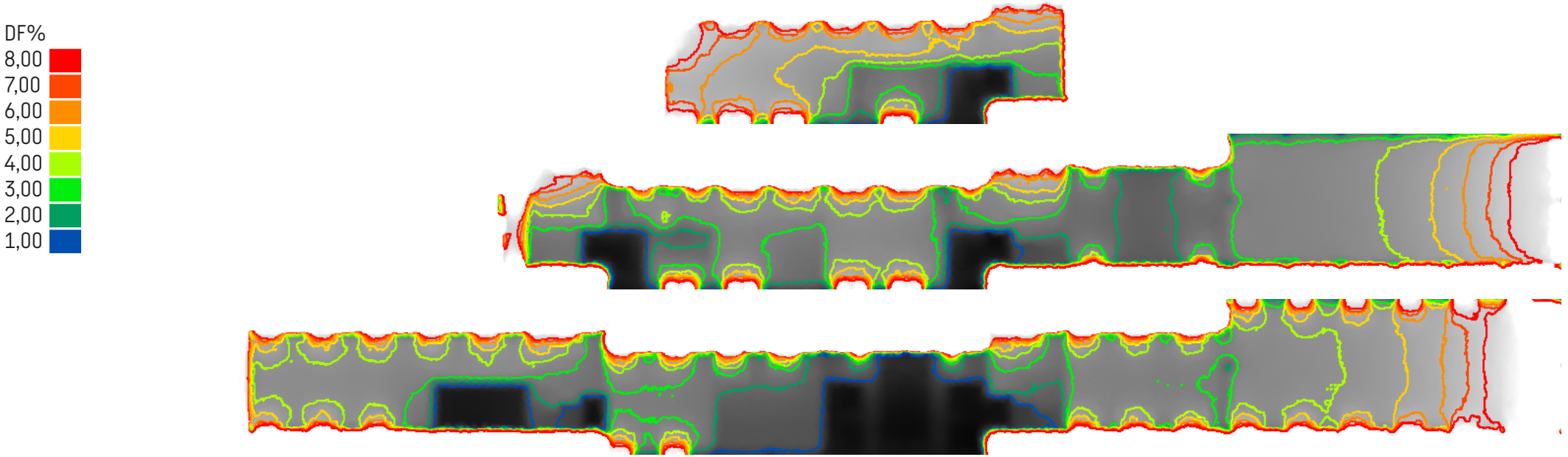
Appendix Ill 1: Daylight model 1



Appendix Ill 2: Daylight model 2

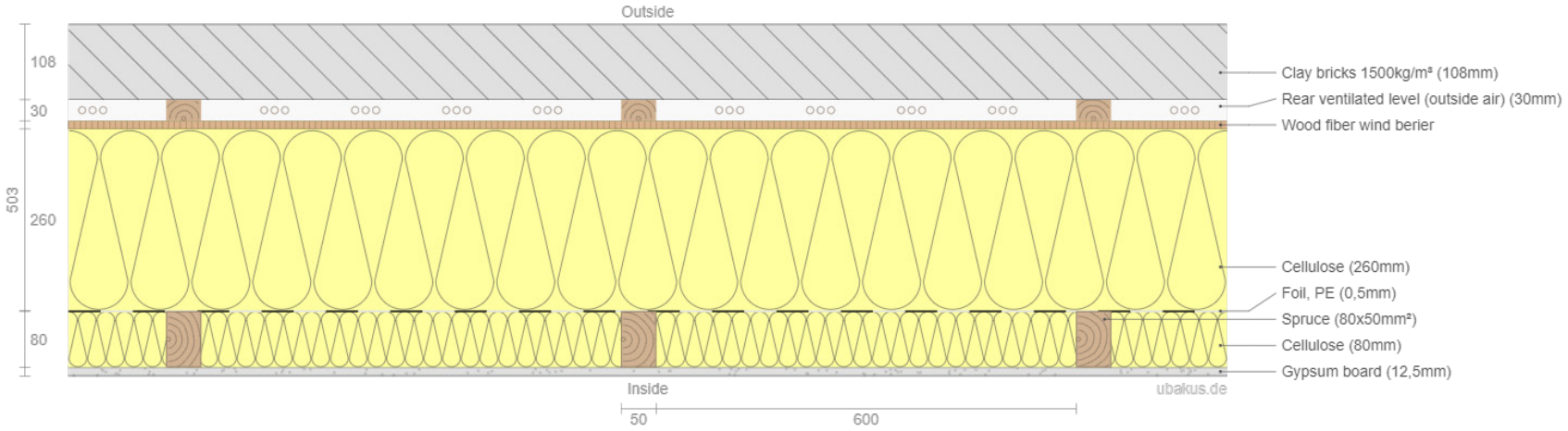


Appendix Ill 3: Daylight model 3

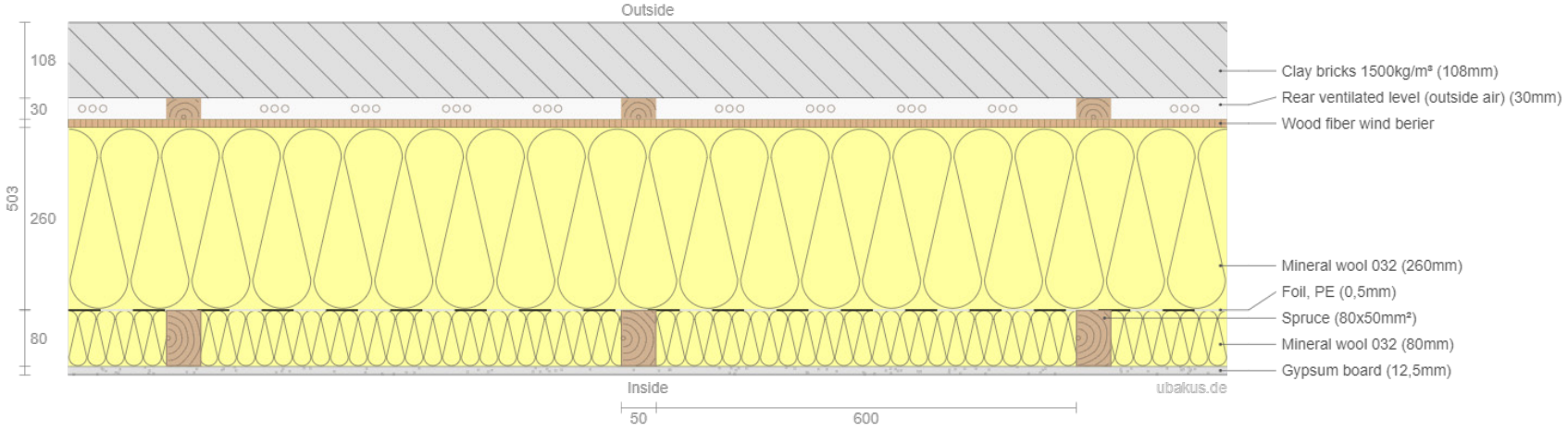


Appendix Ill 4: Daylight model 4

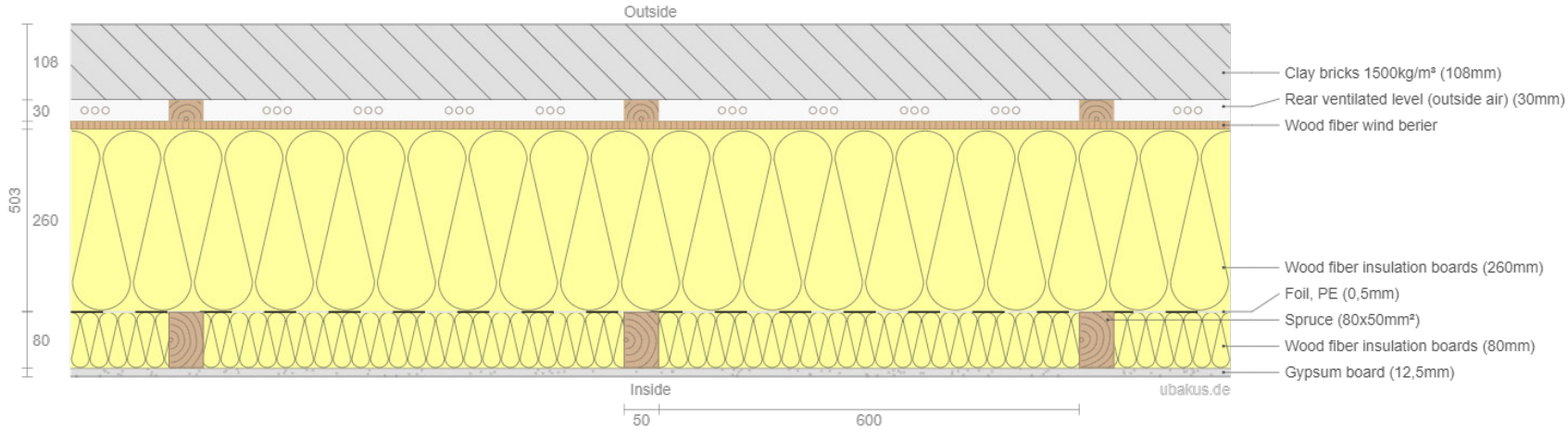
Appendix 2



Appendix Ill 5: Wall construction - Cellulose



Appendix Ill 6: Wall construction - Mineral wool



Appendix Ill 7: Wall construction - Woodfiber

Cellulose: U-value - 0,113 W/(m2K)
Woodfiber: U-value - 0,123 W/(m2K)
Mineral wool: U-value - 0,092 W/(m2K)

Appendix 3

Nøgletal, kWh/m² år

Renoveringsklasse 2

Uden tillæg	Tillæg for særlige betingelser	Samlet energiramme
96,1	0,0	96,1
Samlet energibehov		31,7

Renoveringsklasse 1

Uden tillæg	Tillæg for særlige betingelser	Samlet energiramme
72,1	0,0	72,1
Samlet energibehov		31,7

Energiramme BR 2018

Uden tillæg	Tillæg for særlige betingelser	Samlet energiramme
41,5	0,0	41,5
Samlet energibehov		31,7

Energiramme lavenergi

Uden tillæg	Tillæg for særlige betingelser	Samlet energiramme
33,0	0,0	33,0
Samlet energibehov		31,7

Bidrag til energibehovet

Varme	11,4
El til bygningsdrift	10,7
Overtemp. i rum	1,7

Netto behov

Rumopvarmning	11,4
Varmt brugsvand	5,3
Køling	0,0

Udvalgte elbehov

Belysning	3,8
Opvarmning af rum	0,0
Opvarmning af vbv	0,0
Varmepumpe	0,0
Ventilatorer	6,9
Pumper	0,0
Køling	0,0
Totalt elforbrug	33,1

Varmetab fra installationer

Rumopvarmning	0,0
Varmt brugsvand	0,0

Ydelse fra særlige kilder

Solvarme	0,0
Varmepumpe	0,0
Solceller	0,0
Vindmøller	0,0

Appendix Ill 8: Energy calculation

Nøgletal, kWh/m² år

Renoveringsklasse 2

Uden tillæg	Tillæg for særlige betingelser	Samlet energiramme
96,1	0,0	96,1
Samlet energibehov		6,7

Renoveringsklasse 1

Uden tillæg	Tillæg for særlige betingelser	Samlet energiramme
72,1	0,0	72,1
Samlet energibehov		6,7

Energiramme BR 2018

Uden tillæg	Tillæg for særlige betingelser	Samlet energiramme
41,5	0,0	41,5
Samlet energibehov		6,7

Energiramme lavenergi

Uden tillæg	Tillæg for særlige betingelser	Samlet energiramme
33,0	0,0	33,0
Samlet energibehov		6,7

Bidrag til energibehovet

Varme	11,4
El til bygningsdrift	-2,4
Overtemp. i rum	1,7

Netto behov

Rumopvarmning	11,4
Varmt brugsvand	5,3
Køling	0,0

Udvalgte elbehov

Belysning	3,8
Opvarmning af rum	0,0
Opvarmning af vbv	0,0
Varmepumpe	0,0
Ventilatorer	6,9
Pumper	0,0
Køling	0,0
Totalt elforbrug	33,1

Varmetab fra installationer

Rumopvarmning	0,0
Varmt brugsvand	0,0

Ydelse fra særlige kilder

Solvarme	0,0
Varmepumpe	0,0
Solceller	32,3
Vindmøller	0,0

Appendix Ill 9: Energy calculation with solar panels

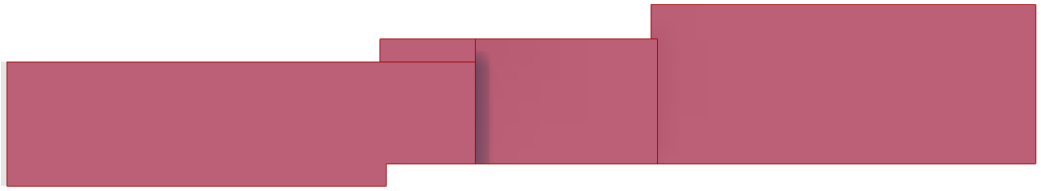
	MWh	Januar	Februar	Marts	April	Maj	Juni	Juli	August	September	Oktober	November	December	I alt
	Varmebehov													
+1	Trans.- og vent.tab	12,69	11,60	13,62	8,20	5,58	3,67	1,46	1,39	3,47	6,71	10,56	12,69	91,63
2	Vent. VF (total)	0,70	0,65	0,86	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,37	0,70	3,28
3	Vent. VGV nedreg.	0,00	0,00	0,00	-0,05	-0,56	-0,85	-1,29	-1,30	-0,89	-0,36	0,00	0,00	-5,30
4	Varmetab	11,99	10,95	12,76	8,24	6,14	4,52	2,75	2,69	4,35	7,07	10,19	11,99	93,65
5	Solindfald	0,85	1,61	3,31	5,10	7,23	7,70	8,04	5,78	3,77	2,13	1,12	0,76	47,40
6	Internt tilskud	7,13	6,27	6,82	6,55	6,73	6,47	6,68	6,73	6,59	6,89	6,85	7,15	80,86
7	Fra rør og VVB konst.	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
8	Samlet tilskud	7,98	7,88	10,13	11,65	13,96	14,17	14,73	12,51	10,35	9,01	7,97	7,91	128,26
9	Rel. tilskud, -	0,67	0,72	0,79	1,41	2,27	3,14	5,36	4,64	2,38	1,27	0,78	0,66	
10	Del af rumopv.	1,00	1,00	1,00	0,18	0,00	0,00	0,00	0,00	0,00	0,38	1,00	1,00	
11	Variabl. varmetilsk.	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
12	Tot. tilskud	7,98	7,88	10,13	11,65	13,96	14,17	14,73	12,51	10,35	9,01	7,97	7,91	128,26
13	Rel. tilskud, -	0,67	0,72	0,79	1,41	2,27	3,14	5,36	4,64	2,38	1,27	0,78	0,66	
14	Udnyt. faktor	0,95	0,93	0,90	0,66	0,43	0,32	0,19	0,22	0,42	0,71	0,91	0,95	
15	Varmebehov	4,45	3,62	3,59	0,10	0,00	0,00	0,00	0,00	0,00	0,25	2,95	4,51	19,47
16	Vent. VF (centralvarme)	0,70	0,65	0,86	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,37	0,70	3,28
17	I alt	5,15	4,28	4,45	0,10	0,00	0,00	0,00	0,00	0,00	0,25	3,32	5,20	22,74

Appendix III 10: Heat demand

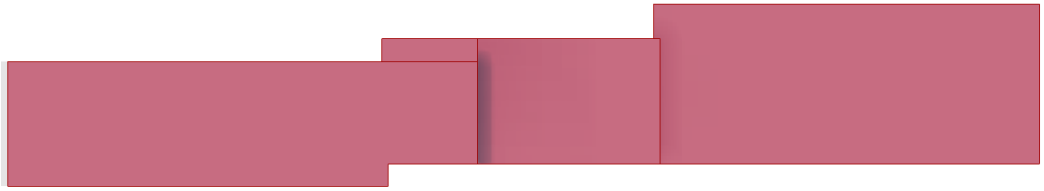
Appendix 4

Solar radiation has been made for the 12 months of the year, as background information for the graph, under energy calculations.

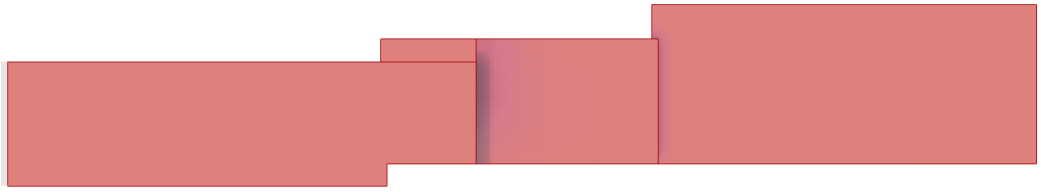
January



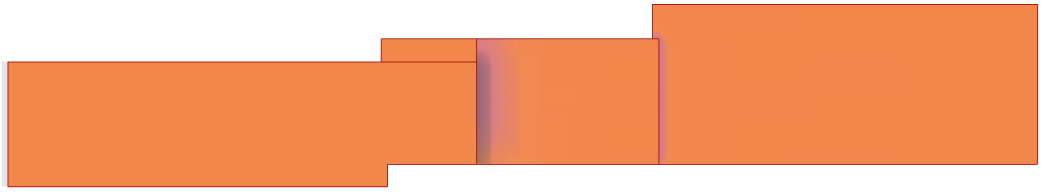
February



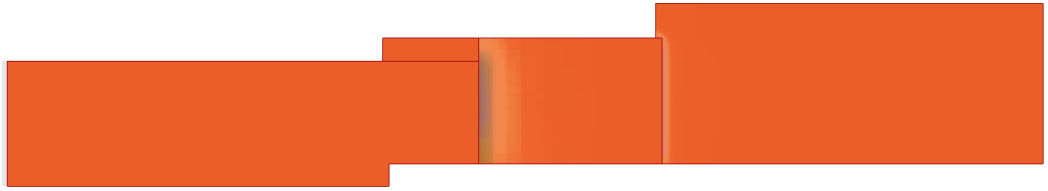
March



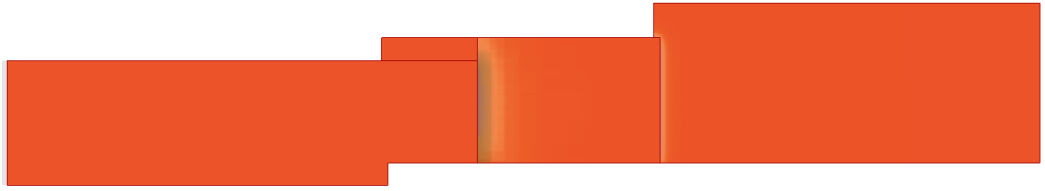
April



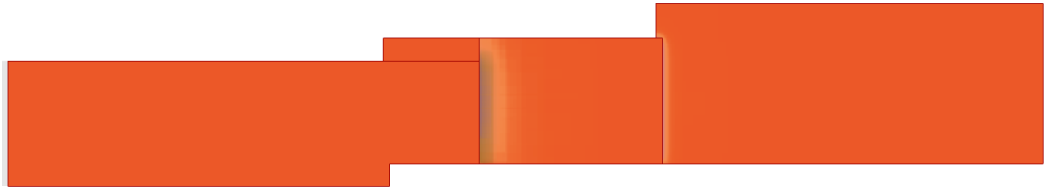
May



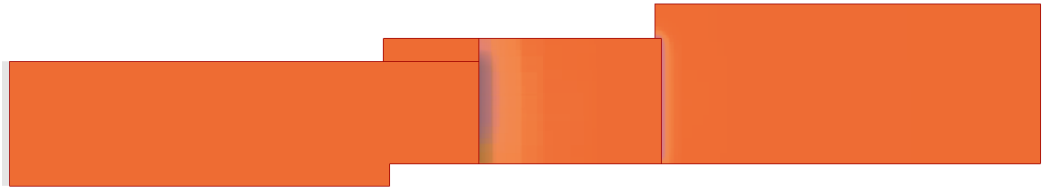
June



July



August



Appendix Ill 11: Solar radiation


September
October
November
December
kWh/m2
200.00
181.82
163.64
145.45
127.27
109.09
90.91
72.73
54.55
36.36
18.18
0.00

Appendix 5

Solar panel https://solcelle.dk/wordpress/produkt/solcellemodul-consort-solar-cst-m10-54bh415-415wp-sort/ (27/05/2024)

The panel can produce 415 W per panel, this gives 415W / (1,722 x 1,134)m^2 = 212.5W/m^2

The sun exposure analysis gives an annual power output of 951 kWh/m^2/year'

0.2125 kW x 951 kWh/m2/year = 202.09 kWh/m^2/year

The angle and direction of the panels mean that there must be a minus of 3% - https://www.solcelleguiden.dk/placement-af-solceller/

202.09kWh/year - 3% = 196.0273 kWh/m^2 per year

To get the total number of kWh/year, multiply by the number of m^2

420 m^2 x 196.0273 kWh/m2 per year = 82,331,466 kWh per year

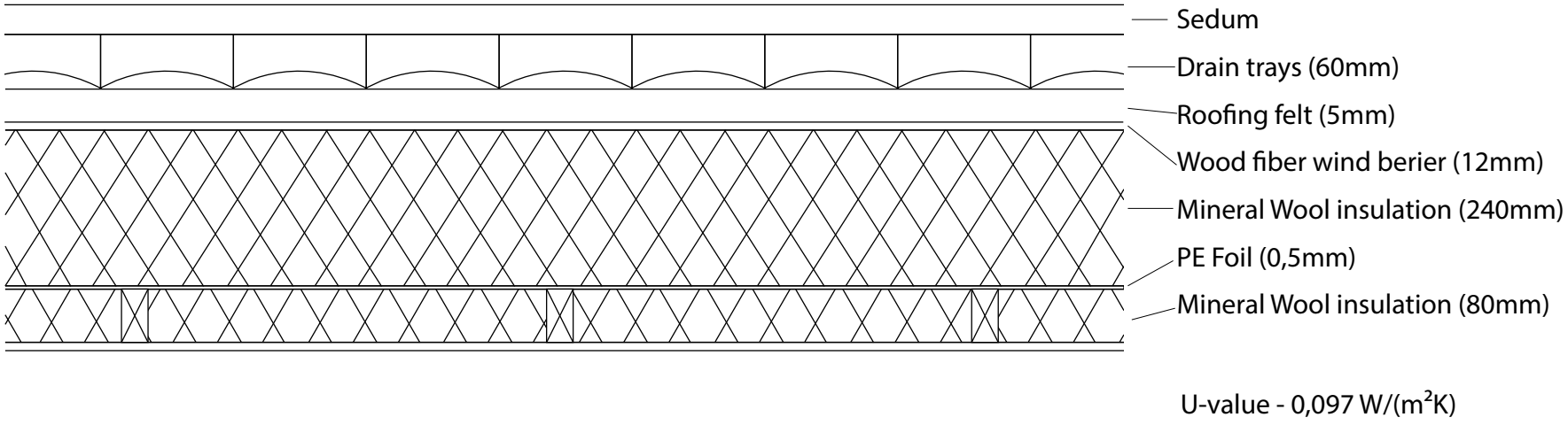
The building's energy consumption 63,439,942 kWh/year

63,439.942 kWh per year / 196.0273 kWh/m2 = 323.6 m^2

323.6 m^2 of solar panels must be used to cover the building's energy needs.

This gives a total net profit of 82,331,466 kWh per year - 63,439,942 kWh/year = 18,891,524 kWh/year

Appendix 6



Appendix Ill 12: Roof detail - 1:10