[RE]MOVING WAREHOUSE

[re]Design of industrial warehouse in Lindholmen into sport facility

Katarzyna Kędziorczyk

| MPARC | 2025

Examiner: Mikael Ekegren

Supervisor: Filip Rem

Chalmers School of Architecture Department of Architecture & Civil Engineering

CHALMERS
UNIVERSITY OF TECHNOLOGY

[RE]MOVING WAREHOUSE

By Katarzyna Kędziorczyk
Year of graduation: 2025
Chalmers School of Architecture
Department of Architecture and Civil Engineering
Master's Programme of Architecture and Urban Design
(MPARC) Master's Thesis Direction: Building and Tectonics
Supervisor: Filip Rem
Examiner: Mikael Ekegren

ABSTRACT

Culturally significant buildings contribute to the identity of a community, yet abandoned and temporary-use structures are often overlooked. This thesis addresses the potential of repurposing post-industrial architecture by proposing the adaptive reuse of an abandoned ship warehouse in Gothenburg's Lindholmen district. The project aims to transform the structure into a modern indoor athletics facility, preserving its industrial heritage while integrating contemporary materials and sustainable design principles.

The research is guided by two key questions: How can the redesign of an industrial warehouse in Lindholmen from steel with wood addition maintain its industrial character? And how can the redesign integrate movable façades to enhance the connection with new additions, natural lighting, and ventilation, optimizing the indoor environment for athletes? These inquiries aim to balance historical preservation with architectural innovation, ensuring that the new design respects the site's industrial past while enhancing functionality and environmental performance.

A crucial aspect of the proposal is the shift from steel to wood, a material choice that not only reduces the building's environmental impact but also introduces a warmer, more sustainable aesthetic. Additionally, the design incorporates adaptable architectural elements that foster a dynamic relationship between interior and exterior spaces. By optimizing daylight penetration, ventilation, and spatial flexibility, the intervention improves the experience for athletes and visitors alike.

In Sweden's harsh climate, the demand for year-round indoor sports venues is increasing. This facility responds to that need, providing an adaptable space for athletes and the local community. The thesis employs an evidence-based design approach, integrating site analysis, material performance studies, and environmental considerations to create a functionally and ecologically responsible solution.

By proposing a sustainable and context-sensitive architectural intervention, this thesis contributes to the discourse on post-industrial urban transformation. The outcome is a design that respects industrial heritage while promoting environmental and social sustainability, setting a precedent for future adaptive reuse projects in rapidly developing urban areas.

Keywords: warehouse, wood&steel, adaptive reuse, sports facility, athletics

CONTENT

STUDENT BACKGROUND

KATARZYNA KĘDZIORCZYK

EDUCATION

M.SC ARCHITECTURE | 2023-2025
Chalmers University of Technology
Gothenburg, Sweden

B.SC ARCHITECTURE | 2019-2023
Silesian University of Technology
Gliwice, Poland

INTERNATIONAL BACCALAUREATE (IB) DIPLOMA | 2017-2019
Gliwice, Poland

STUDIOS
ACE400 Architecture in the Anthropocene
ACE380 Sustainable development and the design professions
ACE470 Healthcare architecture
ACE355 Colour & Light in Spatial Contexts
ACE410 Managing Design Projects
ACE525 Building on building
ACE515 Building Tectonics

IDEA LEAGUE | 2024
Summer School Participant
ETH Zurich
Summer School Participant
Politecnico Milano

WORK
2024 - now Freelance Interior Designer
2022-2023 Architecture Internship at RAU Architects Studio / Amsterdam, The Netherlands
2023 – now Freelance Graphic Designer

AIM

The main aim of this Master Thesis is to focus on the integration of materiality, architectural movability, and the improvement of indoor environments for sports activities. The redesign of the indoor athletics facility at the abandoned warehouse in Lindholmen, Gothenburg, highlights the relevance of sustainable design principles. Given the poor condition of the existing materials, only specific parts of the facade can be reused, necessitating the integration of new, eco-friendly materials (like wood) that enhance durability and performance. This combination of industrial preservation, natural materials, and modern technology ensures a facility that keeps its heritage while offering functionality and sustainability for its future use.

THESIS QUESTIONS

- How can redesigning of an industrial warehouse in Lindholmen integrating steel and wood maintain its industrial character? –

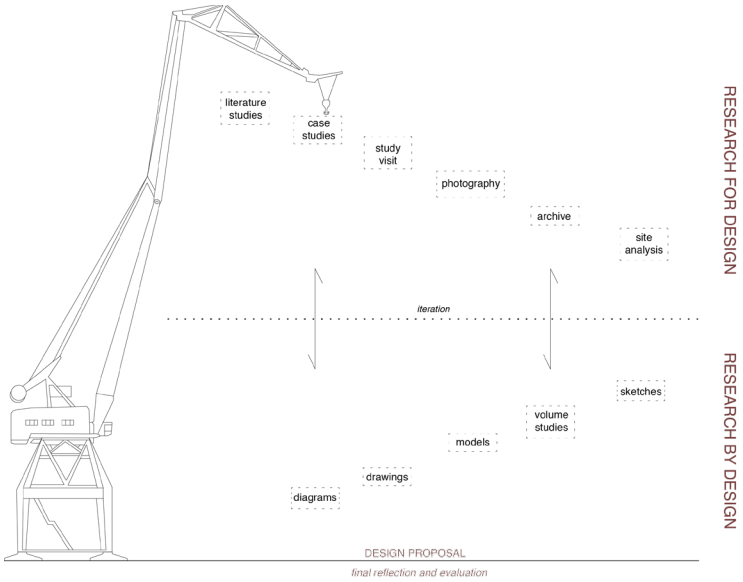
- How can the redesign of an industrial warehouse integrate new additions to enhance and optimize the indoor environment for athletes? -

READING INSTRUCTIONS

The master thesis consists of a theory and a proposal. The theory, part one of the thesis, concerns the adaptive reuse of industrial buildings, wood, as well as reference projects and historical contexts. The proposal, part two of the thesis, is presented through drawings, visualizations and schemes.

METHOD

Various methods have been employed to gain a deep understanding of the significance of this case and to obtain a comprehensive knowledge of the site. The process started with in-depth research of the proper site. Those involved interviews, site visits, and archive readings about Lindholmen. Once it was determined which site was going to be a basis for my thesis, the next step was a photography report of the location. It was of a high importance to notice the condition of the facility, including both the construction as well as the outer shell and the closest surroundings. The main focus during that process was to capture the natural light entering through various skylights in the warehouse as well as to showcase the material aging process over time. The next steps of work include researching case studies, literature, volume studies, and working with 2D and 3D models. Iterations were carried out over most of the project by working with “research by design” and “research for design”, which overlapped and completed each other. In conclusion, the design process and the evidence-based design outcomes are summarized and presented through illustrations and architectural drawings.



DELIMITATIONS

Is about	Touch upon	Is not about
Redesign of industrial warehouse	Lindholmen	Economical aspects
Keeping industrial history in new facility	Sport facilities	Urban planning in Lindholmen
Facade detail	Flexible systems	Community involvment
Construction	Light influence on athletes	Energy efficiency
Movable facades	Context	Technical solutions
Athletics Facility Design	Sustainability	Community involvment
Tectonics	Construction details	Energy efficiency
	Interior design	Flexible systems
		Mobility disabilities

BACKGROUND

LINDHOLMEN HISTORY

Lindholmen, a district in the north-central part of Gothenburg with a rich history of industrial development. Situated between Sannegårdshamnen and Frihamnen, that area was the first industrialized sector on Hisingen – the fifth-largest island of Sweden (History of the Port, 2024). While today Lindholmen is known for its technological and educational institutions, its legacy as a centre for shipbuilding and industry, particularly in the use of steel and wood, remains a crucial part of its identity.

The history of Lindholmen is deeply tied to Gothenburg's development as a major maritime city. A shipyard specialized in building steel ships was founded in the middle of the 1850s, and it soon grew by adding an engineering facility for steamships. During the war years, 1939-1945, 23 ships were launched at Lindholmen. During the war years the harbour was converted into a large quayside warehouse and for almost 50 years it served as the harbour for ocean-going vessels carrying cargo as well as cars. At the end of the 1960s, the yard faced new problems. Lindholmen made huge losses on a new type of ferry built to operate between Sweden and the UK. In 1971 the company was sold to "Eriksbergs Mekaniska Verkstad", which subsequently moved many of its skilled workers to Eriksberg (History of the Port, 2024). In 1976, the closure of Lindholmen's shipyard marked the end of its operations, leading to the abandonment of a repair warehouse located between what are now Bror Nilssons Gata and Anders Carlssons Gata. This facility, once integral to the area's shipbuilding activities, remained unused following the cessation of industrial activities in the region (Varvshistoriska Föreningen, 2024).

Since that Lindholmen transitioned from industrial hub into a vibrant district that emphasises innovation and residential development. Central to this transformation was Lindholmen Science Park finished in 2000, which fosters collaboration among academia, industry, and government (Lindholmen Science Park, 2022). This collaboration has attracted high-tech companies and research institutions, changing Lindholmen's reputation as a centre for innovation and economic growth. Commercial but also residential development in Lindholmen is also notable, with a rising number of offices and business facilities being established. These developments often feature energy-efficient architecture and are strategically connected to public transportation networks to minimize reliance on private vehicles (City of Gothenburg, 2023).

Even with this advancement, Lindholmen still faces the problem of abandoned industrial warehouses from its shipbuilding past. Many of these warehouses remain vacant, posing obstacles to further development and urban cohesion. While efforts have been made to repurpose some of these structures, a significant number still stand unused, awaiting redevelopment (Göteborgs Stad, 2023).

ARCHIVES

Figure 1. Postcard of Lindholmen shipyard, Gothenburg, 1930.


Figure 2. Gunnar Jonsson's research trip to the West Coast of Sweden, June 1940.

Cranes as a strong identity of the Eriksberg and Lindholmen coast in Gothenburg. Dominating in the city skyline, the industrial cranes reflect the city's rich maritime history.


Figure 3. Worker grinding ship's turbines in the warehouse.


Figure 4. Worker's cleaning ship's turbines in the warehouse.

In the Lindholmen warehouse, workers meticulously cleaned and restored ship parts, ensuring every component gleams under the industrial lighting.

Figure 5. Wooden houses with a view on steel cranes.

Figure 6. Aerial view on the warehouse site and cranes.

The Lindholmen area showcases a unique blend of traditional wooden homes and modern steel warehouses, reflecting the district's evolving industrial character.

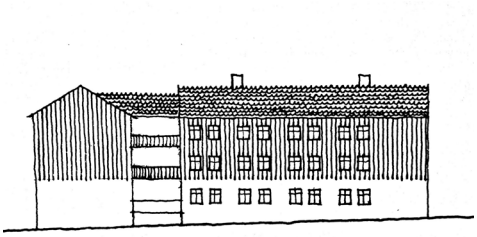


Figure 7. Drawing of typical house façade in Lindholmen.

Figure 8. Close-up on the steel framed window in wooden façade.

The integration of wood and steel creates a striking contrast. This combination of materials emphasizes both durability and tradition, seamlessly blending the area's past with its industrial present.

INDUSTRIAL FACILITIES

Industrial heritage sites are not only central to cultural discussions but also significantly impact planning debates concerning conservation, urban development, and architectural practices. These historical sites, along with their architecture and machinery, serve as tangible reminders of the past and act as spatial resources for urban development. However, they also pose challenges for planning due to their loss of function, large scale, deteriorating structures, and often disadvantaged socioeconomic contexts (Overmann & Mieg, 2015). The reuse of such sites and their historic fabric involves a spectrum of approaches, from strict protection guided by traditional conservation principles to more radical transformations driven by economic considerations, as seen in certain development strategies. According to Overmann & Mieg (2015) by preserving built infrastructure, a site's identity or character is retained, though adapted to meet new needs. This approach reinforces the value of sustainability, which, as Mieg and Töpfer (2013) highlight, is crucial for both innovation-driven urban development and heritage conservation (Petzet & Hassler, 1996). Moreover, identity plays a key role in urban innovation, particularly in attracting cultural and creative industries. Unlike more rigid approaches, heritage conservation here focuses less on strict preservation of the building fabric and more on ensuring its long-term reuse (Overmann & Mieg, 2015).

Sweden is increasingly confronted with the challenge of numerous abandoned industrial warehouses and facilities that remain underutilized despite their latent potential. According to Croisette Real Estate's Industrial Real Estate Report 2025, there are over 54,000 industrial properties across Sweden, many of which are either forgotten or in state of disrepair. The high initial costs of renovation often deter investment; however, demolition and reconstruction are substantially more resource-intensive and environmentally unsustainable. Adaptive reuse of these structures can preserve architectural heritage, reduce carbon emissions, and support urban regeneration. Successful transformations in cities such as Malmö (Malmö Market Hall by Wingårdh) and Gothenburg (Magasin 113 by MVRDV) illustrate the socio-economic and ecological benefits of this approach (Croisette, 2025; SCB, 2023; MDPI, 2023). Sweden's commitment to sustainable development goals necessitates a strategic shift toward renovation over replacement.

Maintaining the significance of industrial heritage in warehouses is crucial, even when they are integrated into newly designed buildings with new functions eq. athletics facility. Preserving elements of their historical character fosters a sense of identity and continuity within urban landscapes, enriching the experience and memory of both users and the community living nearby this site.

CLT, LVL AND STEEL CONSTRUCTIONS

Integrating laminated veneer lumber (LVL) into existing steel structures offers a powerful strategy for adaptive reuse in architecture, merging heritage preservation with sustainable innovation. A prominent example of this approach is the Gjuteriet project in Malmö, designed by Kjellander Sjöberg. In this transformation, the original industrial steel framework was preserved and augmented by newly added timber elements, including LVL and cross-laminated timber (CLT), which created a dialogue between heritage and modern materiality (Kjellander Sjöberg, 2023).

LVL provides multiple technical and environmental benefits. Its high strength-to-weight ratio allows for long spans with minimal material use, making it particularly well-suited to retrofit existing steel structures without overloading foundations (Swedish Wood, 2023). The use of prefabricated timber components reduces construction time and minimizes on-site waste, contributing to overall project efficiency (Swedish Wood, 2023). In Gjuteriet, the precision of CNC-cut timber elements ensured high-quality construction with minimal surplus material.

In addition to its structural and aesthetic performance, LVL and CLT contributes significantly to sustainability objectives. Timber stores carbon throughout its life cycle and, when sourced responsibly, has a much lower embodied energy compared to steel or concrete. Sweden, with its well-managed forests, leads globally in sustainable wood production. Approximately 70% of the country is forested, and the forestry industry operates under strict environmental guidelines, ensuring regrowth exceeds harvesting (Time, 2023). This makes timber not only a renewable resource but also a climate-smart building material.

Moreover, combining steel with LVL in transformation projects helps celebrate industrial history while reprogramming buildings for new uses. The contrast between exposed steel and warm timber highlights the architectural layers of history, offering both spatial richness and material honesty. This approach supports circular economy principles by retaining valuable structures, reducing demolition waste, and extending building lifespans.

WEATHER CONDITIONS AND INFLUENCE ON SPORT

Sweden experiences four clearly defined seasons, each with weather patterns that significantly influence outdoor activities. Winters, which last the longest, are particularly harsh with average temperatures often dropping below freezing and heavy snowfall, especially in northern regions. In some areas, daylight can be limited to just a few hours or even absent for several weeks (Migrationsverket, 2024). Spring (April to May) is a transitional period with rising temperatures and increasing daylight. Summer (June to August) is the warmest season, with average temperatures around 20–25°C in southern Sweden and very long days, including the midnight sun in the far north (Visit Sweden, 2024). Autumn brings falling temperatures, more rainfall, and shorter days, leading into another cold and dark winter. These seasonal changes directly impact how and when athletes can train. During winter, outdoor training becomes extremely difficult due to low temperatures and darkness, increasing the risk of injury and reducing the effectiveness of practice (Visit Sweden, 2024). Even in spring and autumn, fluctuating temperatures and frequent rain create instability in training schedules. As a result, athletes often have only a short summer window for optimal outdoor practice. This inconsistency can negatively affect performance progression and preparation for competitions.

To address these environmental challenges, all-year indoor training facilities are essential. Such spaces offer stable conditions, allowing athletes to train consistently regardless of weather. Indoor environments also allow for advanced equipment, climate control, and better safety, all of which are particularly valuable during Sweden's long and severe winters (Migrationsverket, 2024). Year-round facilities also support the hosting of athletic events throughout the year, which is vital for maintaining competitiveness and visibility in the sport.

Despite the necessity for indoor athletics facilities, their number in Sweden is limited – especially in Gothenburg. Most comprehensive indoor training centers are concentrated in major cities, especially Stockholm, which creates a disparity in access for athletes from other regions (Swedish Athletics Federation, 2023). This uneven distribution not only limits training opportunities for athletes outside the capital but also risks leaving regional talent underdeveloped. Expanding access to modern, climate-resilient sports infrastructure across the country is crucial for fostering athletic potential and promoting equality in sports development. Sweden's variable and often severe climate presents major challenges for athletic training. While summer offers ideal conditions, the rest of the year can hinder athletic development without proper infrastructure. Indoor, year-round training facilities are not just beneficial—they are essential. Greater investment in such facilities would ensure more equal opportunities for athletes across the country and help Sweden maintain a strong presence in international athletics.

ATHLETICS IN SWEDEN

Athletics has a rich history and significant cultural importance in Sweden, where it is not only a popular sport but also a means of promoting physical health and community engagement. The country has a strong tradition of athletic events, with a notable emphasis on track and field disciplines. Sweden has produced world-class athletes, exemplifying the nation's commitment to excellence in athletics, including Armand Duplantis, who recently set the world record in pole vaulting with a height of 6.26 meters at the 2024 Silesia Diamond League, reinforcing Sweden's reputation in the sport (Olympics, 2024). According to Statistics Sweden, nearly 20% of the population participates in sports and physical activities regularly, with athletics being one of the most accessible forms.

Gothenburg, as Sweden's second-largest city, plays a vital role in promoting sports and physical activities. However, it faces a shortage of indoor athletic facilities compared to other major cities like Stockholm or Malmö. The availability of high-quality indoor venues is essential for fostering talent, hosting competitions, and encouraging public participation in athletics. The Slotshöjdens Slottskogen Athletics Facility in Gothenburg is a crucial venue for athletes and sports enthusiasts in the region, however, it faces many challenges. The need for improvement requires a much better ventilation system or better spatial organisation.

As of 2023, Stockholm boasts approximately 50 athletic facilities, including state-of-the-art indoor arenas, while Malmö has around 30 facilities. In contrast, Gothenburg has about 20 indoor athletic venues (Gothenburg City Sports Council, 2023). The disparity in facilities directly impacts the number of competitions these cities can host. For instance, Stockholm frequently hosts major events such as the European Athletics Indoor Championships, contributing to its reputation as a centre for athletics. If Gothenburg were to develop additional indoor athletic facilities, it could potentially increase its hosting capacity for regional and national competitions, similar to the scale of events held in Stockholm. This could significantly boost the city's profile in athletics, increase local participation, and enhance community pride.

Figure 9. Pole vault.

SITE

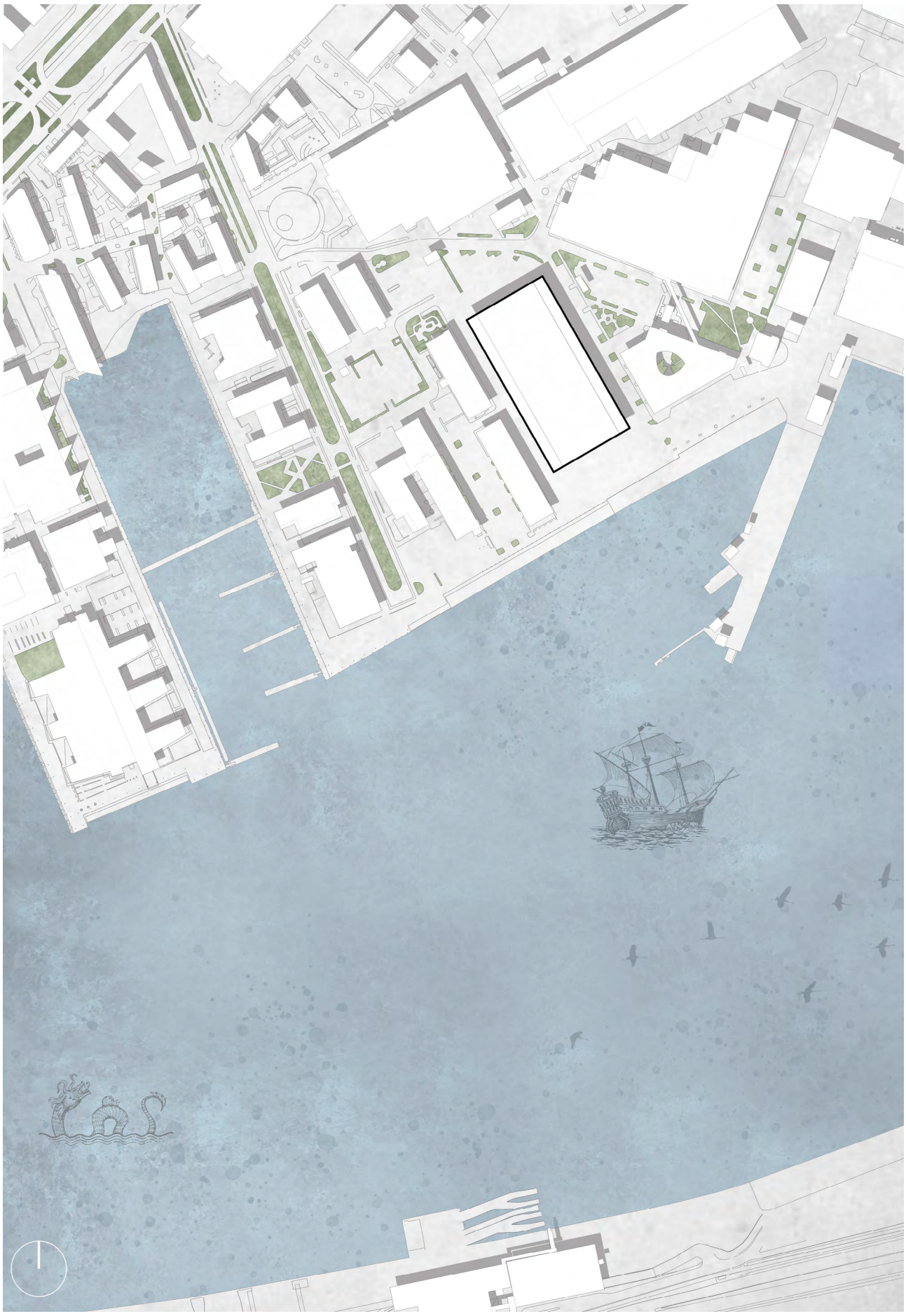
The surroundings of Lindholmen blend industrial heritage with modern innovation, creating a unique urban character. The area features a mix of repurposed shipyard buildings, contemporary glass-and-steel offices, and housing facilities. Green spaces, pedestrian pathways, and public plazas contribute to a lively and accessible district, balancing work, education, and leisure in a forward-thinking environment.

Public transportation is well-established, with buses and ferries ensuring quick access to the city centre. The ferry stop at Lindholmspiren provides a direct and scenic commute, while bus routes link the district with major parts of Gothenburg.
The pathways in the area are well-integrated with pedestrian and cyclist friendly streets, waterfront sidewalks, and small green spaces, making the district highly walkable. A key feature is the Lindholmen quay, which offers scenic views across the river and connects the area with central Gothenburg via ferry services.

Lindholmen is home to several key buildings, including Lindholmen Science Park, a research and development hub focused on technology, mobility, and digital innovation. The Chalmers University campus, along with various tech companies and start-ups, brings a strong academic and business presence. The nearby Radisson Blu Riverside Hotel and the Gothenburg Film Studios add to the diverse mix of commercial and cultural activities. Restaurants, cafés, and co-working spaces are scattered throughout the area, catering to students, professionals, and visitors.

Site plan 1:6000

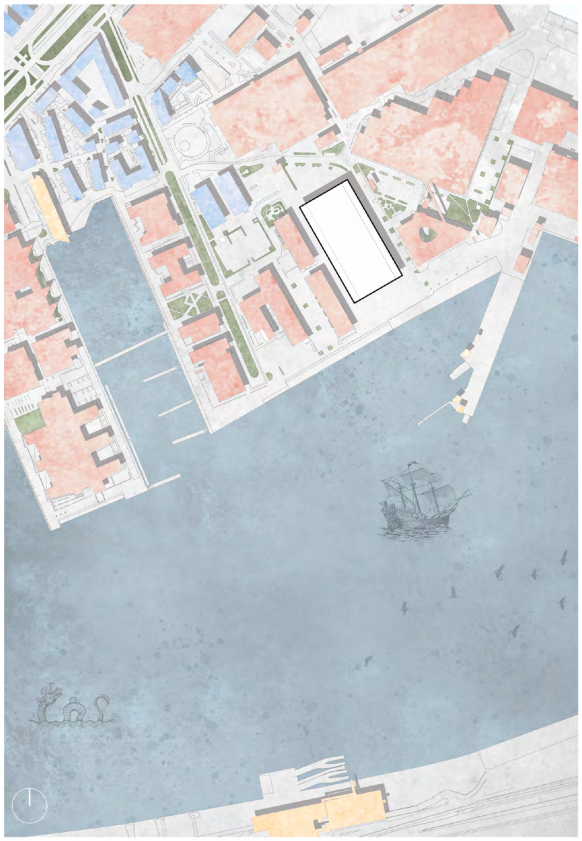

Masthuggets distrikt



Site plan 1:4000 Proposed site at Lindholmen

Trafic and public transport

Pedestrian & cyclist pathways



Commercial(red), Recreational (yellow), Residential (blue)

Closest connections - Science Park, Foodhall, Sport Facility, Karlatorget, Abroad Ferry Stop

INVENTORY

After site visits, an inventory was made to estimate how much material there is to work with for the transformation of the warehouse. The idea is to reuse the façade sheet metal and windows and create new additions in order to blend new materiality with old. In addition to being a more sustainable alternative to existing materials, it provides an interesting design constraint and an imaginative framework for work.

The simplest solution would be to demolish the structure and replace it with a new one that complies with modern greenwashing regulations and uses CO2-compensated construction methods. But everything of this site's history would be lost only due to lucrative business strategy, which is overseen by influential real estate investors. It is also necessary to take into account other voices. According to data from Boverket, the building sector is accountable for 40% of waste management, 34% of energy consumption, and 21% of greenhouse gas emissions in Sweden overall, according to a recent article in Sydsvenskan (2023) authored by a group of architects promoting a more sustainable approach.

Being a part of one of the most polluting businesses, architects have a crucial role in promoting a built environment that is more effective, creative, and compassionate to surroundings. Where, regardless of a project's budget, innovation, upkeep, and workmanship are valued. These days, the only people who enter the warehouse halls are those who are looking for a place to park their cars. Moreover, only the ground floor of the warehouse is in use, leading to significant inefficiency—less than 7% of the total floor area is actively occupied. Despite of such a large space such being unused, the building remains in excellent structural condition.

Finding the need is the first stage in the process. A need can be classified into three categories. The first relates to the potential for providing care. The second is the requirement for facilities, which begins with possible maintenance and care measures based on breakdowns rather than the desire for development. Needs for the site's primary activity—in this case, athletics sports with a possible flexible floorplan —from the caregiver's point of view fall under the third category.

The building was assessed according to nine categories, each evaluated in terms of area, physical characteristics, and current condition. These evaluations informed decisions regarding material reuse and guided the development of the design proposal.

01 Foundations – Historical floor plans provided by Göteborgs Stad indicate the presence of 39 reinforced concrete foundations, each supporting a steel column. These foundations measure approximately 4 m × 2 m × 1 m and are arranged in three rows. Over the foundations, layers of soil and asphalt are present. The structural integrity and dimensions of these foundations support their inclusion in the proposed transformation.

02 Structural Frame – The primary structure consists of 39 steel columns and four main IPE100-profile beams, each spanning 135 meters. The maximum height reaches 17 meters in the western section and 15 meters in the eastern wing. The structural components are well-preserved, free of deformation or corrosion, and exhibit sufficient stability to support adaptive reuse.

03 Concrete Walls – The building is enclosed on all sides by concrete walls, each approximately 3 meters in height, with a combined surface area of 945 m². These walls include pre-existing openings and show no signs of damage or cracking. As such, they are considered suitable for retention and integration into the new design.

04 Bicycle Parking Area – Covering 246 m², this structure was added in the late 1990s and holds no heritage value. It exhibits visible patina and rust. Due to its poor condition and limited architectural significance, it is deemed unsuitable for reuse in the transformation.

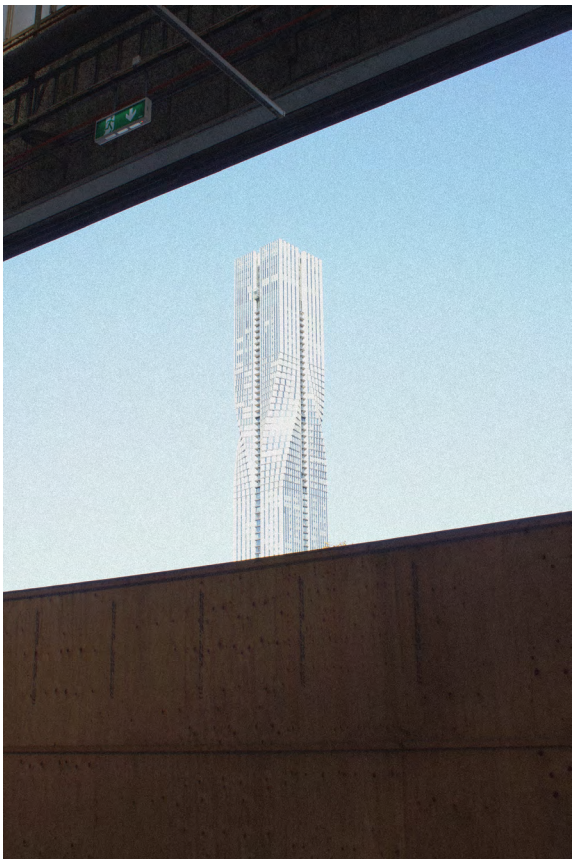
05 Office Area – Encompassing 1,440 m² over two floors, the office extension was also constructed in the late 1990s. It is currently abandoned and displays signs of aging, including patina and structural cracks. It holds no heritage value and is considered unfit for incorporation into the new design.

06 Façade – The entire façade is clad in 500 mm wide corrugated metal sheets. In many areas, the cladding shows signs of deterioration, including moss, dirt, and corrosion but some have good quality. While some sections remain intact, the overall condition suggests that the façade will be taken down, washed and reused.

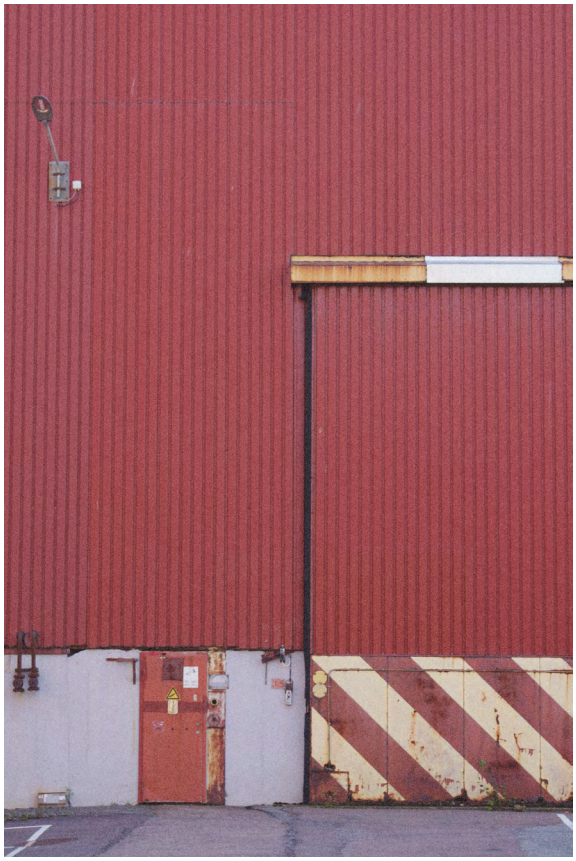
07 Windows – The building contains 385 windows distributed across all four façades. A significant number are broken, dirty, and housed in deteriorated frames. Neither the windows nor their frames are suitable for reuse in the transformation.

08 Roof – The roof structure mirrors the façade's condition, exhibiting holes and corrosion in several areas. Due to extensive damage, the roof is not considered viable for reuse.

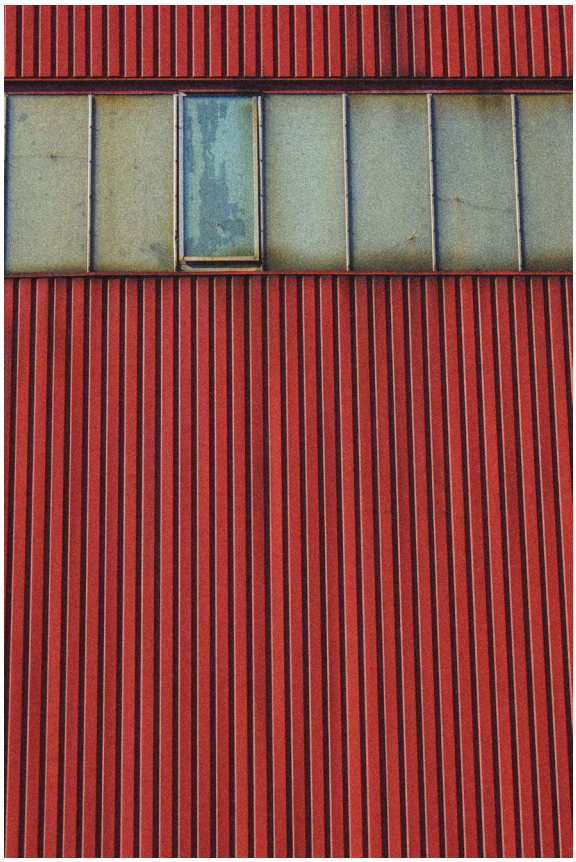
09 Skylights – The arched skylights and their frames are in relatively good condition compared to the façade windows. Their structural soundness and aesthetic quality support their reuse in the transformation project.

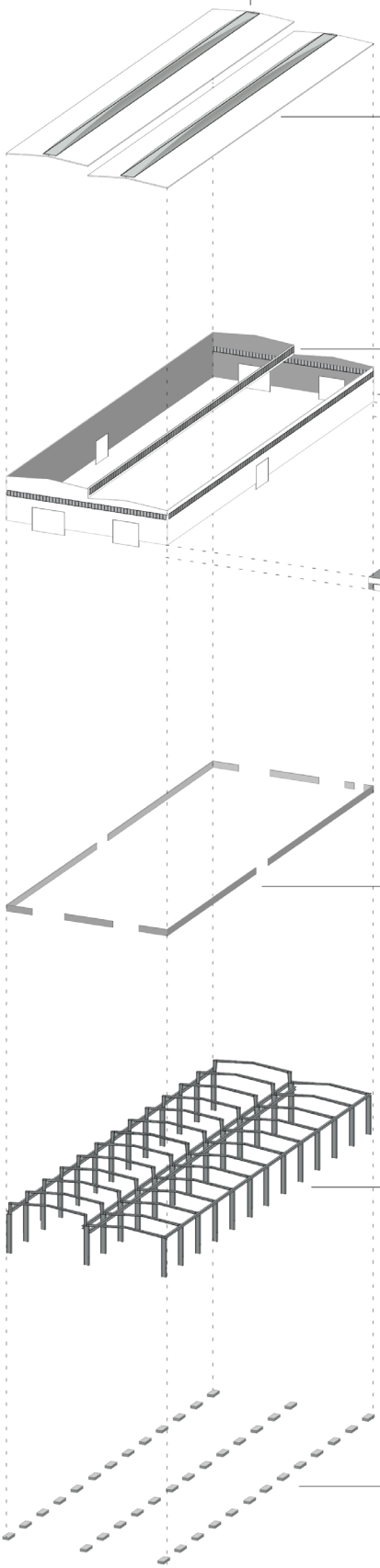


Self made site photos



Self made site photos





09 SKYLIGHTS

MEASUREMENTS: 130 x 5 m
QUANTITY: 2 rows
TOTAL AREA: 1300 sqm

CHARACTERISTICS: frame in good condition, arched, fluted glass, filtered light, creates a sharp ray
of light during sunshine

08 ROOF

MEASUREMENTS: 135 x 22,5 m
QUANTITY: 2
TOTAL AREA: 6075 sqm (both)

CHARACTERISTICS: corrugated steel sheets, patina, rust, moss, large chunks, bleached ruby red, recyclable

07 WINDOWS

MEASUREMENTS: 1670 x 800 mm
QUANTITY: 358
TOTAL AREA: 478 sqm

CHARACTERISTICS: frame in bad condition, broken glass, patina, fluted glass, stained, filtered light, two-sided reinforced windows in rough cast glass

06 FACADE

MEASUREMENTS: width 500mm CC
QUANTITY: 4 facades
TOTAL AREA: 3897 sqm

CHARACTERISTICS: corrugated steel sheets, patina, rust, moss, large chunks, bleached ruby red, recyclable

05 OFFICE

MEASUREMENTS: 60 x 12 m
QUANTITY: 2 floors
TOTAL AREA: 1440 sqm

CHARACTERISTICS: abandoned, bad condition, patina, no heritage quality

04 CYCLING PARKING

MEASUREMENTS: 20,5 x 12 m
QUANTITY: 1 floor
TOTAL AREA: 246 sqm

CHARACTERISTICS: abandoned, bad condition, patina, no heritage quality, corrugated steel sheets, patina, rust, moss

03 CONCRETE

MEASUREMENTS: height 3m
QUANTITY: 4 facades
TOTAL AREA: 945 sqm

CHARACTERISTICS: good condition, #f2f2e6 colour base, smooth surface, no cracks either broken parts

02 CONSTRUCTION

MEASUREMENTS: IPE100
QUANTITY: 39 columns, 4 beams
TOTAL AREA: length135 m

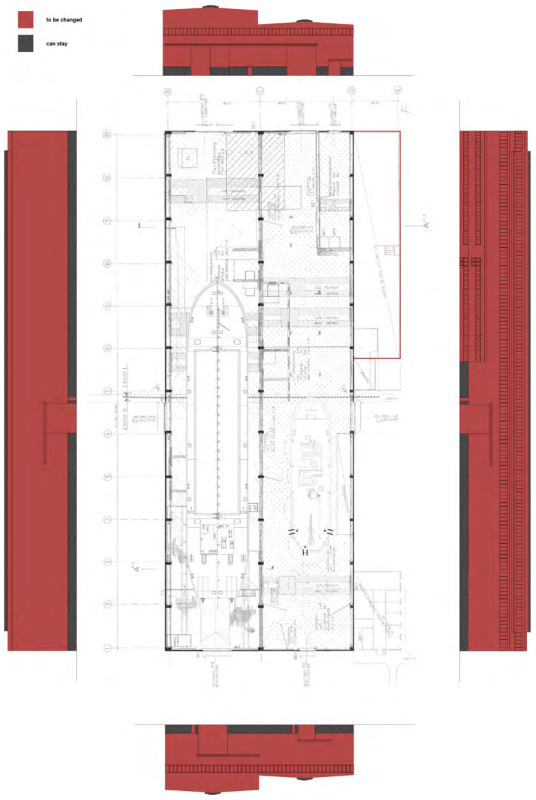
CHARACTERISTICS: sturdy, intact, durable, preserved

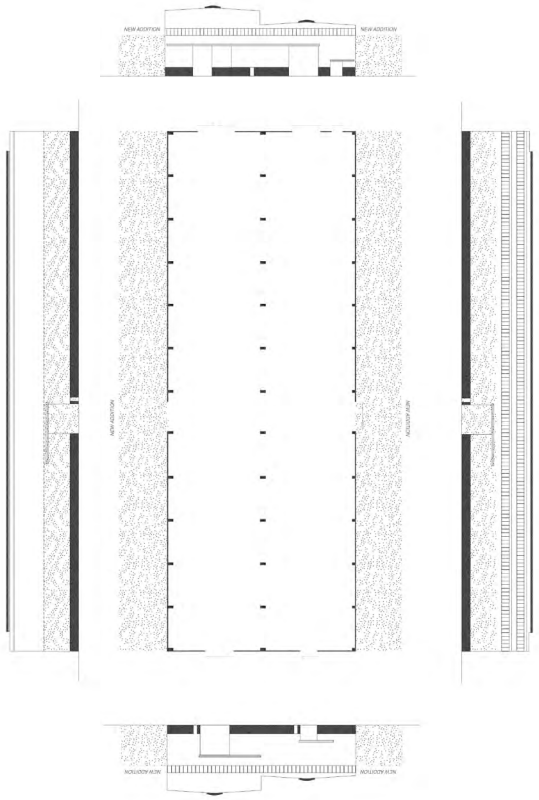
01 FUNDAMENTS

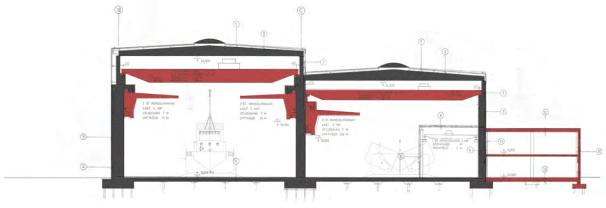
MEASUREMENTS: 4 x 2 x 1 m
QUANTITY: 39
TOTAL AREA: 3 rows

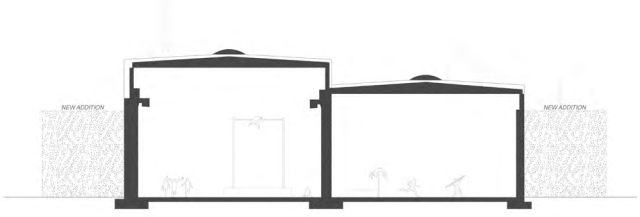
CHARACTERISTICS: reincofrced conrete foundaments under every column

Elements analysis and the condition


to be changed
can stay


NEW ADDITION
NEW ADDITION
NEW ADDITION
NEW ADDITION
NEW ADDITION
NEW ADDITION




NEW ADDITION
NEW ADDITION



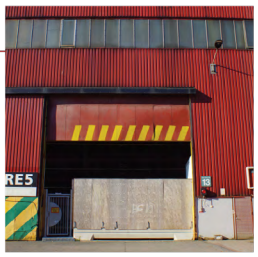

the facade dominates in red steel with movable parts and many skylights

consistent pattern on each facade

highly visible rusting effect on the materials





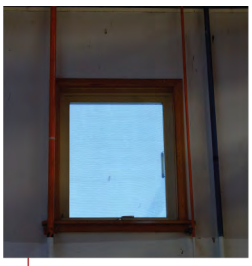
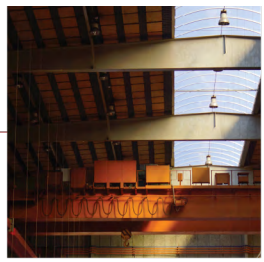






Exterior materiality

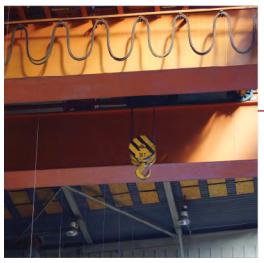


clearly visible bad condition of interior walls and facade

many unused steel elements hanging from roof construction

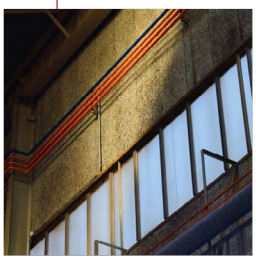
dirt & rust










REFERENCES

GAME STREETMEKKA VIBORG
VIBORG, DENMARK

GAME STREETMEKKA AALBORG
ETERNITEN, DENMARK

MILLSIDE RED BARN
BOX, UNITED KINGDOM

WHITE SHED
OPATOV, CZECH REPUBLIC

MICASA VOL.C
SÃO PAULO, BRAZIL

ROOFTOP SAUNA
LONDON, UNITED KINGDOM

The references chosen for these projects are rooted in contemporary architecture, drawing from innovative approaches to adaptive reuse, material experimentation, and spatial fluidity. Each project responds to its immediate context while integrating design strategies that emphasize openness, flexibility, and sustainability. Game Streetmekka Viborg and Aalborg take inspiration from industrial conversions and urban cultural hubs, where former warehouses are transformed into sport halls. The designs emphasize open and flexible floor plans, exposed structures, and multifunctional areas that blur the boundaries between sports, outdoor, and social engagement.

Both Millside Red Barn and White Shed share a common theme of reinterpreting traditional agricultural architecture with modern materials and design principles. They both share contemporary functionality, serving as an archive and storage facility for stage sets and machinery equipment. Millside Red Barn features a simple, barn-like form with high-quality timber cladding, seamlessly integrating into its rural surroundings while offering a practical and visually appealing space. However, White Shed takes inspiration from local agricultural buildings, using a minimalist, industrial approach with white trapezoidal metal cladding to create a sleek yet functional workshop for servicing large farming machinery.

Micasa vol.C and Rooftop Sauna explore the possibilioties of joining two different materials: wood and polycarbonate. Both projects emphasize modularity and define the aesthetic of functional approach. In those projects the importance of laminated wood frames enhance its modular space, wood's capability to serve both as a primary structure and a visual feature.

In conclusion, those selected references serve as both inspiration and a framework for my design of transforming an abandoned ship warehouse into a highly contextualized sports center in Gothenburg. They emphasize material innovation, spatial adaptability, and the seamless integration of architecture into its surrounding environment.

GAME STREETMEKKA VIBORG

Location: Denmark

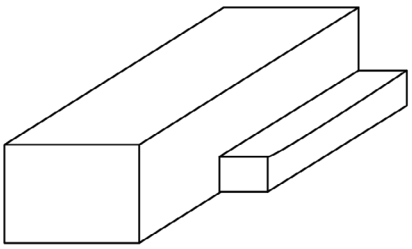
Year of construction: 1960 building, 2017 adaptive reuse

Architect: EFFEKT

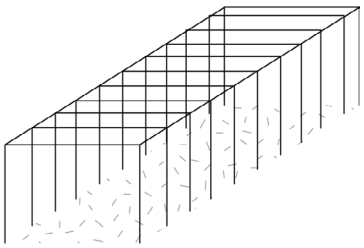
Building typology: Sport Hall

GAME Streetmekka Viborg transforms a former 1960s industrial hall into a vibrant sports and cultural hub. The architects preserved the original structure's industrial charm while introducing a translucent polycarbonate façade that allows natural light to flood the space. The redesign includes prefabricated wooden modules that house workshops, social spaces, and creative studios. The flexible interior accommodates a variety of sports, including skateboarding, parkour, basketball, and bouldering. Outdoor spaces extend the activity zones, featuring graffiti walls and green pockets. By combining raw industrial aesthetics with modern interventions, the project successfully revitalizes an abandoned space into a multifunctional, community-driven venue. The innovative approach makes it an ideal setting for both athletes and artists, encouraging engagement and personal development in Viborg's urban environment.

1.



2.



3.

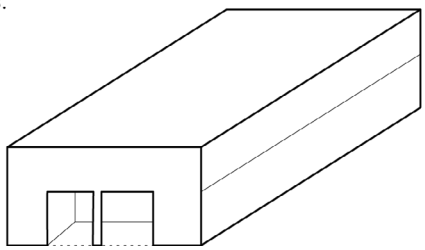


Figure 10. Exterior view

Figure 11. Detail

GAME STREETMEKKA AALBORG

Location: Denmark

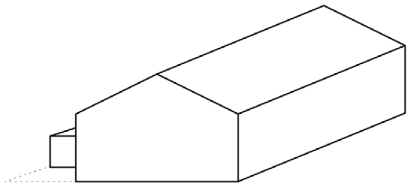
Year of construction: 1963 building, 2018 adaptive reuse

Architect: JAJA Architects

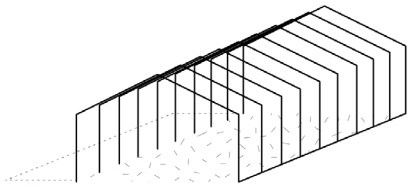
Building typology: Sport Hall

Designed in Eterniten (Denmark) is a project handling a multi-sport function. As the architects describe: “The production building from 1963 testifies to the industrial history of the neighbourhood with its raw and distinctive character, almost demanding to be conquered by urban street culture. “Inspired by the beauty of the existing building, they tried to preserve the industrial atmosphere and generate an environment that invites the users to play and experiment with new forms of movement (ArchDaily, 2019).

1.



2.



3.

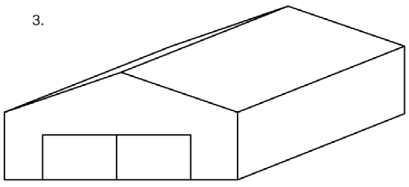


Figure 12. Exterior view

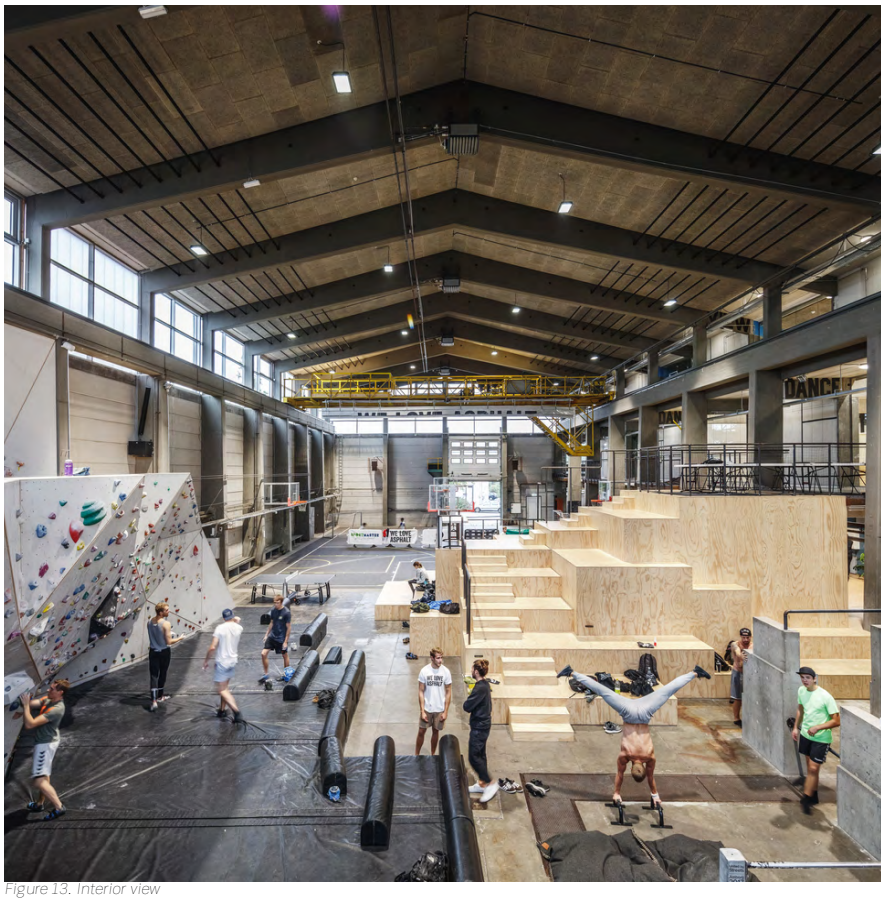


Figure 13. Interior view

MILLSIDE RED BARN

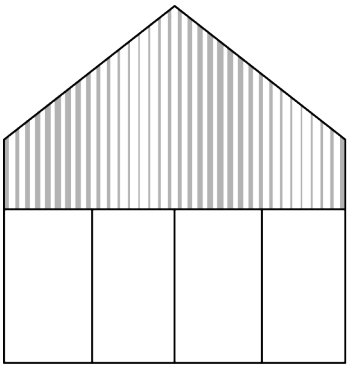
Location: United Kingdom

Year of construction: 2015

Architect: StoneWoodDesign

Building typology: Barn

This project designed by StoneWoodDesign is based in the village of Box, Wiltshire (UK). It exemplifies studio's commitment to blending modern architecture with the natural landscape, while respecting the historic contexts of the site. The overall project includes a mixed housing development on the adjacent timber yard site, and a co-working office building at Millside. Those two facilities sit either side of the Bybrook river and valley, in a picturesque rural setting (Divisare, 2024). This project incorporates traditional barn-red tones in its exterior cladding. The materials are thoughtfully chosen to emphasise the region's vernacular architecture, by using timber to connect with the environment. The wood was also locally sourced to reduce the carbon footprint. The studio decided to design big movable openings to take advantage of natural light and ventilation, reducing the need for artificial energy use.



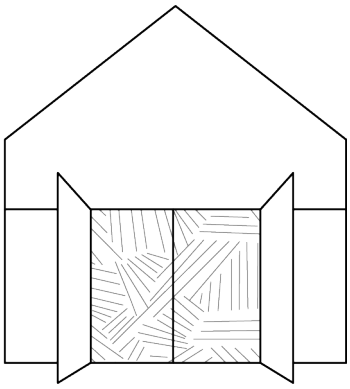


Figure 14. Exterior view

Figure 15. Construction detail

WHITE SHED

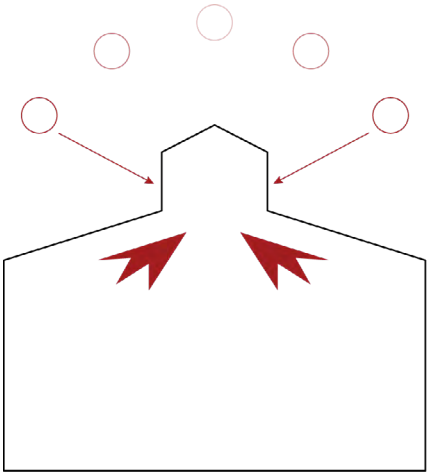
Location: Czech Republic

Year of construction: 2019

Architect: Atelier 111

Building typology: Workshop

The new workshop building, located in an agricultural compound on the periphery of Opatov (Cz. Republic), is designated mainly for the service and maintenance of large agricultural machines. Facilities for employees of the whole compound, consisting of changing rooms, day rooms, and sanitary facilities, are also part of the building. The white trapezoidal metal sheet cladding is similar to the cladding of the neighbouring biogas plant. The structural element in the form of a truss beam creates a distinct linear skylight in the position of a roof ridge. Both the skylight and side walls are made of translucent materials, allowing the truss structure to be visible from the outside. The facade adds a subtle, dynamic quality to the building, as it reflects and interacts with



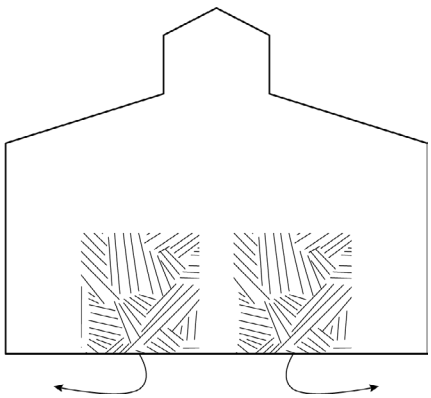


Figure 16. Exterior view

Figure 17. Construction detail

MICASA VOL.C

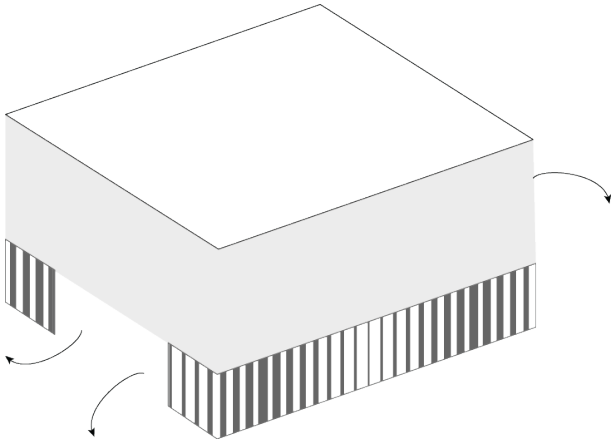
Location: Brazil

Year of construction: 2018

Architect: Studio mk27

Building typology: Store

Designed by Studio mk27 store located in São Paulo (Brazil). An indoor space that could be used as a shop, exhibition space, or temporary dwelling for invited artists was created in response to the need for a flexible program. Almost 15-meter spans are covered by a series of glued laminated timber frames. Steel rods are utilized to brace the structure in the top plane between every two modules. In addition to provide support for the building's exterior, a foundation separates the pillars from the façade plane. The building's façades are made of folded sheets of two different materials: translucent polycarbonate and a white metal plates. (ArchDaily, 2018).



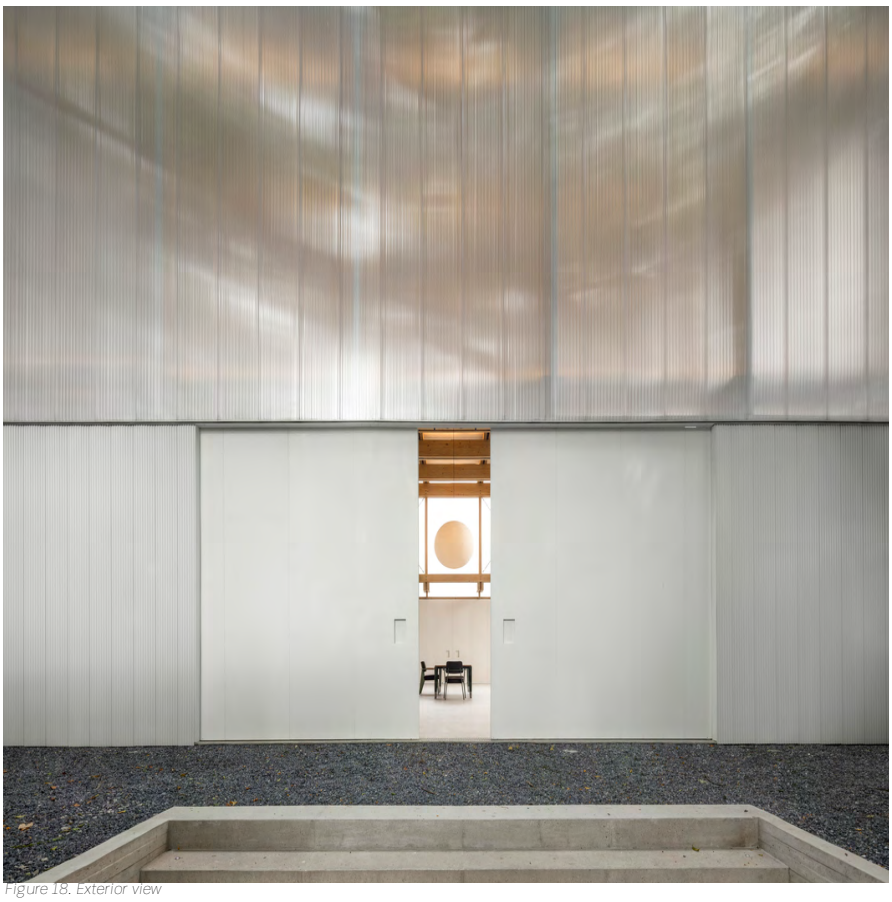


Figure 18. Exterior view

Figure 19. Interior detail

ROOFTOP SAUNA

Location: United Kingdom

Year of construction: 2017

Architect: Aalto University - School of Arts, Design and Architecture

Building typology: Sauna

Aalto University in collaboration with Southbank Centre designed the sauna on the top of existing building in London (United Kingdom). The sauna's architecture features a wooden frame structure, resulting in a longitudinally oriented building that fits well with the surrounding harsh environment. The structure is enveloped with translucent polycarbonate plates that are illuminated. The idea of the architects was to create a bright landmark that will stand out during London's winter nights (ArchDaily, 2017).

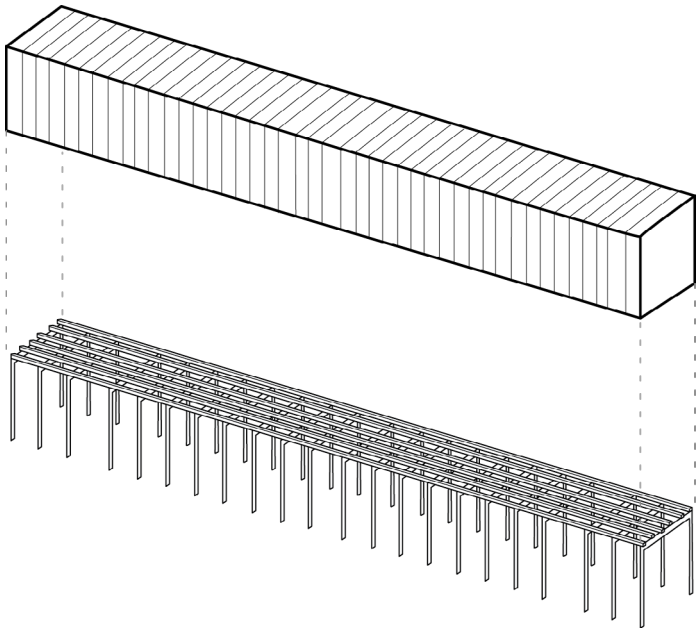


Figure 20. Exterior view

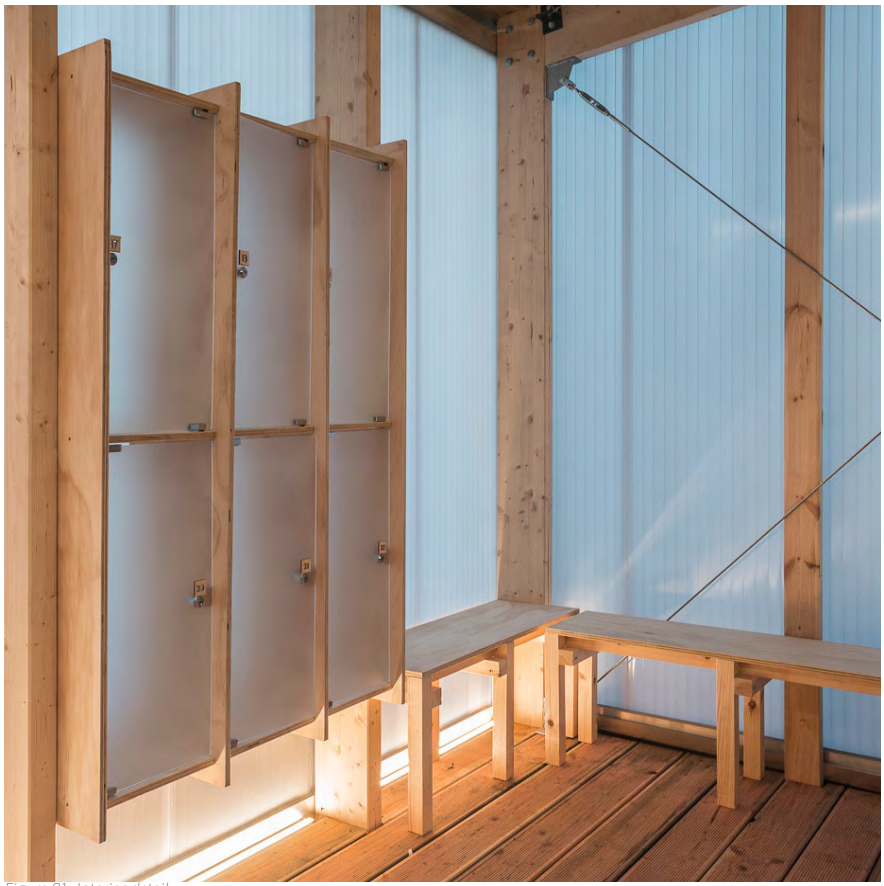


Figure 21. Interior detail

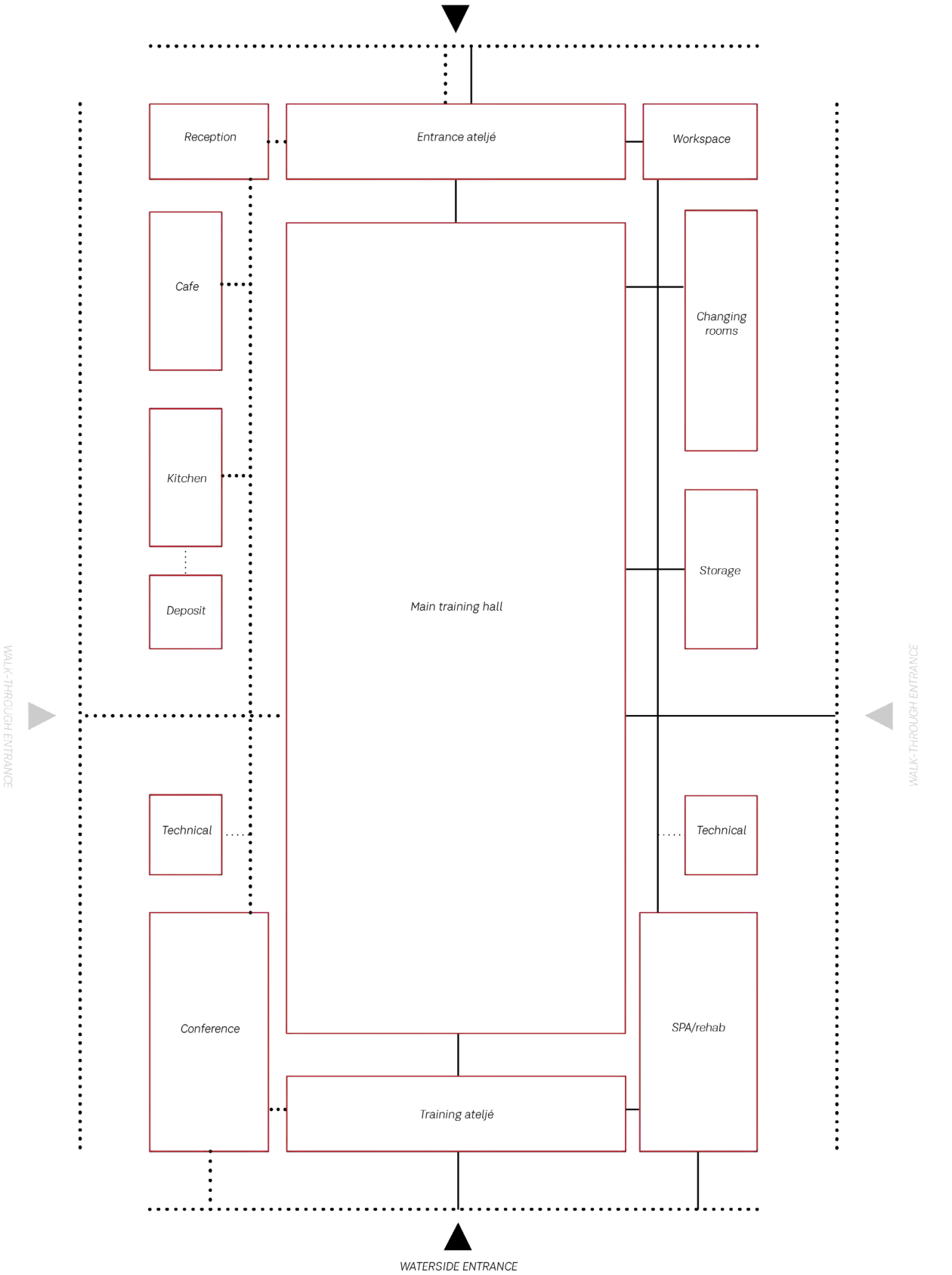
DESIGN PROPOSAL

A comprehensive evaluation of the building's materiality and categorization, made possible through an inventory analysis, guided the development of the architectural design. The primary element that reflects the site's industrial heritage is the exposed steel structure, which will remain visible from the interior to preserve its historical character. Externally, select fragments of the original red steel façade will be retained, further emphasizing its industrial identity. New architectural extensions, each 10 meters wide, will be added to the eastern and western façades, introducing contemporary materials such as wood and glass. These additions contrast the original steel elements, offering visual warmth and highlighting the transformation. The steel structure and preserved red cladding, will serve as key design components. The integration of wood throughout both the interior and exterior enhances the atmosphere with natural texture and human scale, contributing to a balanced interplay between old and new.

The building is designed to be accessible from all sides, reinforcing openness and a welcoming atmosphere. The primary entrance is located at the northwest corner, leading to a reception area on the western side and an athletes' lobby to the east. The western (left) wing accommodates recreational functions, while the eastern (right) wing is dedicated to athletic use. The central hall serves as the primary training for sports like high jumps, 200m and 60m run trail, pole vault, long jumps and warm-up area. That space features a significant visual line extending from Karla Tower to the Göta River. The left wing includes support functions such as a café, kitchen, waste management, cleaning facilities, technical rooms, a lounge, and a conference area. This side also features wooden spectator stands accessible from the main hall. Beneath the stands, mechanical ventilation and storage spaces are integrated, supplying fresh air to the central hall. Access between the corridor and the training hall is provided through entry points beneath the tribunes. The right wing is designated for athlete-specific functions, including workspaces, changing rooms, fast-access toilets, storage, technical areas, as well as spa and rehabilitation rooms. A secondary entrance on the southern façade opens the possibility for seasonal outdoor uses, such as an open-air gym or beach volleyball court during the summer months.

At the heart of the design is the preserved steel structure, which will serve as the focal point for all sports and training activities. The central hall, designed with a modular layout, offers flexibility and can accommodate various uses beyond track and field, such as team sports, a skatepark, or other community-driven functions. This adaptability ensures the building remains responsive to evolving urban and recreational needs.

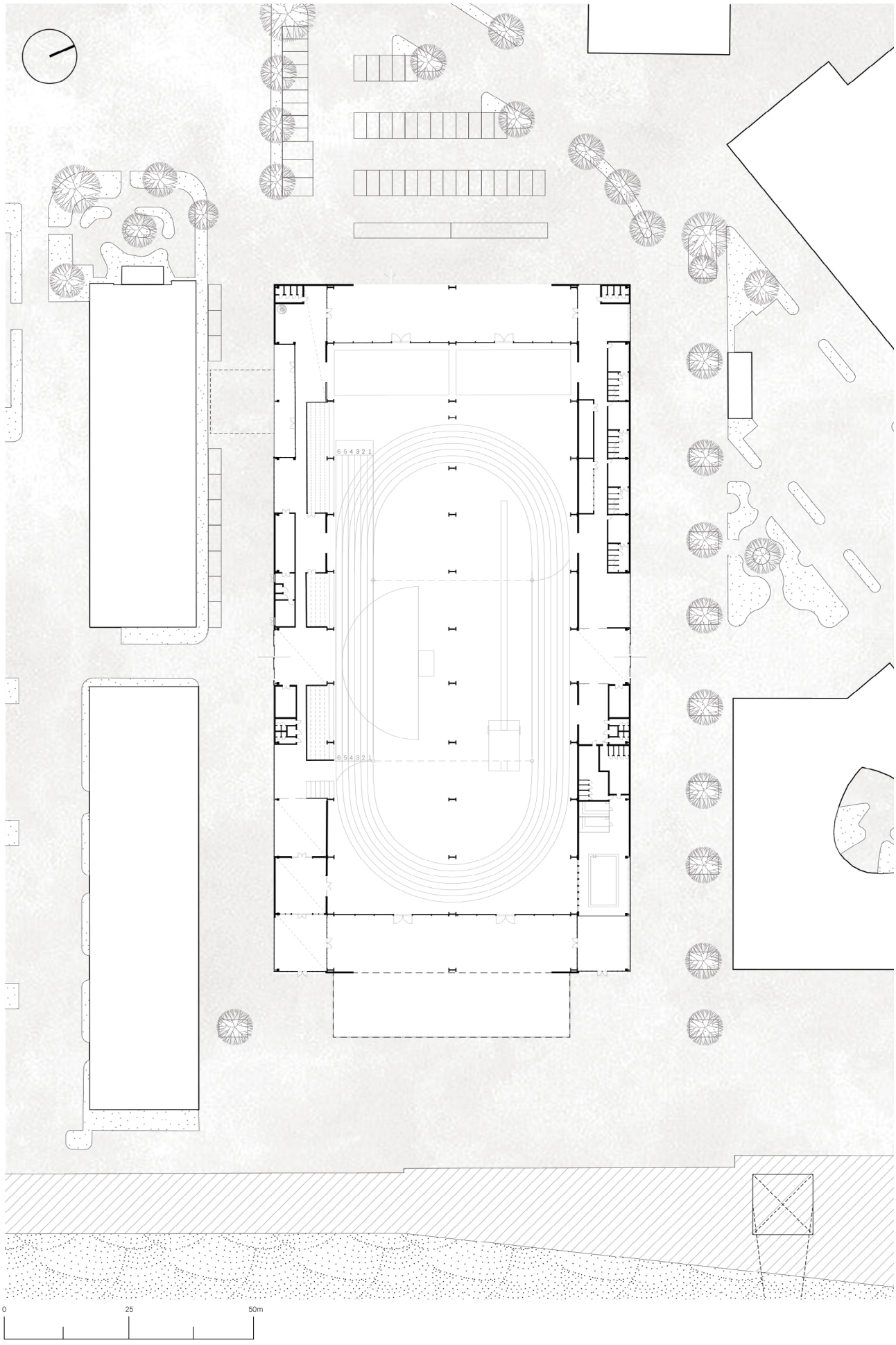
SITUATION PLAN 1:4000


Reception
Entrance ateljé
Workspace
Cafe
Changing rooms
Kitchen
Storage
Deposit
Main training hall
WALK-THROUGH ENTRANCE
WALK-THROUGH ENTRANCE
Technical
Technical
Conference
SPA/rehab
Training ateljé
WATERSIDE ENTRANCE
visitors
athletes
staff

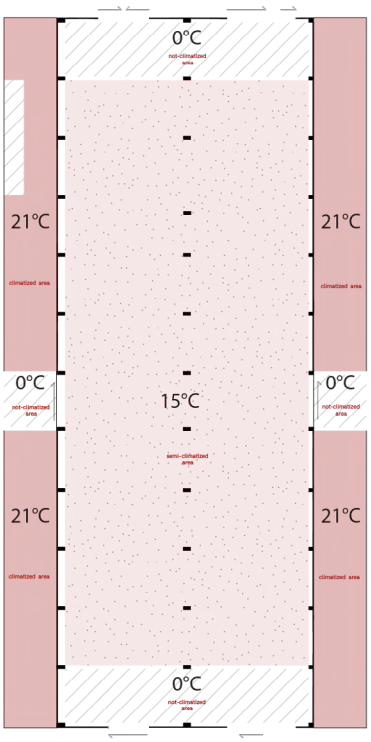
QUANTITY	NR	ROOM	AREA	TOTAL AREA
1	1.	Reception with mezzanine	195 sqm	195 sqm
1	2.	Cafe	45 sqm	45 sqm
1	3.	Storage	130 sqm	130 sqm
1	4.	Kitchen	64 sqm	64 sqm
1	5.	Deposit	20 sqm	20 sqm
2	6.	Technical/cleaning	25 sqm	50 sqm
1	7.	Lounge	50 sqm	50 sqm
1	8.	Workspace	112 sqm	112 sqm
1	9.	Conference	108 sqm	108 sqm
2	10.	Winter garden	113 sqm	226 sqm
1	11.	Tribunes	595 sqm	595 sqm
1	12.	Main training hall	5475 sqm	5475 sqm
1	13.	Athlete zone	164 sqm	164 sqm
4	14.	Changing rooms	46 sqm	185 sqm
1	15.	Rehab room	32 sqm	32 sqm
1	16.	Yoga rooms	30 sqm	30 sqm
1	17.	Equipment storage	117 sqm	117 sqm
1	18.	SPA	330 sqm	330 sqm
		WC & communication	613 sqm	613 sqm
				TOT: 8541 sqm

EXTERIOR

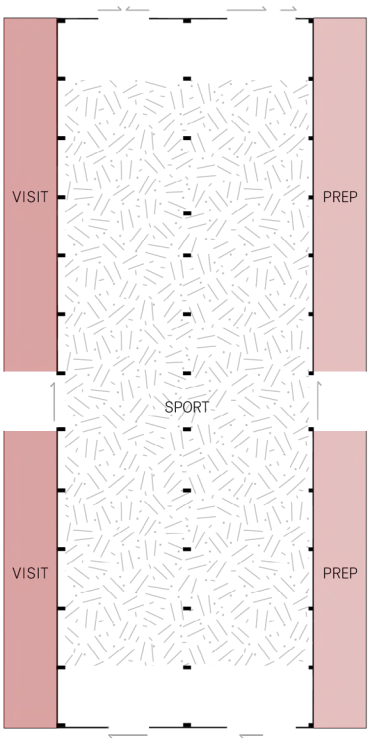
1	19.	Atelier	551 sqm	551 sqm
1	20.	Cafe	90 sqm	90 sqm
1	21.	Gym/workout area	551 sqm	551 sqm
				TOT: 1192 sqm



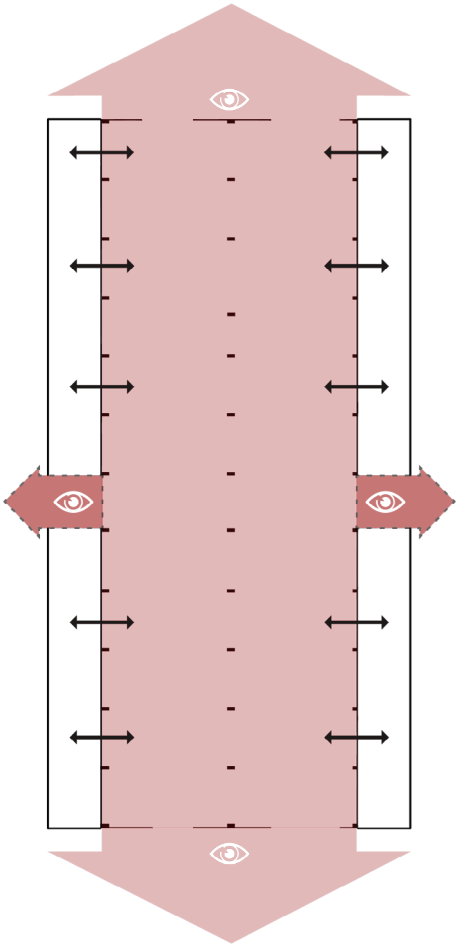
SITUATION PLAN 1:1000



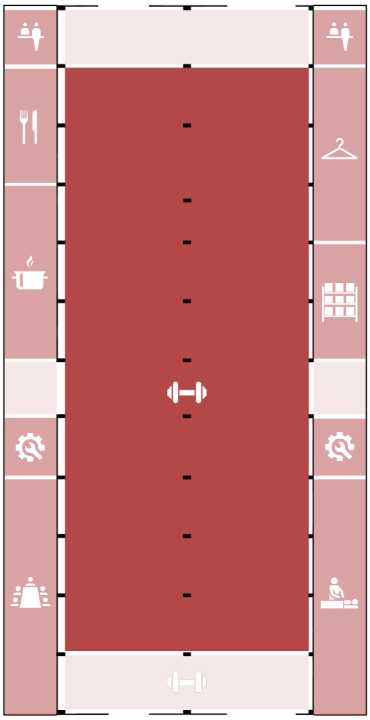
Temperature zones



Zones

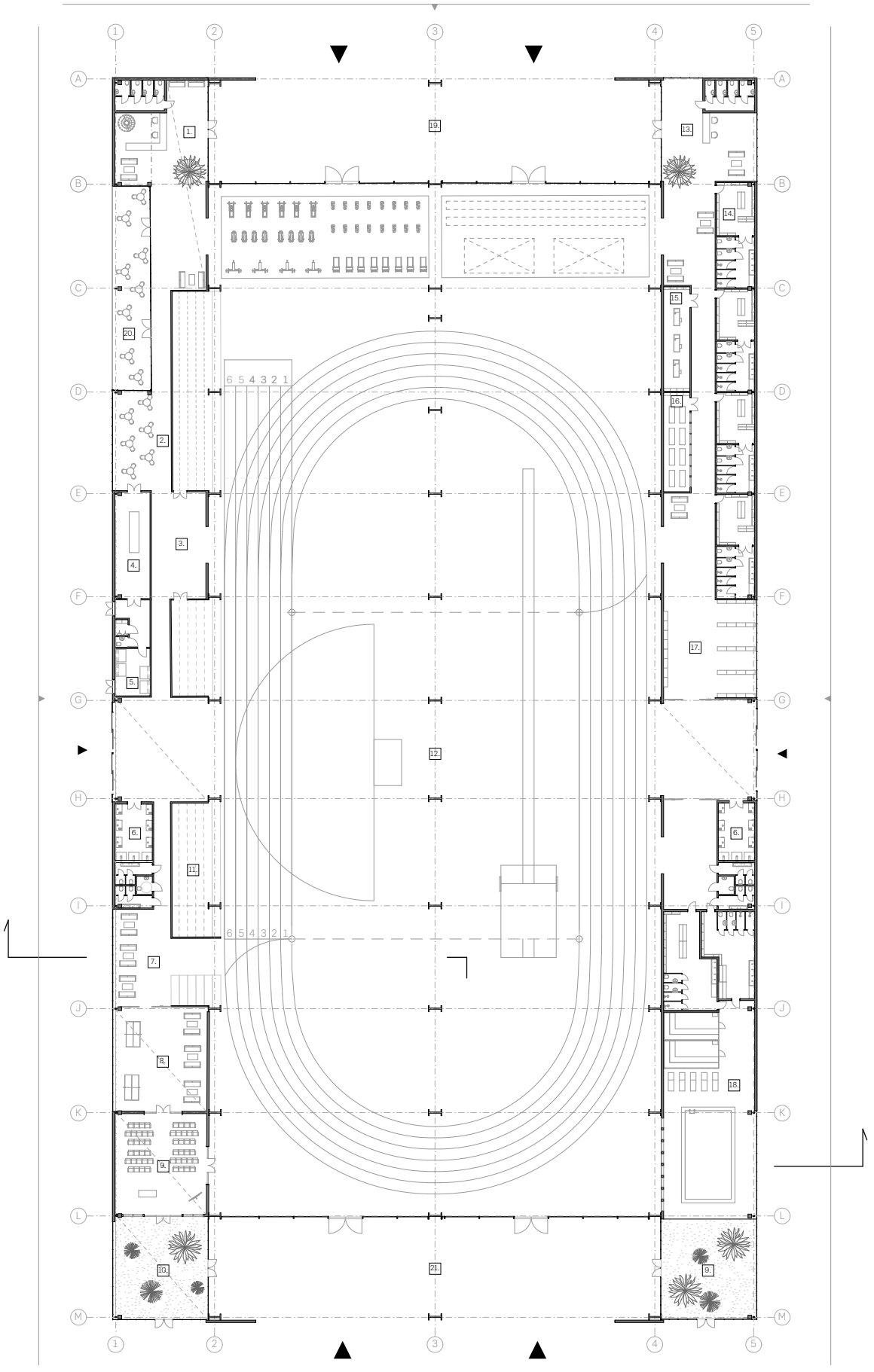


Program proximity & views

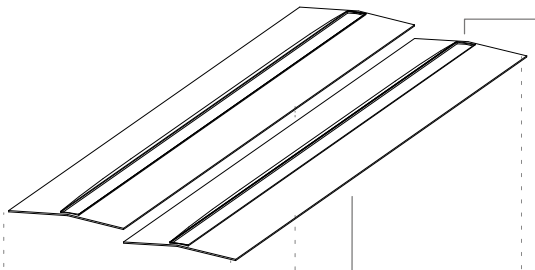


Program allocation


LINDHOLMEN
ATHLETICS
CENTER



GROUND FLOOR PLAN 1:600



09 SKYLIGHTS

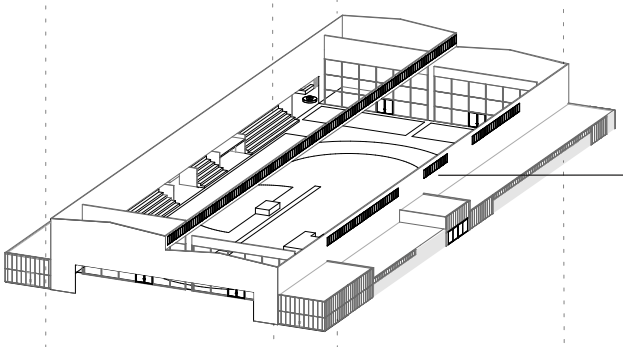
MEASUREMENTS: 130 x 5 m
QUANTITY: 2 rows
TOTAL AREA: 1300 sqm

CHARACTERISTICS: frame in good condition, arched, fluted glass, filtered light, creates a sharp ray
of light during sunshine

08 ROOF

MEASUREMENTS: 135 x 22,5 m; 10x 135 m
QUANTITY: 4
TOTAL AREA: 6075 sqm (both), 2700 sqm (new)

CHARACTERISTICS: recycled, ruby red, white, steel



07 WINDOWS

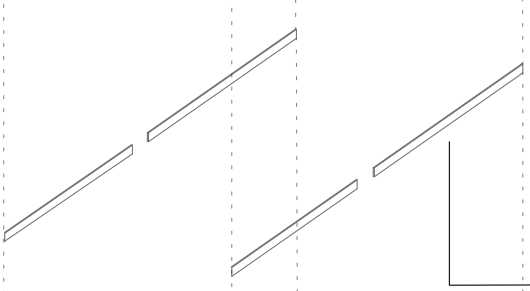
MEASUREMENTS: 1670 x 800 mm
QUANTITY: 170
TOTAL AREA: 478 sqm

CHARACTERISTICS: new wooden frames, new glass, filtered light, two-sided reinforced windows in rough cast glass, milk glass, polycarbonate panels

06 FACADE

MEASUREMENTS: width 500mm CC
QUANTITY: 10 facades
TOTAL AREA: 5679sqm

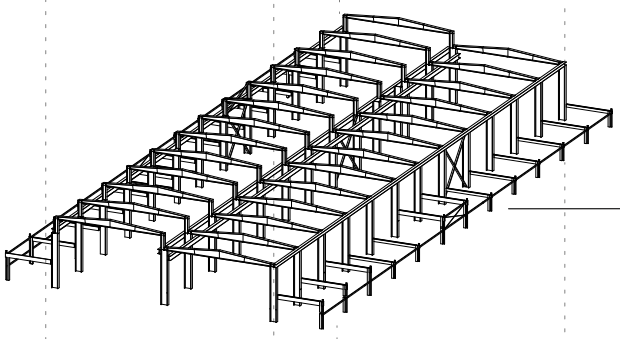
CHARACTERISTICS: recycled steel sheets, ruby red, polycarbonate panels, white, movable facades, curtain wall



03 CONCRETE

MEASUREMENTS: height 3m
QUANTITY: 2 facades
TOTAL AREA: 500 sqm

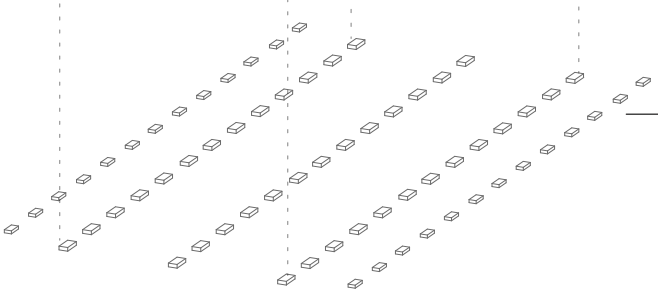
CHARACTERISTICS: good condition, #f2f2e6 colour base, smooth surface, no cracks either broken parts, new openings



02 CONSTRUCTION

MEASUREMENTS: steel - IPE100
wood - CLT 140x990mm
QUANTITY: steel - 39 columns, 4 beams
wood - 26 columns, 28 beams

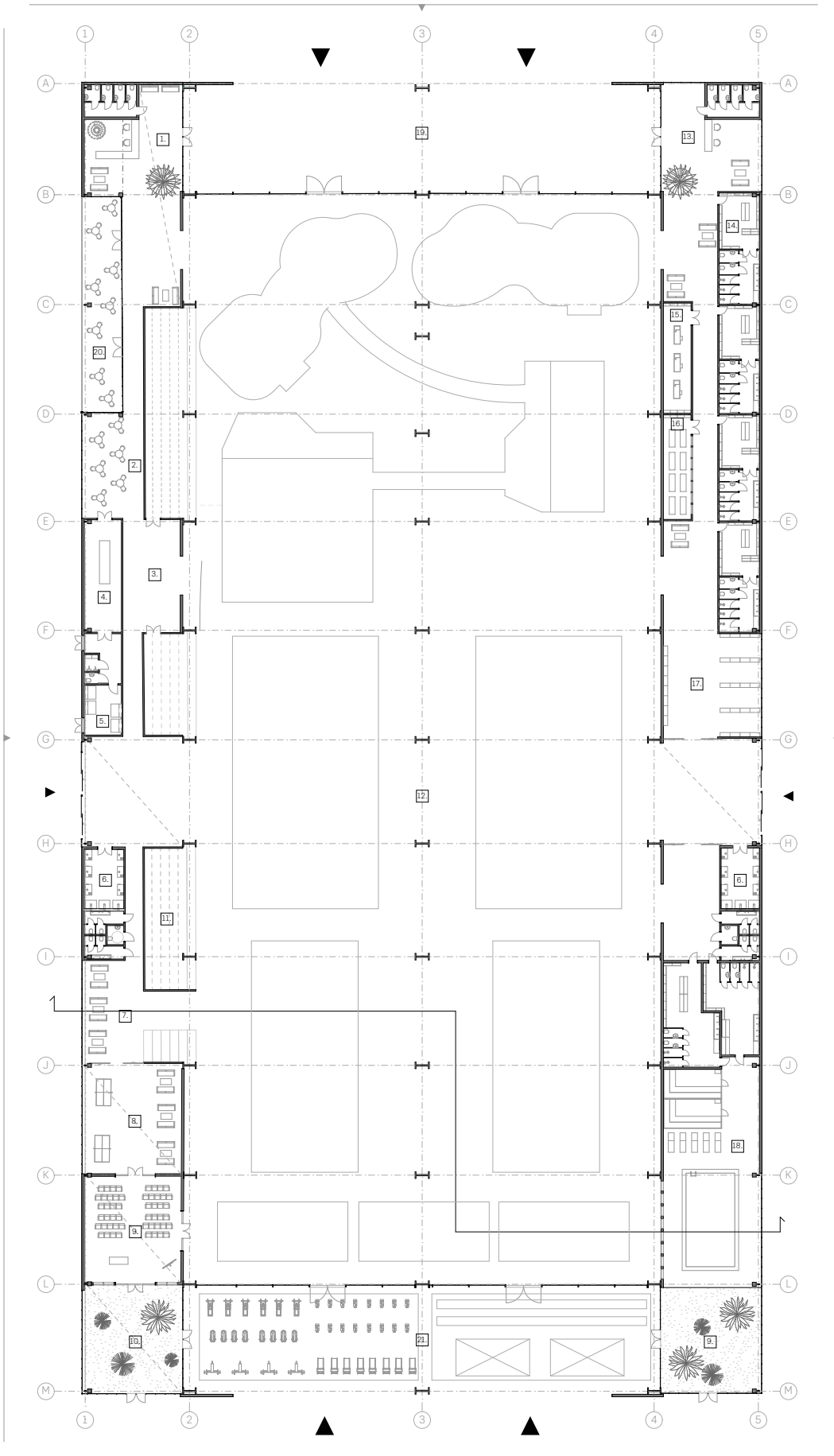
CHARACTERISTICS: sturdy, intact, durable, preserved, steel, wooden



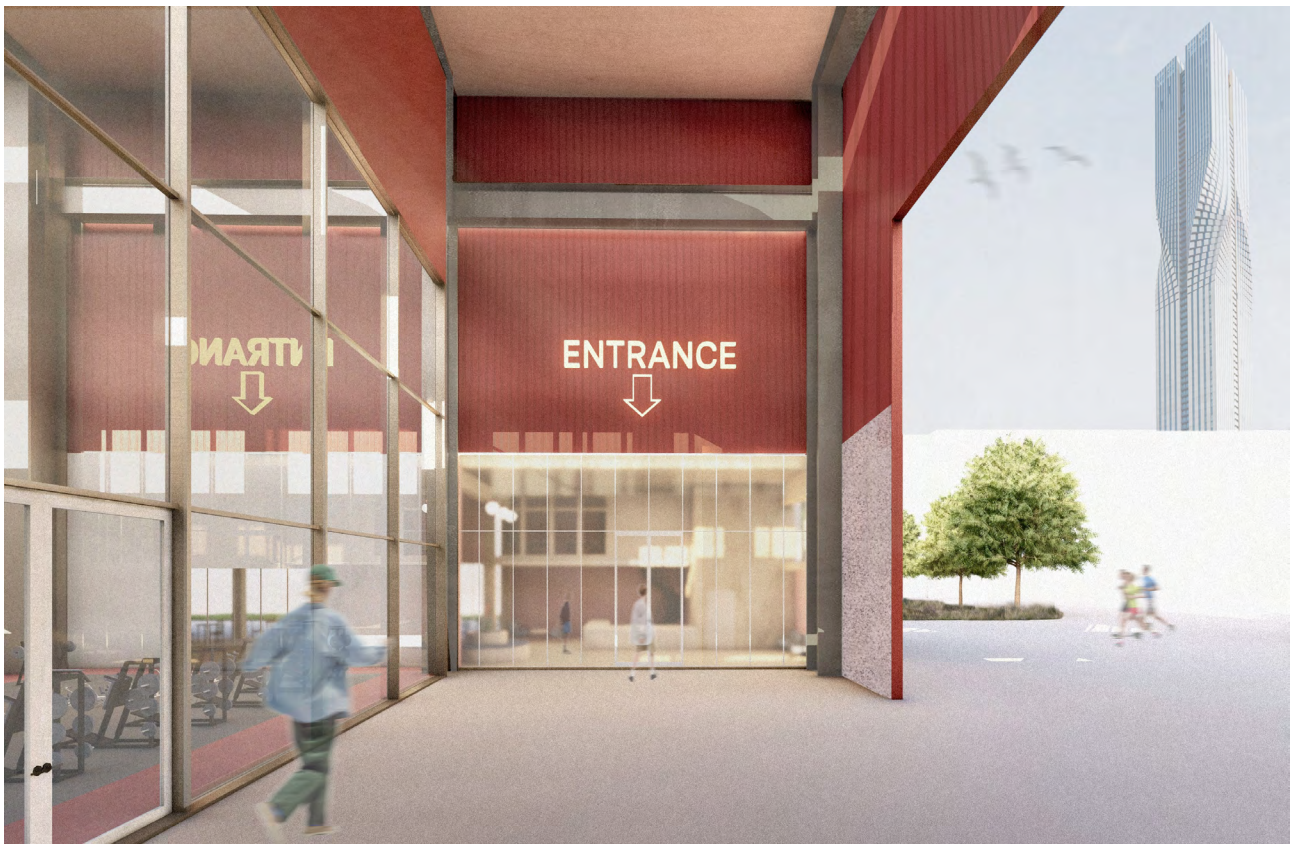
01 FUNDAMENTS

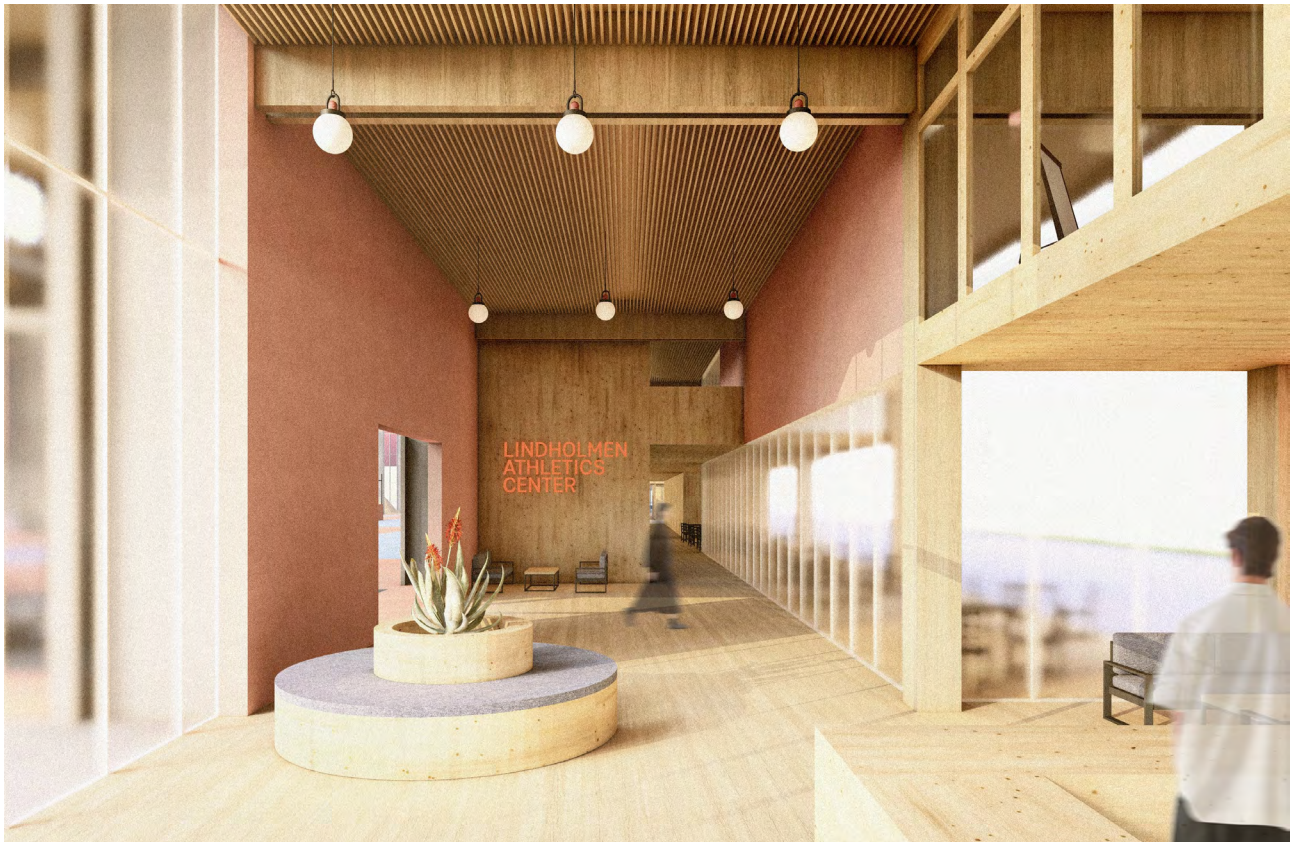
MEASUREMENTS: steel - 4 x 2 x 1 m
wood - 3 x 2 x 1m
QUANTITY: steel - 39
wood - 26
TOTAL AREA: steel - 3 rows
wood - 2 rows

CHARACTERISTICS: reincofrced conrete foundaments under every column


1
2
3
4
5
A
B
C
D
E
F
G
H
I
J
K
L
M
1.
2.
3.
4.
5.
6.
7.
8.
9.
10.
11.
12.
13.
14.
15.
16.
17.
18.
19.
20.
21.

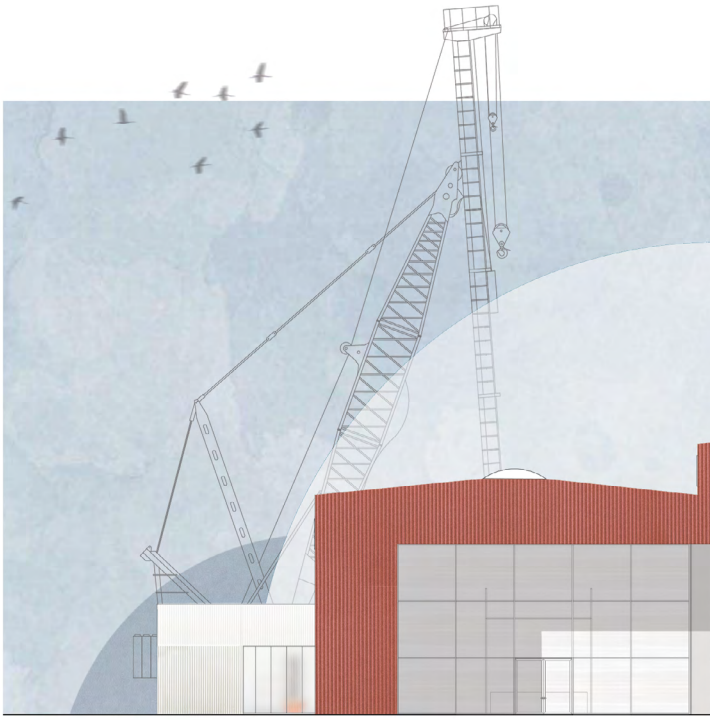
0
2.5
5
7.5
10m



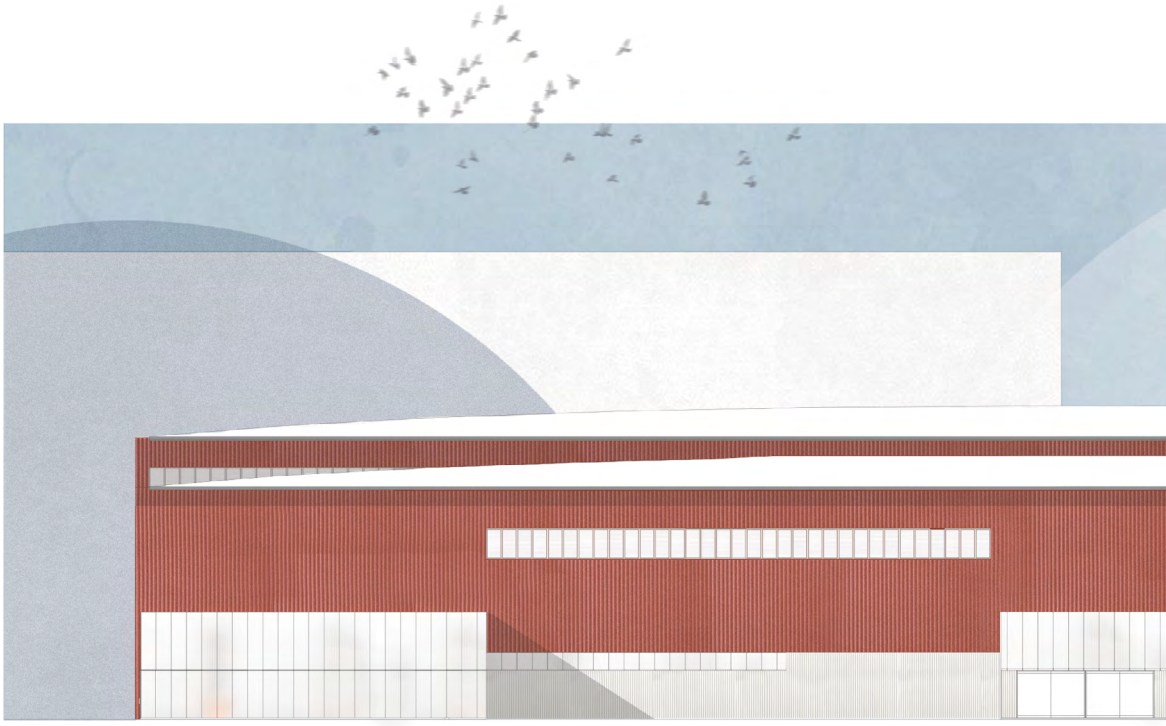


ENTRANCE & RECEPTION VIEW

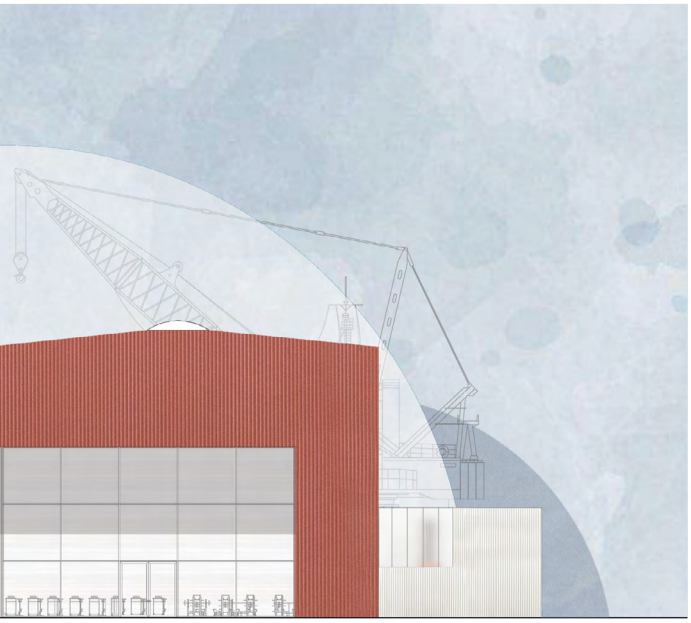
N

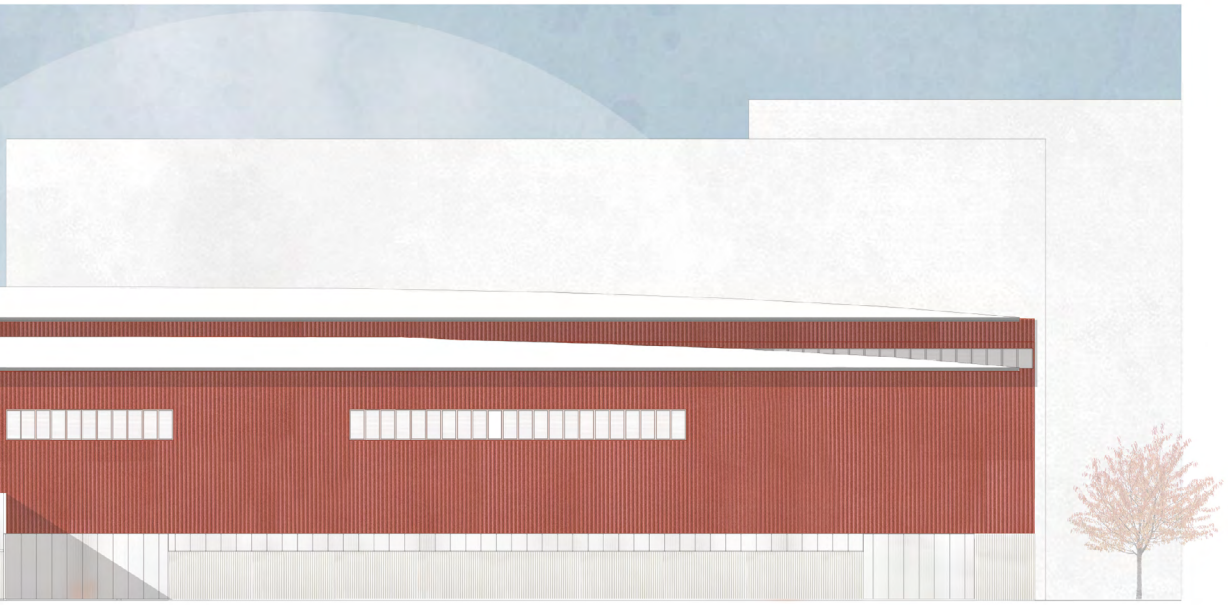


E

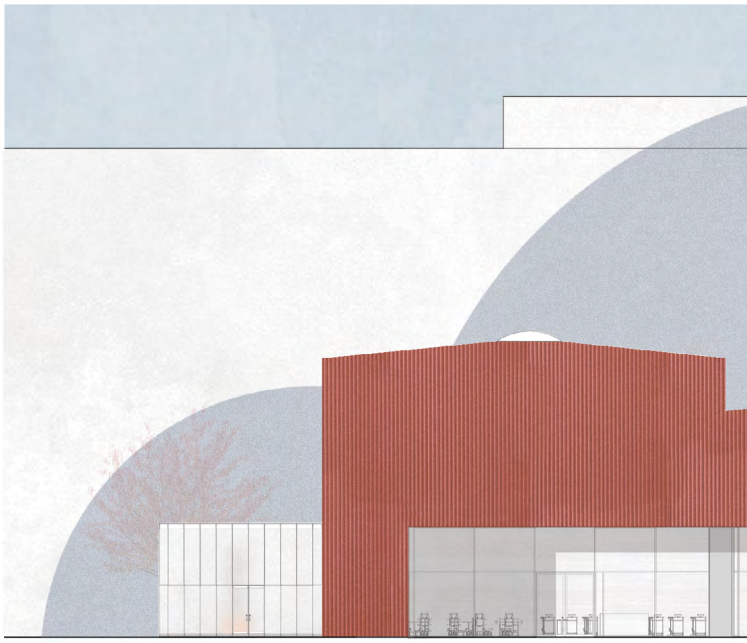


0 2.5 5 7.5 10m

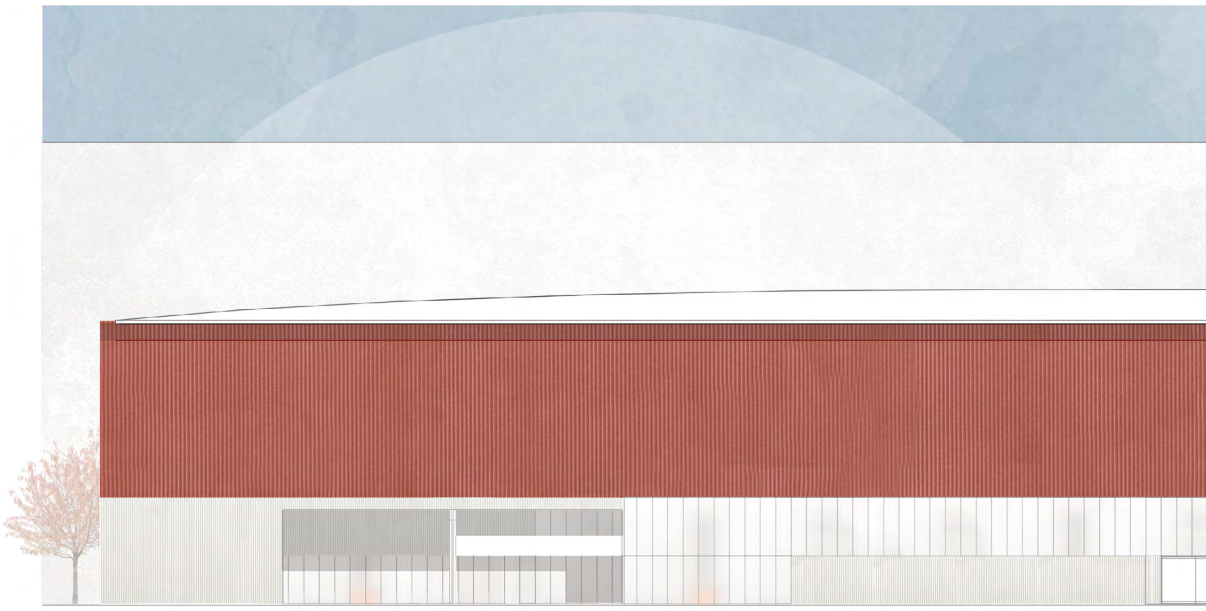




S

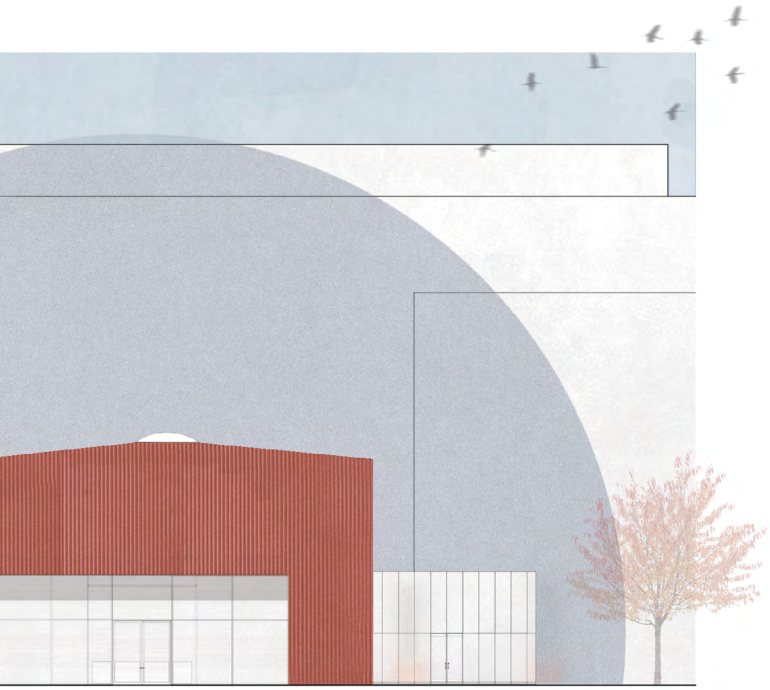


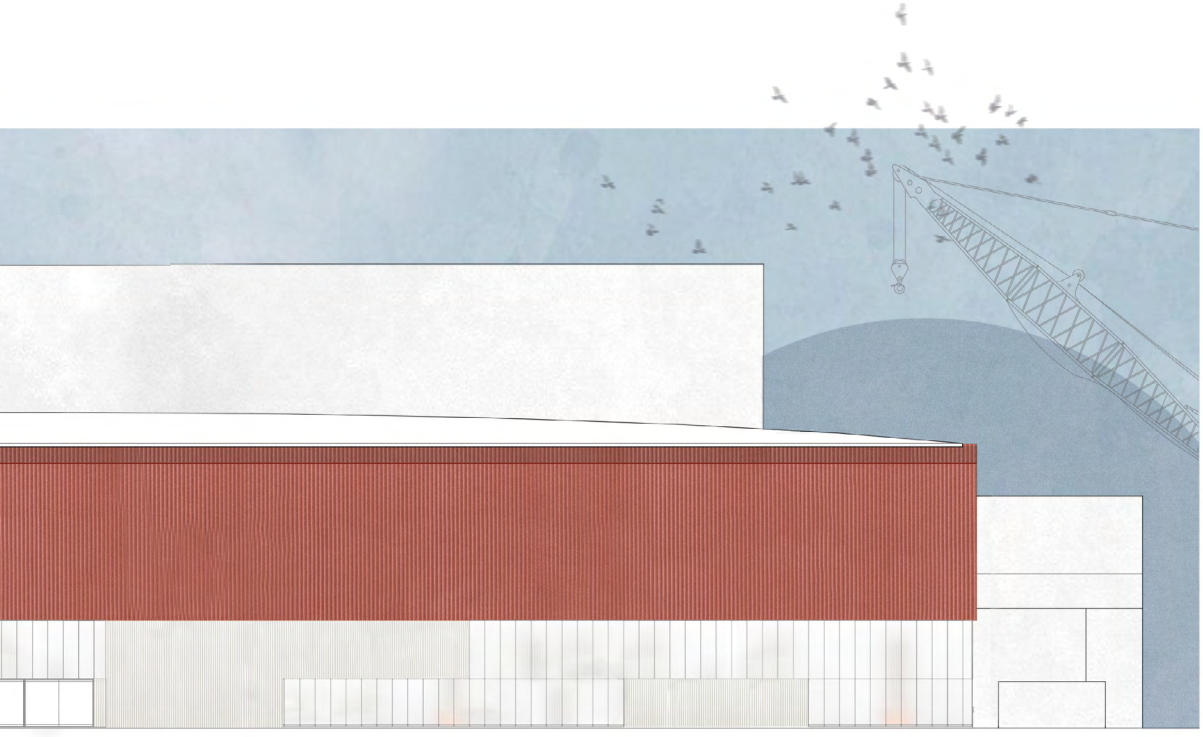
W

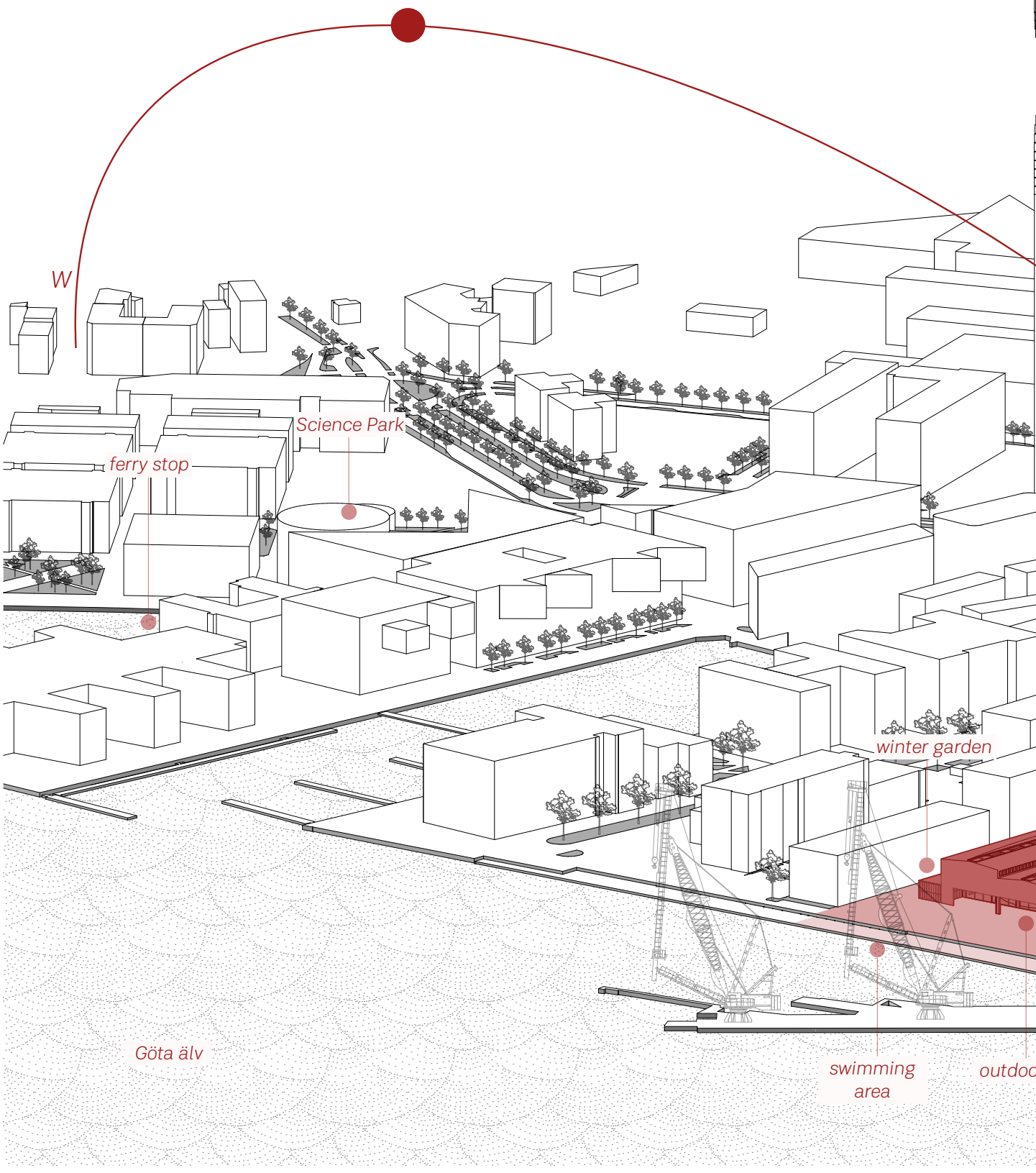


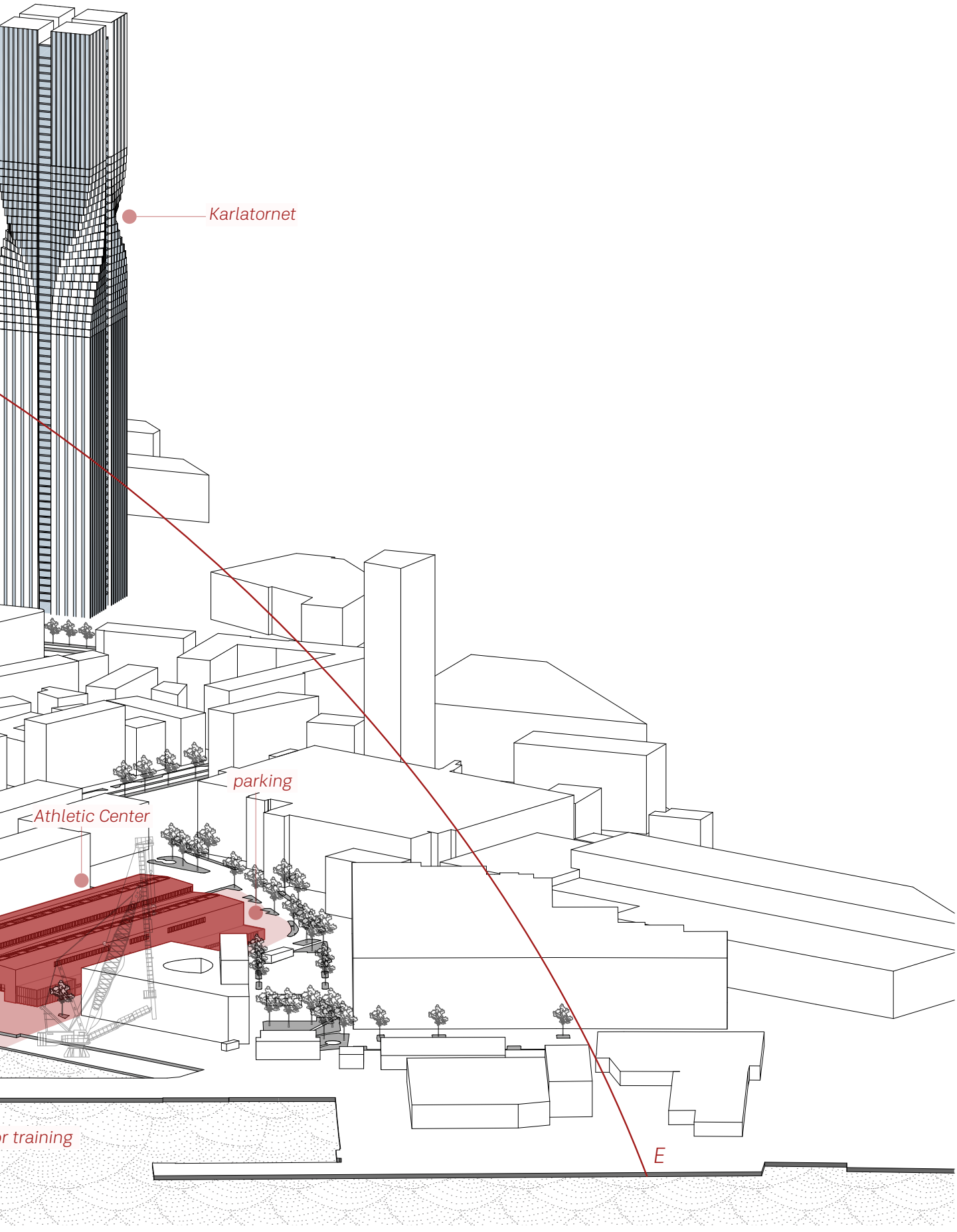
0 2.5 5 7.5 10m

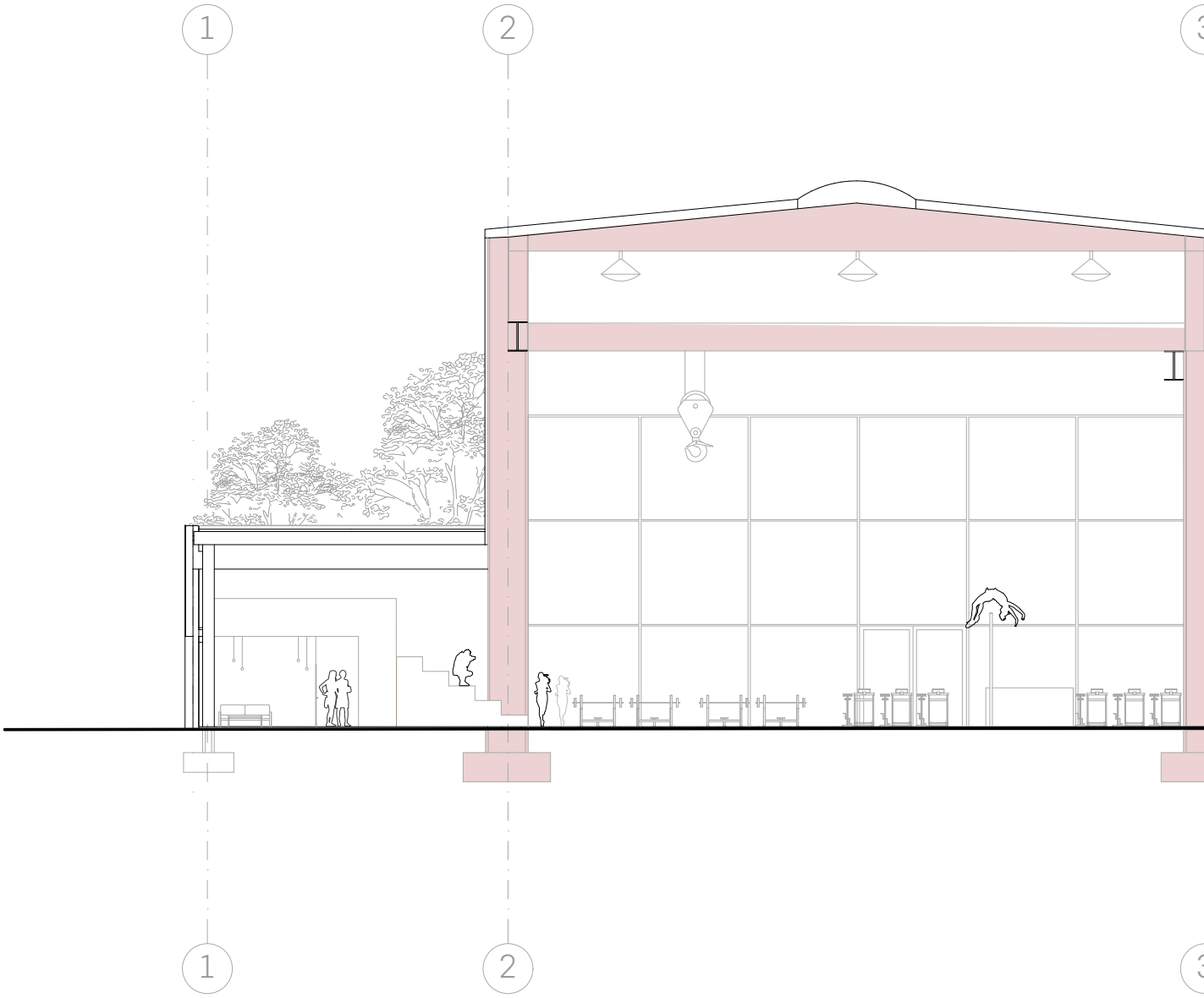
FACADES 1:300

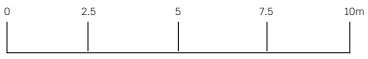




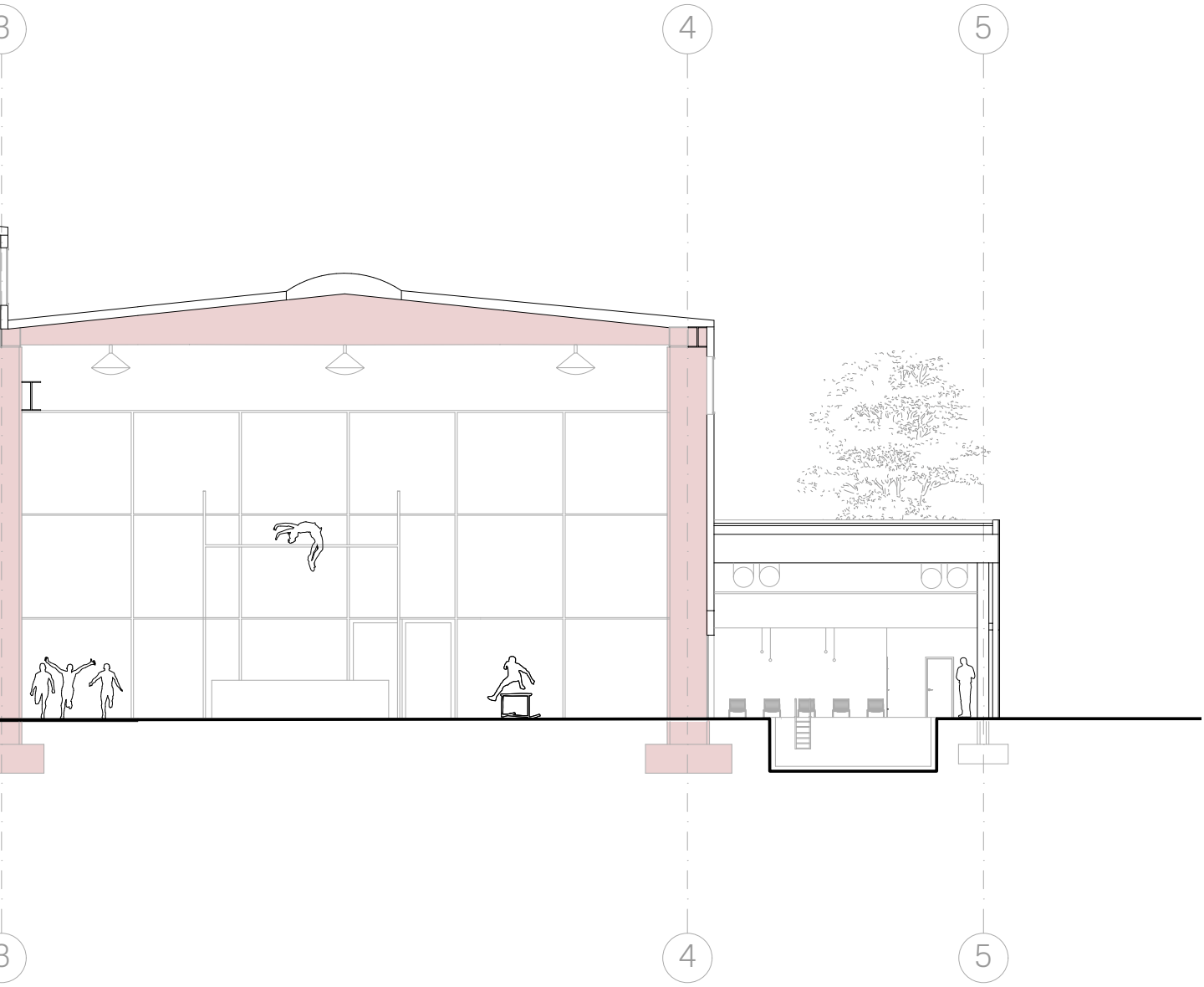

W
Science Park
ferry stop
winter garden
Göta älv
swimming
area
outdoo

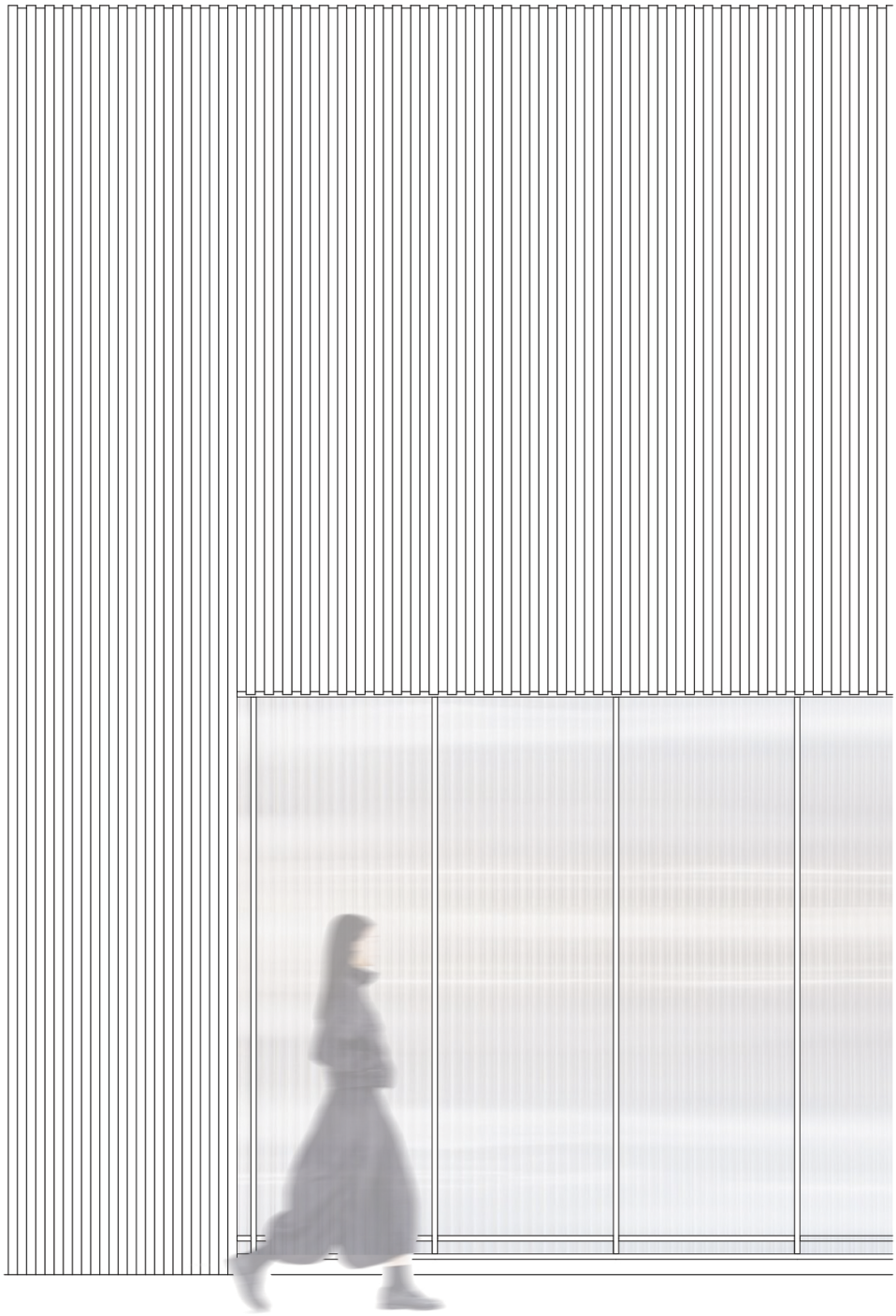

Karlatornet
parking
Athletic Center
r training
E



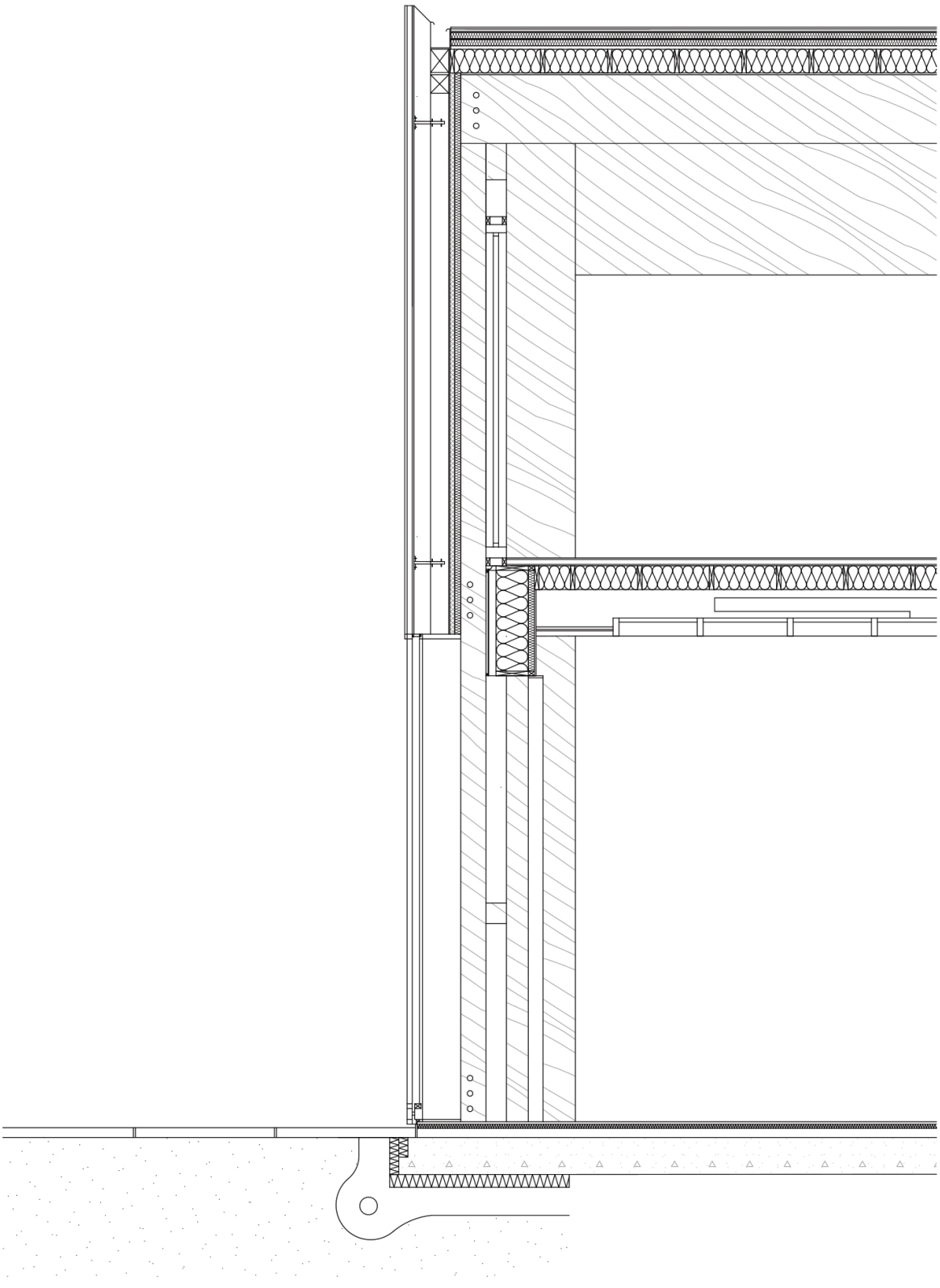


SECTION I-I 1:200

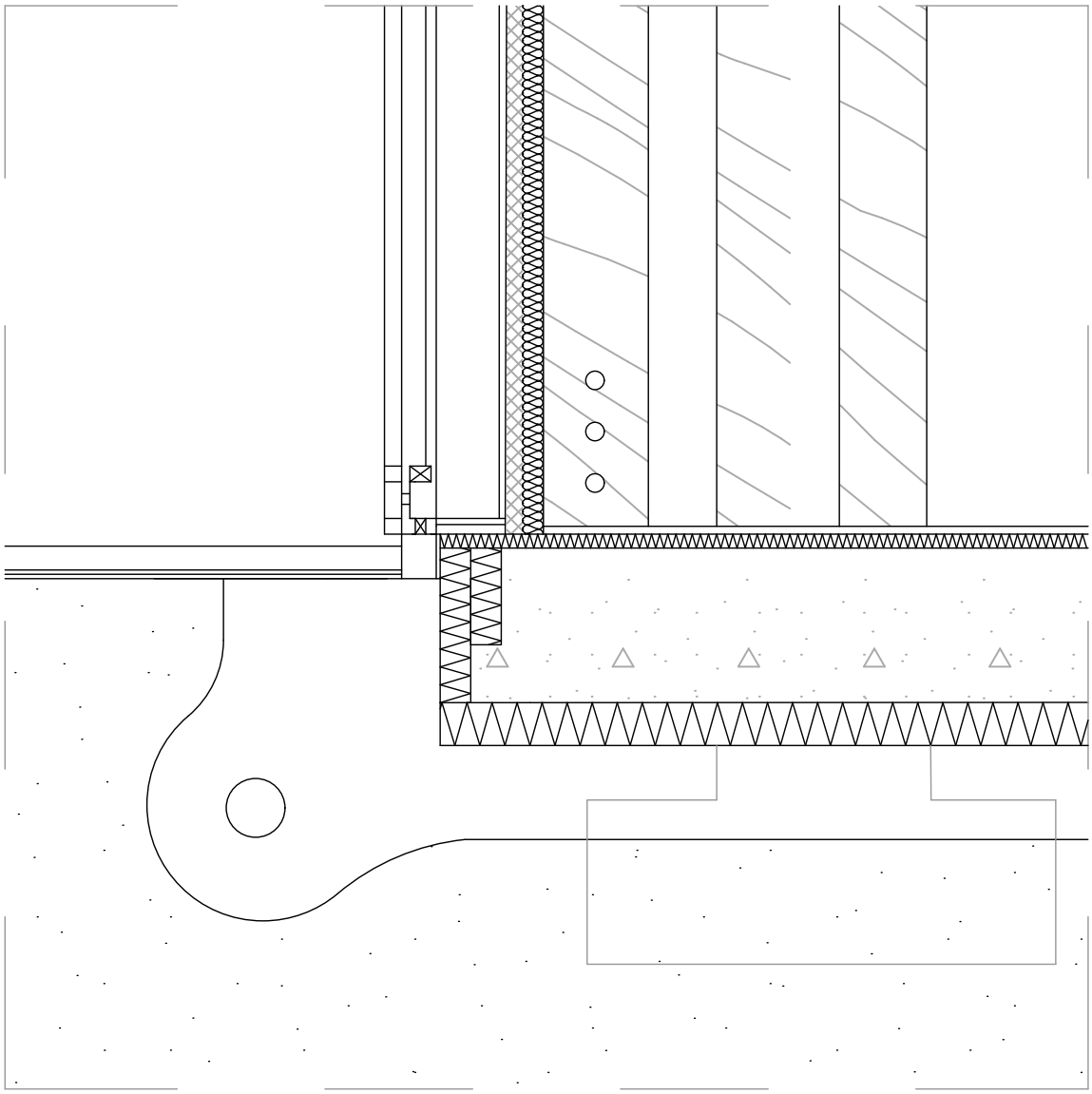

3
4
5
3
4
5



FACADE DETAIL 1:40

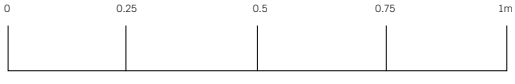


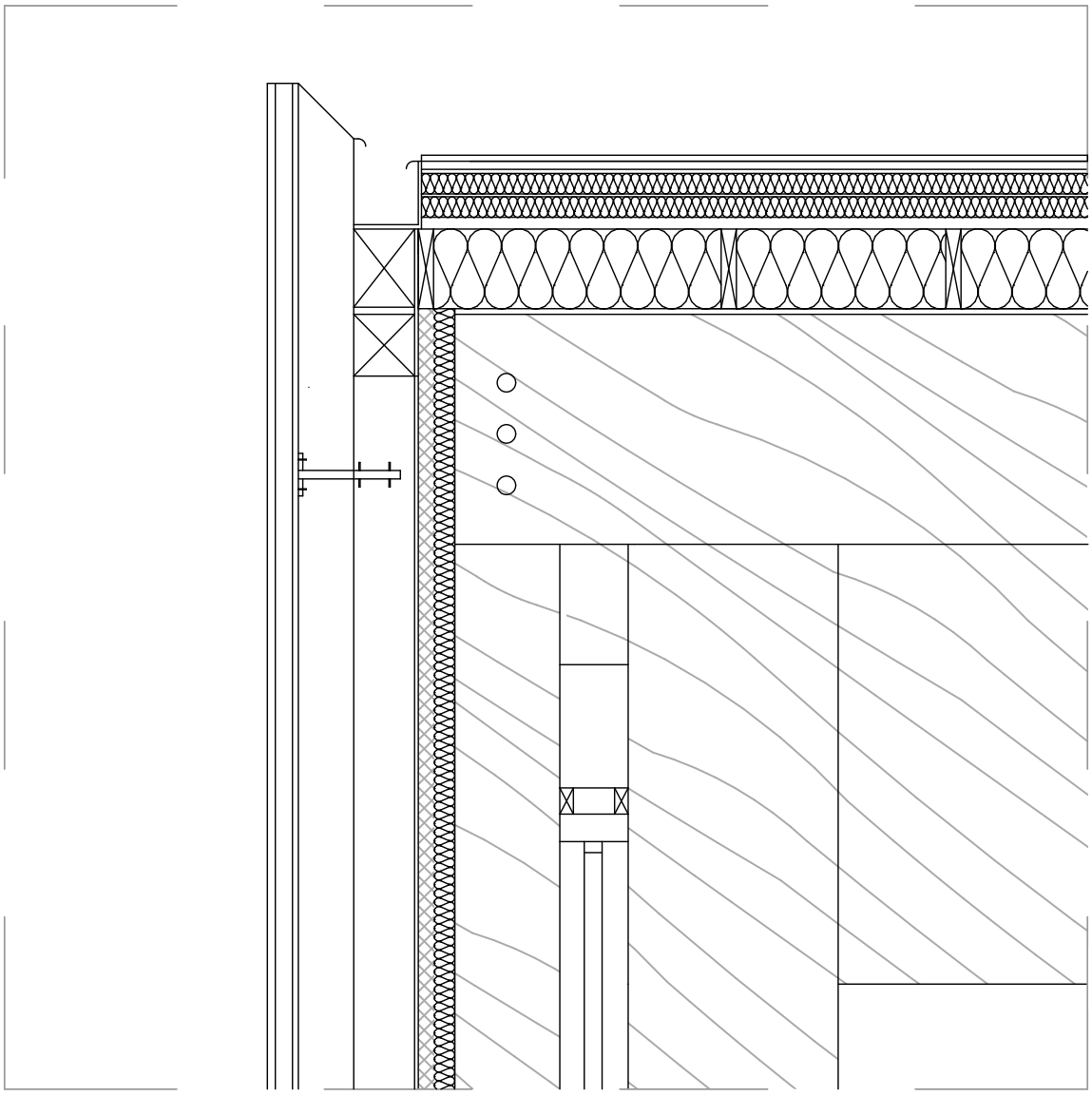
DETAIL SECTION 1:50



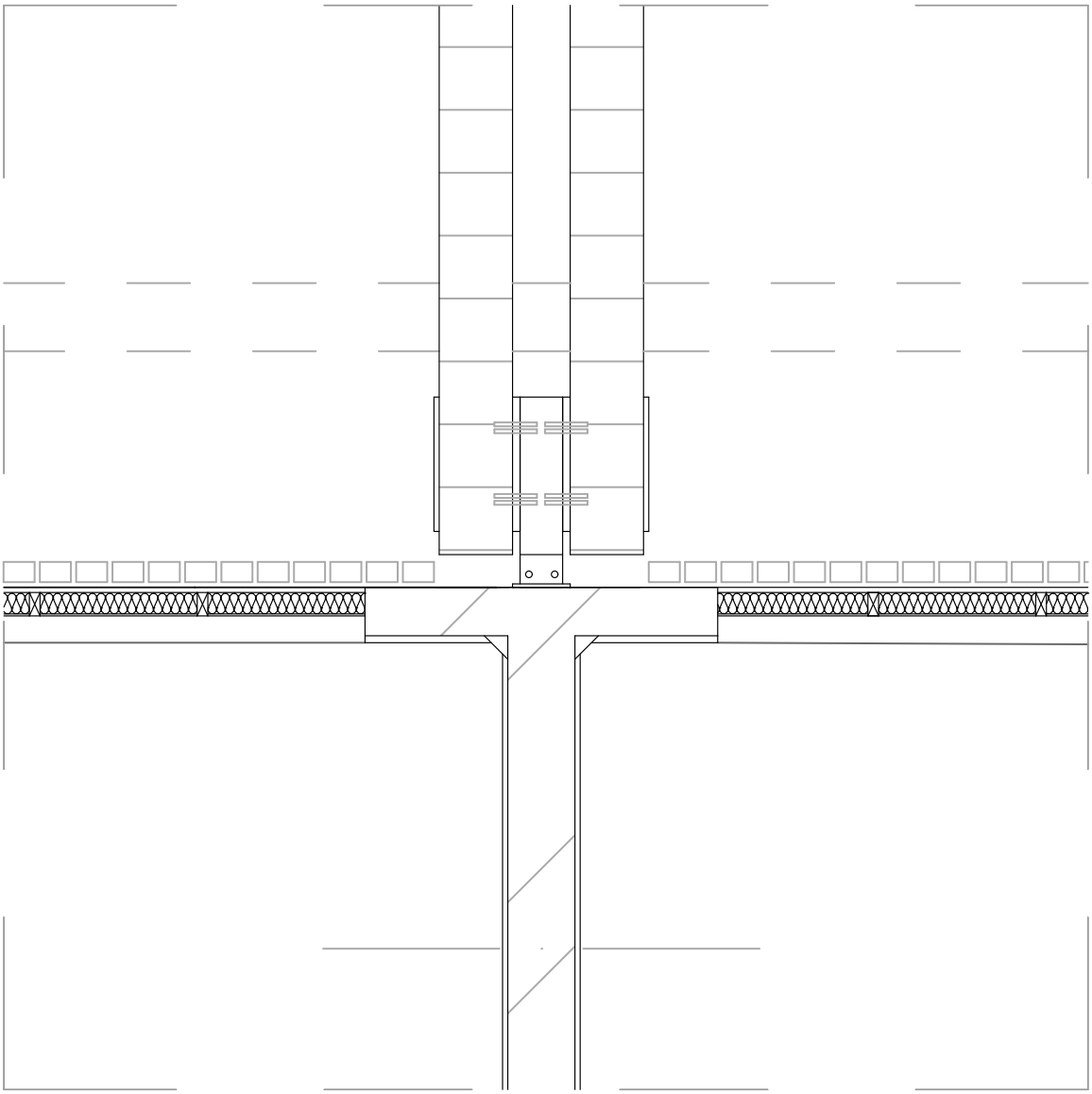
FLOOR
25 PINE FLOORING
3 UNDERLAY FOAM
22 FLOOR CHIPBOARD
20 IMPACT SOUND ISOLATION
VAPOR LAYER
300 CONCRETE

WALL
420 CLT COLUMN
100 LVL COLUMN
45 JOINST INSULATION
1 VAPOR LAYER
300 JOINST INSULATION
34 AIRGAP/BATTENS
40 SEAMLESS TRANSLUCENT POLYCARBONATE PC2540-7

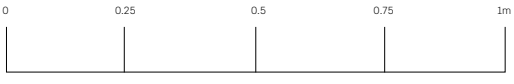


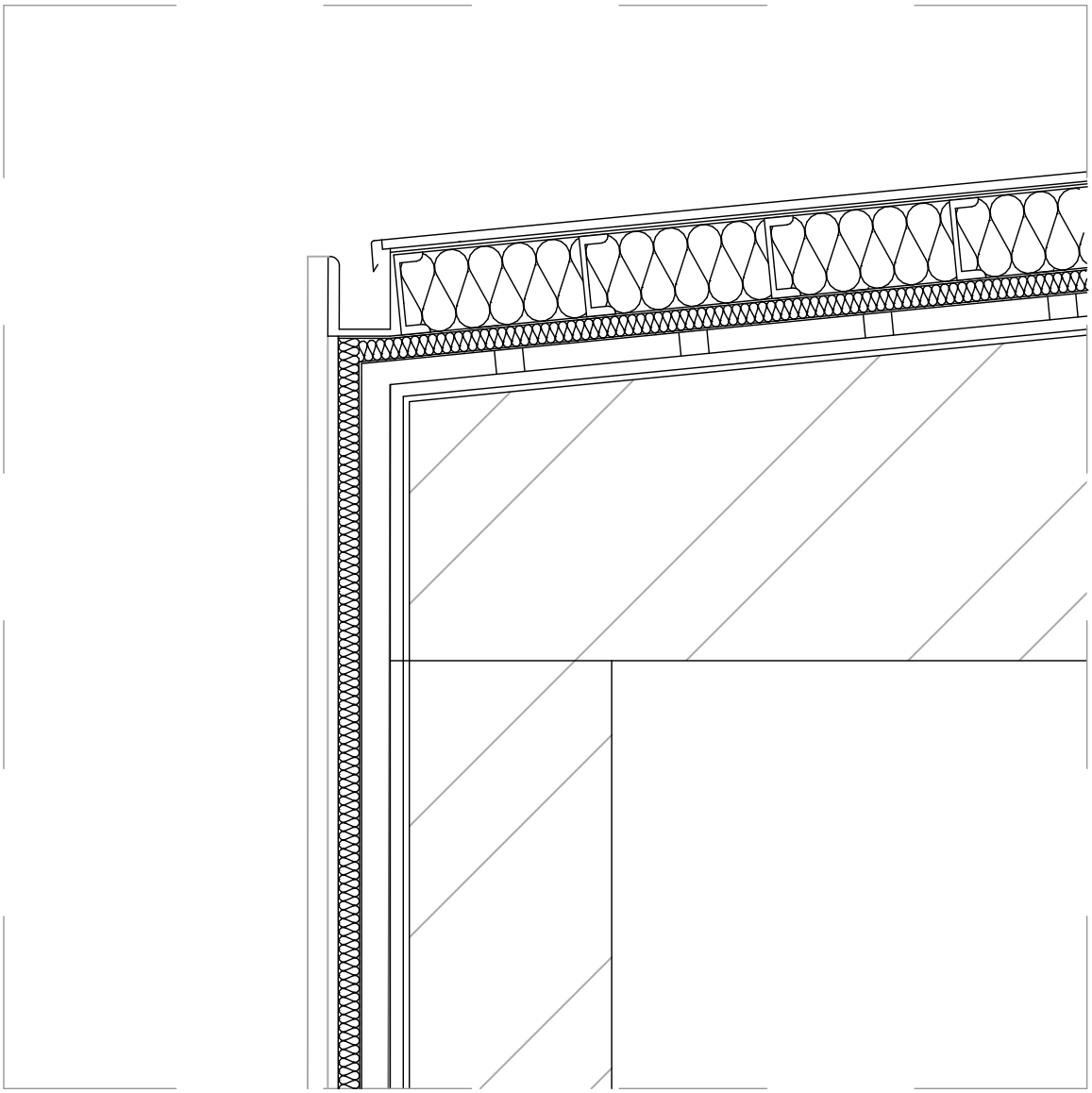


ROOF
990 CLT BEAM
AIR BARRIER
200 INSULATION
40 BATTENS
40 IMPACT SOUND ISOLATION
2 SAFETY MESH
40 INSULATION
2 UNDERLAYMENT
AIR BARRIER
2 WATER PROOF BARRIER
130 METAL ROOF CLADDING

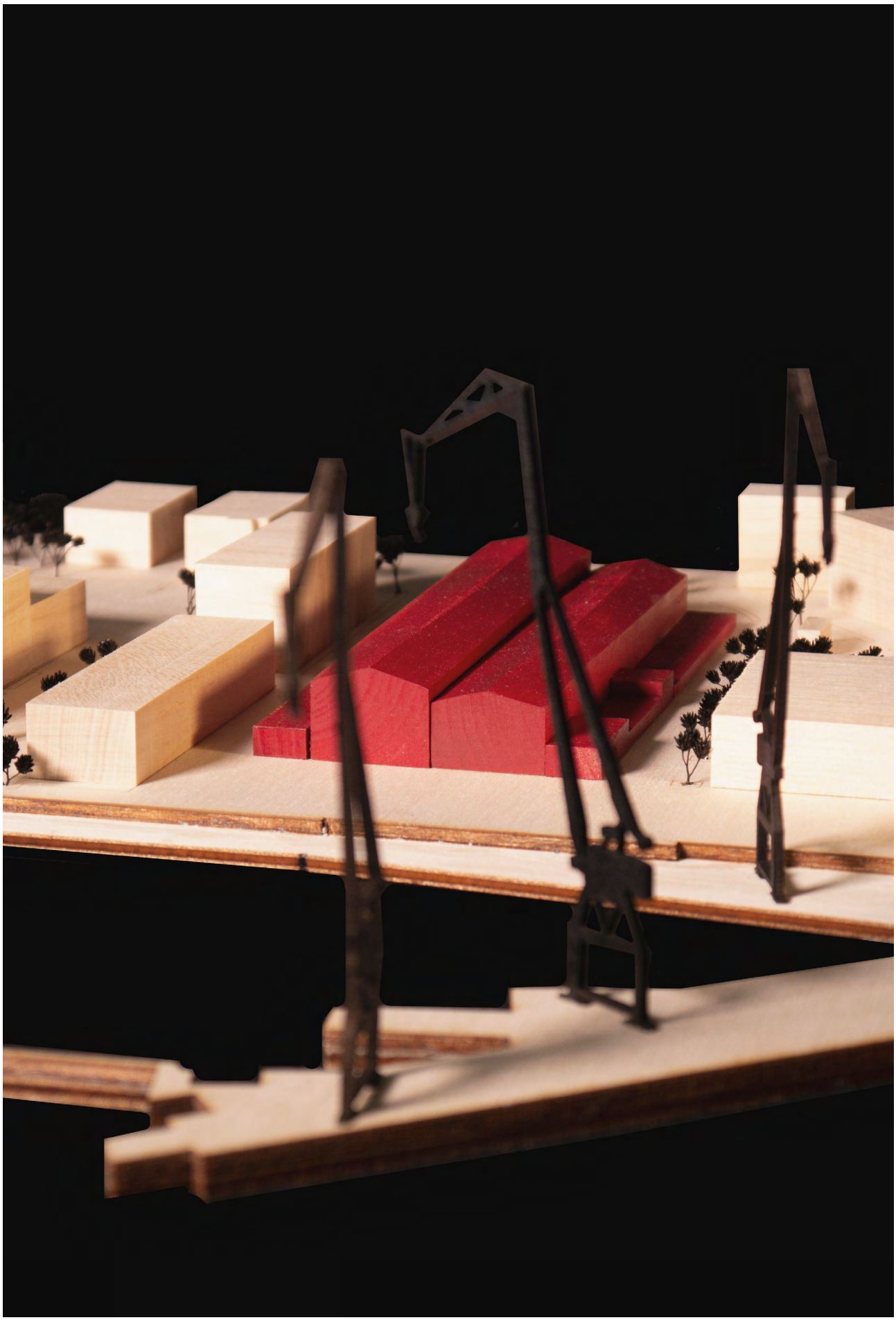


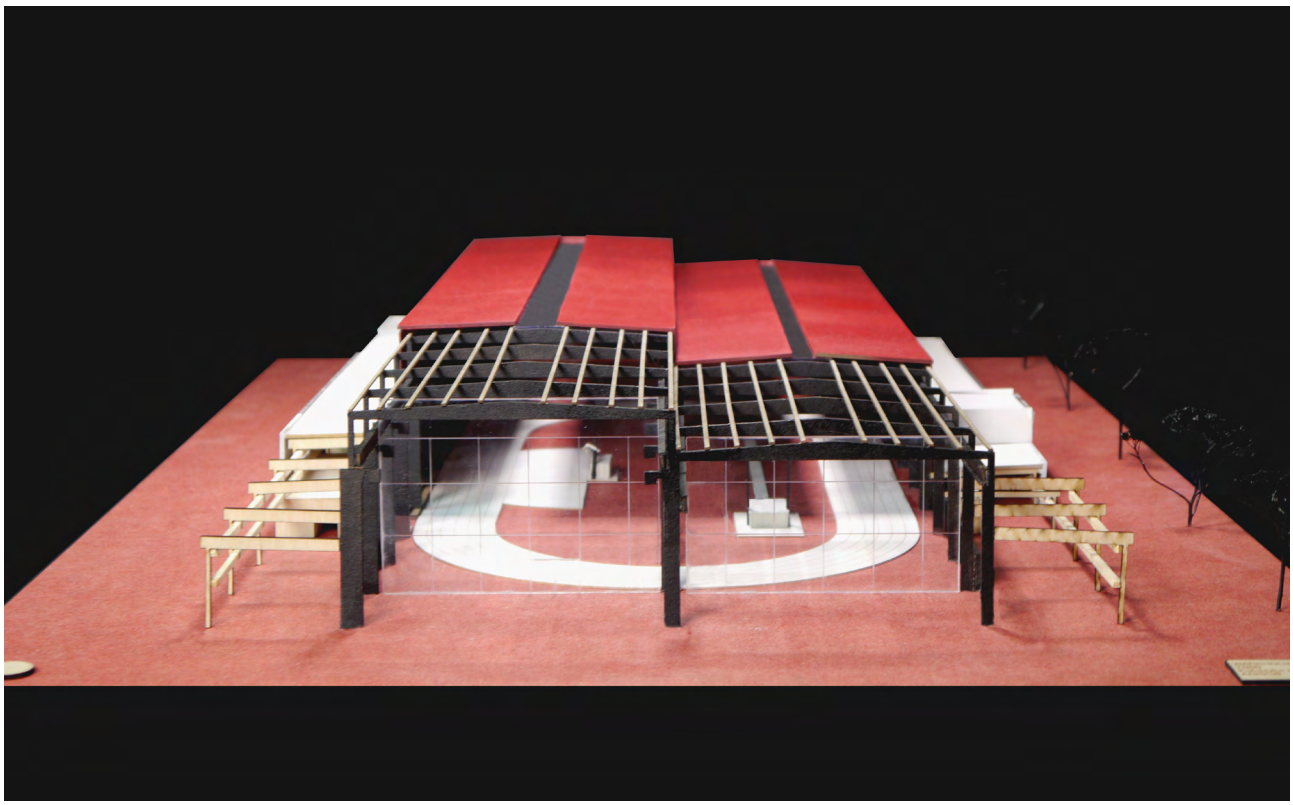
WALL CONSTRUCTION
METAL CLADDING CC RUBY RED
45 JOINST/INSULATION
1 VAPOUR LAYER
10 WIND BOARD
60 INSULATION
30 BATTENS
300 CONCRETE
STEEL CONSTRUCTION COLUMN IPE 100

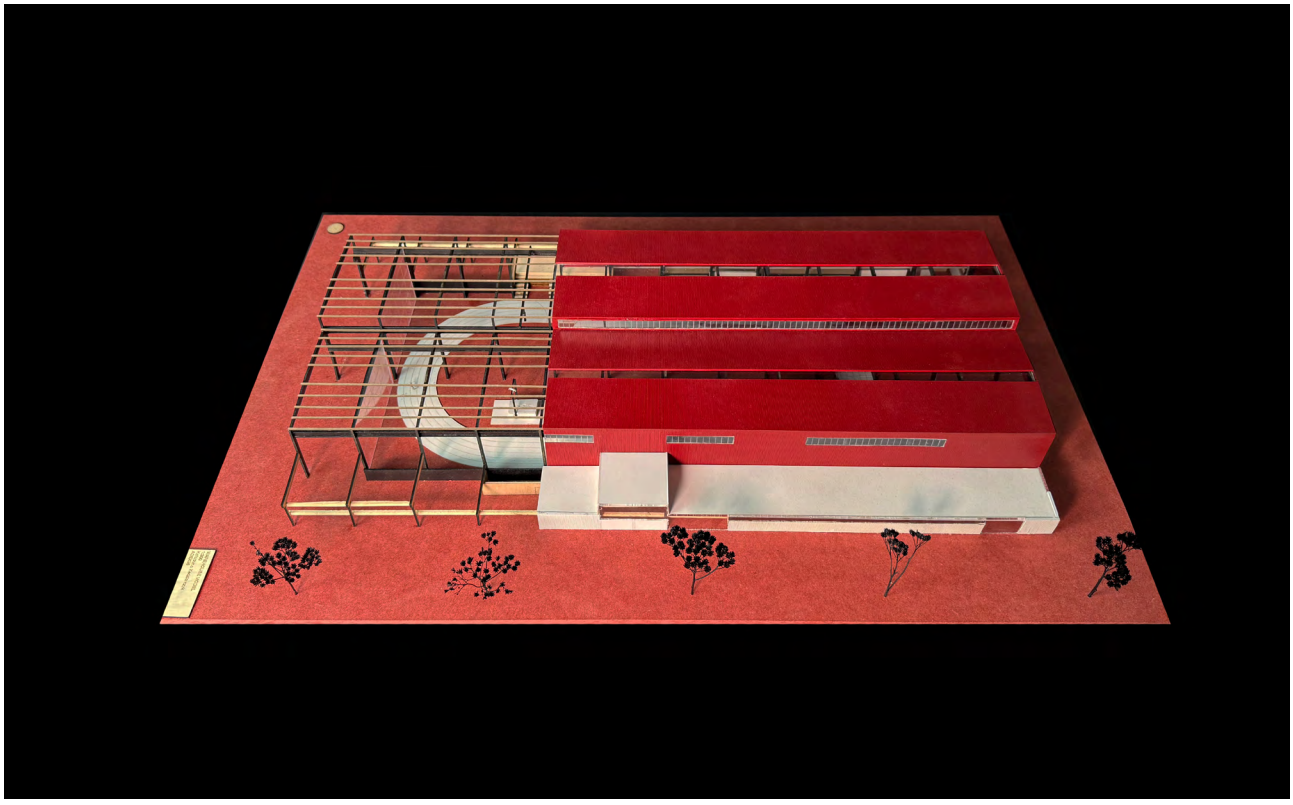




ROOF
STEEL CONSTRUICTION COLUMN IPE 100
AIR BARRIER
40 BATTENS
20 IMPACT SOUND ISOLATION
PURLINS&CLEATS
200 INSULATION
2 SAFETY MESH
AIR BARRIER
2 UNDERLAYMENT
2 WATERPROOF BARRIER
130 METAL ROOF CLADDING







DISCUSSION

This master's thesis aimed to answer the question of how adaptive reuse and redesigning of an industrial warehouse in Lindholmen/Gothenburg, can preserve its industrial character while integrating steel and wood. The motivation for this topic stems from mix of personal experience with athletics but also a broader inquiry into the lack of year-round, professional training spaces for athletic sports in Gothenburg. Furthermore, throughout the design, it has been investigated how integrating those new additions can enhance and optimize the indoor environment for athletes. While initially, the idea for that project was focused on technical issues of ventilation, openings, and daylight – especially concerning existing windows and skylights - these subjects became secondary to broader focus of construction, materiality, and tectonics.

Major part of this thesis involved an investigation of historical materials about Lindholmen, the closest area to the ship warehouse, and most importantly, analyzing archive plans and construction documentation about the ship warehouse. Simultaneously, inventarization has been conducted by study visit, photography and site analysis. All the materials were consolidated and discussed during design consultations to determine what elements of the structure could be preserved, reused or required demolition. This decision-making phase proved critical and challenging process, particularly due to the limited availability of detailed material records and current condition assessments. However, the outcome of these investigations led to the new proposal of two wing additions (each 10m width) to the existing construction and create space where the history of the place meets new sustainable approach.

Choosing and analysing six reference projects helped with deciding what materiality will cover the new additions, how to reuse old industrial facilities, and how the new design can enhance the performance of athletes. With the choice of new wooden construction, the aim was to create a space that will emanate warmth, tranquility and natural aesthetic qualities of wood. Given Sweden's extensive forestry industry and commitment to sustainable timber production, wood was a logical and environmentally responsible choice. The main training hall maintains still the industrial character – as the steel construction is renovated and left. Due to different properties of steel and wood the contrast can be clearly visible and ads curiosity which space holds what character. This combination ensures the new design does not dominate the existing structure but rather contributes to an evolving narrative of place. Due to high rains it that geographical area wood hasn't been chosen for outer cladding of the new additions.

Due to the different material properties of wood and steel, the measurements resulted in differences between existing and new construction. That creates distinct spatial atmospheres. From the exterior, the facility maintains the robust industrial character. Internally, the main training hall acts as a transition space between the preserved steel and newly introduced wood, whereas the new addition holds a natural and warm wood character. Particular attention was given to the construction details of the junction between wooden beams and steel construction as well as the steel/polycarbonate façade to the wooden construction. In that case, two references hold major value: Game Streetmekka Viborg and Micasa vol.C. In both those cases, architects balanced between what has an industrial character and what emphasises the new additions.

Another key aspect of the design was optimizing the training area to enhance and support the performance of athletes. That involved in strategic and new placement of windows (to avoid direct glare while maintaining natural light), removal of internal partitions in the facility (creating a larger and open space for the main running track and storage of the equipment). The possibility of movable facades (big doors) in the east and west wings created a possibility to open the facility, letting fresh air in and creating a connection between the outdoors and indoors during spring and summer.

Overall, this master thesis work has presented the complex challenge of balancing preservation with innovation – determining which historical elements warrant conservation and which require remaining. The interplay between the robustness of steel and the warmth of wood became a central theme in achieving a harmonious yet dynamic architectural composition. What could be investigated further is the specific ventilation requirements for training facilities and how to implement movable facades and doors. Additionally, the potential for multifunctionality—such as repurposing the training hall for alternative uses like a food market on weekends—could enhance the building's social and economic viability. It is my hope that anyone reading this thesis will enjoy it as much as I did, without having any prior knowledge about this subject.

BIBLIOGRAPHY

Literature:

1. Cairns, Stephen, and Jane M. Jacobs. (2014). Buildings Must Die: A Perverse View of Architecture. Cambridge: MIT Press.
2. City of Gothenburg. (2023). Urban Development in Gothenburg: Lindholmen District. Available from: https://goteborg.se/lindholmen
3.City of Gothenburg's Action Plan for Events 2023-2026 (2024) City of Gothenburg's destination development programme. Available from: https://goteborgco.se/uploads/2024/04/Handlingsplan-Evenemang_Eng-1.pdf
4. Croisette (2025) Croisette Industrial Real Estate Report 2025. Available from: https://croisette.com/reports/industrial-real-estate-report-2025/
5. Göteborgs Stad. (2023). ElectriCity: Sustainable Transportation Solutions. Available from: https://goteborg.se/electricity
6. Isabela Narea for Designboom (2017) MVRDV and BSK arkitekter to transform warehouse into riverfront cultural hub in sweden. Available from: https://www.designboom.com/architecture/mvrdv-bsk-arkitekter-magasin-113-sweden-09-06-2017/
7. "Lindholmen – en stadsstel I Göteborg" (1973) Chalmers Tekniska Högskola, Sektionen för Arkitektur, Göteborg.
8. Lindholmen Science Park. (2022). Innovation and Collaboration at Lindholmen. Available from: https://lindholmen.se
9. Migrationsverket (2024). Sweden's Geography and Climate. Available from: https://www.migrationsverket.se/
10. Olympics (2024) Mondo Duplantis sets pole vault world record for the 10th time. Available from: https://olympics.com/en/news/mondo-duplantis-sets-pole-vault-world-record-10th-time
11. Swedish Athletics Federation (2023). Facility and Infrastructure Report Available from: https://www.friidrott.se/forening-forbund/forbund/forbundsinfo/styrelsemoten/rapporter-2023
12. Swedish Wood. (2023). Sustainable Development in Three Ways – Gjuteriet. Available from: https://www.swedishwood.com/
13. The Port of Gothenburg. (2024). History of the port. Available from: https://www.portofgothenburg.com/about/history-of-the-port/
14. Urban Next Lexicon (2025) Gjuteriet: Industrial Heritage Reimagined. Available from: https://urbannext.net/gjuteriet-industrial-heritage-reimagined/
15. Time Magazine. (2023). Sweden's Stockholm Wood City Is the Future of Sustainable Urban Design. Available from: https://time.com/7207873/sweden-stockholm-wood-city-sustainability/
16. Varvshistoriska Föreningen. (2024). The yards. Available from: https://varvshistoriska.se/litteratur.

Practical references:

1. ArchDaily (2018) / Streetmekka Viborg / EFFEKT. Available from: https://www.archdaily.com/902877/streetmekka-viborg-effekt
2. ArchDaily (2019) / Game Streetmekka Aalborg / JAJA Architects. Available from: https://www.archdaily.com/914863/game-streetmekka-aalborg-jaja-architects?ad_medium=gallery
3. Divisare (2024) / Millside Red Barn / StoneWoodDesign. Available from: https://divisare.com/projects/511360-stonewood-design-nick-dearden-millside-red-barn
4. Divisare (2024) / WHITE SHED / ATELIER 111. Available from: https://divisare.com/projects/421045-atelier-111-alex-shoots-buildings-white-shed?utm_campaign=journal&utm_content=image-project-id-421045&utm_medium=email&utm_source=journal-id-362
5. ArchDaily (2018) / Micasa vol.C / Studio mk27. Available from: https://www.archdaily.com/894663/micasa-vo-studio-mk27?ad_medium=gallery4.
6. ArchDaily (2017) / Rooftop Sauna / Aalto University - School of Arts, Design and Architecture. Available from: https://www.archdaily.com/884586/rooftop-sauna-in-london-aalto-university-school-of-arts-design-and-architecture?ad_medium=gallery

Figures:

Figure 1. Available from: https://digitaltmuseum.se/011015431573/lindholmens-varv-goteborg-vykort-forestallande-goteborgs-hamn-och-lindholmens
Figure 2. Available from: https://digitaltmuseum.se/021015640578/lindholshamnen-i-goteborg-m-s-hallaren-av-goteborg-vid-kajen-fil-lic-gunnar
Figure 3. Available from: https://varvshistoriska.se/
Figure 4. Available from: https://varvshistoriska.se/
Figure 5. “Lindholmen – en stadsstel I Göteborg” (1973) Chalmers Tekniska Högskola, Sektionen för Arkitektur, Göteborg, page 14, 106, 142
Figure 6. “Lindholmen – en stadsstel I Göteborg” (1973) Chalmers Tekniska Högskola, Sektionen för Arkitektur, Göteborg, page 14, 106, 142
Figure 7. “Lindholmen – en stadsstel I Göteborg” (1973) Chalmers Tekniska Högskola, Sektionen för Arkitektur, Göteborg, page 14, 106, 142
Figure 8. Available from: https://varvshistoriska.se/
Figure 9. Available from: https://www.lensculture.com/articles/klaus-lenzen-pole-vault
Figures 10.,11. Available from: https://www.archdaily.com/902877/streetmekka-viborg-effekt
Figures 12.,13. Available from: ttps://www.archdaily.com/914863/game-streetmekka-aalborg-jaja-architects?ad_medium=gallery
Figures 14.,15. Available from: https://divisare.com/projects/511360-stonewood-design-nick-dearden-millside-red-barn
Figure 16.,17. Available from: https://divisare.com/projects/421045-atelier-111-alex-shoots-buildings-white-shed?utm_campaign=journal&utm_content=image-project-id-421045&utm_medium=email&utm_source=journal-id-362
Figure 18.,19. Available from: https://www.archdaily.com/894663/micasa-vo-studio-mk27?ad_medium=gallery4.
Figure 20.,21. Available from: https://www.archdaily.com/884586/rooftop-sauna-in-london-aalto-university-school-of-arts-design-and-architecture?ad_medium=gallery