

Naturum Haverdal

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Examiner: Björn Gross
Supervisor: Filip Rem

Graduation year 2023

Chalmers School of Architecture
Department of Architecture and Civil Engineering





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M. Sc Architecture and Urban Design

Abstract

The vastness of the ocean, the sound of waves crashing on the shore, and the subtle hues of green of the windswept trees. A sense of calmness and peace of mind. For many people, nature is a sanctuary. To preserve especially significant natural areas, the concept of nature reserves emerged in the 19th century.

Haverdal Nature Reserve, north of Halmstad, is one of the oldest in Halland County. Some of the most prominent characteristics of this coastal site include a vast stretch of beach that gradually transitions into undulating sand dunes, patchy fields of grass, reed, and mythical pine forests.

Apart from being a significant biotope, Haverdal is also an appreciated recreational area. To emphasize the importance of protecting this unique and fragile environment for future generations, knowledge is crucial. Therefore, the result of this thesis is a speculative design proposal for a naturum in Haverdal, a visitor center focusing on educating about the local ecosystem and cultural history.

The initial phase of the investigation involves defining naturum as a concept, providing a brief history and analysis of the site, including its unique ecological, historical, and geographical conditions. Following this, two built reference projects are studied. The result is the identification of four design principles, which are then tested and implemented in a final design proposal.

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Introduction

Aim and Purpose

For better or for worse, any form of architecture will inevitably interact with its surroundings. This is especially true of public buildings in nature. The design process for a visitor center located in a nature reserve should therefore involve careful considerations regarding, for example, placement, structure, sightlines, visual impact, materiality, and ecology.

This raises an important question:

How do you design a building on a site where a man-made structure maybe should not be built at all?

Throughout history, different approaches have been practiced in response to this complex question. As a point of departure, the initial investigation therefore includes a brief definition of naturum as a concept, an analysis of the site, as well as a study on built references with a similar approach to nature as the intended speculative design proposal for the naturum in Haverdal.

By identifying appropriate features, concepts, and principles for this context, the aim is to create a framework for deliberate and conscious decision-making considering the site's unique conditions and the architectural qualities and experiences a naturum in Haverdal Nature Reserve may offer to its visitors.

Thesis Question

What site-specific approaches and design strategies should be considered when designing a public building in nature?

Methodology

The method for developing a theoretical framework for this thesis is initially carried out through the study on the concept of naturum and an analysis of the site. This is done partially to build a knowledge base but also to provide a broader understanding of the context and discourse within this project.

As the naturum phenomenon is uniquely Swedish, the first part of the contextual exposition aims to define and clarify the purpose of this subject. Therefore, the first chapter investigates the history and ideas behind the naturum concept.

This is followed by a site analysis to identify the site's current conditions and circumstances. Additionally, a historical account of Haverdal Nature Reserve is conducted to place the project in a cultural landscape.

The reference projects, the Simpson-Lee House by Glenn Murcutt, and Flyttfågelmuseet by Jan Gezelius, are studied with a research on design approach. Since the Simpson-Lee House dates back to 1989 and Flyttfågelmuseet to 1957, their qualities can be assessed from a retrospective viewpoint. These buildings have certainly stood the test of time. Thus, today, the design principles used by Murcutt and Gezelius can arguably be considered well-grounded.

Although they differ in terms of function, size, and geographical context, the Simpson-Lee House and Flyttfågelmuseet provide relevant ideas regarding experiential qualities, structure, and their relationship to their surroundings. The analysis of each reference project is divided into two parts: one descriptive and one analytical. The initial part of each project's analysis contains a description, followed by three take-aways each.

Based on the collected knowledge derived from the material above, four essential design principles are crystallized: Wooden Construction, Minimized Footprint, Orientation, and Pathways. These principles are subsequently elaborated upon to form the theoretical framework for the final design proposal.

In the final design proposal, the above-mentioned principles are put into practice. Essentially, the design aims to embody the theoretical framework in every design choice.

Delimitations

As the primary content revolves around a highly speculative design proposal, there are several aspects not included within the scope of this thesis.

The first and perhaps most obvious concern relates to legislation, such as beach protection, which has not been addressed.

Another issue not factored into the proposal is the economic perspective. Considering the angular shape of the design, many bespoke solutions would likely be required to achieve the desired outcome. However, in reality, many of these solutions would expectedly be changed to standardized procedures due to economic reasons.

There is also the matter of energy efficiency. A large part of the façade area is covered in glass, mainly due to factors such as spatial experience, views, and exterior appearance. However, the high amount of glass might pose challenges concerning energy consumption and limit values. Estimations and passive strategies, such as sun shading and appropriate insulation, have been implemented. Nevertheless, no energy calculations have been conducted for the purpose of this thesis.

Finally, logistical matters related to construction, the placement of ventilation outlets, as well as municipal water and wastewater management, have been considered as solvable issues. However, these have not been accounted for in the investigation.

Reading Instructions

The chapter arrangement is structured linearly, enabling a progression from general to specific information. Following the introductory chapter, the thesis can be divided into three parts: the pre-study, the theoretical framework, and the design proposal.

The pre-study provides essential information about the naturum concept. Subsequently, the site analysis illustrates the unique characteristics and challenges of Haverdal Nature Reserve.

The theoretical framework begins with an account of two reference projects. The takeaways from these projects are to be considered influential on the final design. However, the four main design principles focus on the primary objectives of the project.

The design proposal is the realization of the pre-study and the theoretical framework combined. This chapter aims to exemplify how the thesis question can be addressed in an architectural project. Finally, the last chapter concludes with a discussion on how the final design aligns with the theory and objectives.

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Background



Naturum Vattenriket, Kristianstad

(Meyst, n.d.)

Naturum as a Concept

A naturum is a visitor center focused on education about local plant and animal life, geology, and cultural history. The Swedish Environmental Protection Agency defines naturum simply as “the port to nature” (Naturvårdsverket, n.d.). At the time of writing, there are 32 existing naturum centers in Sweden, with more currently under development.

The name “naturum” is a combination of the Swedish words “natur” (meaning nature) and “rum” (meaning room). It is spelled with a lowercase *n* and only one *r*. Naturum is a protected name owned by the Swedish Environmental Protection Agency, which also has the right to approve upcoming visitor centers with this title. However, the facilities are administered by either the County Administrative Board, the municipality, or a foundation.

The first three naturum centers in Sweden were built in 1973 and were located in Visby, Ödeshög, and Öland. Inspired by British and North American predecessors, the Swedish Environmental Protection Agency initiated this concept with the intention of increasing public interest in local nature and preservation (Sveriges Nationalparker, n.d.). The naturum centers are now considered a very important part of the information work for the national parks and nature reserves.

This turned out to be a successful campaign. There is now an apparent public interest in this type of destinations. During summer, the collective number of people visiting one of the 32 naturum centers reaches approximately two million annually (Sveriges Nationalparker, n.d.).

While the primary objective of every naturum center is to spread knowledge of its local environment, they do so in diverse ways. The 32 existing naturum centers differ significantly in size, function and architectural style. Some centers emphasize wildlife, vegetation, and geology, while others focus on history and cultural heritage. Despite having exhibition spaces, the additional features of naturum centers vary based on their purpose, required programs, and intended themes. For instance, some naturum centers may as well include observation towers, cafes, or laboratories.

Requirements for a Naturum

Localization

A naturum should primarily be located in or in close proximity to attractive natural areas of high value for nature conservation and outdoor recreation, such as national parks, well-visited nature reserves, and national urban parks. In some cases, a naturum may also address a larger area, a region, a county, or a specific type of nature – but should be close to naturally appealing areas.

Local Anchoring

When deciding on new naturum, consideration should be given to how the establishment of how a naturum can contribute to local development and thereby increase acceptance for nature conservation and area protection. The establishment of a naturum should include a local process and collaboration.

Function and Quality

A naturum should be an attraction in itself through its design and content, while also enhancing the value and identity of the place or area.

Projecting and Building

The content and design of exhibitions should collaborate early on with the design of the building. The building and its function should be adapted to the upcoming activities. Accessibility according to applicable legislation should be fulfilled. Future staff should be involved early in the work and planning process.

Design

Staff play a central role. The space should be designed and adapted for both the visitor's encounter and the staff's needs. The placement of the reception is a particularly important factor in this context. The exhibition area should be at least 100 m². In or in direct connection to the naturum, there should be an assembly room for at least 25 people.

Environmental Adaptation

The exhibition and building should be environmentally adapted in terms of materials, operation, and construction processes.

Public Facility

As a public facility, a naturum should have high ambitions and be an exemplar when it comes to quality in architecture, design, and form. This applies to both naturum buildings and exhibitions and adjacent land. According to the government, new architecture should enrich and renew the existing environment but at the same time, consider the values of the older buildings, natural conditions, and the overall environment.

(Naturvårdsverket, n.d.a)



Naturum Tåkern, Östergötland

(Lindman, n.d.)



Haverdal Nature Reserve

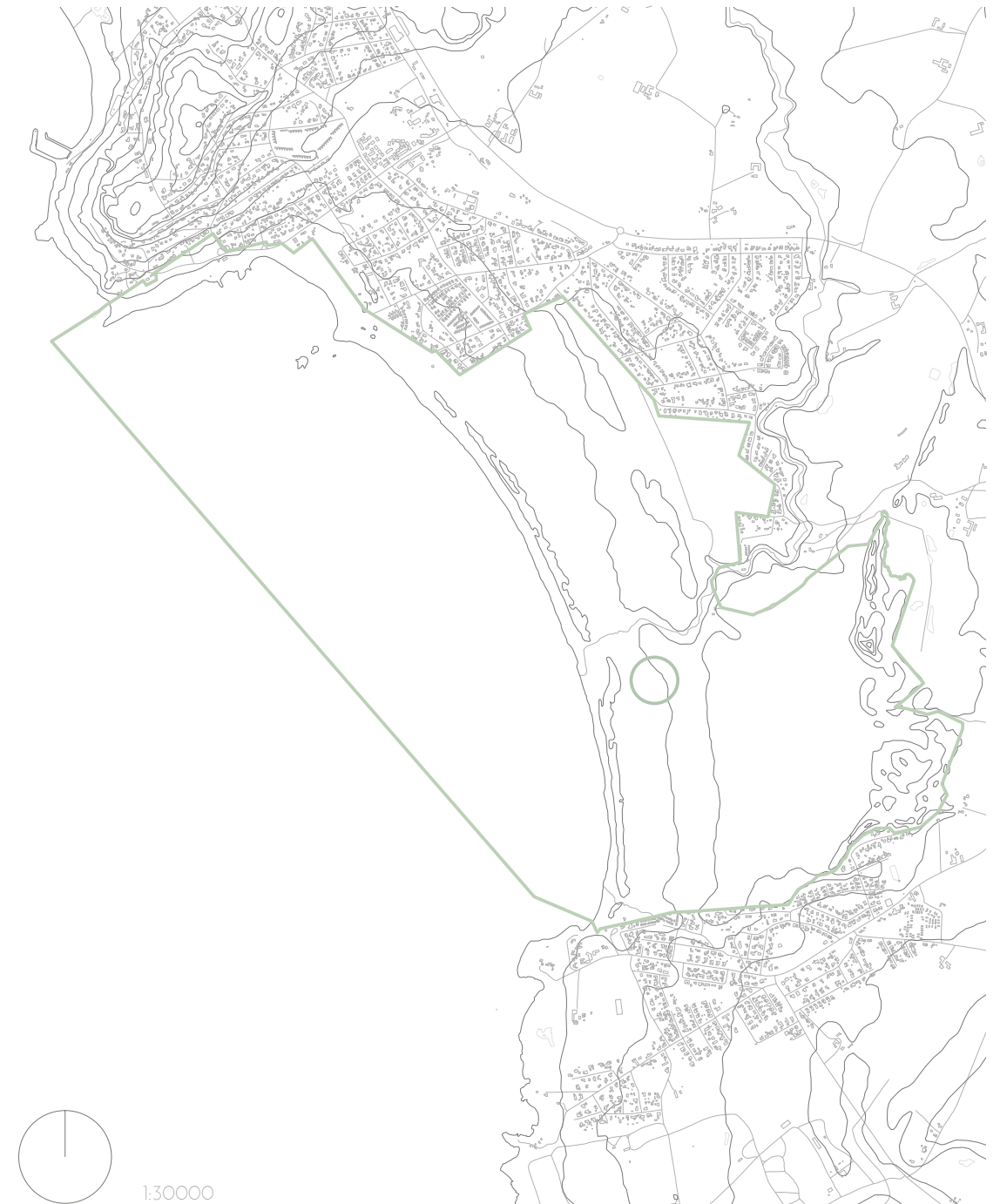
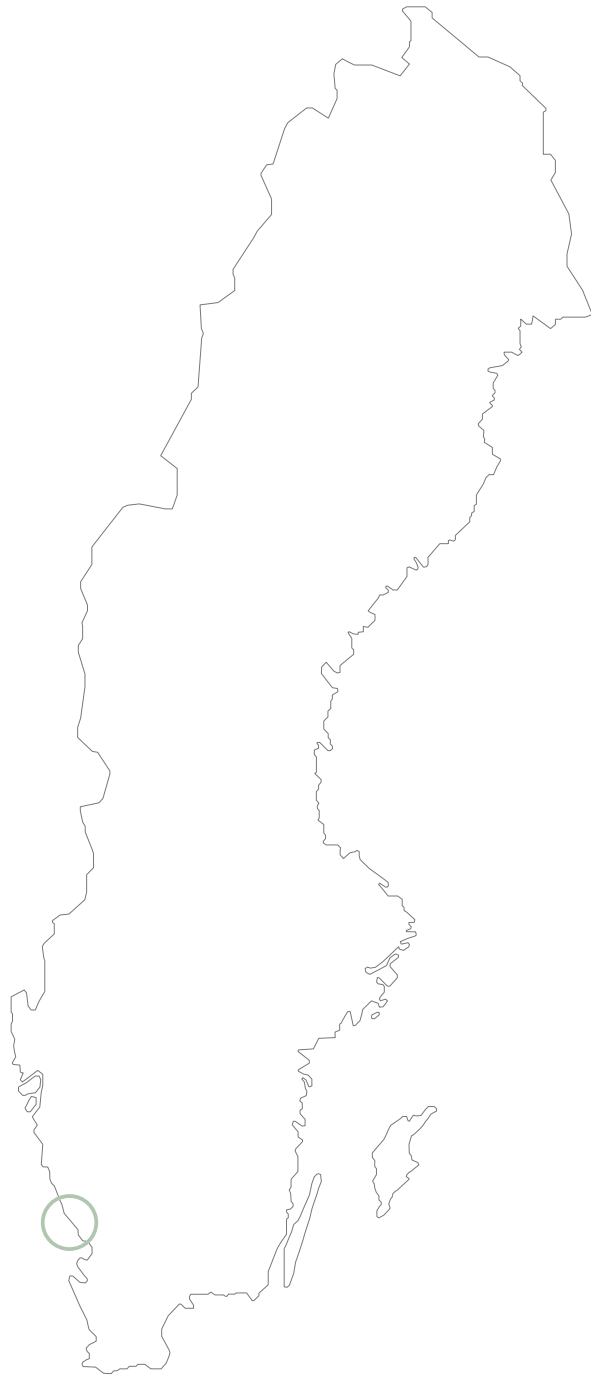
Established in 1942, Haverdal Nature Reserve is among the most longstanding nature reserves in the area, covering 632 hectares. The reserve is owned by the Swedish Environmental Protection Agency and overseen by the County Administrative Board.

Located in the Halland County of Sweden, Haverdal Nature Reserve is situated along Harplinge Bay. The region is known for its persistent western winds throughout the majority of the year. Nonetheless, despite these harsh climatic conditions, the area remains a popular tourist destination during summer and a frequented recreational spot. In addition to the long stretch of beach, the reserve boasts various walking and horse-riding trails, as well as the "Sanddynen Lynga", which is estimated to be the tallest sand dune in Scandinavia, rising at approximately 36 meters above sea level (Destination Halmstad, n.d.).

The nature reserve primarily features grass-covered flying sand fields, meandering brooks, and dense pine forests, which are home to a diverse bird population. However, the most prominent feature is likely the undulating sand dunes.

Throughout history, life in Haverdal has been a struggle between sand and civilization. The name "Haverdal" dates back to 1466 AD and is thought to derive from "clearing the forest" (Destination Halmstad, n.d.). However, after the original forests were cleared, the flying sand fields gradually spread inland, causing problems for local farmers. In response, measures such as sand fences and the planting of different types of vegetation were implemented to bind the sand.

However, the problem has now reversed. As these measures have caused limitations for several species of vascular plants, as well as insects and birds, that were once common in Haverdal. As a result, more recent efforts have been implemented to address the issue of overgrowth and to free up areas of sand. The "Sand Life" project was established with the overarching goal of restoring the sand fields to promote greater biodiversity in the region. Specifically, 150 hectares of overgrown and forested dunes, along with sandy moors, have been cleared to ensure a more sustainable future for a variety of red-listed species in the area (Sand Life, n.d.).



1:30000

56°42'24.4332"N, 12°41'9.708"E



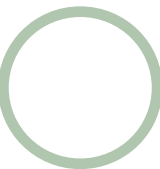
Haverdal Nature Reserve



Proposed site

Site Analysis

1:7000



Parking



The site



Main pathway



Reference Projects

Reference Project 1:

Glenn Murcutt, Simpson-Lee House, New South Wales (1989-94)



(Architecture of Glenn Murcutt, 2008)

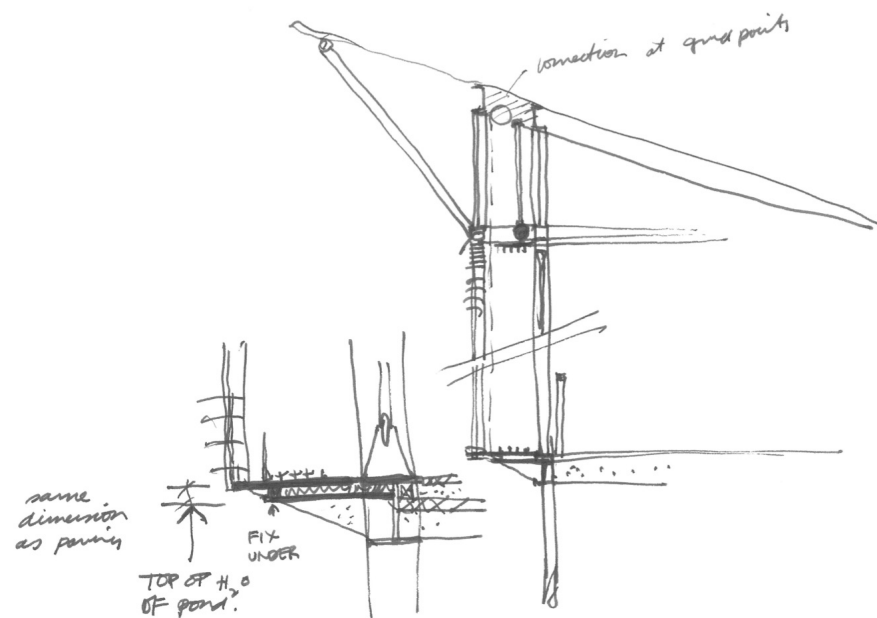
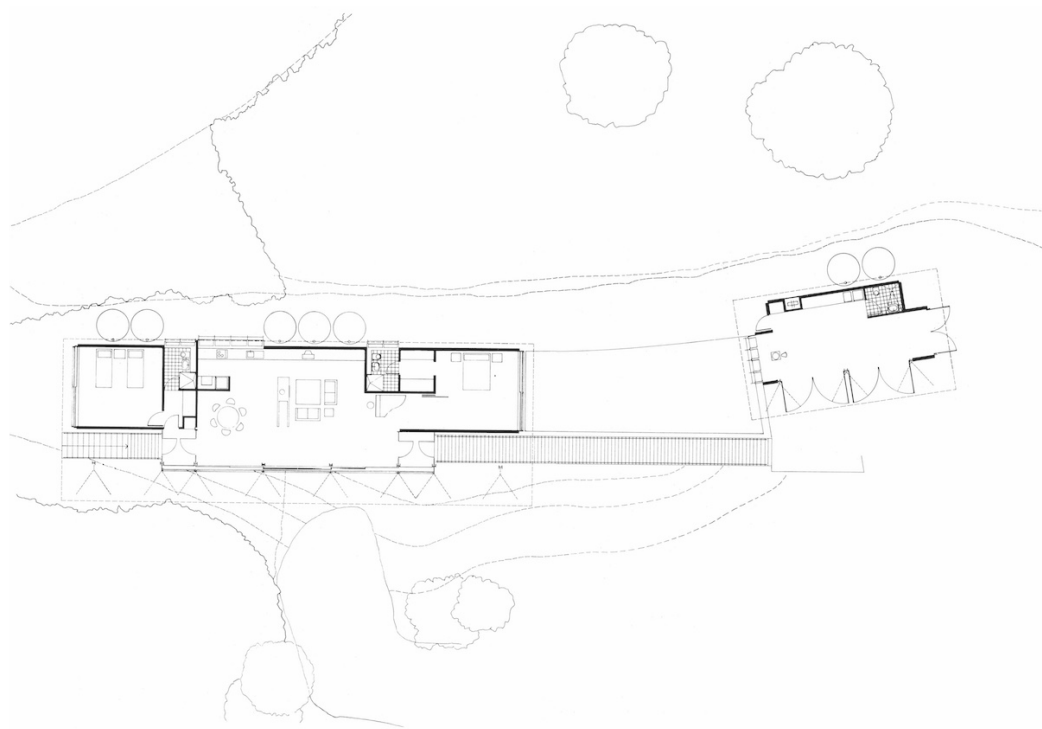
Simpson-Lee House

The Simpson-Lee House, located in the Blue Mountains, 150 kilometers northwest of Sydney, is situated in a dramatic landscape characterized by steep sandstone cliffs, dense eucalyptus forests, and deep canyons. The clients, a retired couple with an interest in art and architecture, requested a sanctuary with minimal and monastic qualities. Murcutt's intention for the building was for it to "ring true to modernism and also be of its place" (Márquez Cecilia & Levene, 2012, p. 187). This resulted in one of Murcutt's most recognized buildings.

The project comprises two pavilion-like structures, the main living quarters and a small pottery studio and garage. Both with pitched roofs with generous overhangs supported by triangulated trusses, mimicking the canopies of the surrounding eucalyptus trees. The Simpson-Lee house is constructed primarily with silver-painted steel and aluminum and the structural elements are organized in a 1.9-meter modular system. Being partially elevated by loadbearing columns, it has an almost floating expression.

Separated by a small pond, the buildings are held together by a continuous pathway. The volumes are arranged in a linear sequence, with a rocky hillside to the rear and with views of the Blue Mountains' eucalyptus forest on the front side. The interior organization follows a similar linear sequence, with a clear division between the served and serving spaces. The bathrooms and the kitchen are located at the back and the main living spaces at the front. This parallel alignment is a common feature in many of Glenn Murcutt's projects.

Another feature commonly found in Murcutt's buildings is the intermediate space between inside and outside. In the Simpson-Lee House, this transition starts with the outside walkway that continues under a sheltered portico before reaching the main entrance.



(Architecture of Glenn Murcutt, 2008)

Key Takeaways

The Linear Arrangement

The linear room arrangement is based on a rational division between enclosed serving areas, such as bathrooms and kitchens, at the back, and served, open living spaces at the front. In addition to the functional benefits of this linear approach, it also satisfies the fundamental human need for shelter. This inherent desire to protect oneself on one side, while keeping an eye on the surroundings on the other, can be traced back to numerous vernacular settlements and building principles (Fromont, 1995).

The Continuous Pathway

The Simpson-Lee House features an exterior elevated pathway that connects the two separate pavilion-like structures into a coherent expression. This pathway emphasizes the linear room arrangement and creates a linear movement from the outside through the main building, allowing for easier orientation and providing a direct overview of the building. Or as Françoise Fromont (1995) puts it, "the passage through the interior becomes an unfettered progression, and each moment in the journey through the landscape's vast continuity one of many possible experiences of place" (p.41).

The Elevated Platform

Although Murcutt uses a concrete foundation for a large part of the structure, the exterior pathway and the front section of the main building are partially supported by slender steel columns. These serve dual purposes. From a structural perspective, they decrease the building's footprint on the site and the amount of concrete needed for the foundation. From an aesthetical perspective, they give the building a lighter impression. Much of the iconic light appearance of Simpson-Lee House can be attributed to the load-bearing columns. The front section of the building appears to be floating out over the eucalyptus forest, above the sloping terrain.

Reference Project 2:

Jan Gezelius, Flyttfågelmuseet, Ottenby (1957-1961)



(Caldenby & Walldén, 1989)

Flyttfågelmuseet

The Migratory Bird Museum in Ottenby, situated at the southern tip of Öland and designed by Jan Gezelius, is a perfect example of a public building completely committed to its place and function. Positioned along a major migratory bird route across the Baltic Sea, Ottenby has long attracted ornithologists, bird watchers, and tourists. Consequently, in 1957, the Swedish Ornithological Association commissioned Jan Gezelius to create a small museum housing a permanent exhibition on migratory birds on the site.

The building exhibits a distinctive double-symmetrical geometry, featuring a low-sloping pitched roof extending on all sides. The angled, blue-painted walls on the long sides serve dual purposes, acting as exhibition screens internally, with slim full-height windows in between each wall. Additionally, there are two big square windows on the short sides, accompanied by a series of clerestory windows running continuously along the roof beams, ensuring a well-lit and illuminated exhibition space.

Positioned on an open, windswept heath by the sea, the structure is fully exposed to the elements. Given the necessity for this light timber construction to endure frequent harsh winds, crossed braced steel rods play a crucial role in stabilizing the slender roof. Notably, the structure is not insulated, but serves merely as a protecting envelope sheltering the exhibition from the wind, rain, and snow.

The Migratory Bird Museum can be perceived as both monumental and simple. A self-assertive structure in a challenging environment. Or, in the words of Gezelius himself, "We have chosen to give this building to the sky. Hence its exterior blue color. It has accidentally landed in this vast landscape, like a migratory bird" (Gezelius et al., 1989, p. 76).

Key Takeaways

The Window Placement

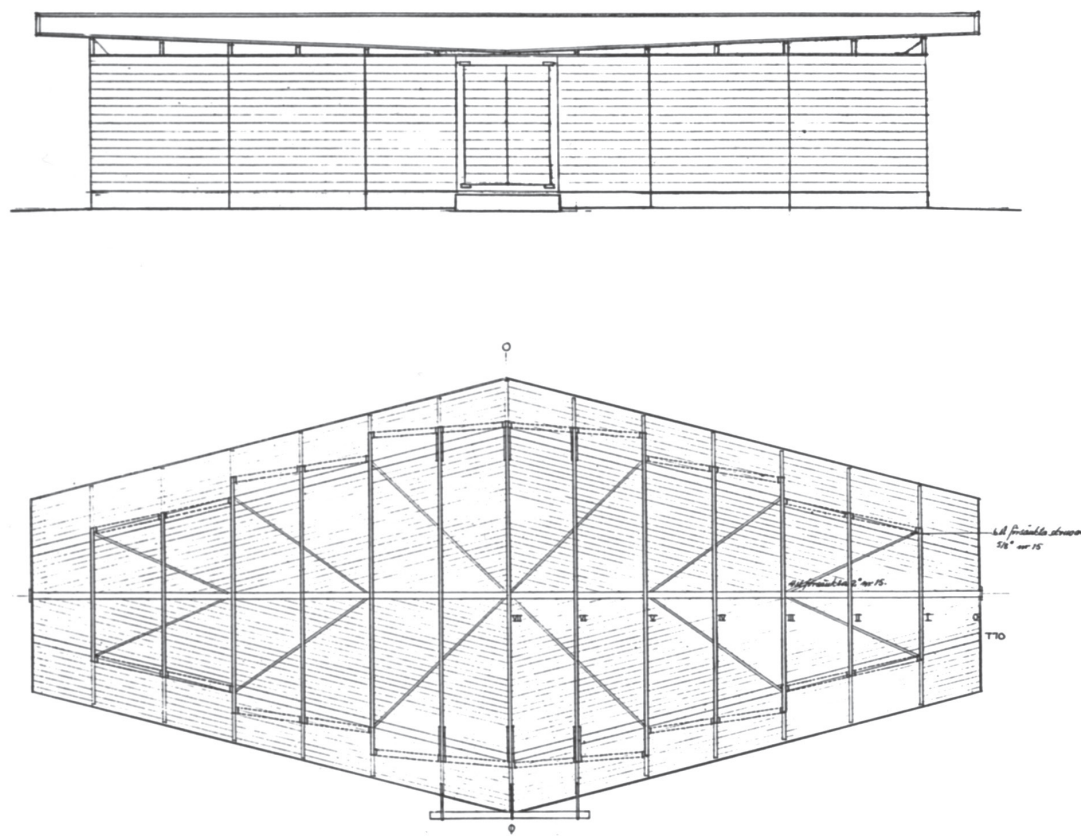
One of the most prominent qualities of the Migratory Bird Museum's interior is its daylight management. While the expansive windows at the short ends provide ample daylight for the entire space, the slim windows between the angled walls cast diffuse light on the exhibition walls. Another feature facilitated by separating the angled walls with full-height windows is the visual illusion that they are freestanding in the landscape, creating an interesting inside-outside dynamic. Additionally, the clerestory windows bring in light from above, giving the roof a floating appearance.

The Visible Structure

Since the Migratory Bird Museum is uninsulated, it allows the structural elements to be a visible part of the interior expression. One example of the building's tectonic qualities is the slender roof beams that rest lightly on the thin walls, held in place by crossed braced steel rods. Essentially, this expression reflects the building's fundamental structural principles. A major advantage of using timber as the main building material is its relatively low environmental impact. This aligns well with the Swedish Environmental Protection Agency's requirement to use eco-friendly materials for upcoming naturum projects (Naturvårdsverket, n.d.).

The Challenging of the Elements

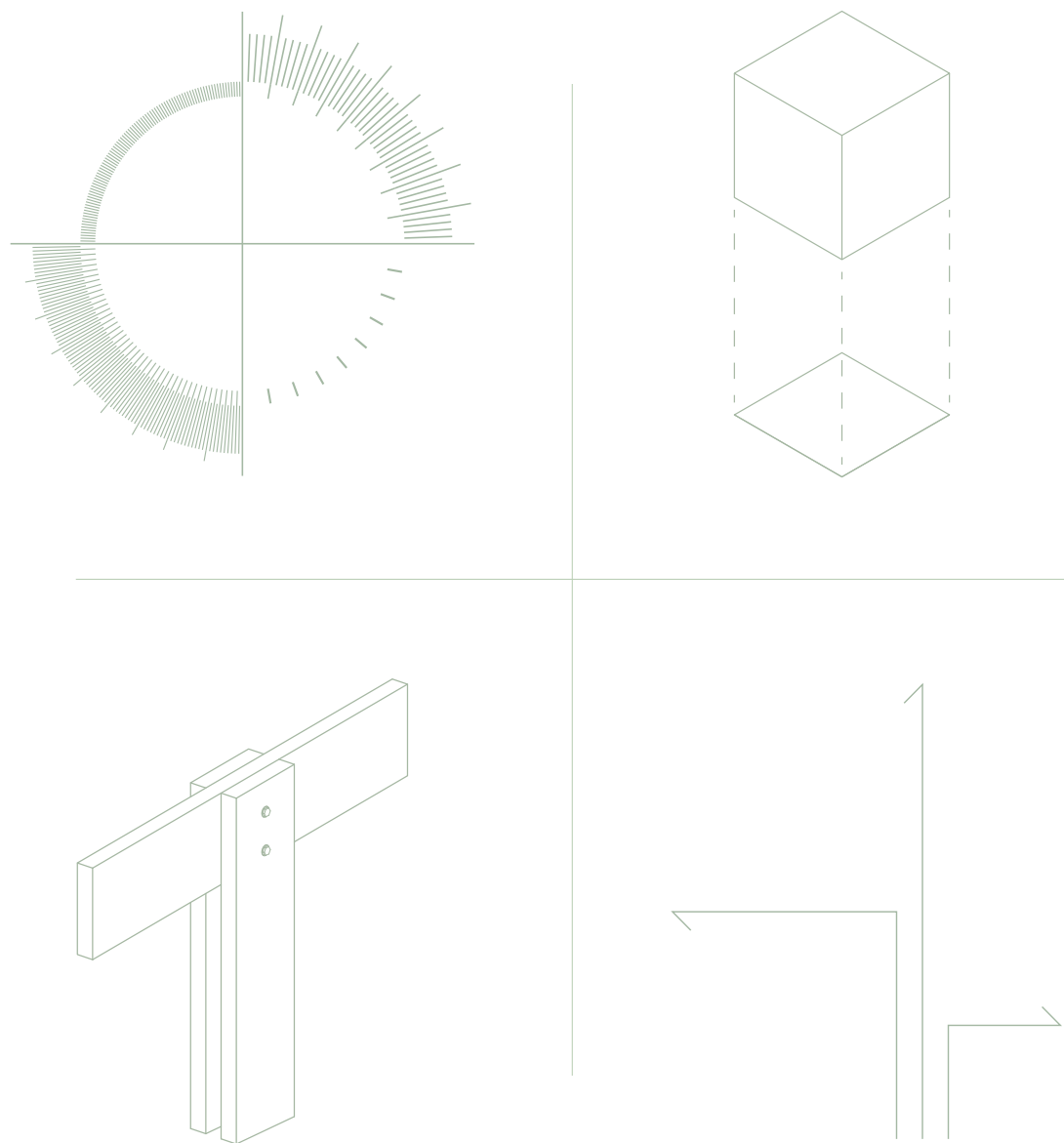
There are diverse ways to plan a built project on a site like Ottenby. One important consideration is the interplay between the building's architectural expression and the site's local conditions. As noted by Lundequist (2003), Gezelius chose to challenge the elements. Instead of subordinating the building to the landscape by placing it protected from the wind, the Migratory Bird Museum stands tall like a monument. On windy days, the constructor claimed that "the walls will sound like a cello" (p. 77). According to Lundequist, this makes the surrounding nature both more visible and present within the building.



(Caldenby & Walldén, 1989)

IV

Design Principles



Four Principles

The planning of a naturum encompasses a multitude of considerations, conceptions, and evaluations. Considering all the aspects taken into account, this chapter focuses on four essential design principles to categorize and emphasize the primary objectives within the scope of this thesis.

These design principles have primarily been derived from previous studies on the concept of naturum, the site analysis, and the takeaways from the reference projects. For the purpose of this thesis, the design principles have all been adapted to the conditions of the site and program. Collectively, they form the foundation upon which the final design proposal is based.

The four design principles are:

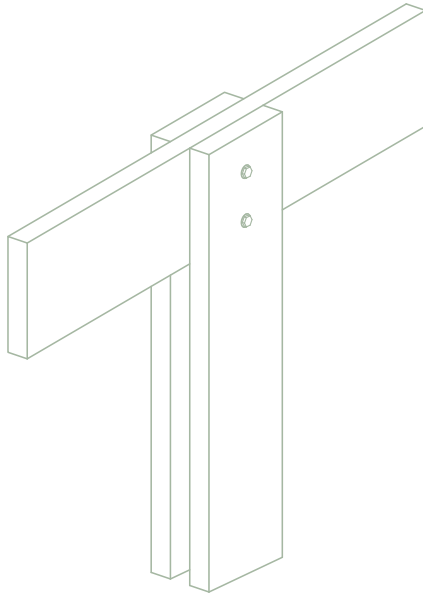
Wooden Construction

Minimized Footprint

Orientation

Pathways

The principles are explained and elaborated on below. Correspondingly, they will be implemented and put into practice to suit the specific conditions and characteristics of Haverdal Nature Reserve in the design proposal in the upcoming chapter.



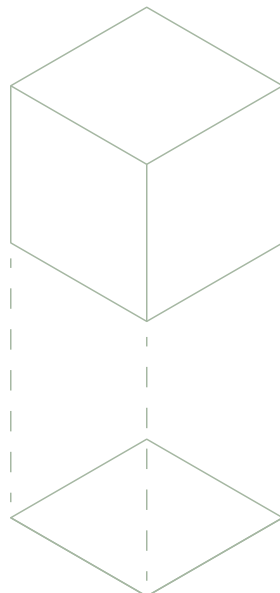
Wooden Construction

Building with wood has numerous advantages, one of which is its sustainable attributes, as previously stated in the passage about "The Visible Structure" of the Migratory Bird Museum by Jan Gezelius. For larger construction projects, glue-laminated timber is typically required to address the necessary spans and loads. Considered a sustainable material in Sweden, glue-laminated timber is generally composed of locally sourced fir.

Another example from Gezelius illustrates the potential tectonic qualities manifested by a wooden structure. Although it is a composite material, fabricated from individual layers of lumber and bonded by moisture-resistant adhesives, glue-laminated timber still retains the natural beauty and characteristics of wood. Additionally, glue-laminated timber allows for a high degree of customization, further enhancing the intended architectural expression.

Accordingly, the purpose of implementing a wooden construction in this project is both practical and aesthetic. As glue-laminated timber aligns well with Naturvårdsverket's requirement for environmentally friendly material use, it is also compatible with the natural environment of the forested site. Moreover, the wooden features become a fundamental part of the overall design articulation.

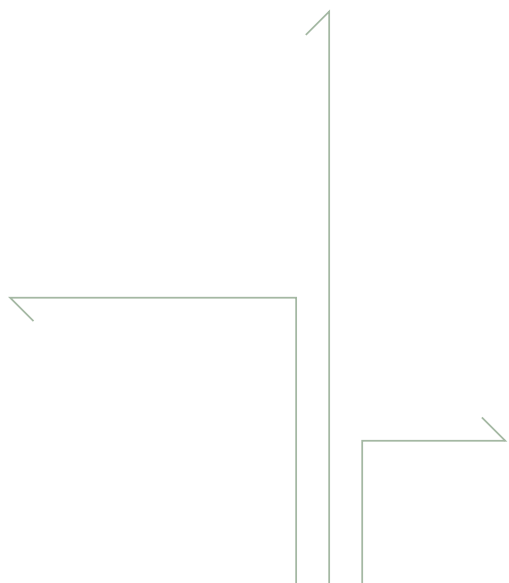
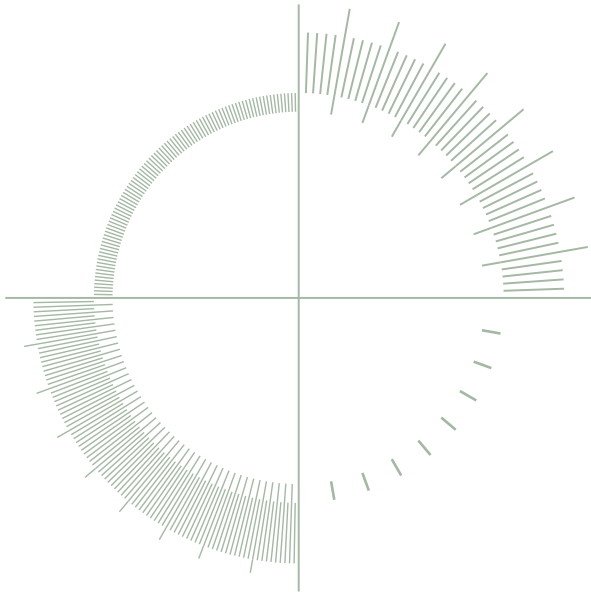
Minimized Footprint



Elevating the building on columns can be an effective method for minimizing the impact of construction on the immediate surroundings. While some groundwork is typically required for any construction project, raising the structure on columns and reducing the need for a concrete base can significantly reduce the footprint on the site. As exemplified by Glen Murcutt in the Simpson-Lee House, this approach is particularly suitable when building in natural settings.

On a site like Haverdal Nature Reserve, elevating the building from the ground is considered a sensible decision for several reasons. In a delicate ecosystem, ground-level biodiversity is likely to benefit from minimal intervention. Another reason for elevating the building is the presence of flying sand-fields on the site. With sand blowing inland, the columns allow for it to pass underneath the building.

Moreover, this principle may have positive implications for the building's entire life cycle. This aligns with the Aboriginal proverb "to touch the earth lightly," a fundamental aspect of Murcutt's design philosophy. Once the structure is no longer in use, its small footprint may facilitate the natural site restoration process.



Orientation

The ocean has an alluring effect on humans. The Haverdal beachfront extends longitudinally from south to north, bordered by the Kattegatt Ocean to the west. Consequently, upon entering Haverdal Nature Reserve from inland, visitors are likely to follow a trajectory westward, toward the sea.

Therefore, an important aspect in this project is its orientation, particularly in relation to the beach and sand dunes. By aligning the building with the natural occurrences in Haverdal Nature Reserve, the objective is to achieve seamless integration with the site.

Furthermore, the orientation influences the overall disposition of the building, including room arrangement, shape, and form. The expansiveness of the site allows the program of the building to be organized in a linear sequence with a front-to-back division between the public (served) and the enclosed (serving) spaces. Given the south-west facing front section of the building, passive strategies for sun protection, such as roof overhangs, will be utilized to address high sun exposure during the summer. These approaches draw inspiration from the design principles of the Simpson-Lee House by Murcutt.

Pathways

Haverdal Nature Reserve features a network of pathways, along with marked and unmarked trails that meander across the entire area. These trails encompass a diverse range of characteristics and experiences, including open and secluded spaces, wooded areas, sandy dunes, and ocean views.

As evident from the site analysis, the main pathway leading from the parking lot initially makes a few turns through the dense pine forest. However, the forest opens up into a clearing, and the pathway takes on a straight axuality toward the ocean. Although not intended for regular traffic, this pathway is dimensioned for larger vehicles, serving as an emergency access road.

Careful consideration of the main pathway and the various walking trails has been a crucial aspect in finding a suitable placement for the building. In fact, the pathways have played a governing role in the design process by establishing access points, sight-lines, and movement through the building. Thus, the aim of adapting the building to the existing trails and pathways is to facilitate a harmonious interplay with the current procession of the site.

V

Design Proposal



Naturum Haverdal

Welcome to Naturum Haverdal, an exhibition center in the periphery, where the paths fade into nature. Upon arrival, the main pathway creates a distinct axis, dividing the building into two volumes connected by a continuous roof. As you gaze further, the characteristic sand dunes of Haverdal unfold, with only the horizon and the vastness of the ocean beyond.

In harmony with the direction of the sand dunes, the building mirrors the horizontality and expansiveness of the site. Naturum Haverdal appears to float above the ground, supported by wooden columns, integrating with nature while maintaining a respectful distance.

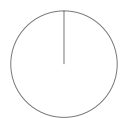
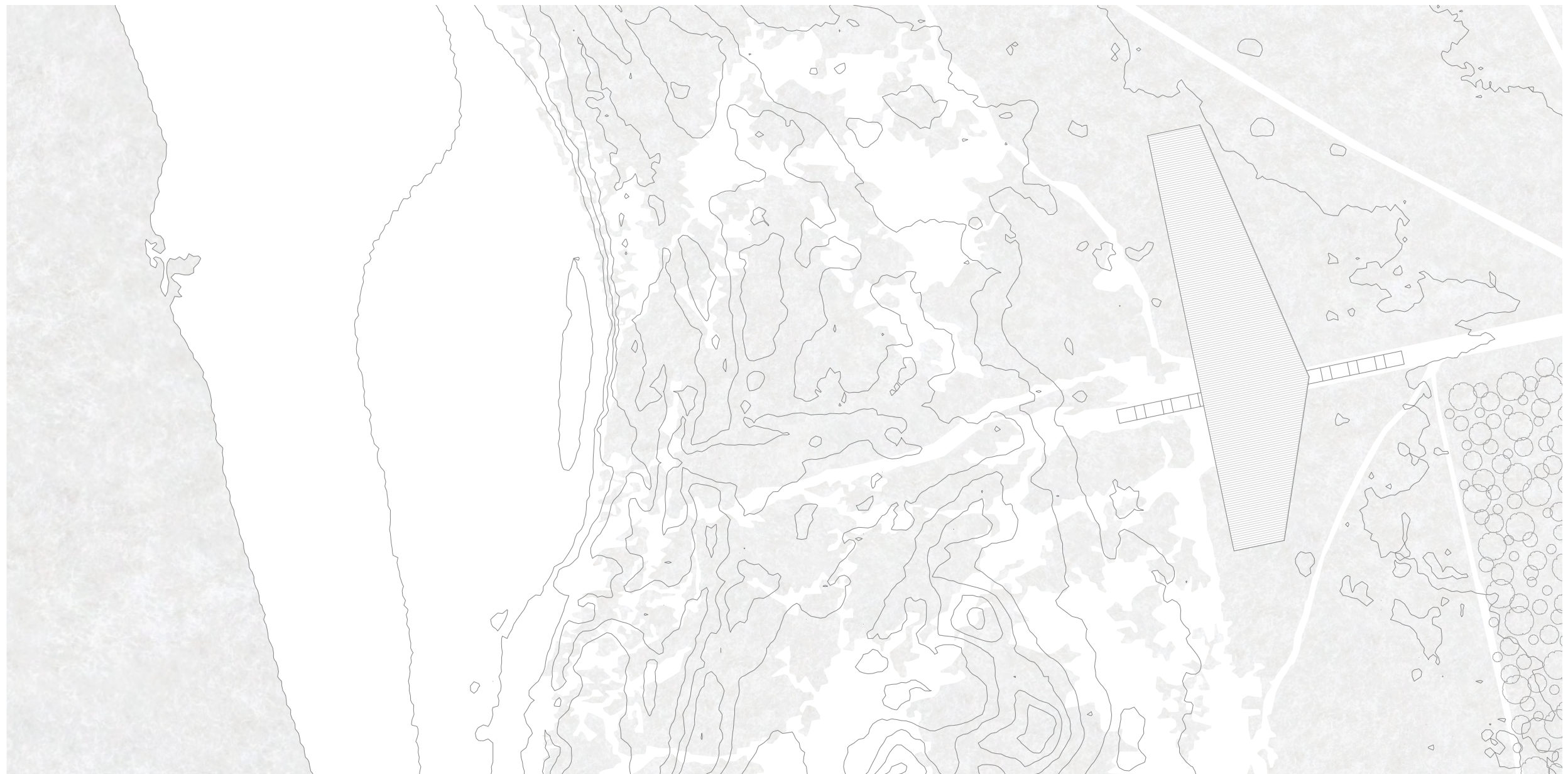
Although visibly man-made, the wooden pillar-beam structure is designed to harmonize with the landscape, serving as an additional horizontal element. Its shape is influenced not only by natural occurrences in Haverdal but also by the trodden paths crisscrossing the site, giving the building its distinctive diagonal form.

The presence of nature extends inside the building, with the main public functions like the café, exhibition space, and assembly room arranged linearly. Moving through the building, the sand dunes and surrounding nature become an essential part of the experience, serving as either a backdrop or the main feature.

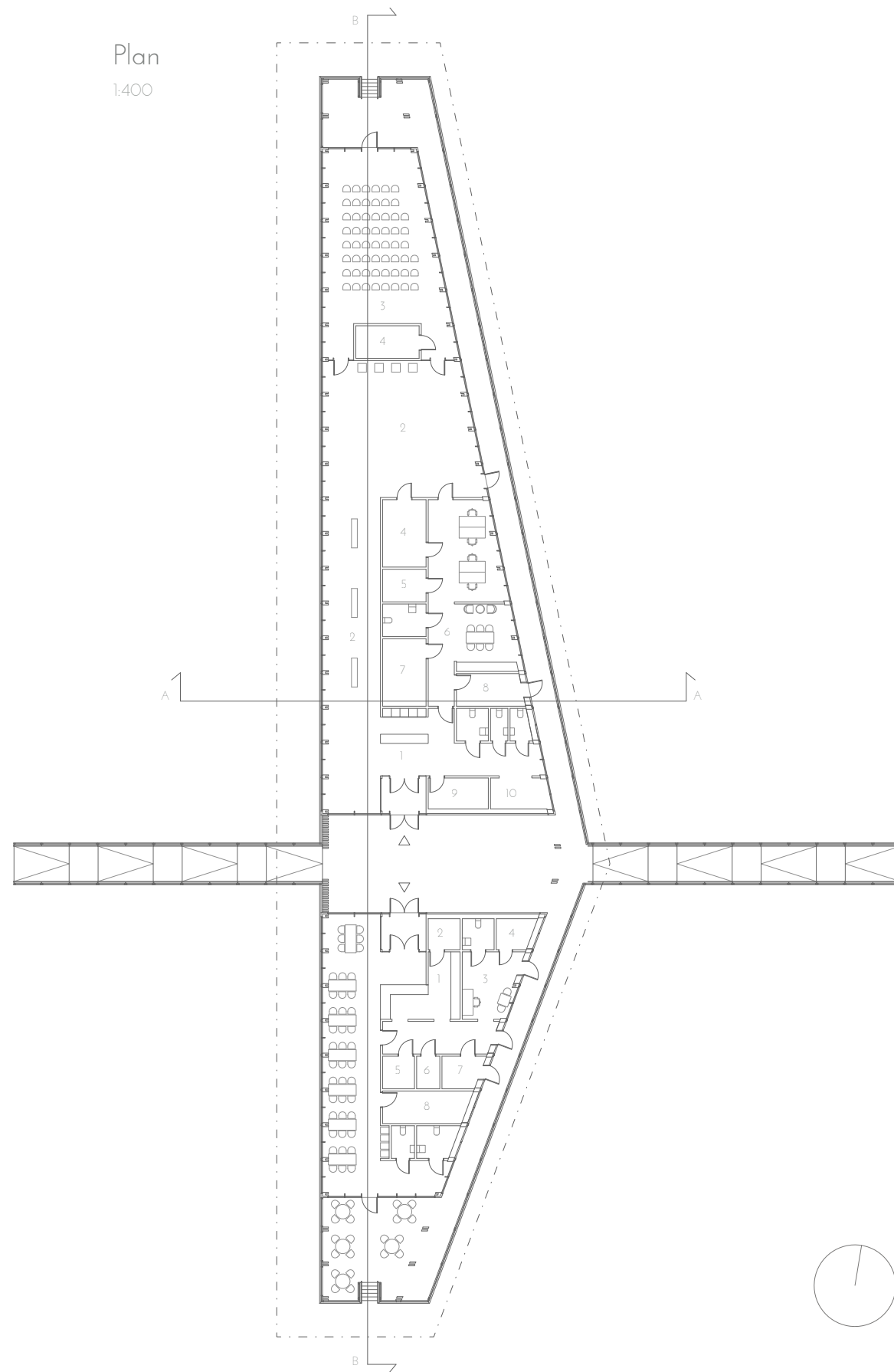
Challenging the elements in this windswept location, Haverdal Naturum aims to be an integral part of the nature reserve. This public building serves both as a destination and an educational hub, fostering a deeper understanding of local wildlife, cultural history, and the preservation efforts dedicated to this unique environment.



Site Plan
1:1000



Plan
1:400



Naturum

514 sqm

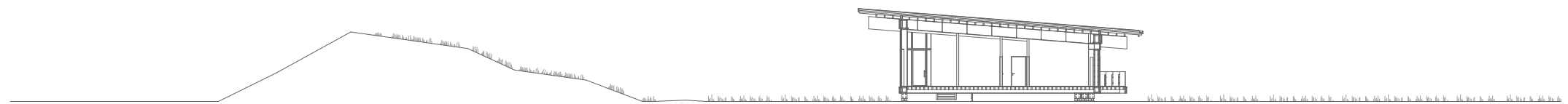
1. Entrance/Reception
2. Exhibition space
3. Assembly room
4. Storage space
5. Staff changing room
6. Staff room/Administration
7. Technical room
8. Waste room/Recycling
9. Maintenance supply room
10. Coat room

Café

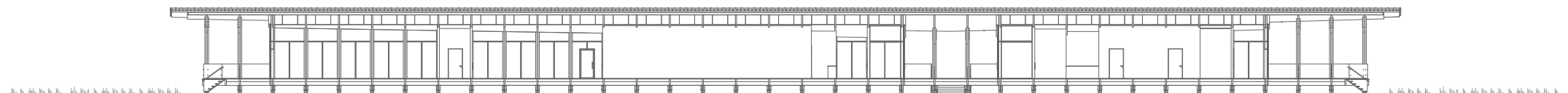
229 sqm

1. Kitchen
2. Cold storage
3. Staff room/Administration
4. Staff changing room
5. Dishwashing room
6. Maintenance supply room
7. Waste room/Recycling
8. Technical room

Section A-A
1:400

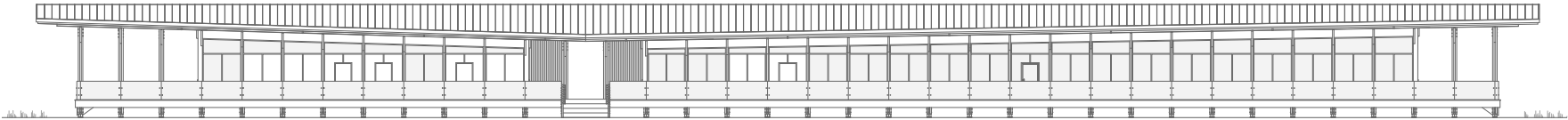


Section B-B
1:400

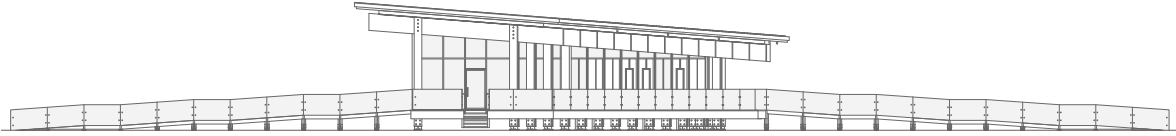




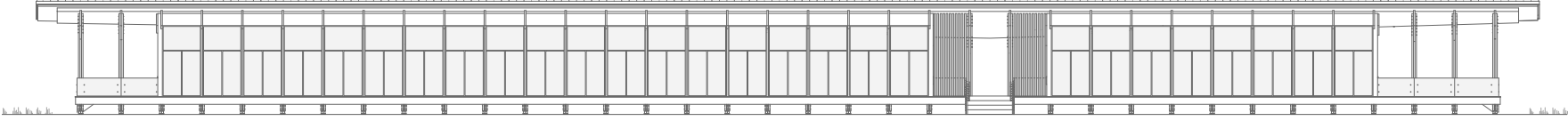
Elevations
1:400



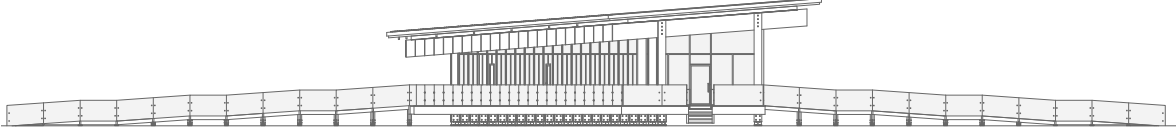
East



South



West



North



The Inside

The materiality of the interior spaces can be summarized in a single word: wood. This material is consistent throughout the whole structure, from the plank floor below and the CLT inner walls to the glulam pillars and beams, extending up to the suspended plywood ceiling.

As discussed in the previous chapter, the decision to employ wooden construction as a primary design strategy is grounded in both practical and aesthetic considerations. While the structural and sustainable attributes of wood are undeniable, equal attention is given to its visual expressiveness and tactile qualities, extending from the exterior to the interior.

One example of this is the visibility of structural elements. Echoing Gezelius' Flyttfågelmuseet, the interior spaces of Naturum Haverdal aim to articulate wood's tectonic qualities by partially revealing the building's structure. Elevating the suspended ceiling exposes the glulam roof beams, making them an integral part of the architectural expression. Accordingly, this showcases the connection between the pillars and the beams, makes the structural principles legible, and articulates a rhythm throughout the entire building.

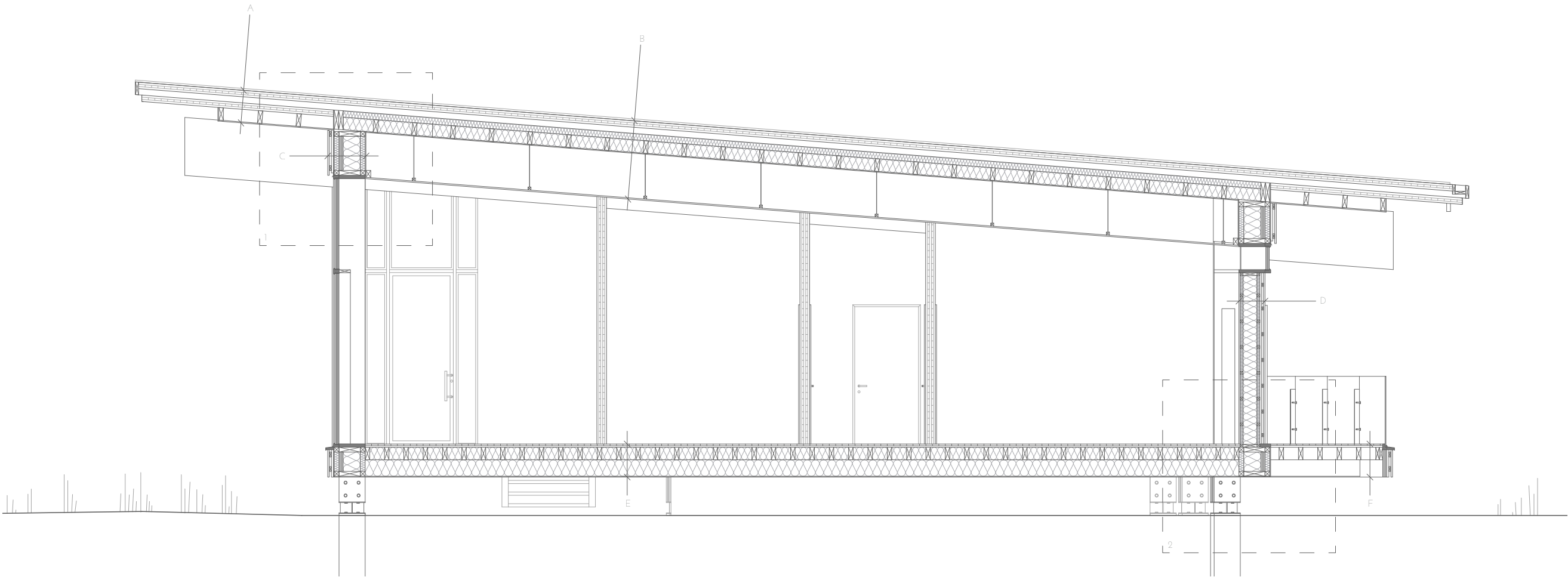
Another example lies in the distinct color and pattern of the wood. The prevalent choice for both glulam and CLT is the light, pale fir with visible grain patterns. Arguably, the inherent color and texture of fir establish a harmonious interplay with the naturally occurring pale hues of the site.





Detail Section A-A

1:70



A. Uninsulated roof

3	Sheet metal
0,5	Waterproof membrane
100	CLT roof slab
100	Air gap/Wooden battens
100	CLT roof slab
195	Wooden beams
13	Wooden board

B. Insulated roof

3	Sheet metal
0,5	Waterproof membrane
100	CLT roof slab
97	Air gap/Wooden battens
0,2	Wind barrier
3	Masonite board
100	Dense insulation
195	Wooden beams/Insulation
0,2	Vapor barrier
13	Plasterboard
694	Ventilation and installation space
20	Suspended plywood ceiling

C. Exterior wall. Type 1

24	Wooden paneling
32	Horizontal battens
32	Vertical battens/Air gap
12	Fiber cement board
0,2	Wind barrier
75	Insulation
63	LVL beam
267	Insulation
0,2	Vapor barrier
75	Insulation
13	Plasterboard

D. Exterior wall. Type 2

24	Wooden paneling
28	Horizontal battens
28	Vertical battens/Air gap
0,2	Wind barrier
45	Insulation
215	Insulation
0,2	Vapor barrier
45	Insulation
20	Interior wooden panel

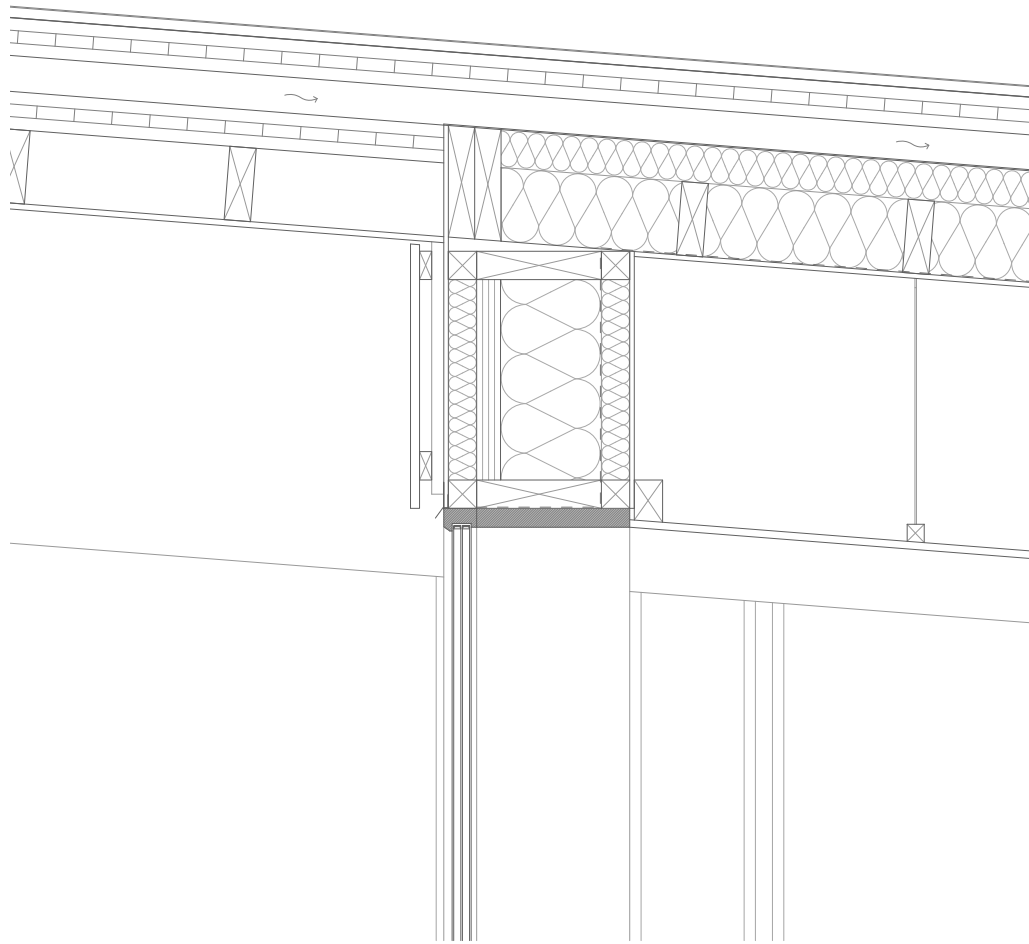
E. Floor

30	Interior wooden plank floor
20	Floorboard
450	Glulam beams
0,2	Vapor barrier
195	Wooden beams/Insulation
255	Insulation
12	Fiber cement board

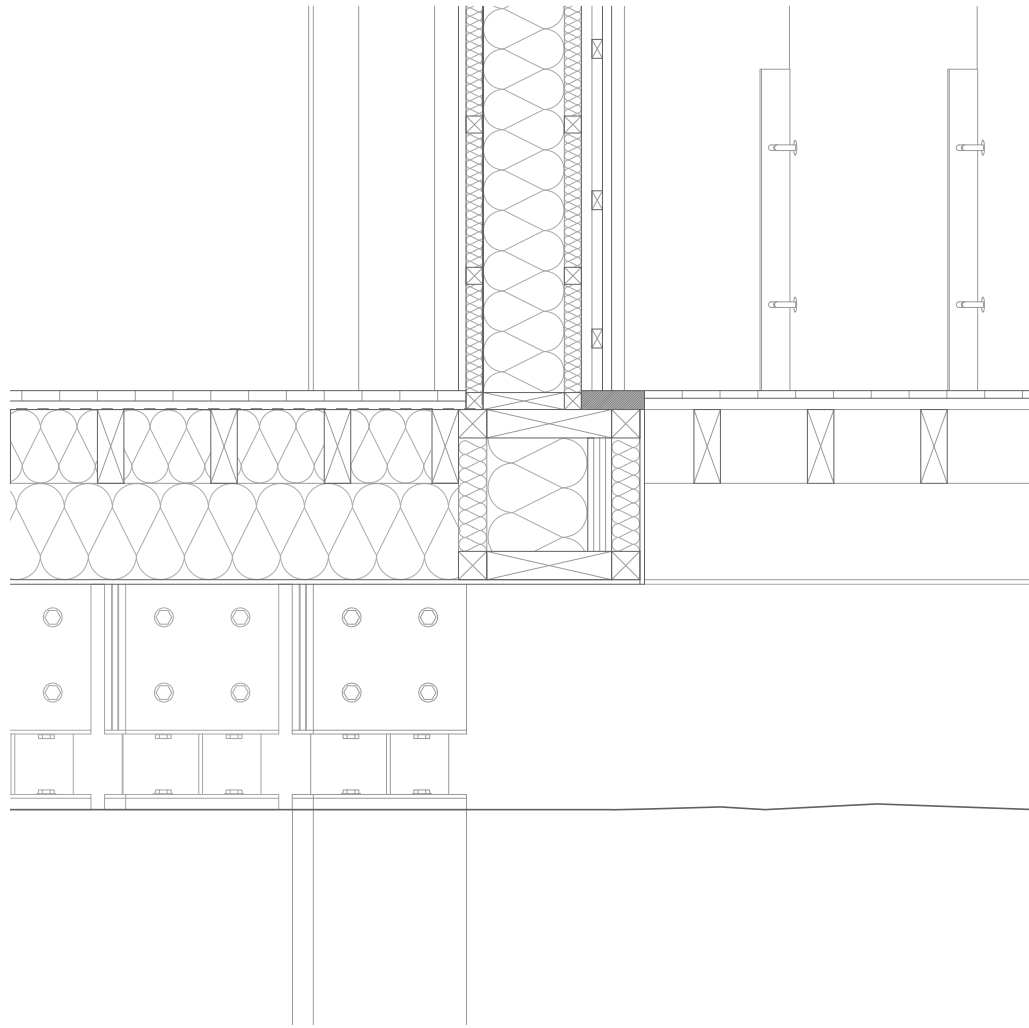
F. Boardwalk

18	Wooden planks
32	Wooden board
450	Glulam beams
195	Wooden beams

Detail 1
1:20



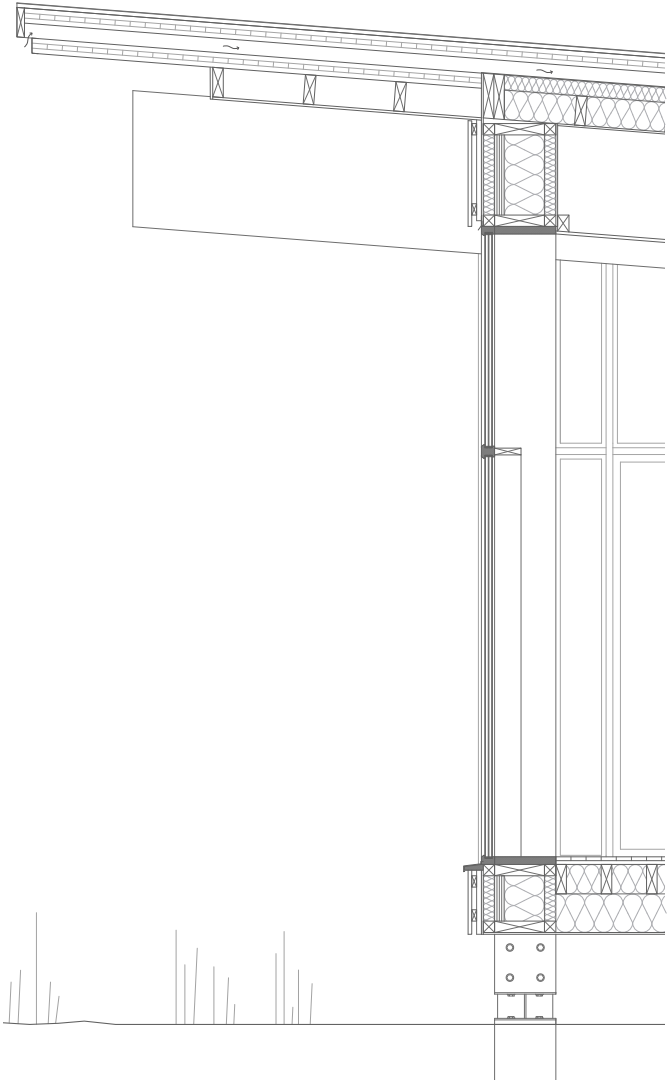
Detail 2
1:20



Elevation
1:50

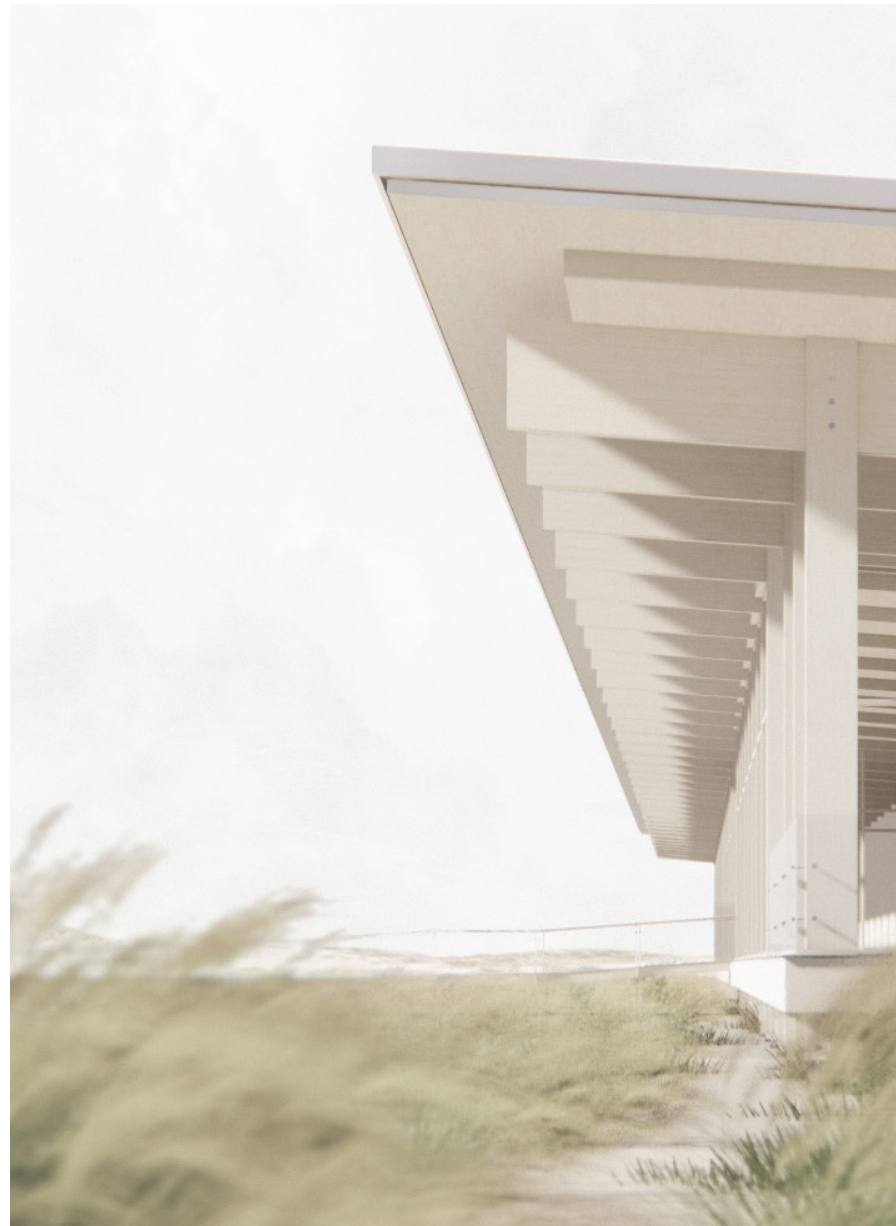


Detail Section
1:50



VI

Conclusion



Conclusion

The primary goal of this thesis has been to identify and test four context-specific design strategies suitable for a speculative design proposal for a naturum in Haverdal Nature Reserve. The initial pre-study included a site analysis, an exploration of the concept of naturum, and a study of two built reference projects by Glenn Murcutt and Jan Gezelius. Based on this foundational knowledge, the design strategies chosen for the theoretical framework (Wooden Construction, Minimized footprint, Orientation, and Pathways) emerged. Consequently, the aim of the final design proposal has been to incorporate these strategies into every design choice.

Personally, I found it useful to confine myself to a reasonably constrained framework. Throughout the thesis process, *simplicity* emerged as a keyword. Focusing primarily on only four design strategies facilitated clearer decision-making.

However, constructing a building on a site with a sensitive ecology, like that of Haverdal Nature Reserve, poses a significant challenge for any architectural project of this size. Since this thesis primarily focuses on architectural design strategies for a speculative design proposal, numerous practical delimitations have been necessary.

Overall, I believe the design proposal successfully implements the intended theoretical framework. However, for the purposes of this thesis, the design remains in a somewhat conceptual state. It would be interesting to further develop this concept with a higher degree of realism, such as exploring how to address logistical and practical construction matters with the least impact on the existing natural environment.

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