

TJOLÖ BATH HOUSE

Architecture for body and mind

Kamila Machnik | Master's Thesis | 2024



Supervisor | Filip Rem
Examiner | Björn Gross
Chalmers School of Architecture
Department of Architecture and Civil Engineering



CHALMERS
UNIVERSITY OF TECHNOLOGY

Tjolö Bath House
Architecture for Body and Mind

Author | Kamila Machnik

Supervisor | Filip Rem

Examiner | Björn Gross

Chalmers University of Technology
Department of Architecture and Civil Engineering
Master's Thesis Direction: Building Tectonics
Master's Programme of Architecture and Urban Design

ABSTRACT

In the modern world, stress has become very common and for some people it is an integral part of their lives. The fast pace of modern life has created a society extremely absorbed in constant competition, people striving to meet all the needs and requirements which often is overwhelming and in most cases leads to chronic stress, which is classified as a disease of the 21st century due to its negative effects on human body and mind.

The whole idea of the project is to bring people closer to nature and calm their minds through architecture. Therefore, this master's thesis aims to explore the potential of sensory architecture as a means to reduce stress and enhance well-being.

Sensory architecture design focuses on creating spaces that engage various senses, such as sight, hearing, touch, smell and taste, to create an attractive and healing environment. The study focuses on analyzing different strategies and their impact on stress reduction and mental health.

To give a broader understanding on how the human brain works in relation to architecture this thesis uses the philosophical thought of well-known architects who use sensory tactics in their projects. Additionally it includes some case studies of existing sensory architecture designs to identify practices and design principles to reduce stress.

The knowledge gained during the research is used in a recreational project, i.e. place for bathing located outside the city of Gothenburg in Sweden. The site is in a breathtaking Tjolöholm Castle area and has a natural character with the sea and forest in the foreground.

KEYWORDS

Phenomenology | multisensory architecture | sensory experience.

THANK YOU

Filip Rem | *Supervisor*

Björn Gross | *Examiner*

External Critics

Family and Friends

Robert ♡

STUDENT'S BACKGROUND

2022 - M.Sc Architecture and Urban Design

2024 *Chalmers University of Technology*

Studios:

Healthcare Architecture

Housing Inventions

Building Tectonics

2018 - BSc in Architecture

2021 *Chalmers University of Technology*

CONTENT

CHAPTER 1 INTRODUCTION	4-5	CHAPTER 3 CONTEXT	22-23
ACADEMIC FRAMEWORK		Area.....	24-27
Purpose & Aim.....	6	Site.....	28-33
Building type.....	6	CHAPTER 4 DESIGN PROPOSAL	32-33
Desired outcome.....	6	Design strategies.....	34
Methodology.....	6	Program.....	35
Delimitations.....	7	Concept Evoltion.....	36-37
Thesis Question.....	7	Siteplan.....	38-39
THEORETHICAL FRAMEWORK		Floor Plan.....	40-41
Health and Well-being.....	8-9	Visualisations.....	42-53
Phenomenology.....	10	Elevations.....	54-55
Temperature.....	11	Sections.....	56-57
Light.....	11	Materials.....	58-59
Materials.....	12	Detailes.....	60-67
Colors.....	13	CHAPTER 5 EPILOGUE	
CHAPTER 2 REFERENCE PROJECTS	14-15	Discussion.....	66-67
Villa Kjaerholm.....	16-17	Bibliography.....	70-71
Barcelona Pavlion.....	18-19		
Fallingwater.....	20-21		

CHAPTER 1
INTRODUCTION

PURPOSE & AIM

The purpose of this master's thesis is to investigate the psychological impact of architecture, with a specific focus on multisensory experience of space. Therefore, this study seeks to provide a comprehensive understanding of the interplay between the human brain and architectural environments, elucidating the potential ways in which such environments can improve the well-being and mood of their users.

BUILDING TYPE

The type of a building chosen for this research is a bath house, which can provide various experiences inside and outside the building.

DESIRED OUTCOME

The goal of this design proposal is to create a space that is not only visually appealing, but also emotionally impactful. The space should enhance human experience of the built environment, reduce stress levels, and ultimately foster better well-being for people. The outcome hopefully will be a kind of an example of how to design other spaces as well.

METHODOLOGY

The methodological approach used for this master's thesis is research for design and includes an evidence-based approach, where preliminary design decisions were informed by insights gained through research of existing projects, literature, academic research and case studies.

DELIMITATIONS

MAIN FOCUS

This project focuses on different design solutions that contribute to stress reduction and better well-being of users. Factors that are taken into account during the project are construction, flow, light, materials and colors.

SOCIAL GROUP

Research and the final design proposal are not addressed to one specific social group. The building is intended for everyone who feels the need to take care of their health and to experience something close to a mind cleansing ritual.

NATURE

The design proposal is designed with nature in mind, which is why the building has the lowest possible impact on the surroundings.

ECONOMY

This project is only a proposal of architectural solutions for the building, therefore no economic limit was taken into account.

THESIS QUESTION

What are the key design principles and strategies for integrating sensory elements into architectural environments that will promote stress reduction?

HEALTH & WELL-BEING

Current reality in which people's live generates many stress reactions such as, constant rush, lack of rest time, pressure to pursue a professional career, devaluation of family life and many other factors contribute to the fact that people emotionally cannot cope with all challenges that life is giving them. This brings undesirable consequences such as, experiencing extreme stress (Mental Health Foundation, 2023).

According to current research conducted by World Health Organization, the most common health problem of the 21st century is stress, which in the medical world is considered a disease, and the reason why, is because it significantly affects both the human mind and the body (WHO, 2023).

This problem brings thoughts about the relationship between architecture and the human psyche, and how to design to support our well-being.

Architecture cannot be excluded from human life, because we are surrounded by it and spend almost our whole lives in different types of buildings, which is why they should be designed with well-being in mind, even if it's not their primary purpose. It is worth noting that feeling unwell may result from various reasons, not only technical ones caused by wrong-designed environments or spaces without human perception in mind but also some deeply personal causes that should not be underestimated (Clements-Croome, 2012, p.8).

However human centered perspective of designing a building can help to create spaces that can have good impact on human emotions. The best examples of such architecture are hospitals that are designed for faster recovery of patients in mind.

The science of space psychology is still dynamically developing, shedding new light on human interactions with the surrounding environment. Different research tactics provides new arguments for innovation in design, combining the areas of architecture and psychology. A key element of the psychology of space is the analysis of the relationship between people and their environment, focusing on the impact that space has on our well-being, moods and general mental condition (Marczyńska, 2023, p.49).

A study that was conducted on patients in Poole Hospital in UK showed that patients treated in a modernized ward that was designed with human psyche in mind reported significant satisfaction with their surroundings compared to people in older departments of the ward from the 1960s. Additionally, patients that were placed in modern wards spend 21% less time in hospital and needed less painkillers compared to patients in a traditional older departments (Lawson, Phiri, 2003).

Augustyn Banka describes in his book the analysis conducted by R.G. Alen who assessed various architectural factors in terms of the synchrony of their impact on various mental states, including the sensation of relaxation and significant pleasure of users, and they are as follows:

- introducing known and liked elements such as greenery into the building
- maintaining order in the surroundings and freedom of movement in spaces
- a combination of large and small forms on a scale understandable to humans
- introducing dynamic elements into the interior of the space like feeling of movement or elements being completely mobile. (Bańka, 2016, p.116).

THEORETICAL FRAMEWORK

PHENOMENOLOGY

"The authenticity of architectural experience is grounded in the tectonic language of building and the comprehensibility of the act of construction to the senses. We behold, touch, listen and measure the world with our entire bodily existence, and the experiential world becomes organised and articulated around the centre of the body"
~Pallasmaa.

Architecture has the ability to have a direct, very sensual impact on people. It is possible to perceive it not only through sight but also through other senses such as touch, hearing, and smell. Over the years, architecture that is supposed to harmonize with people has sacrificed this ability in favor of external appearance, as if all senses except our eyesight have disappeared.

Juhani Pallasmaa reflected on this problem and questioned why, if there are at least five senses, only sight has become so privileged in architectural culture and design. Subordinating the other senses to the visual sphere has led to the impoverishment of the surrounding, depriving it of its most important task, which is providing with existential support in the world (Pallasmaa, 1996, p.29). Pallasmaa emphasizes a holistic approach to the problem of the relationship between human and its environment, and how big role the human body and senses play in this process.

"The door handle is the handshake of the building." ~Pallasmaa.

Architecture that allows us to experience it through various senses can create a sense of connection and solidarity with a space. The sound of steps bouncing off the surrounding walls in a building has extraordinary emotional significance. The echo produced by people brings us into direct interaction with a space, helping us better understand its size and scale (Pallasmaa, 2012, p.30-31). He also emphasizes the importance of touch thanks to which we have capability to read the texture, density, weight and temperature without even looking, it also can simply connect us to the past and tradition of a space which is very important for human sense of existence. (Pallasmaa, 2012, p.33).

These thoughts of Pallasmaa and his sensitivity to architecture can be understood in a way that architecture is supposed to be a part of people and not something that will be overwhelming or something completely plain not evoking any feelings. There is need of a balance. It's supposed to show the past, teach us something about it and also to arouse a type of sense of belonging to this world. Designing with a great care to details such as sound, light and texture will strengthen this sense of connection with a certain space, which will not be just four walls in which we feel like birds locked in a cage.

LIGHT

Natural light is an incredibly powerful factor that is able to create a certain type of atmosphere along with potential to transform our environment and mood. It can be used as a tool to enhance the overall experience of space and create a sense of harmony between the built environment and nature. The light can be shaped by solids and voids. (Holl, 2006). Steven Holl believes that natural light is an essential element in creating dynamic and engaging architectural spaces, by incorporating different elements such as, strategically placed windows, skylights or light wells it is possible to bring daylight and at the same time create absence of connection between indoors and outdoors (Ertaş, Sirel, 2022). A very interesting architectural project that uses natural light to strengthen the experience of space in a slightly different way than usual is Therme Vals by Peter Zumthor. The combination of darkness and light that enters the building through small gaps in the roof creates reflections on the water, walls and in the steam-saturated air, giving the impression that the light has become something that we can physically touch.

TEMPERATURE

Each building has its temperature in all senses of this word. A well-known issue that Zumthor mentions is that every material is more or less capable of extraction of the warmth that our bodies produce and the temperature in this sense is simply physical, but it can also be psychological – *"Temperature (...) It's in what I see, what I feel, what I touch, even with my feet."* (Zumthor, 2005). What he means by that is how the human body and its senses perceive each material. Taking as an example wood and stone, wood seems to be warm and soft while stone is associated more often with cold and roughness. Even though, the processed stone can become smooth, it will still be associated with coldness in comparison to smooth wood. In fact, it could be argued that a given material is associated with given temperature by our experience of nature, where stone can most often be associated with dark, wet, and cold caves, while wood is mostly in forest in the form of trees that seems to almost hugging your body when you step in there.

THEORETICAL FRAMEWORK

MATERIALS

"The patina of wear adds an enriching experience of time where matter exists in time continuum." ~ Juhani Pallasmaa.

Looking around at modern cities, it is easy to notice that their architecture is mostly very simple in its appearance. Smooth surfaces that usually cover natural materials and their unique character or structures simply clad only in glass makes them plain and have almost no effects on our senses (Pallasmaa). Glass, enameled metal and synthetic materials convey nothing of their material essence or age unlike natural materials such as brick, stone or wood that can express its age and history along with its birth and use by humans over the years (Pallasmaa, 1996, p.29).

Zumthor supports the thesis put forward by Pallasmaa that plain buildings simply clad only in one material don't have that much effects on our senses. The right diversity of the building's materials can provide various sensory experiences (Zumthor, 2005, p.23).

Peter Zumthor also emphasizes the uniqueness of natural materials, and how one material can become different thing each time after various ways of processing it. For example, an ordinary stone can be very diverse depending on how we process it – saw it, grind it, drill into it, split it, polish it or simply expose it to the light – it will be unique and different each time and hence will provide different sensual experiences (Zumthor, 2005, p.25).

The combination of completely different materials can create a building that, as Zumthor compared, will create one harmonious organism despite many different organs, just like the human body – *"It's like our own bodies with their anatomy and things we can't see and skin covering us (...) The body! Not the idea of the body – the body itself! A body that can touch me."* ~Zumthor.

Natural materials convey a sense of authenticity making the structure sensual and alive, almost like the building have a soul. It speaks to the user through its organic structure that develops and changes over time which gives unique aesthetic qualities to the building but at the same time corresponds with different human senses, in contrast to the more sterile and impersonal qualities of synthetic materials that are man-made, manufactured to be smooth and consistent in appearance without sense of age, history and human use.

COLORS

"People generally feel great joy about the color. The eye needs it as well as it needs light. Let's just think of the revival we experience when the sun looks out on a gray day and illuminates a lot in the night, so that you can see the colors. The fact that colored gemstones were attributed healing power may perhaps be due to this deep sense of this unspeakable pleasure." ~Goethe (Sällström, 2014).

For a considerable period, the field of color psychology has been exploring how humans perceive and associate colors (Fridell Anter, 2004). Recent studies have revealed that certain colors can stimulate and energize, while others have completely opposite effect (Schweitzer, 2004).

A study conducted by a group of scientists in which 24 students participated showed that colors indeed can have impact on humans' feelings, and even their heart rate. The study was conducted using makeshift rooms, where each of them was in one specific color (blue, yellow, red) and shade (pale or vibrant).

The study had the following effects:

- pale blue: was comfortable for the eyes and made it easy to concentrate on the task.
- pale red: made it difficult to focus, increased the feeling of stress and people could not focus on the task.

- pale yellow: was comfortable for the eyes, helped with focus, increased the desire to finish the task.

- vibrant blue: students felt more active but also relaxed, helped to focus on the task.

- vibrant red: felt very disturbing and annoying, zero concentration.

- vibrant yellow: made it harder to concentrate, many students felt physical heat.

The study indicates that colors have the potential to create physiological and emotional responses in young individuals.

However, further research is needed to determine if similar effects occur among old people and children. Noticable is that hue and brightness significantly influenced the participants' emotional states. Pale colors were perceived more positively, being associated with feelings of calmness and relaxation, compared to vivid colors. Additionally, intense colors such as red and yellow led to an increase in heart rate, while blue tended to decrease it (Al-Ayash & Kane & Smith & Armytage, 2015).

As the study shows, colors play an important role in architecture. With their help architects are able to create a certain environment and enhance its impact on the users.

CHAPTER 2
REFERENCE PROJECTS

Villa Kjærholm. Hanne Kjærholm



Villa Kjærholm was built in 1962 on the Rungstedt coast in Denmark. This 145 sqm villa features a visible construction with simple, minimalistic design using wood and brick. The interior, crafted by her husband Poul, includes custom-design furniture specifically for their home.

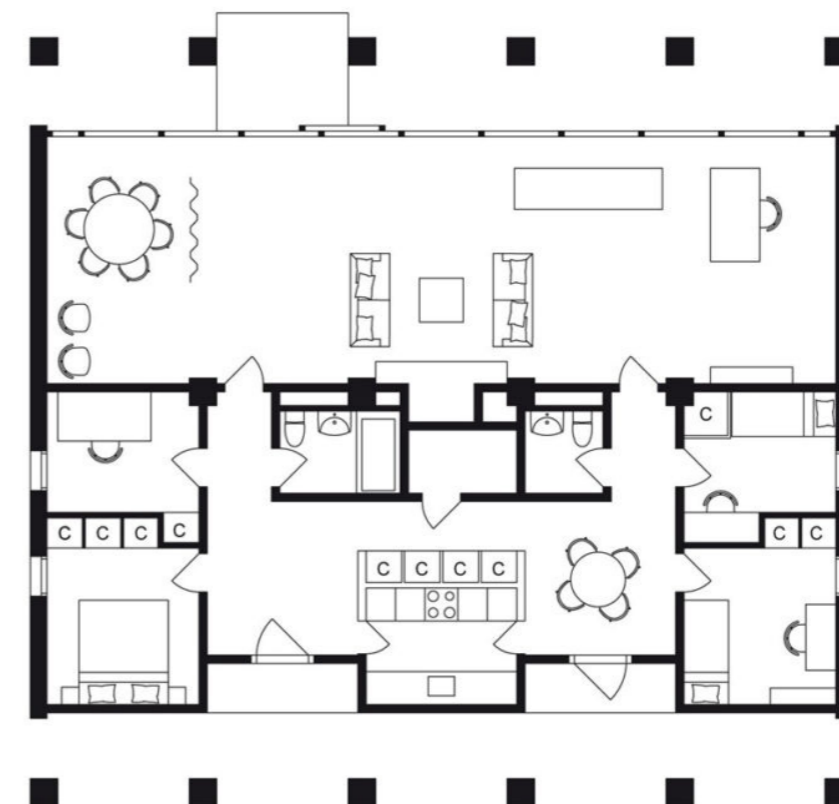
Inspirations for the project were a pergola and the Japanese concept of "borrowing the landscape." Hanne aimed to create a "zen" vibe by combining open facades with the proximity to the sea and the lush green surroundings.

The building is constructed with stained wood and white painted bricks that are visible both inside and out. This contrast between warm and cool materials creates a balance and minimalistic atmosphere.

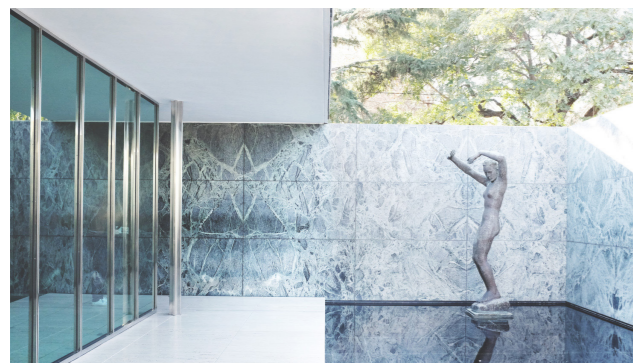
The flat roof is edged with oxydized copper and topped with sedum, seamlessly blending the structure with the surrounding greenery.

The house plan is very compact, has two entrances to the west that are separated by a small kitchen as well as master and children's bedrooms. There are also two toilets and a furnace room in the core of the building. This represents the compact and closed zone strictly following the beam and pillar system of the building structure.

The grid of the house makes the placements of the walls into a symmetrical pattern that clearly shows the contrasts between the compact core and the open living room towards the sea (Chalmers School of Architecture, 2022).



Barcelona Pavilion. Mies van der Rohe



Barcelona Pavilion is literally a piece of art. The building was the German Pavilion for the 1929 International Expositions in Barcelona, Spain. It was used for the official opening of the German section of the exhibition.

Barcelona Pavilion is an important building in the history of modern architecture, known for its simple form and its spectacular use of extravagant materials, such as marble, red onyx and travertine. Furnishing that was designed specifically for this building, including the Barcelona Chair, are still in production.

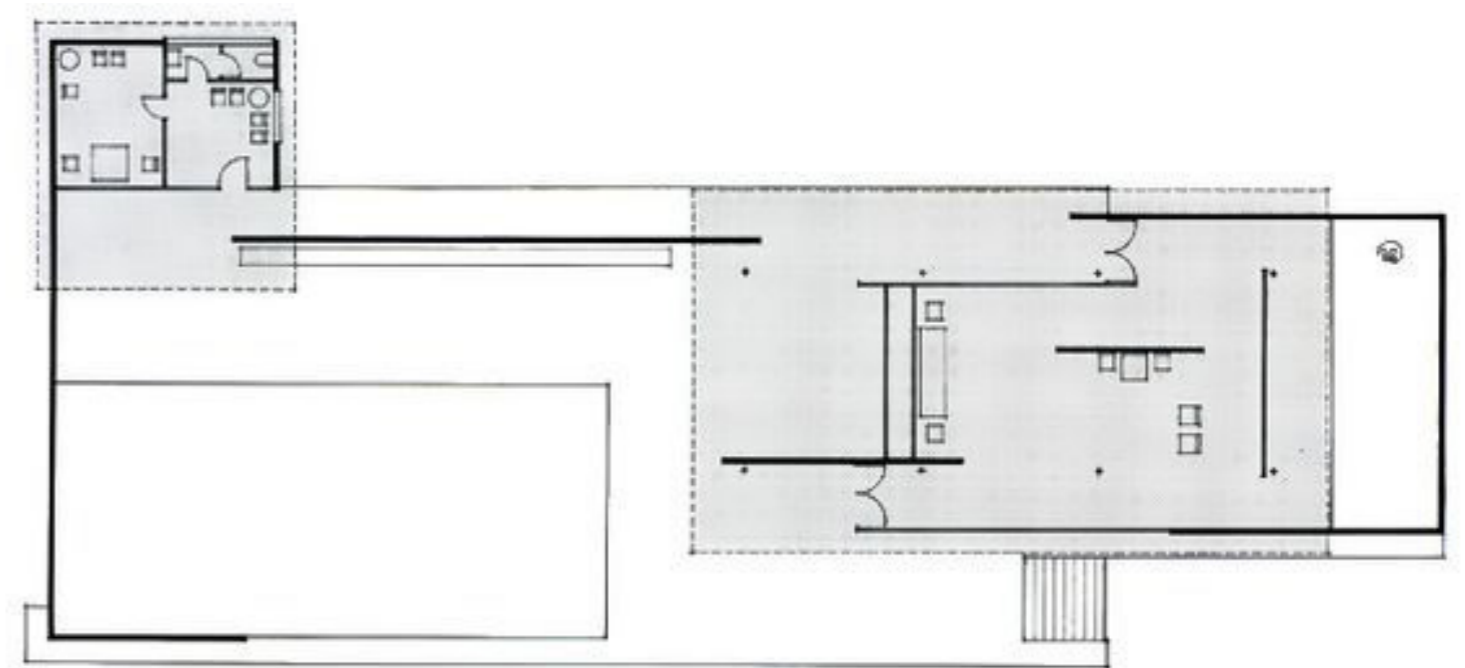
The pavilion was design to be bare, without any exhibits, featuring only the structure itself, a single sculpture, and specifically-designed furniture - the Barcelona Chair.

This minimalistic approach allowed Mies to treat the Pavilion as a continuous space, seamlessly blurring the boundaries between inside and outside.

"The design was predicated on an absolute distinction between structure and enclosure - a regular grid of cruciform steel columns interspersed by freely spaced planes" (Weston, Richard, 2004). However the structure was more of a hybrid style, some of these planes also acted as supports (Weston, Richard, 2004).

The floorplan is very simple and the entire building rests on a plinth of travertine. A southern U-shaped travertine enclosure creates a service annex and a large water basin. The pavilion's floor slabs extend over the pool, further integrating the interior with the exterior. On the opposite side, another U-shaped wall forms a smaller water basin, where a statue by Georg Kolbe is placed.

The roof plates are supported by chrome-clad cruciform columns, creating the impression of a hovering roof.



Fallingwater. Frank Lloyd Wright.



"[Wright] understood that people were creatures of nature, hence an architecture which conformed to nature would conform to what was basic in people. For example, although all of Falling Water is opened by broad bands of windows, people inside are sheltered as in a deep cave, secure in the sense of the hill behind them." ~ Edgar Kaufmann Jr.

Fallingwater is a house designed in 1935 by the architect Frank Lloyd Wright and is situated in the Mill Run section of Stewart township, in the Laurel Highlands of southwest Pennsylvania.

The private residence was intended to be a nature retreat for its owners. It is built on top of an active waterfall that flows beneath the house giving sensory experience and strong connection between human and nature.

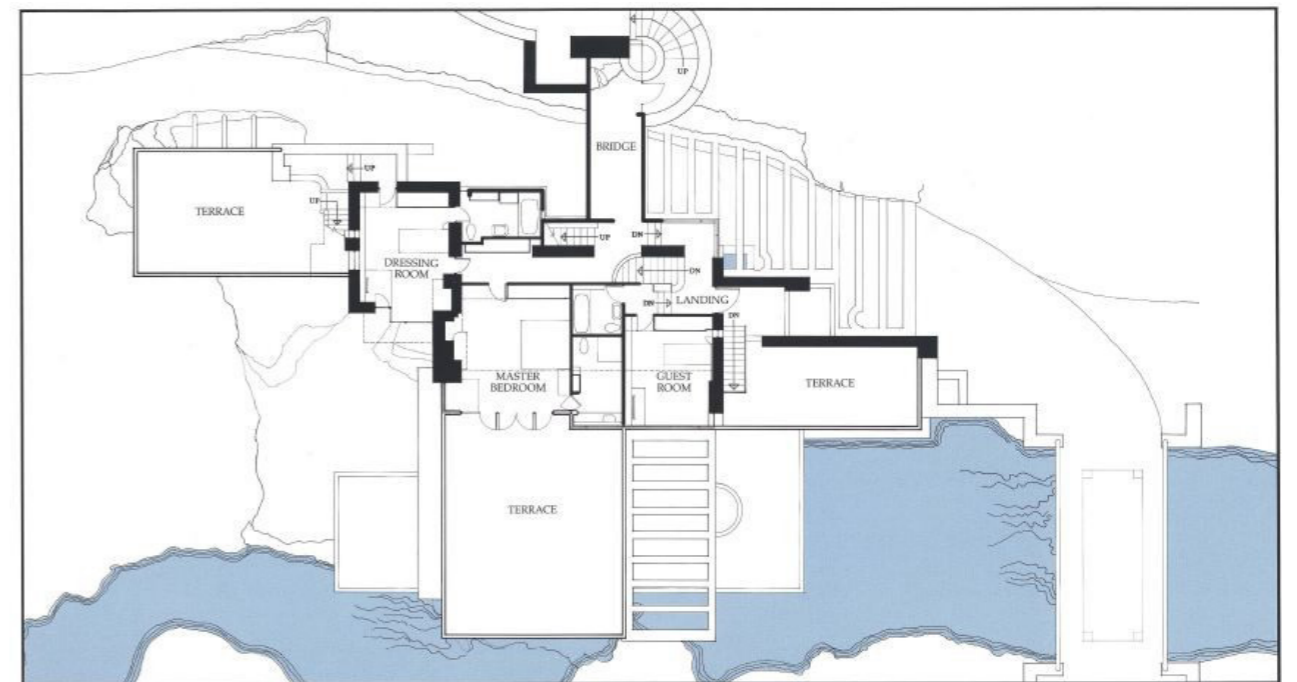
The house color palette is limited to only two colors, a light ocher for the concrete and his signature Cherokee red for the steel, so as to

blend into its natural settings in rural Pennsylvania. The building has also stone walls made of stone from local quarries and cantilevered terraces that were intended to resemble the nearby rock formations, while the windows and balconies are extended into surroundings.

For the cantilevered floors, Wright and his team used inverted T-shaped beams incorporated into a monolithic concrete slab. This design served as both the ceiling for the space below and provided compression resistance.

Fallingwater is described as a tour de force of Wright's organic architecture. The building incorporated Japanese architectural details, reflecting Wright's admiration for this type of design.

Because of its uniqueness, in 2019, the house was inscribed as World Heritage Sites under the title "The 20th Century Architecture of Frank Lloyd Wright".





CHAPTER 3
CONTEXT

AREA

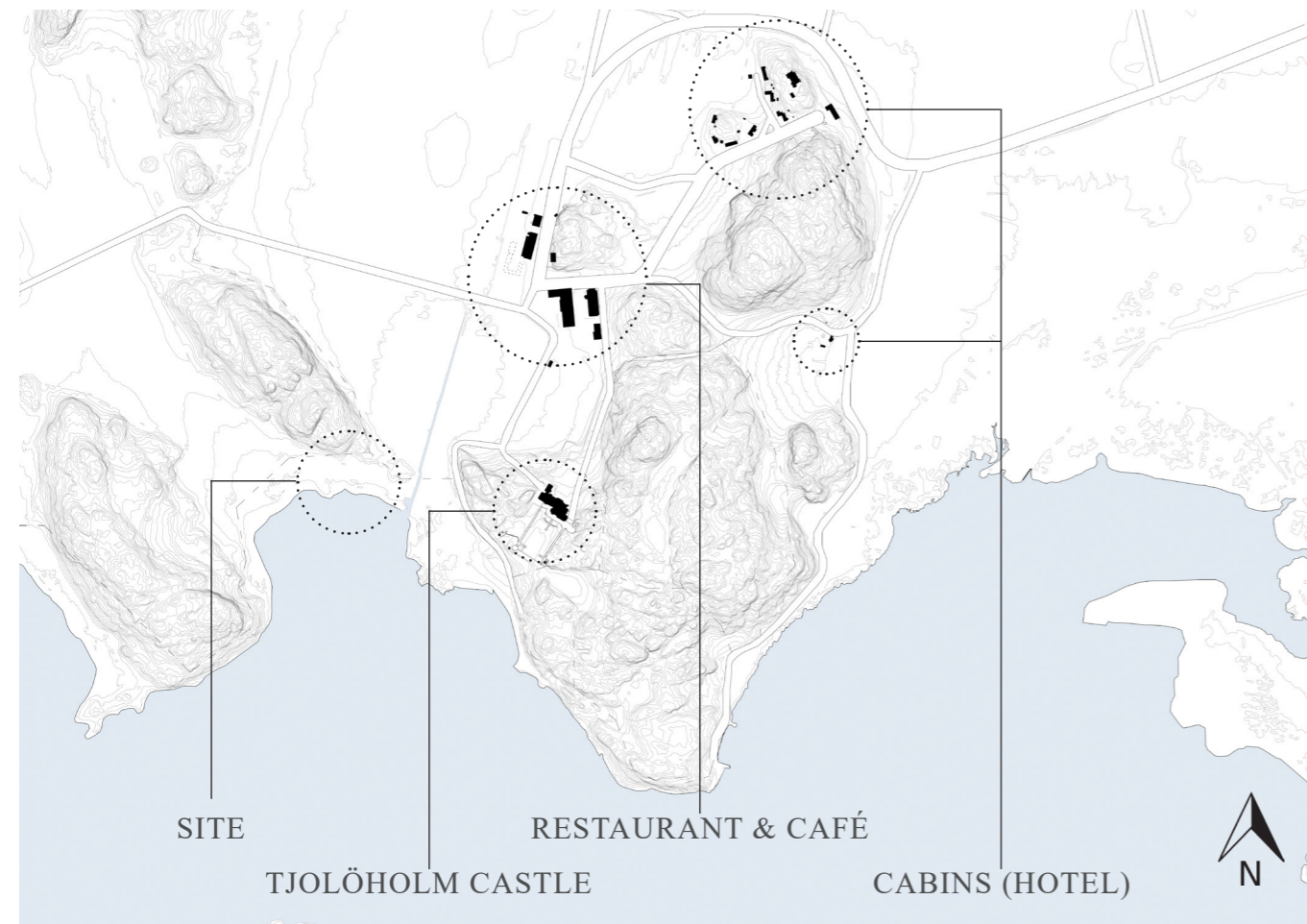
TJOLÖHOLM CASTLE, SWEDEN

The area chosen for this project is situated in Kungsbacka County, just right outside the city of Gothenburg.

What attracts people to this area is a beautiful Tjolöholm Castle built in English style that is almost 120 years old and is open for visitors to explore. The area around the castle is very active, especially during summer season. There are two restaurants and a village with small cabins that visitors can rent for couple of nights and enjoy this place longer.

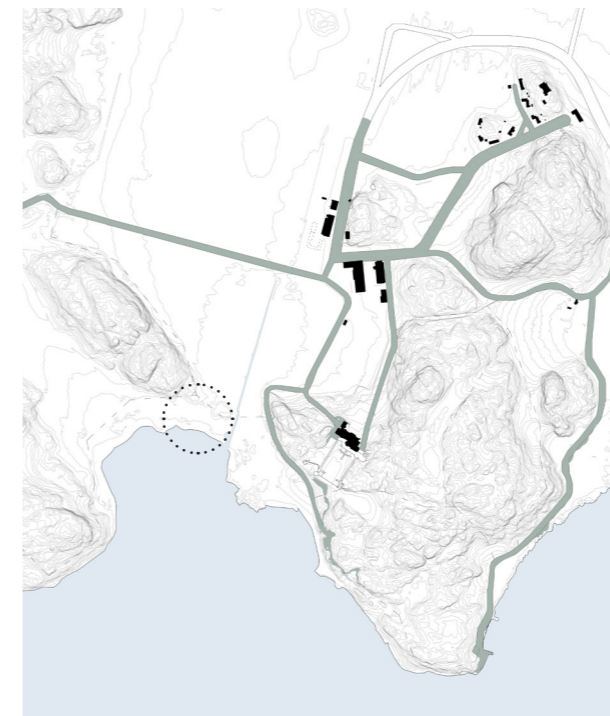
The area around the castle and the site has natural character with a lot of greenery and direct access to the sea, which usually attracts many visitors and people living in the area during summer time.

There are many walking trails to explore and numerous hills around there. Some parts of the castle area are also accessible with a car but it is only possible for people who work there and in cases of special situations that require it.

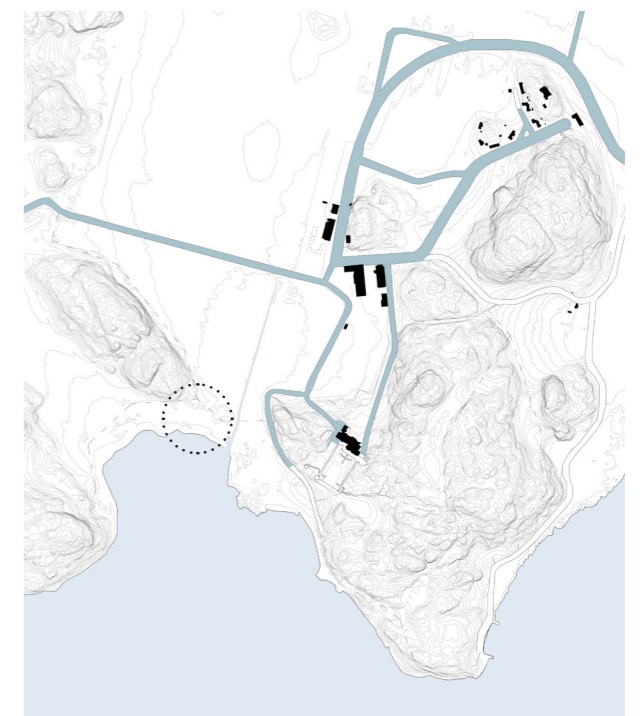


WAYS OF MOVING

WALKING AND WHEELCHAIR



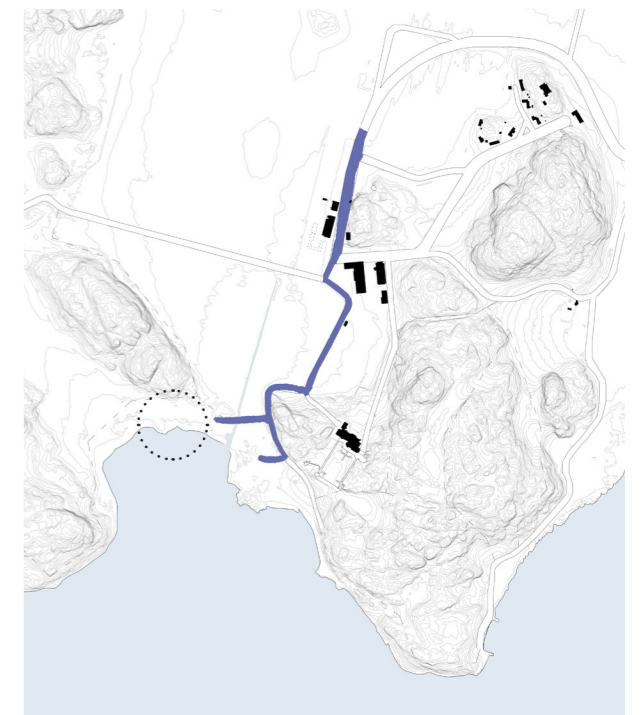
VEHICULES



HIKING



POSSIBILITY OF NEW ACCESSIBLE PATH TO THE SITE (incl. vehicles).



AREA



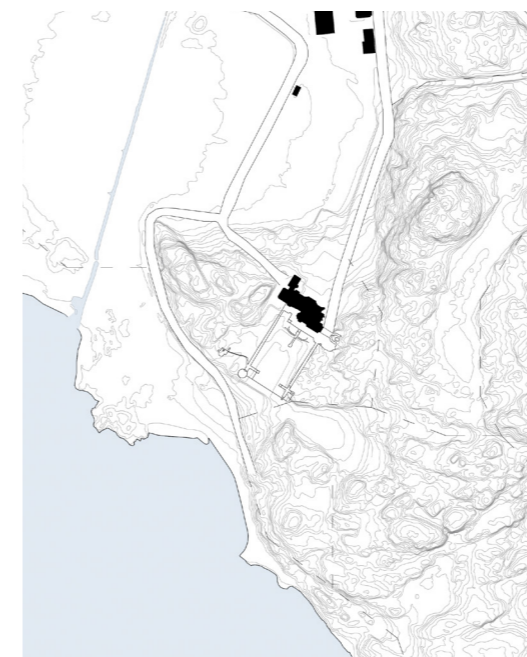
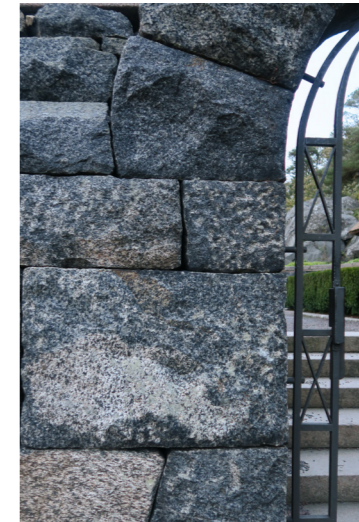
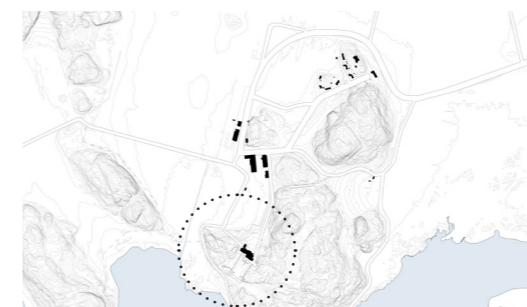
THE VILLAGE

This part of the area has a rural atmosphere and most of the buildings are very subtle but there are also some bigger buildings like barns that have been converted into shops and restaurants. Red color and wood are dominant. There is also a lot of greenery and gardens where vegetables and fruits are grown. When you are there, you feel like time is slowing down.



THE CASTLE

In the castle area there is a very big contrast compared to the village. There is a heavy masonry architecture and more subdued colors of the building materials. At the back of the castle there is a beautiful large garden with different types of flowers that stretches towards the sea. The power and wealth are very noticeable in this part.

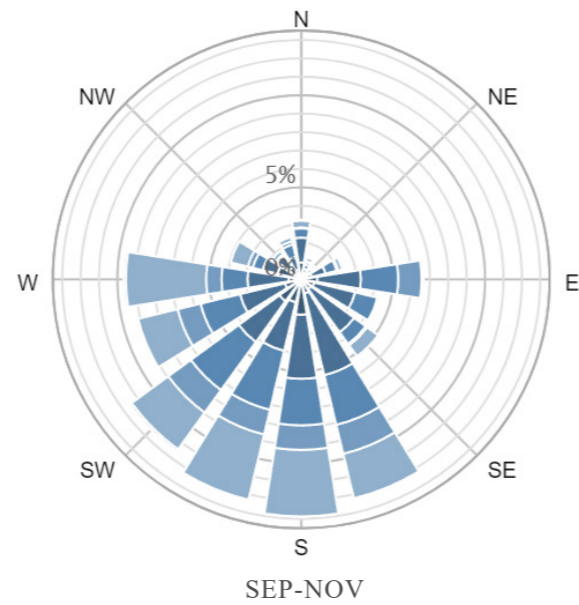
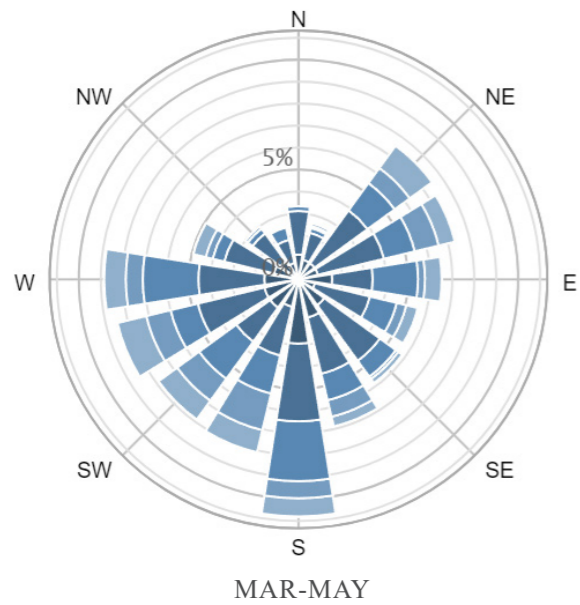
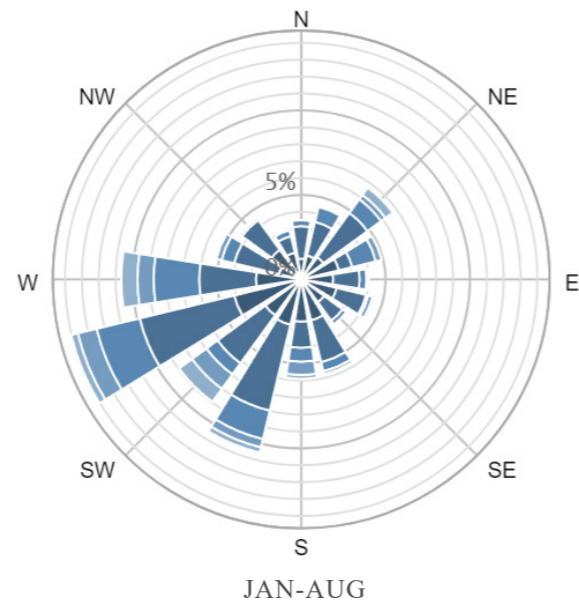
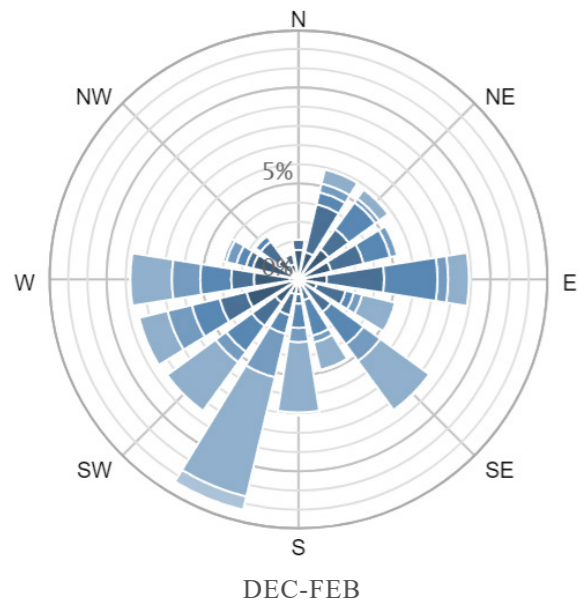


SITE

NAURAL FACTORS

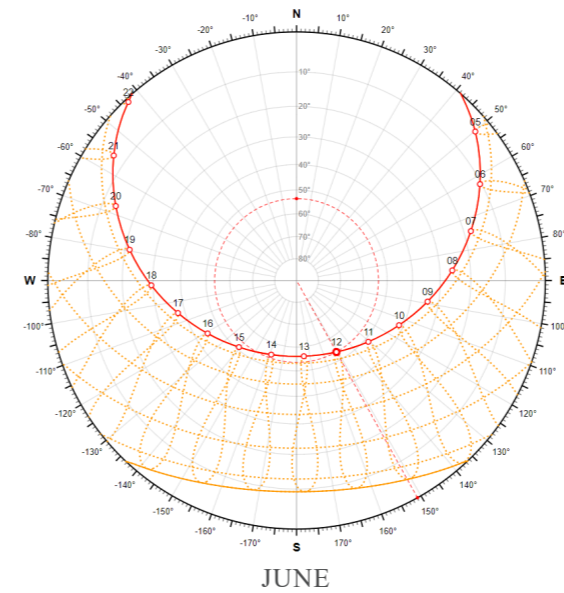
WIND

The wind is felt mainly from the south-west, i.e. from the sea, and has different intensity depending on the weather conditions and time of the year. It can be vary strong but also almost imperceptible .

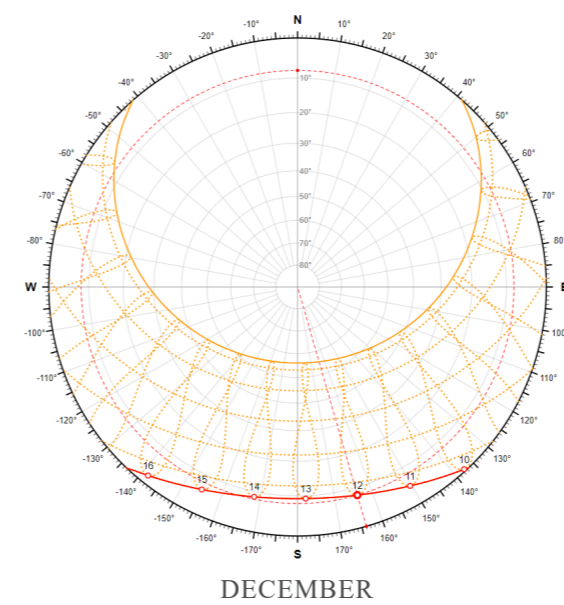


SUN

The position of the chosen site to the sun allows for a lot of daylight and sunlight into desirable spaces. Moreover, there is a possibility of creating delightful spaces with the sunset in the foreground year round, which will enhance the experience of the space.



Time	Elevation
4:16	0 °
6:00	10 °
9:00	34 °
12:00	54 °
15:00	51 °
18:00	29 °
21:00	5 °



Time	Elevation
8:00	0 °
9:00	1 °
12:00	9 °
14:00	6 °
18:00	0 °

SITE

Access to the site is currently difficult to cross and completely inaccessible for wheelchairs because the only way to it is through a medieval stone fence, which over time became a bridge connecting two parts of the area. The bridge has a strong character and in its way is unique, which is why it became inspiration for the concept of the building later on.

While crossing the bridge, we are surrounded by tall grass and after a while the sea begins to emerge together with the forest on the opposite side.



After reaching the site, we are greeted by low and quite flat rock formations that stretch towards the sea as if they wanted to touch it.

The beach and playground in the picnic area is visible from the site but despite the many people there it is not irritating. The sound of chirping birds, the sea and light wind prevailing there.

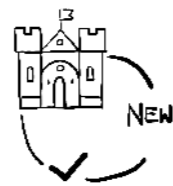


CHAPTER 4
DESIGN PROPOSAL

DESIGN STRATEGIES

HERITAGE

The new building will fit into the image of the area so as not to stand out too much from buildings that are already there.



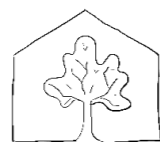
LOCAL MATERIALS

To reduce potential carbon footprint, only lokal materials are taken into account during this project.



NATURE

Building will provide instant and persistent connection to nature by introducing it into spaces in the building

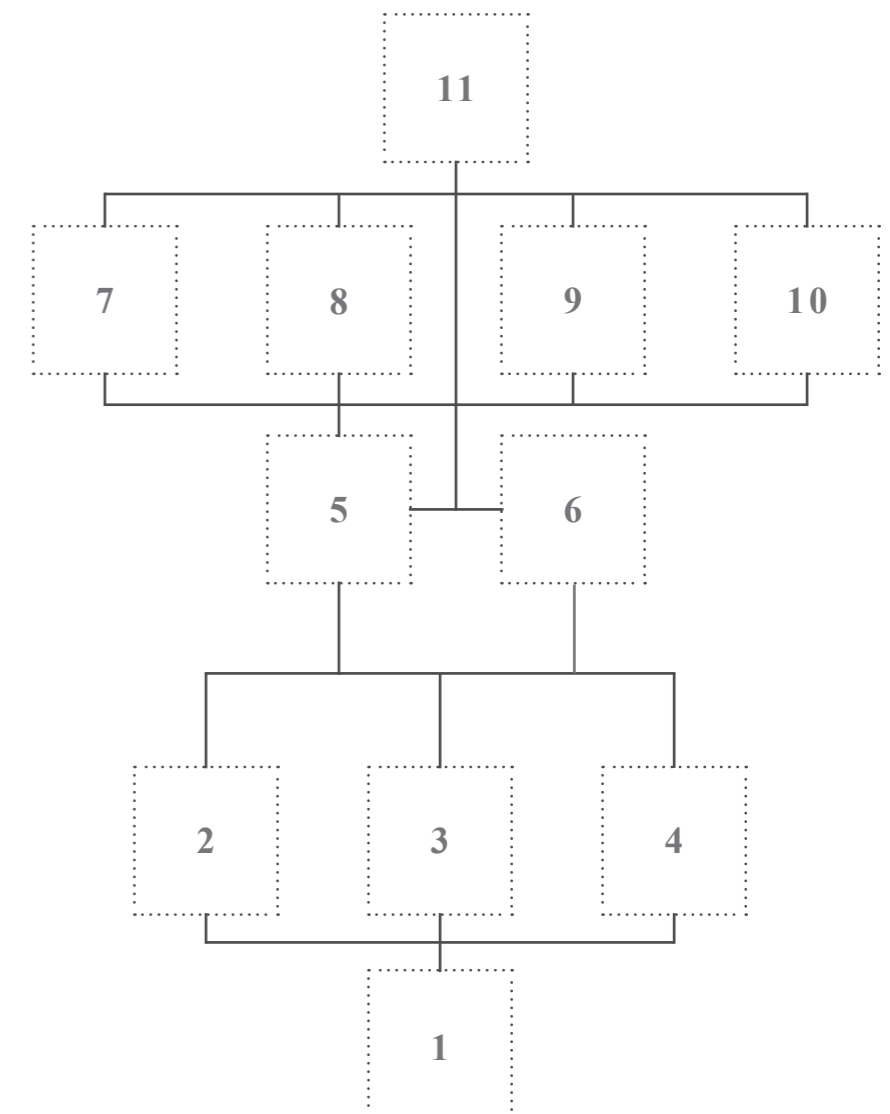


PROGRAM

To obtain a more primitive feel to this building, but to also not make it overcrowded, the program was created with mind for guests staying at the hotel in the castle village, who can use this facility after prior reservation or after receiving access in the form of a key, card or a phone app.

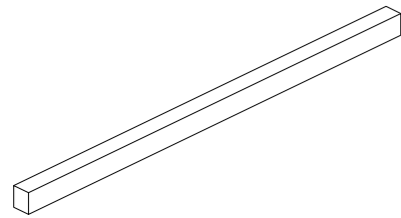
The program includes:

1. Entrance
2. Womens' changing room
3. Neutral changing room
4. Mens' changing room
5. Indoor bath
6. Resting spaces
7. Ice bath
8. Fire bath
9. Scented bath
10. Sauna
11. Outdoor bath = sea

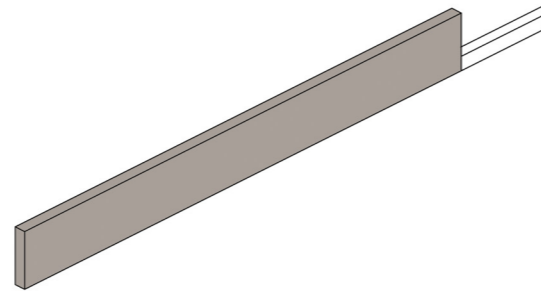


CONCEPT EVOLUTION

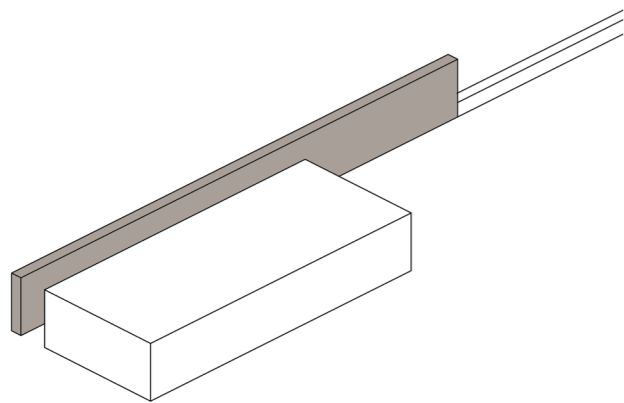
1. STONE BRIDGE AS A STARTING POINT



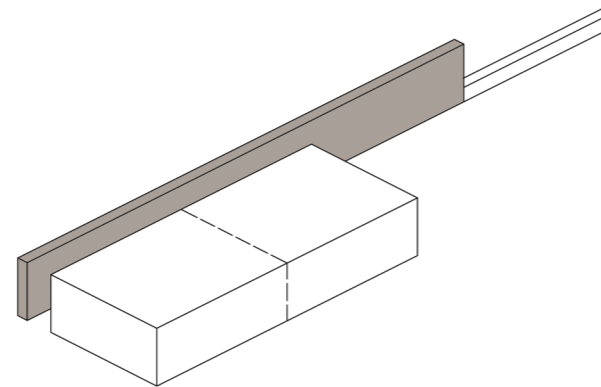
2. EXTRACTION OF THE STONE BRIDGE BY ADDING A WALL



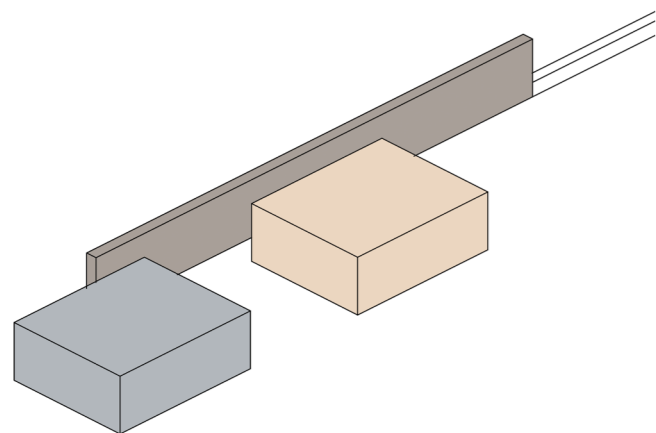
3. ADDITION OF A BUILD MASS



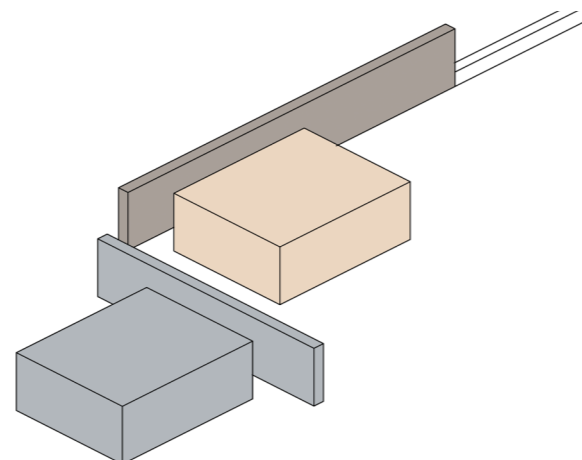
4. DIVISION IN HALF TO CREATE DIFFERENT ZONES



5. MOVING APART THE ZONES TO GIVE LIGHTNESS TO THE BUILDING

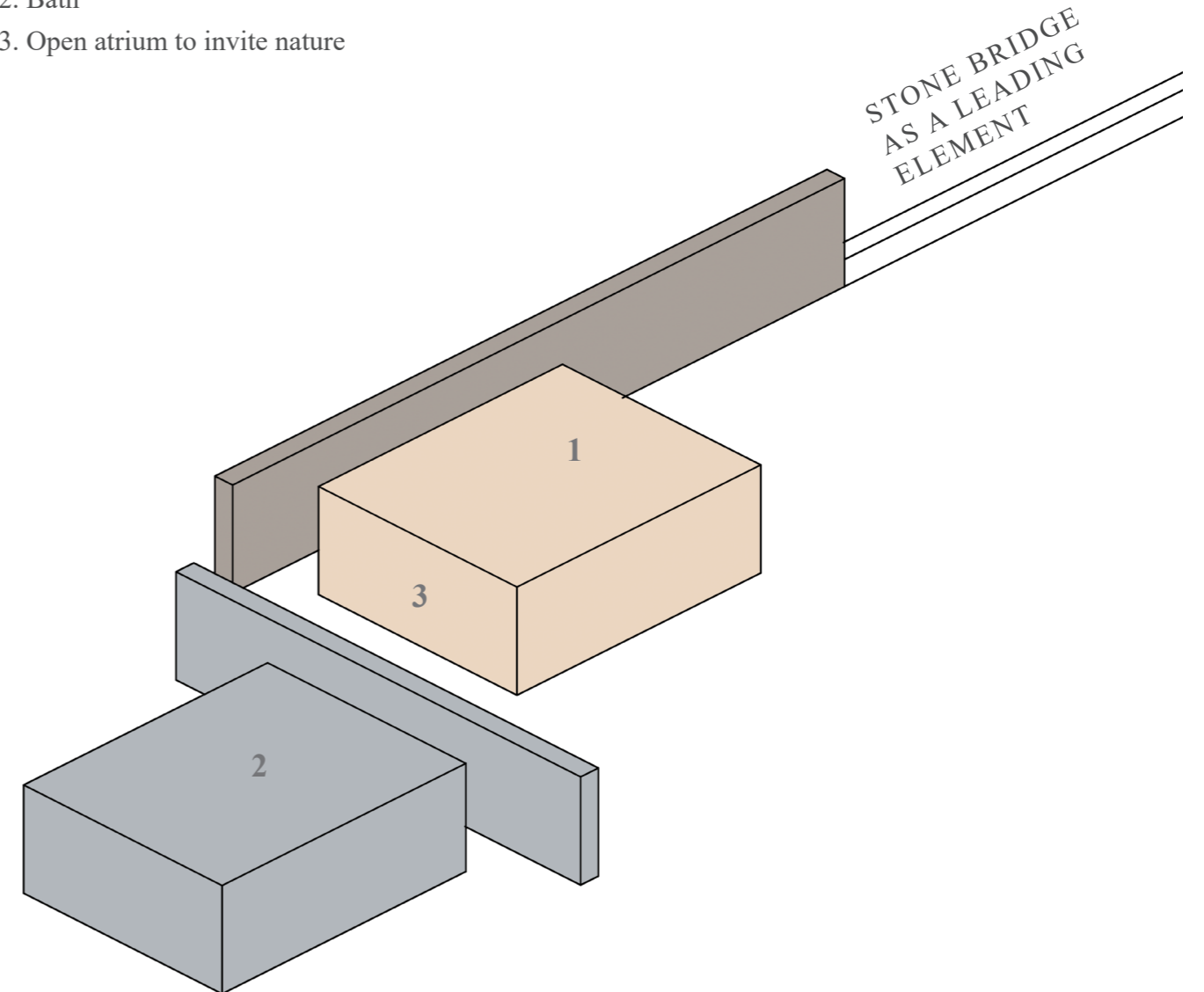


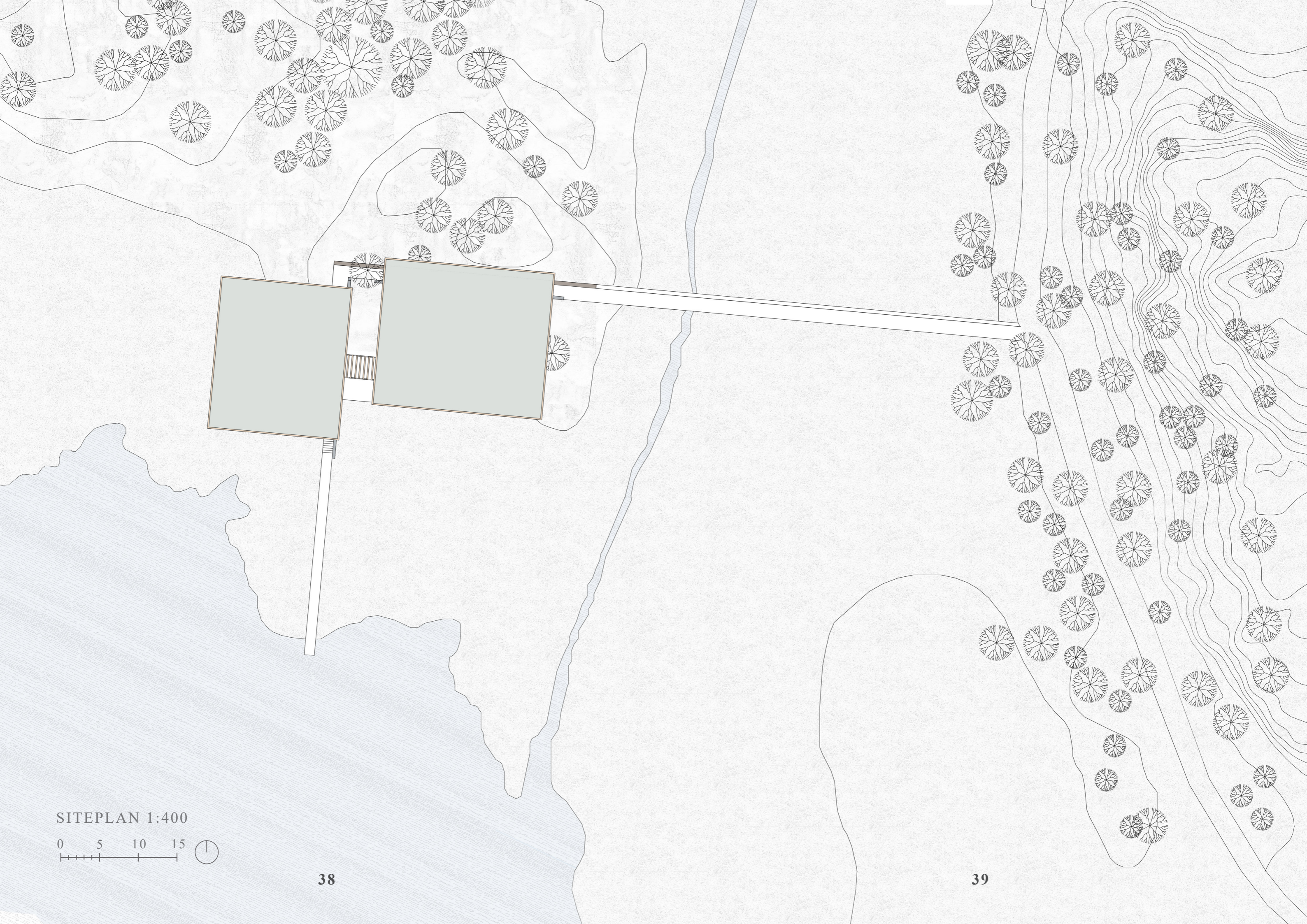
6. MOVING ONE PART TOWARDS THE SEA AND ADDITION OF ANOTHER WALL TO KEEP THE SAME LANGUAGE



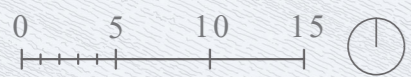
PLACEMENT OF ZONES:

- 1. Changing rooms and resting spaces
- 2. Bath
- 3. Open atrium to invite nature





SITEPLAN 1:400



1. The stone bridge leads to the building and at the same time forms a part of it through a raised and connected wall in medieval style that became bridge's extension. Next to the bridge there is a concrete pavement that facilitates access to the other side of the area.

2. A concrete wall was placed right next to the wall in medieval style and has created a clear path that leads to the first part of the building which is a changing area.

3. Considering the psychological idea of this project the changing zone is supposed to be a transition part where visitors leave everything behind both physically and mentally. There are no windows in any of the changing rooms except some openings between the wall and the ceiling that let in some daylight, but also to give an impression of a floating roof. Because of that, the visitors are not aware of what is on the other side yet. The lack of windows also means that visitors are not distracted by the view and can focus all their attention only on the transition journey.

4. The next thing that the visitors see when they open the door to the next part is sea stretching to the horizon. The transition part is noticeable here because the starting point in the building was quite subdued and darkened due to the lack of windows while here, people are basically in a glass box surrounded by nature. This space is characterized by openness and brightness, but at the same time coziness because of the wood that dominates there.

Many loungers and a few hanging chairs provide comfortable places to relax and to admire the view. The loungers are placed at the corners of the building and are covered by nature that were already on the site, providing more privacy, especially from the entrance when the new visitors arrive. Additionally, it is possible to open up the glazed parts and create completely different environment.

5. While moving to the next part where bath experience is placed we are passing through a glass connection, with the sea on one side and an outside atrium on the other.

6. After passing through the glass hallway we are greeted by almost cave looking interior. It differs significantly from the relaxation part, as it is dominated by stone that you can feel with your hands and feet. Perhaps its smell is also noticeable due to higher humidity there. At the very center of the cave box there is a swimming pool that can be accessed from two sides and is surrounded by four rooms to uncover. This whole part of the building is supposed to allow people to move freely and explore the rooms, strengthening their curiosity and at the same time create different experience than in the first part of the building. Each room hides something different and is designed to stimulate different senses.

- 7. Steam room
- 8. Ice bath
- 9. Scented bath with rain
- 10. Fire bath
- 11. Atrium

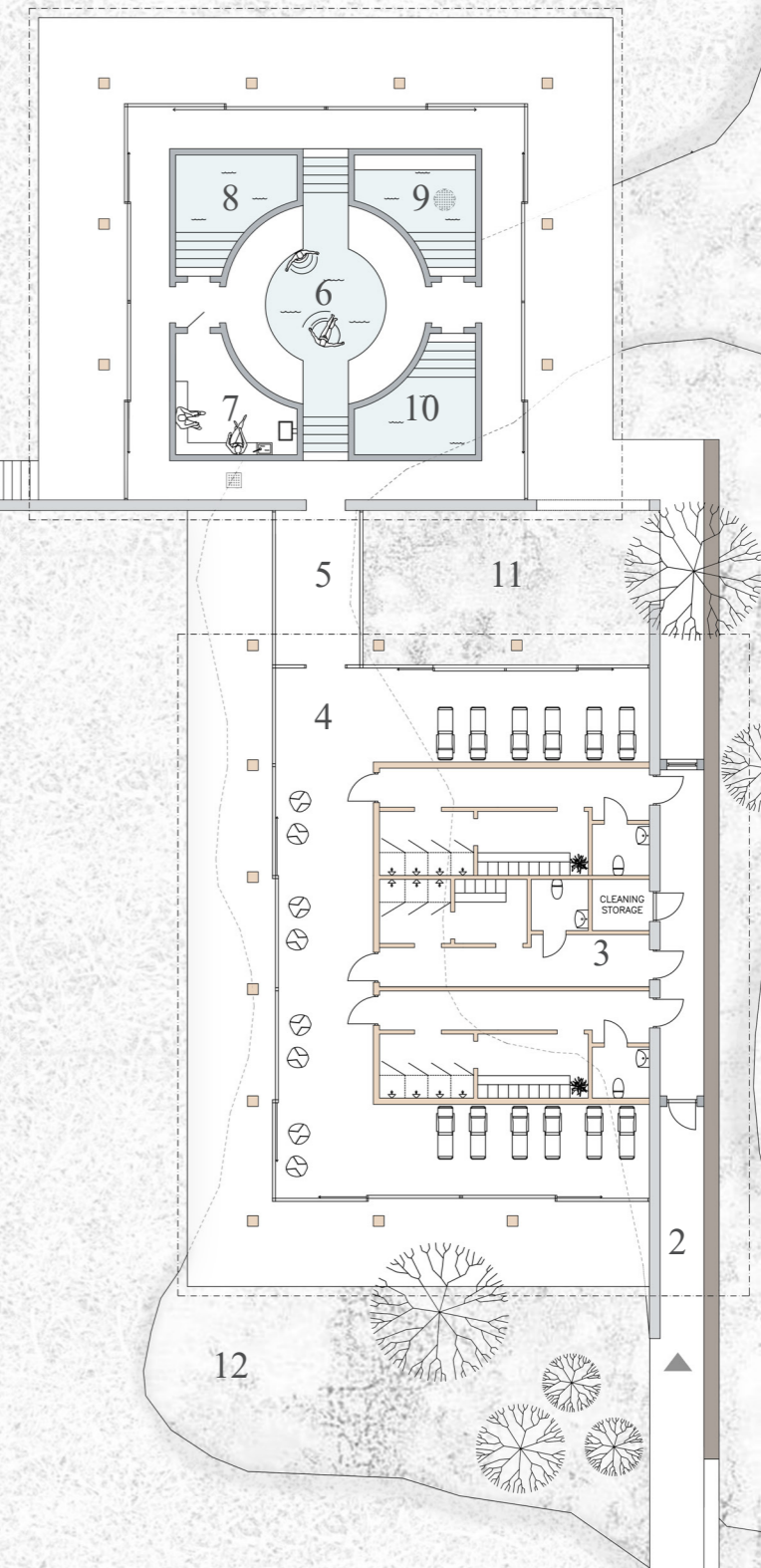
- NATURE
- 12. Stone
- 13. Grass
- 14. Water (waterline changes depending on the weather conditions and it can even reach the base of the rock formations)

FLOOR PLAN 1:250



14

13



12

1

THE VIEW WHILE APPROACHING
THE BUILDING



ENTRANCE - different materials. Old medieval wall and modern concrete wall opposite each other



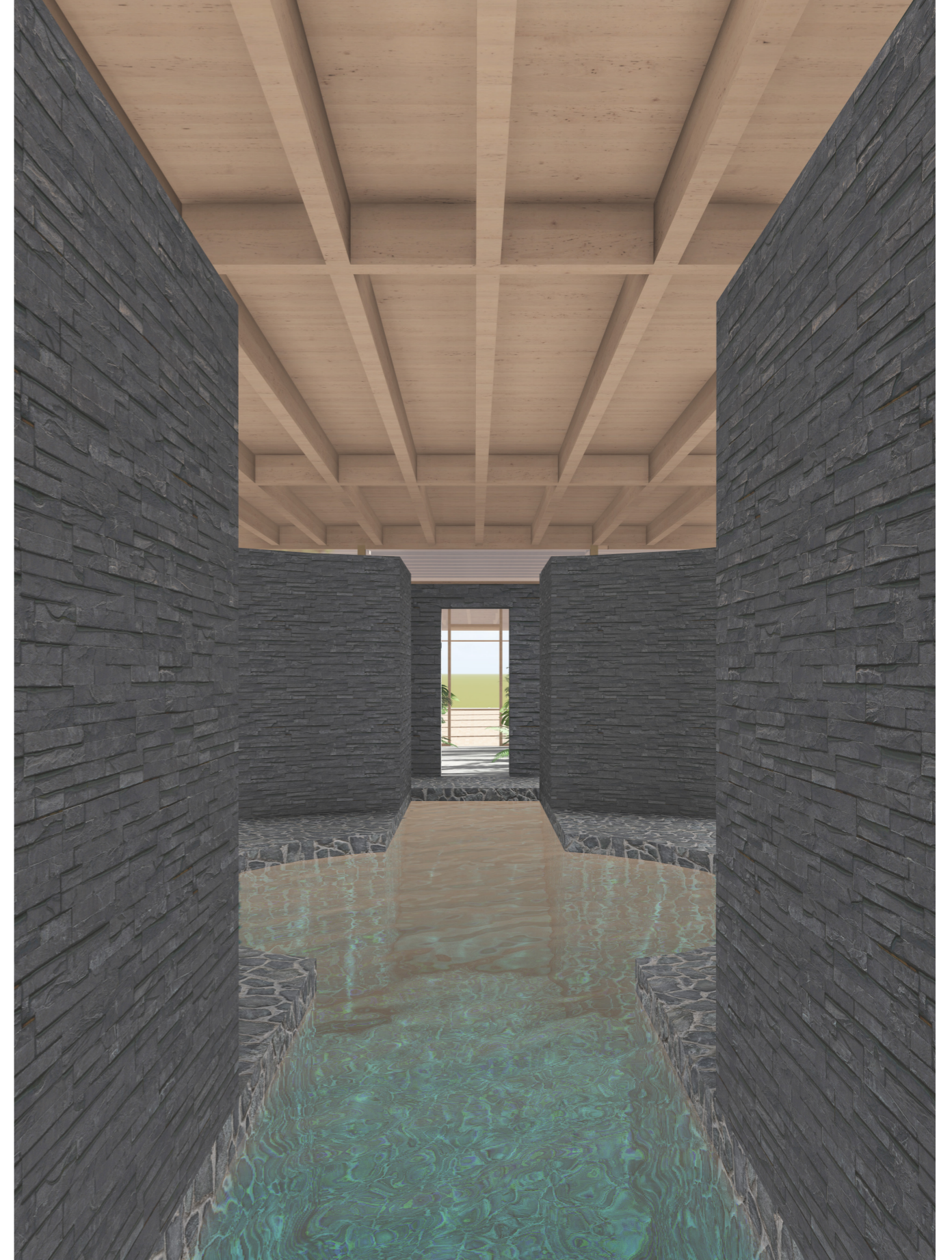
HALLWAY - the way to changing rooms with a sightline to courtyard and different materials visible.



HALLWAY IN RELAX AREA - openness and brightness with wood in the foreground. Visible structure on the ceiling gives the impression of mobility. The beams leading the visitor to the next part of the experience.



BATHING AREA - unlike the relax area, the bathing area is subdued. Dark lime stone is dominating here. As in the previous part of the building there are gaps between the walls and the ceiling to keep the feeling of a floating roof.



THE VIEW WHILE APPROACHING
THE BUILDING FROM THE WATER



GLAZED WALLS - glazed walls in every part of the building make it possible to open the rooms, which allows to create a different atmosphere inside



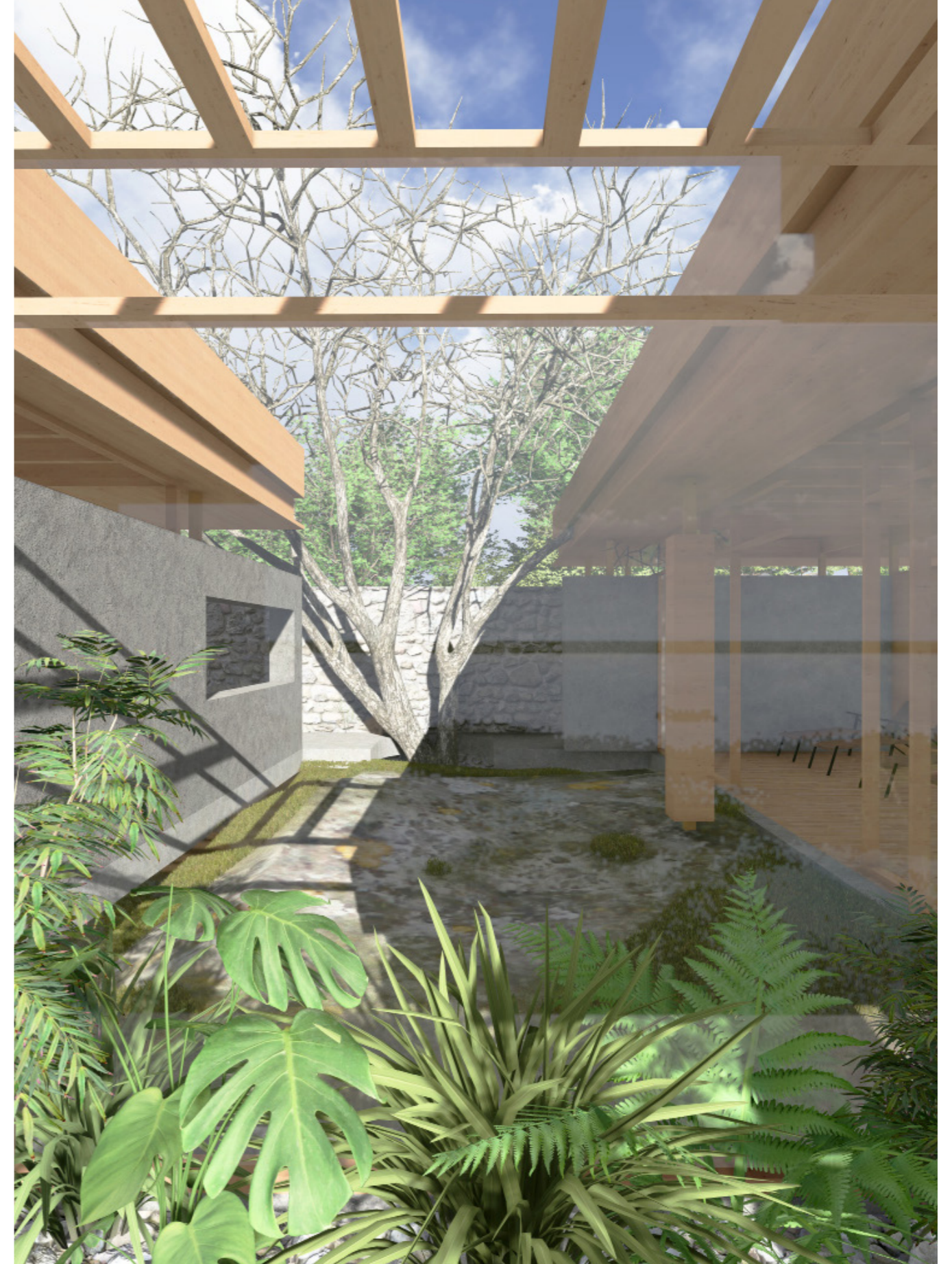
BATHING AREA - concrete wall meets stone wall.



TERRACE, RELAX AREA



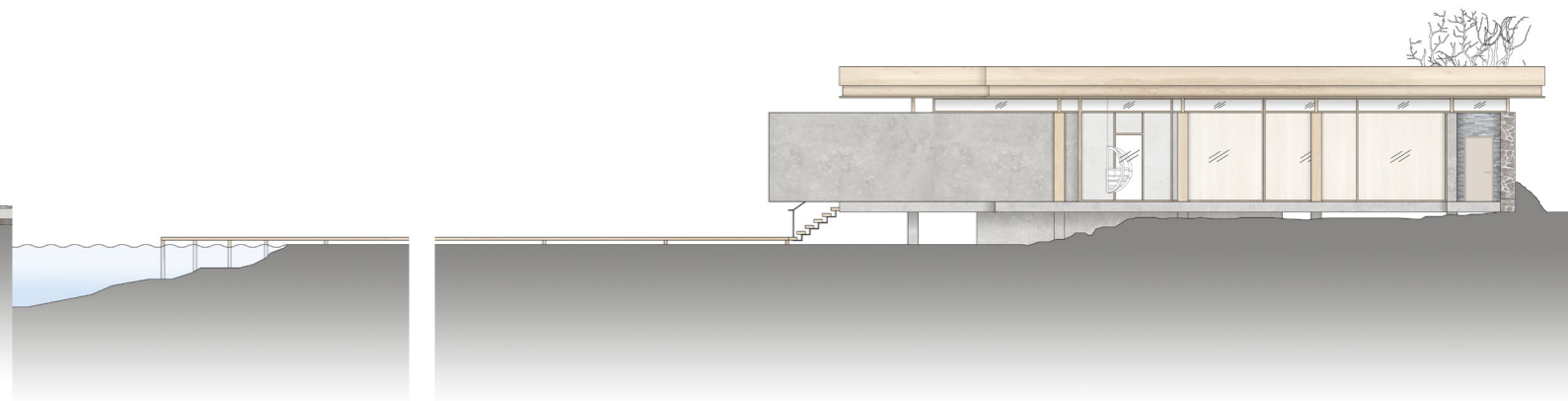
GLAZED CONNECTION - view on the atrium.



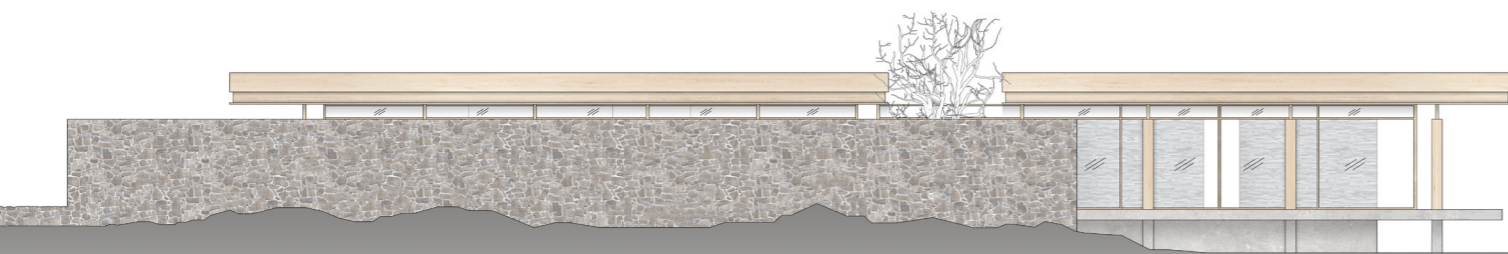
ELEVATIONS



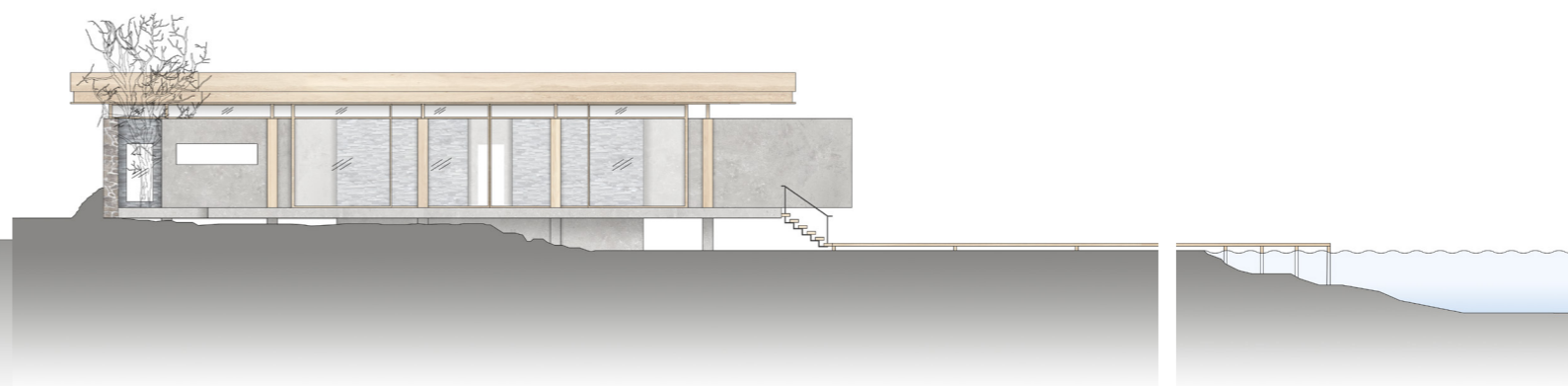
SOUTH



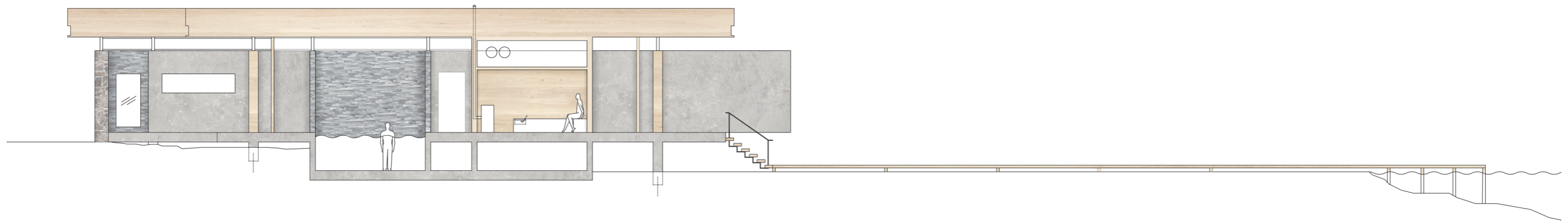
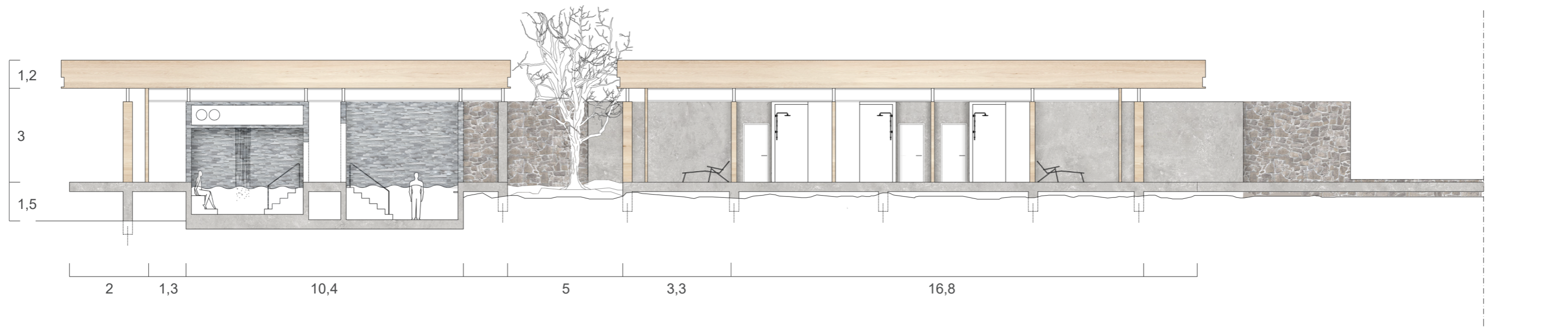
EAST



NORTH



WEST



MATERIALS



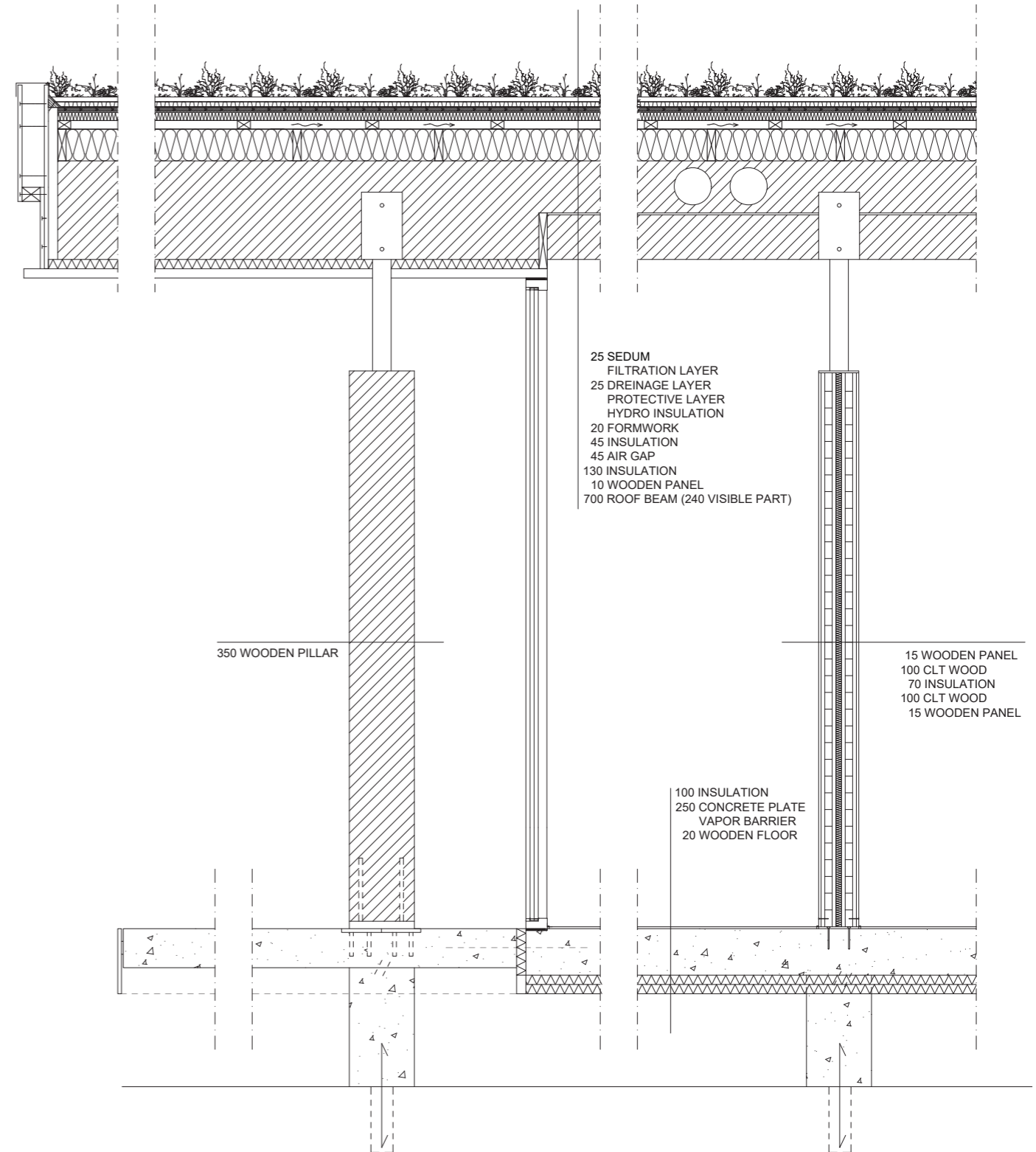
CONCRETE

GRANITE

CLT WOOD

LIMESTONE

DETAILED SECTION 1:30
RELAX AREA



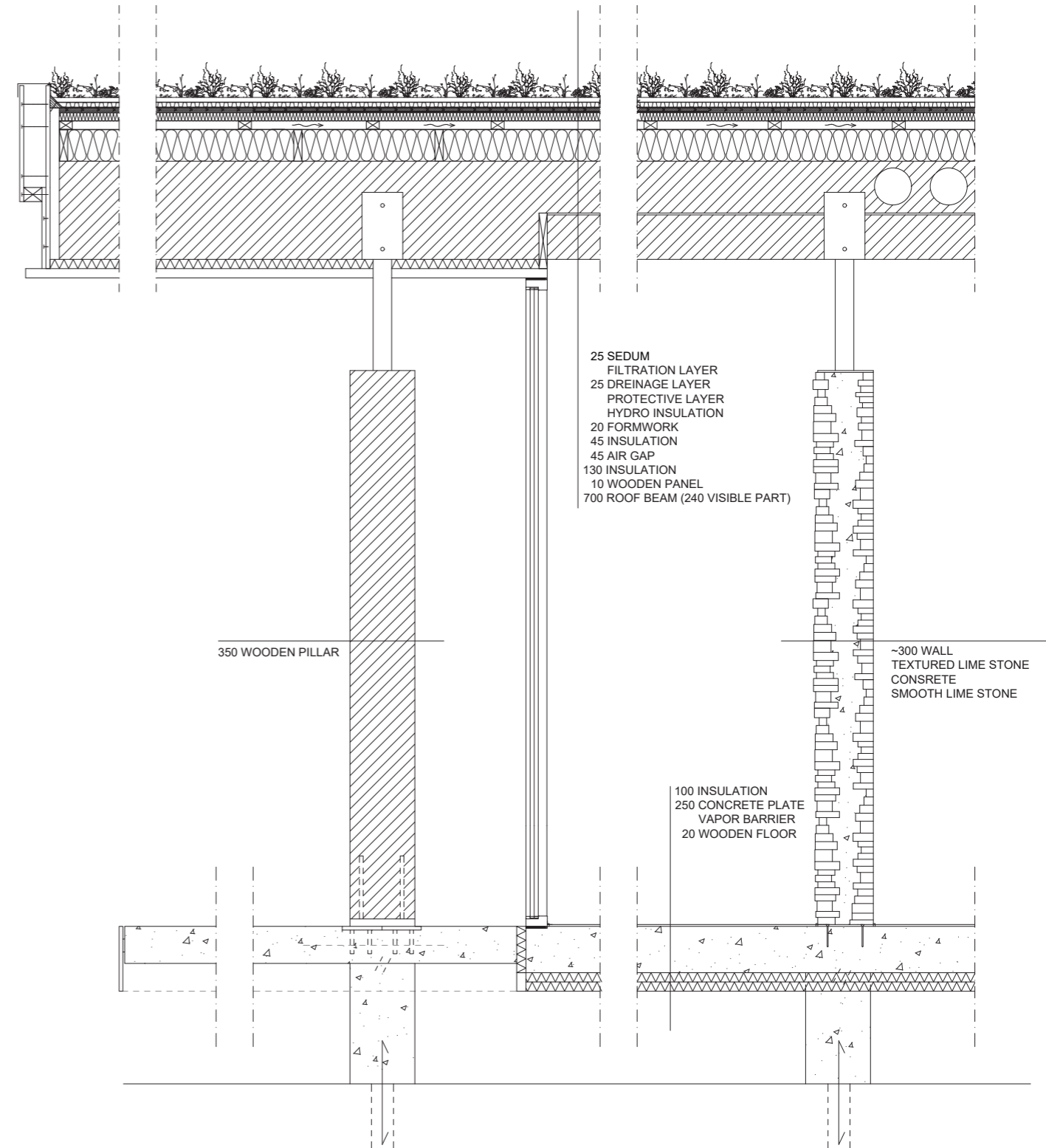
25 SEDUM
FILTRATION LAYER
25 DREINAGE LAYER
PROTECTIVE LAYER
HYDRO INSULATION
20 FORMWORK
45 INSULATION
45 AIR GAP
130 INSULATION
10 WOODEN PANEL
700 ROOF BEAM (240 VISIBLE PART)

350 WOODEN PILLAR

15 WOODEN PANEL
100 CLT WOOD
70 INSULATION
100 CLT WOOD
15 WOODEN PANEL

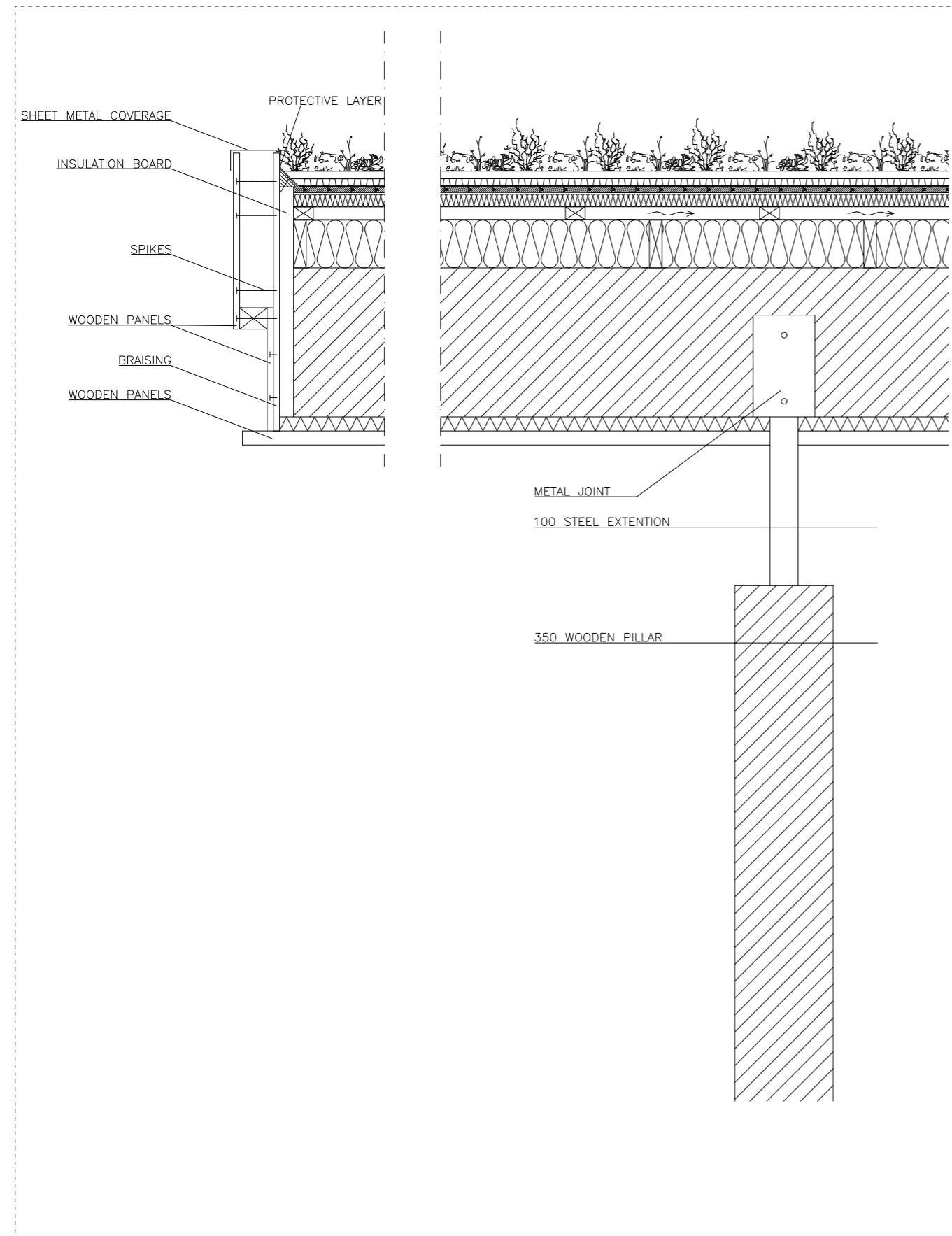
100 INSULATION
250 CONCRETE PLATE
VAPOR BARRIER
20 WOODEN FLOOR

DETAILED SECTION 1:30
BATHING AREA

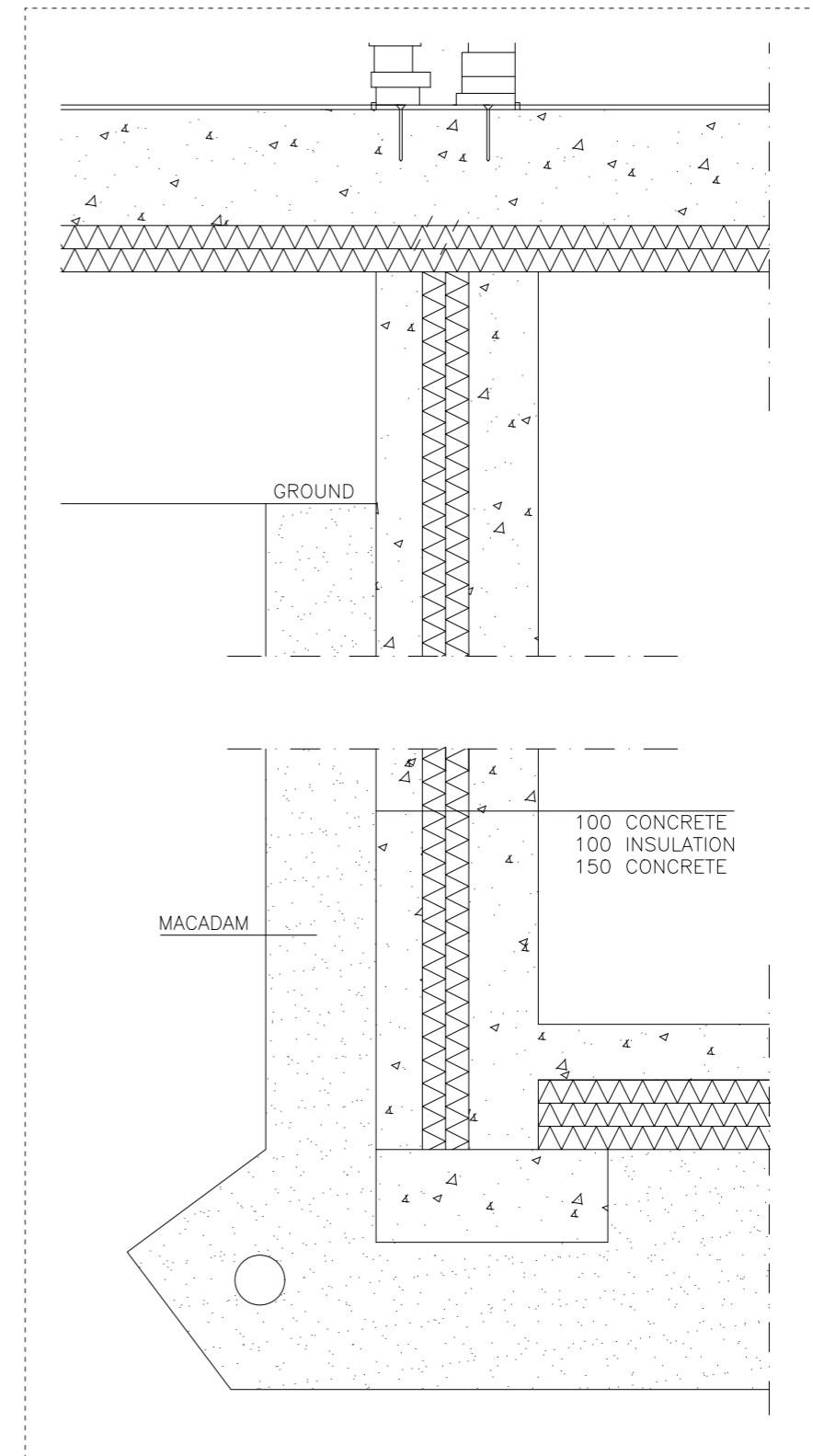


HIGHLIGHTED DETAILS

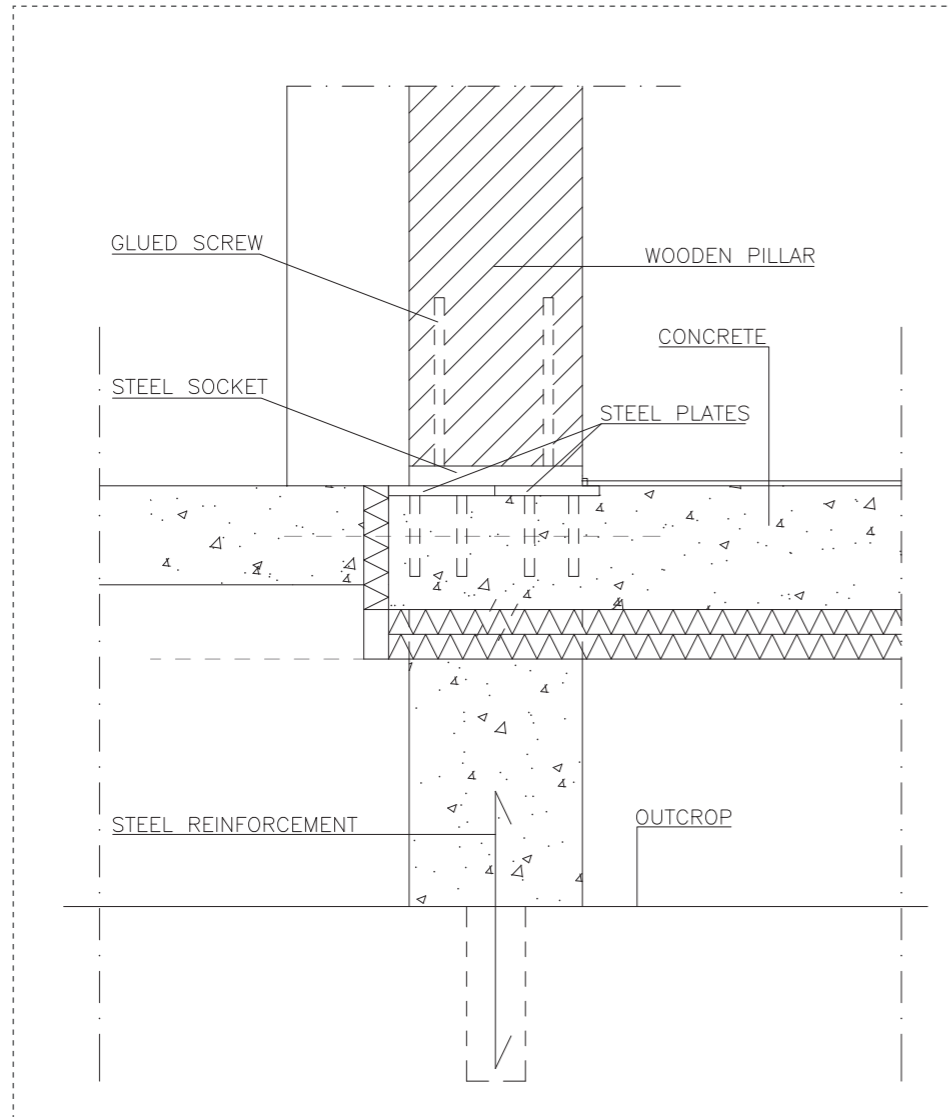
ROOF EDGE 1:15



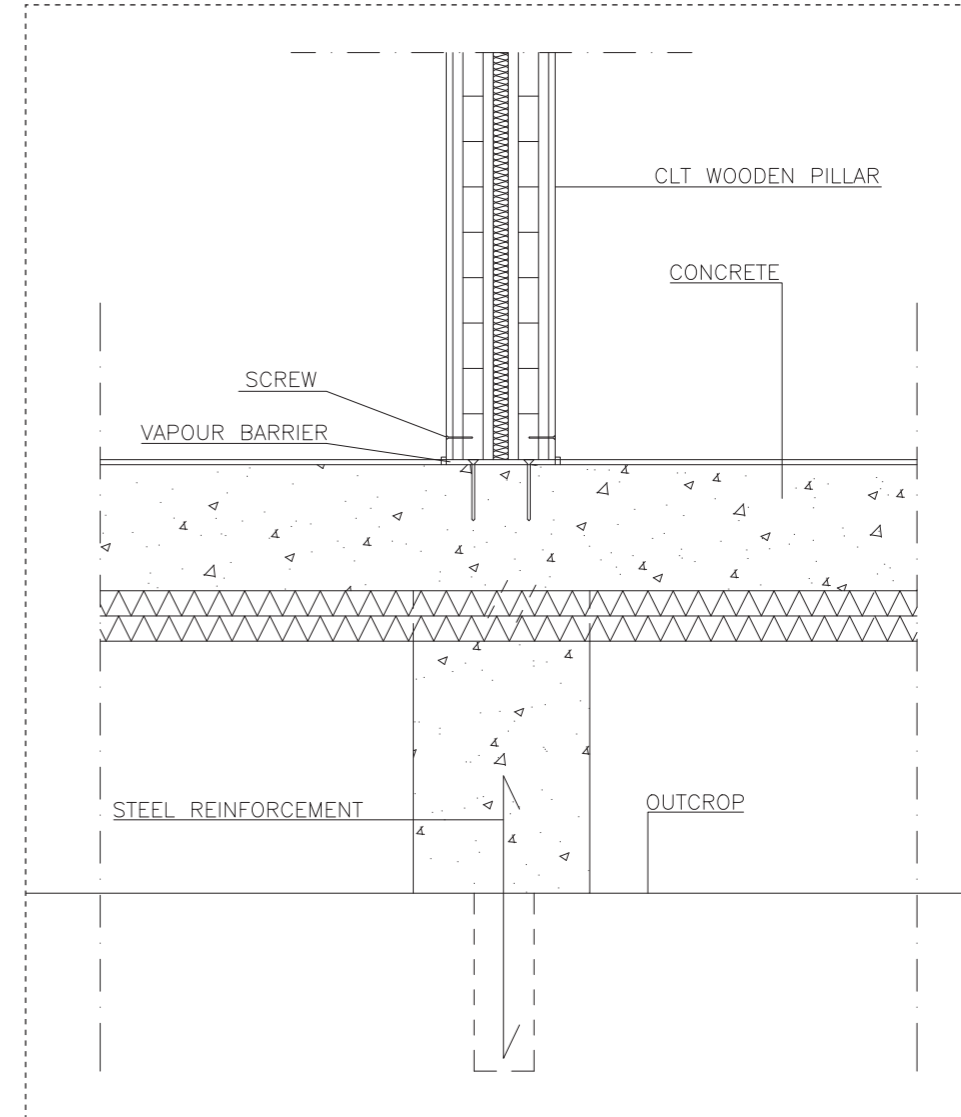
BASEMENT 1:15



WOOD PILLAR AGAINST
CONCRETE SLAB 1:15



CLT PILLAR AGAINST
CONCRETE SLAB 1:15



DISCUSSION



The purpose of this thesis was to explore the potential of sensory architecture as a means to reduce stress and enhance well-being.

Sensory architecture design focuses on creating spaces that engage various senses, such as sight, hearing, touch, smell and taste, to create an attractive and healing environment. The study focused on analyzing different strategies and their impact on stress reduction and mental health.

For many years, I have been captivated by how humans experience architecture and how big is its impact on our quality of life and well-being. Throughout my education, I have consistently gravitated towards designing spaces that promote our well-being, providing a contrast to the hectic, stressful and distracting outside world. Hence my goal is to create environments that will have human well-being in focus. Where light, natural materials, flow of the building and nature will be taken care of to the fullest while creating different types of buildings.

The question of the thesis was - what are the key design principles and strategies for integrating sensory elements into architectural environments that will promote stress reduction?

The research showed that this side of architecture is not easy because there is no single golden solution for therapeutic architecture. There are a lot of different aspects such as integrating nature, lighting, acoustics, colors, textures, spatial organisation, sensory diversity and thermal comfort. By thoughtfully integrating these principles and strategies, architects can create environments that will reduce stress and promote our overall well-being.

Architecture that improves the quality of life must engage all the senses because its basic function is not only to provide shelter, but also to integrate us with the environment and strengthen the sense of reality we live in. Every building and its interior space is in some sense a living organism, it literally penetrates our body and becomes part of our existence and being. That is why for example natural materials will always be better for human perception than man made, artificial materials without a "soul" that are plain and without any visible passage of time.

People came from nature and it is something that can not be deceived. We still need to perceive the environment with all our senses to feel simply safe and mentally stable.

SOURCES

BOOKS

1. Bańka, A. (2016). *Architektura Psychologicznej Przestrzeni Życia. Behawioralne Podstawy Projektowania* (eng. Architecture of Psychological Living Space. Behavioral Foundations of Design)
2. Fridell Anter, K. (2014). *Färg och Ljus: Att beskriva färg och ljus* (eng. Color and Light: Describing Color and Light).
3. Hauser, S., Zumthor, P. (?). *Peter Zumthor; Therme Vals.*
4. Holl, S. (2016). *Questions of Perception.*
5. Sällström, P. (2014). *Goethes Färglära* (eng. Goethe's Color Theory).
6. Pallasmaa, J. (2012). *The Eyes of The Skin. Architecture and Human Senses.*

ARTICLES

1. Mental Health Foundation. (2021). *Explore mental health. Stress.*
Website: <https://www.mentalhealth.org.uk/ex-plore-mental-health/a-z-topics/stress>
2. World Health Organization. (2023): *Stress. What is stress?.*
Website: <https://www.who.int/news-room/questions-and-answers/item/stress>

PUBLICATIONS

1. Al-Ayash, A., Kane, R.T., Smitch, D., Green-Armytage. (2015). *The Influence of Color on Student Emotion, Heart Rate, and Performance in Learning Environments.*
2. Clements-Croome, D.J. (2012). *How the sensory experience of buildings can contribute to wellbeing and productivity.*
3. Ertaş, D., Sirel, A. (2022). *The Importance of Light in Steven Holl's Perceptio of Form.*
4. Lawson, B., Phiri, M., and Wells-Thorpe, J. (2003). *The Architectural Healthcare Environment and its Effects on Patient Health Outcomes*
5. Marczyńska, M. (2023). *Architektura w terapii zaburzeń psychicznych* (eng. Architecture in the Treatment of Mental Disorders).
6. Schweitzer, M., Gilpin, L., Frampton, S. (2004). *Healing space: Elements of environmental design that make an impact on health. The Journal of alternative and complementary medicine.*
7. Weston, Richard (2004). *Key Building of the Twentieth Century.* W.W. Norton and Company.

LINKS TO WEBSITES

1. Pictures and information about reference project nr 1 - <https://hicarquitectura.com/2022/07/hanne-kjaerholm-villa-kjaerholm/>
2. Pictures and information about reference project nr 2:
 - A. <https://europeanwriterstour.com/images-2023/pavillon-de-Barcelone>
 - B. https://en.wikipedia.org/wiki/Barcelona_Pavilion
3. Pictures and information about reference project nr 3:
 - A. <https://www.archdaily.com/60022/ad-classics-fallingwater-frank-lloyd-wright>
 - B. <https://hicarquitectura.com/2022/07/hanne-kjaerholm-villa-kjaerholm/>
 - C. <https://en.wikipedia.org/wiki/Fallingwater>

