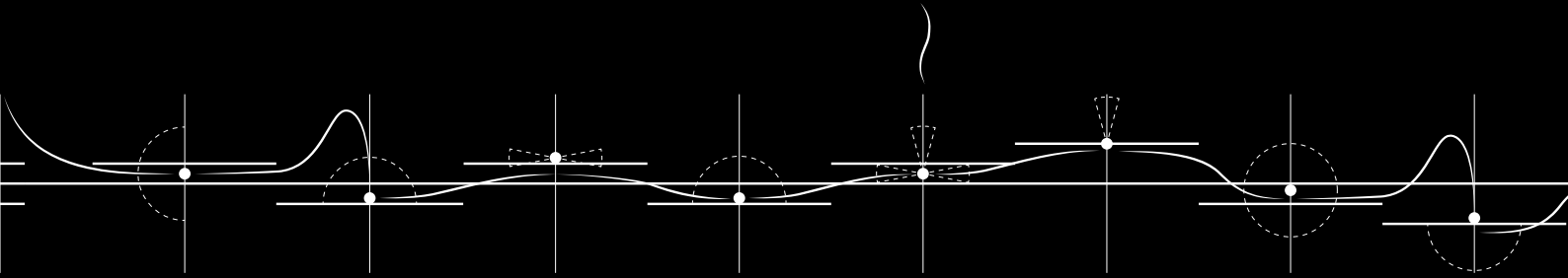


# INTEGRATION

Architecture Report







## **Equilibrating dualities**

*The coalescence of man, machine and territory.*

Architecture Report

Gijs van Berge Henegouwen

*Under the supervision of:*

Design mentor: Taneha K. Bacchin

Building Technology mentor: Sjaap Holst

Research mentor: Kaveh Dabiri

Tutor: Francesca Rizzetto

Delft, University of Technology

Architecture, Urbanism and Building Sciences

North Sea: Landscapes of Coexistence

*Transitional Territories Studio 2019-2020*



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## **Manifesto**

The extraction of oil and fish have played an enormous role in the development of Norway and respectively Bergen. Yet, alongside with this development has always been the imposed structural injustice coming forth out of these industries and their extractivism influenced governance. Directly resulting from the mass extraction is the pollution which is accelerating our global problem of climate change. With both the elements of injustice and climate change present on our minds we stand at a tipping point of this crisis situation. The decisions made now effect both our future climate and the injustice imposed by the industries contributing to our take on climate change. This tipping point therefore allows to rethink the idea's of industries and the production of energy towards an integrated energy transition.

The integration of an industry onto its site of existence relates closely to its territorial specificities. Which in the case of Bergen include its climate, topography, culture and current energy situation. The integration of elements represented by multi scalar interventions are chained as a link through the city. This link allows for the full cooperation and even coalescence of all elements in contact with this industry. The multi scalar approach entails a hydrogen production facility, fuelling stations and a bath house. All in all the collection not only provides the city with a storable and fossil-free fuel but also expose the process from production to use, reflection and result. Together integrating and coalescing man, machine and territory.

Key words: imposing industries, structural injustice, dual existence, energy transition, integrated justice



The cities new industry

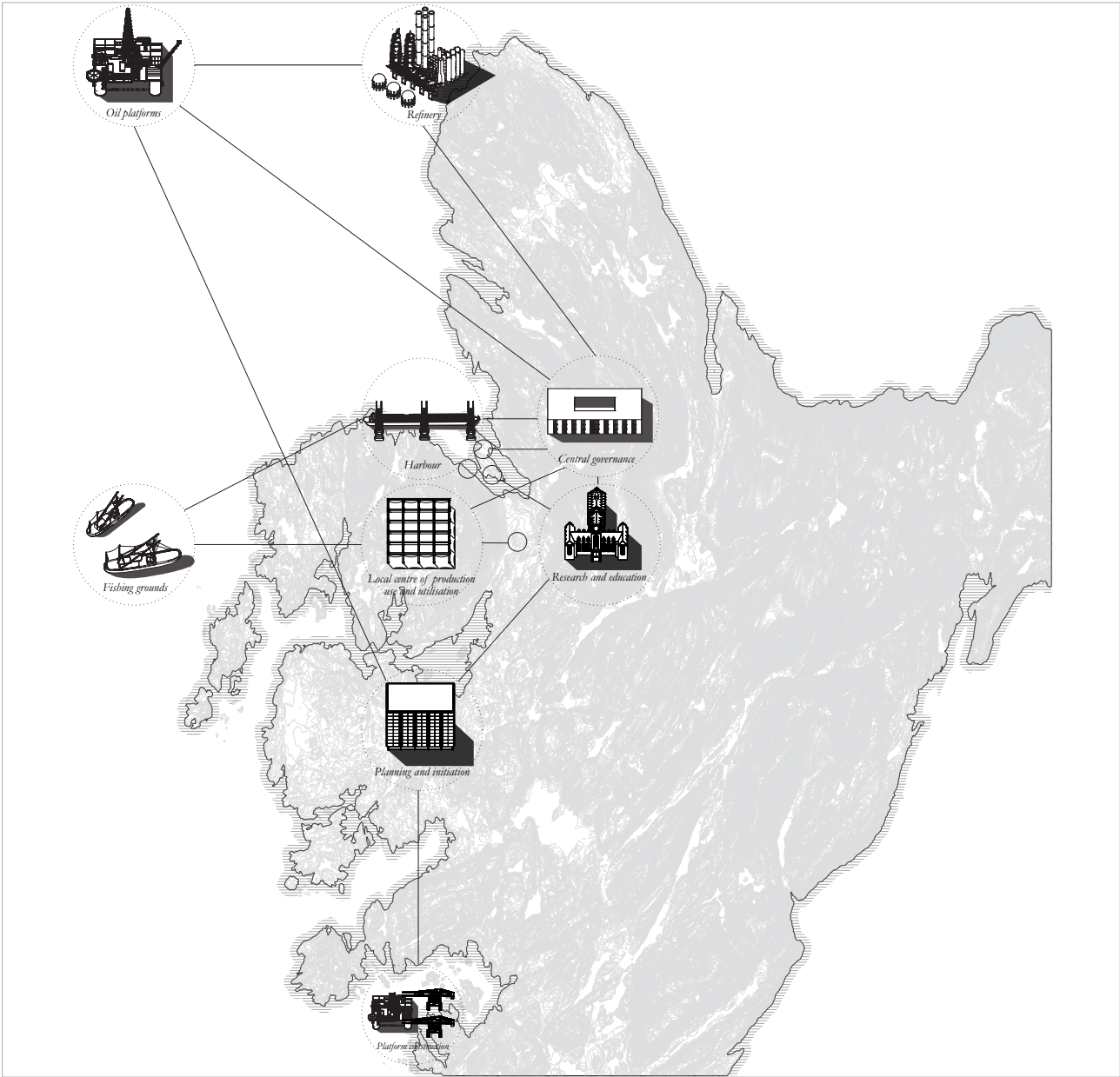
### **1.1. Bergen's industrial sprawl**

Bergen in its current state is known for being Norway's largest port city. Being the largest port has attracted the interest of the centre of research, education, production and management of all entities in the North Sea. This makes the city of Bergen a vital point in both the infrastructural and industrial grid of the North Sea. While the city is a gathering place for all elements are the similar elements still scattered and divided throughout its city. Different types of industries come together in the city of Bergen, yet live completely detached from one other and their unique site of existence. This lack of integration imposes structural injustice to all in contact with the industries infrastructural elements and their results in the form of pollution, territorialisation and loss of culture.

The new industry

Own work





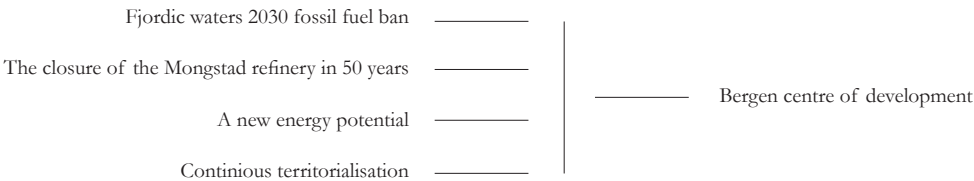
## 1.2. The new industry

The new industry is an act against imposed structural injustice coming forth out of detached industries. This new industry takes its position within the energy transition, being Bergen's biggest crisis and opportunity. The industry entails a series of multi scalar interventions chained through the city of Bergen. The industry entailing a hydrogen production facility, fuelling stations and a bath house. The proposition consists of three main elements: a hydrogen production facility, a fuelling station and a bath house. Each individual element plays a critical role in the integration, exposure and coalescence of production, flows and territory to create an integrated and sustainable energy transition. The hydrogen production facility as the manifestation of integrated production and service to the city by means of both product and waste. The fuelling station as the long term solution and the possibility of reterritorialization of fjordic waters by local fishermen. And lastly the bath house as a social proposition of full process exposure, tangibility and integration. These elements make various appearances ranging from: the uncovering of present-day systems to the management of site specificities, use and enhancement of cultural aspects and the utilisation of clean energy and waste. Furthermore, a moment of reflection on the self and the structural injustice imposed by the governmental machines which we currently heavily rely on. Together acting as a statement of minimal intervention to maximise territorial use and therefore the activation of structural justice by means of integration. Together the elements create a link through the city integrating all aspects ranging from existing flows to experimental research.

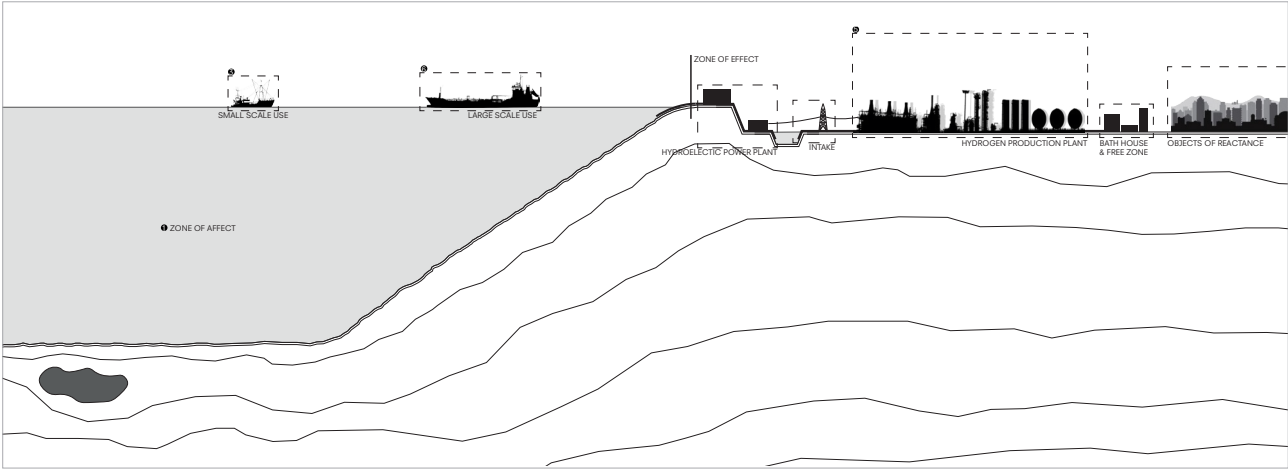
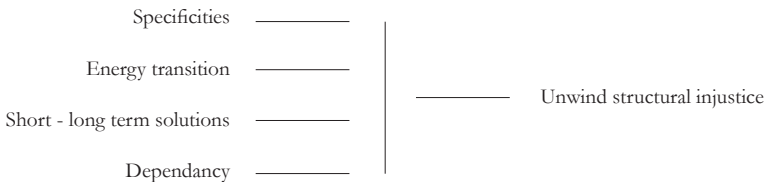
The new industry

Own work

Crisis - opportunity



Integration of the new industry



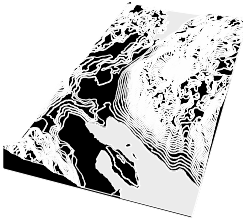
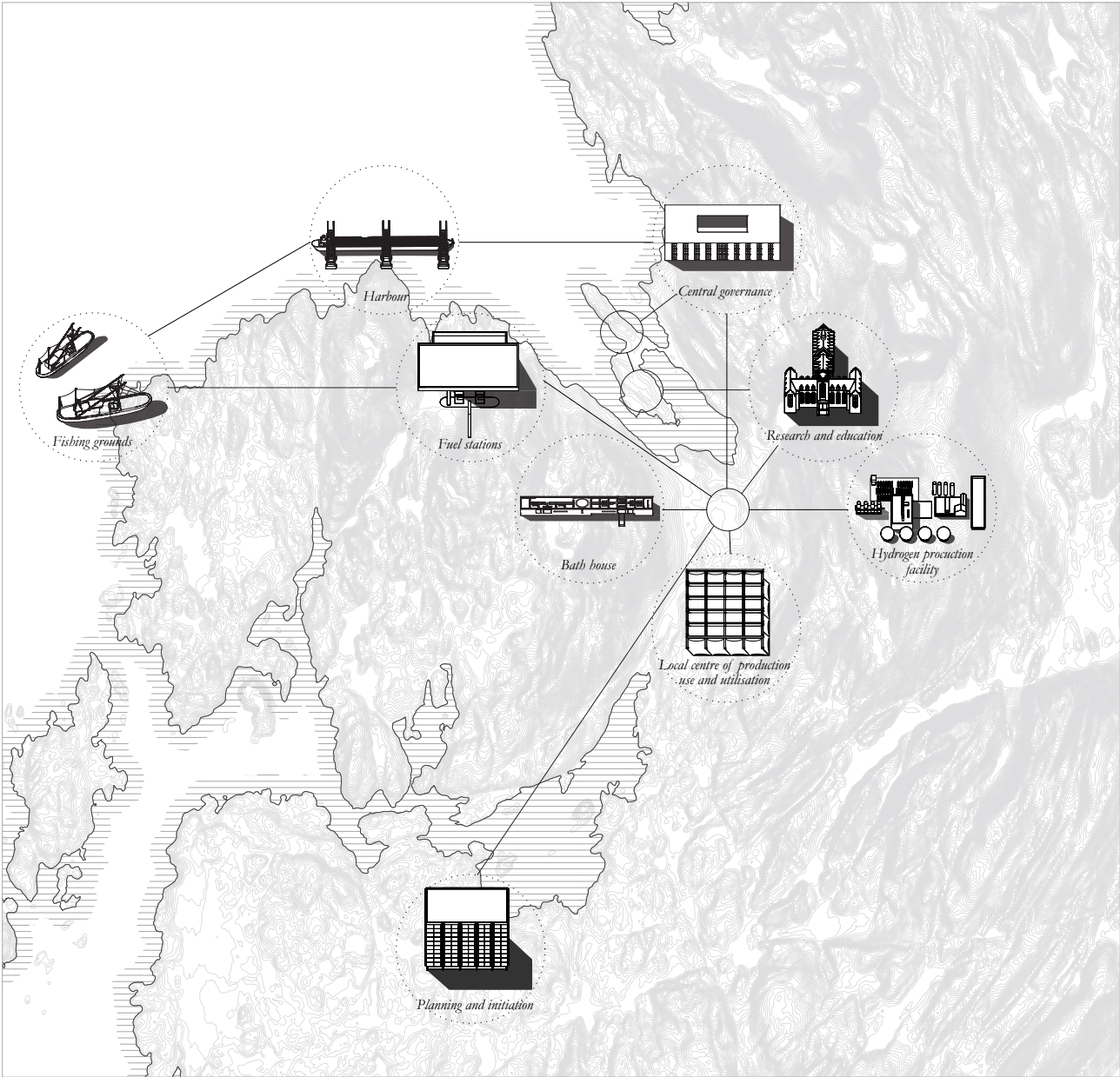
Hydrogen production facility — Hydrogen fuel station — Bath house

### 1.3. Industrial integration

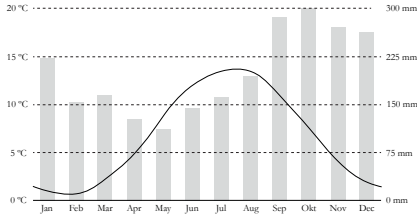
For the integration of this new type of industries the territorial specificities of Bergen are its closest relation. To detach itself from current industries and to create the link with its site the most appearing specificities of the city of Bergen are exposed and utilised. Its unique topography of fjords providing with a natural environment closely linked to the city is currently a place of leisure and relaxation to all inhabitants. However, this natural environment is constantly threatened by urban development and its territorial claims on the similar mountains. Its rainy climate with its constant precipitation and flows of water collecting or running down the mountain. The cities and countries known cultural activities of fishing, embedding oneself in nature and bathing in nature integrated as a social statement. Lastly, the cities surplus energy at night because of Norway's numerous hydroelectric power stations made possible by the investments of the oil industry. The integration of these specificities form a link through the city combining current and newly placed elements to provide for structural justice.

Industrial integration

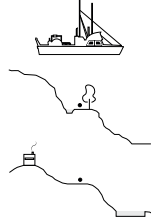
Own work



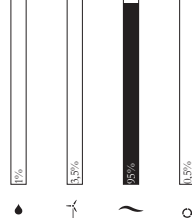
Topography



Climate



Cultural activities



Energy

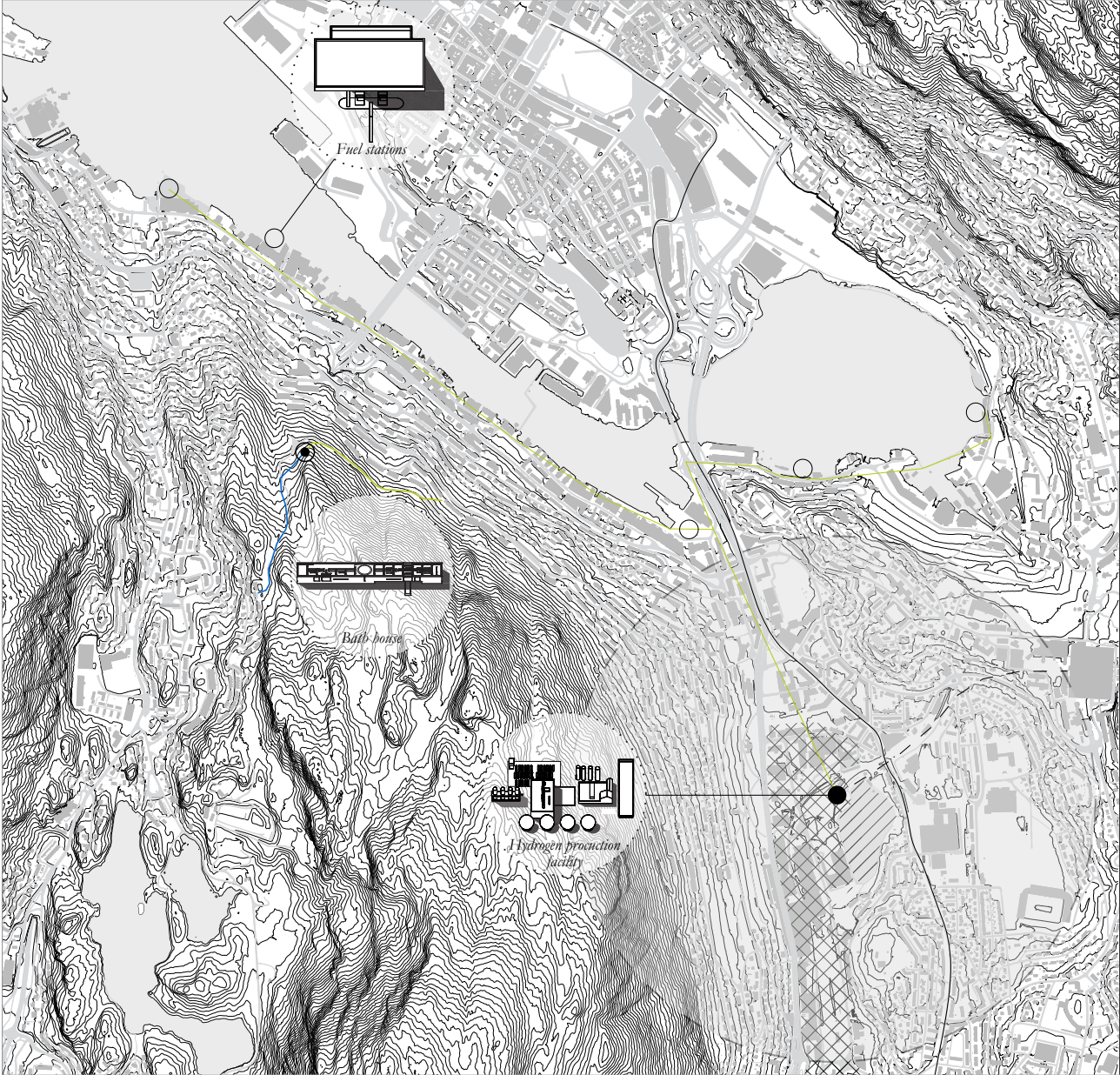
### **Industrial integration**

The three elements are placed throughout the city act as elements of connection, but also to serve their surroundings. The hydrogen production facility is placed in the industrial part of the city next to a body of fresh water. The constant supply of water by means of precipitation allows the facility to fully operate even beyond current limitations. The production of hydrogen produces both oxygen and heat as 'waste' products. These are then utilised by their surroundings through the means of district heating and an oxygen supply for the hospital. The connection from the hydrogen production facility towards the harbour allows for a series of fuelling stations at currently existing harbours. The fuelling station furthest towards the sea has the most industrial influence by means of the ships and fishing vessels docking. For the reterritorialization of the fjordic fishing grounds these will be initialised from the starting phase the rest are further developments. The bath house is the connector of flows, city and people. It is placed in the middle of the split which divides the city in its economic and residential zones. These specific areas with their own urban, morphologic structure serve the bath house with their representative flows of water and hydrogen, together coalesced, exposed and activated within the bath house.

### **Industrial integration**

Own work





#### **1.4. Territorial analysis**

1. Enclosure
2. Opening
3. Leisure
4. Act of culture
5. Calmness
6. Hard rock
7. Flows
8. Present, imposing territorialisation

The mountain

Images by author









## The Project



## 2. The Project

### 2.1. Proposition

*Climate change is currently one of the major topics in the world, in a way directly resulting from our global development and depletion of resources. Side by side with this exhaustion of our planet comes the imposed structural injustice to all in contact with the industries heavily involved in inducing this climate change. Both define a state of crisis build up over time, yet now we stand at a tipping point. This point represented by the developments gained through these industries and our modern insights on the impacts of these similar industries. Currently we stand at the base of a potential to trigger an energy transition and additionally, to fully integrate it onto our sites of existence. The combination of both elements together allows for the full integration of industries to thereby unwind structural injustice from those in contact with them.*

*The project plays within this notion by the placement of three elements as mentioned above. From these elements the 'bath house' will be developed further, being the most interesting case in terms of Bergen's specificities and the desired goal. The typology of the bath house is for the project redesigned to address the specific exposure, management, utilization and activation of flows appearing in its existence. Because of its positioning on the base of a mountain the present factors take their role within the exposure and utilization of the flows. The bath house connects two parts of the mountain which each their represented flows of water and hydrogen. The side of the mountain linked to the cities economical and industrial centre provides the hydrogen through a series of pipes originating from the hydrogen production facility. The side linked to the traditional and suburban area of the city provides the flow of water through precipitation and streams of water coming down the mountain. The flow of water is both directed and exposed using minimal interventions and collected at the central fuel cell which creates the warm water for bathers. After the direction, exposure and activation of both flows the bath house offers a series of moments of reflection and memory to thereby make aware one's own position within this energy transition.*

*The placement of the new industry, the redesign of the bath house typology and the forming of all elements are a manifesto to act against contemporary decision-making with imposing and unjust effects. The bath house integrates as well as disrupts its territory of existence, yet by means of these interventions and disruptions the territory and its flows are maximally utilised to create an integrated energy transition.*

## 2. The Project

### 2.2. Objectives

The desired outcome of the project and its future position revolve around three main principles. Integration to fully link to its site of existence and to unwind structural injustice. Exposure to reveal hidden or unutilised flows appearing at the site of existence. Lastly the activation of to give power to the flows and trigger the energy transition.

1.

#### Integration

The project by itself plays with the different landscape relations to firmly grip its position with the use of various interventions. These interventions each address their own territorial relations according to their sites specificities. The addressing of the different relations while maintaining within the context allows for the placement of various objects without imposing on their sites of existence.

2.

#### Exposure

Knowing our current state of climate crisis rather sooner than later we all have to act and take our stances. Yet, general overthinking becomes more the norm than addressing the small effects. The different elements and interventions are specifically directed at the exposure of these smaller, yet combined impacting relations. The exposure of flows and territory are its main goals to highlight the effect of smaller scale elements within the larger goal of the energy transition.

3.

#### Activation

The precise preparation of the placement of objects and elements allows for a final coalescence and activation. The process leading up to the activation as a guide for flows, yet the activator also the trigger. Possible to say the final element of the process however, simultaneously its start. The transition towards a new and sustainable type of energy to benefit not only our climate situation but also our understanding. A point in the project where elements and flows collide and depart, yet coalesced and activated as one.

### 2.3. Relevance

Within the context of our current climate crisis and the lack of territorial integration the project takes it preeminent and outspoken position. The project makes an ensemble of statements addressed through multi scalar relations.

Firstly, the addressing of enclosed industries to trigger a response of opening and integration, not only towards the benefits possibly provide by their sites of existence, but also through social integration. The current imposition by means of fenced off and alienated industries offer no possibility to integrate with their surroundings. The addition of their climatic impact by means of pollution further deteriorates this position.

Therefore, the project responds to this notion by means of complete opening and exposure of all its elements. Using this methodology the concept or classical typology of industries are addressed and rethought. All in all, to take stance against contemporary industrialised imposition and injustice.

Additionally, the project places itself within the specificities of a specific mountain in the city of Bergen. The choosing of the site not only departs from the addressed flows and division in the city however, also from the positioning as an act of rightful territorialisation. The rethinking of the bath house as a fragmented system does not only allow for the full integration of its site specificities, but also creates a barrier for urban development. The mountains in its current state threatened by the rapid city development and claims on its natural and leisurely oriented territory. Therefore the project sets an example to fully expose, utilise and activate, yet keep the territory in its known state of existence.

## 2. The Project

### 2.4. Spatial Concept

a.

#### Configuration and Composition

The statements and spatial gestures made by the project reflect on the varying conditions of its site, a mountain and city with its two distinctive sides. The project made as a line through the mountain starts and ends at both specific parts of the city which are represented through their flow of people and water or hydrogen. The scattering of elements through the mountain landscape comes forth out of a triangular composition related to its current existence and continuous exposure to the climate. The placed interventions connect not only to the ones before and after, yet also across the landscape by means of these invisible relations. Because of the mountain's and the cities two distinctive sides the placed interventions take their positioning according to the urban fabric, either linear or scattered.

The interventions by themselves are of primary form to expose comprehensible yet bold statements to the territory they exist within. The sequence of these interventions occurs to firstly expose and then provoke actions in sequence of; display, recognition, closure, introduction, interaction, action, reflection and memory. This specific sequence not only exposes current relations but also introduces elements such as the flows existing on site. The moment of action and coalescence of flows at the central point of the route is not only the trigger towards the energy transition, but also features moments of reflection and memory of ones current position within climate change and the energy transition.

b.

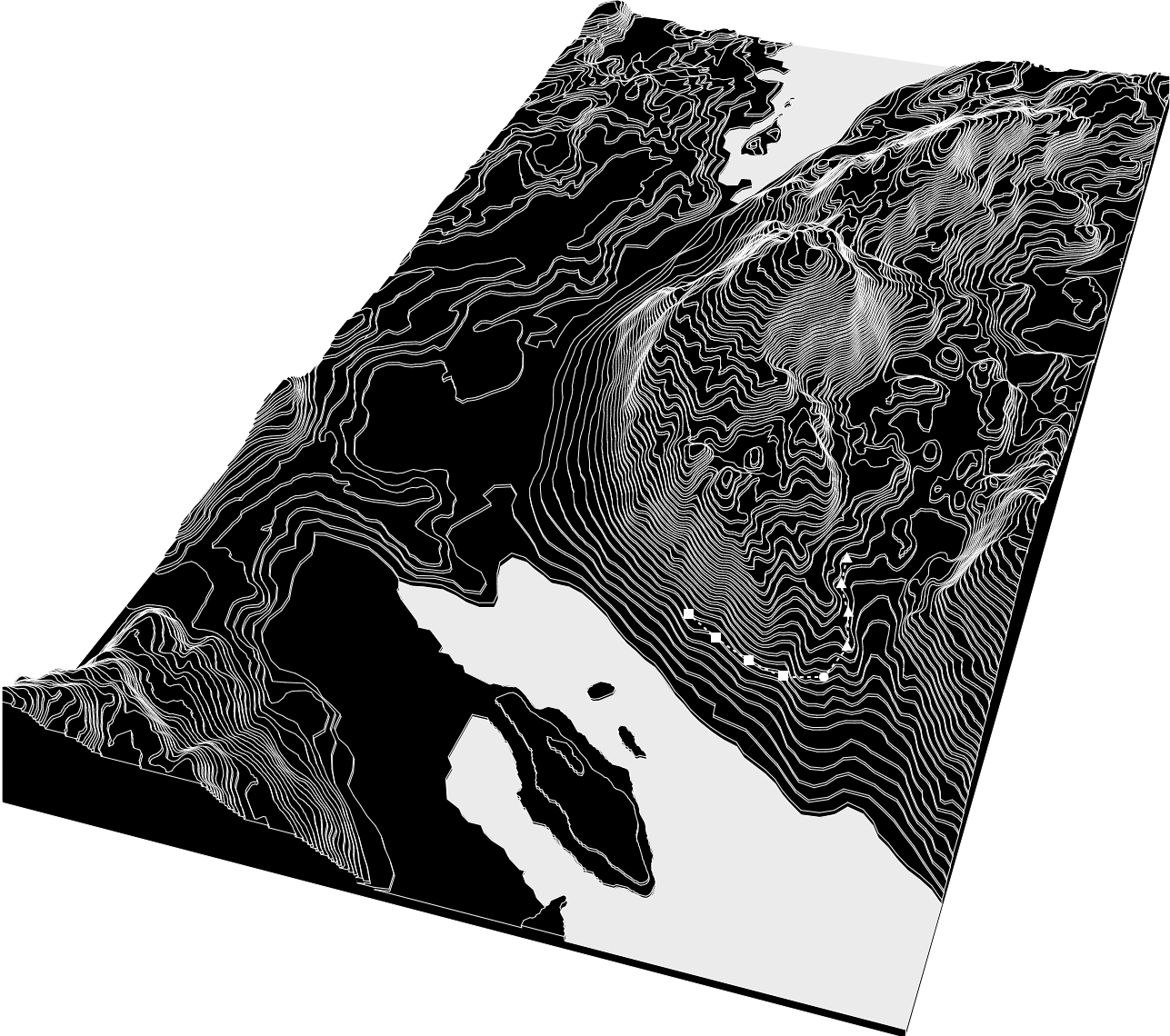
#### Performance

The project operates through a series and sequence of interventions with specific goals to direct flows existing on site to its central point. These existing flows not only allow the project to exist, but also to operate. Within this scheme of operation all elements play their individual role in the directing and guiding of these specific flows towards the central activator. Meaning that, the existing and continuous flows are as much part of the project as its built elements. Therefore, it is the coalescence of the elements of man, machine and territory which allow the project to perform and to integrate into its site of existence.

Rightful territorial claim

Own image





## 2. The Project

### 2.4. Spatial Concept

c.

#### Function and program

The bath house typology does no longer apply to the fragmentation and goal of the project. By itself the project is a machine integrating all different elements which is regarding the sites specificities also a bath house. The sequence of elements all address their own territorial relation and exposure of the flows though means of the landscape, the managing system and their relational field. The combination of these elements addresses all possible relations of the specific mountain to expose the required elements and possible effects of the energy transition. The central and main element of the route coalesces and activates flows originating from both sides of the mountain.

The main bar addresses two relations towards the landscape as it pierces its way through the mountain. One side punctures and disrupts the mountain, therefore relating to the effort required to produce hydrogen. While the other bridges over and rests on top of the mountain, representing the flow of water.

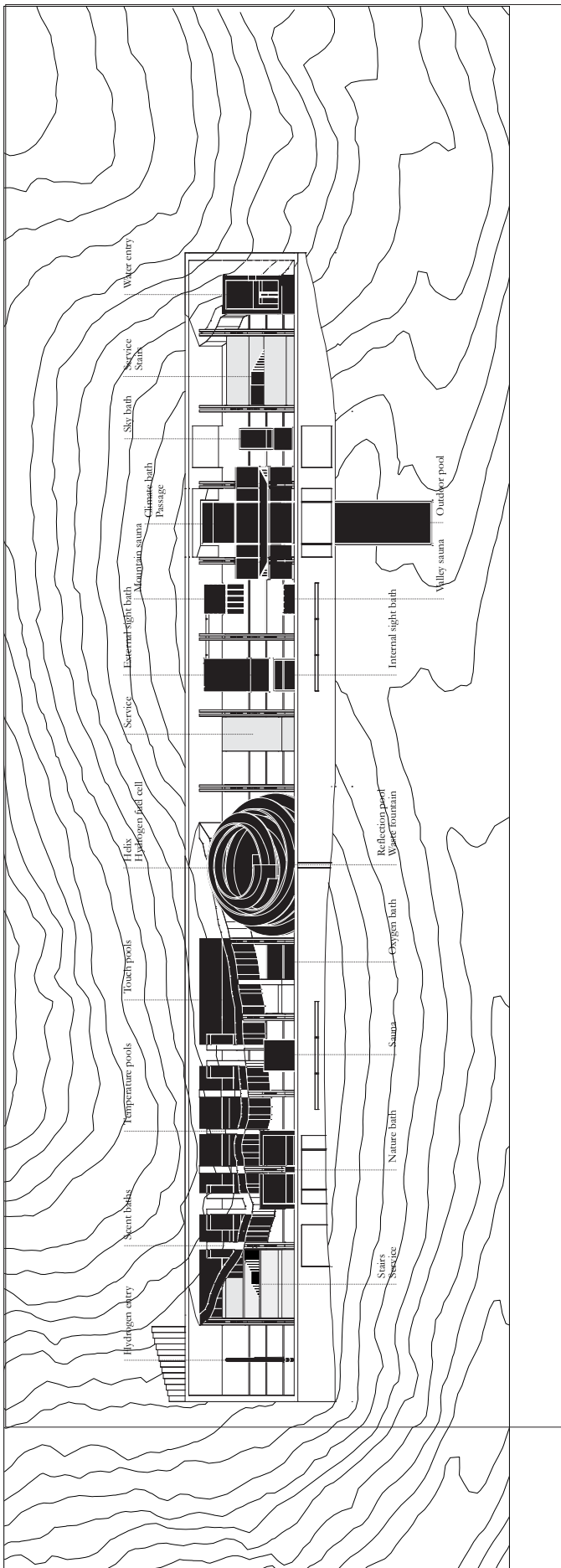
The approach to the building is through its roof designed as a walking pool. The roof element completely exposed to its surroundings, yet with a highlighted linear direction towards its centre. The shallow depth of the pool allows it to be walked in however, forces the visitor into a slow walk to take in the surroundings. The roof and its movement space offer various moments of rest and opening by means of its exceeding walls each framing a different view including one towards the sea.

The building is entered through its central double helix space in which the visitor represents the flow coming from each side of the mountain attaching and detaching while circling around a central fuel cell. The coned shape of the space not only forces an interaction between paths but also creates a reflection in the pool as a reflection on the self and the energy transition.

The program inside the building exposes different elements of activation or result of the machine by means of baths, pools, saunas and corridors each highlighting a specific relation to the territory and the machine. All embedded within the management, processing and utilisation of flows.

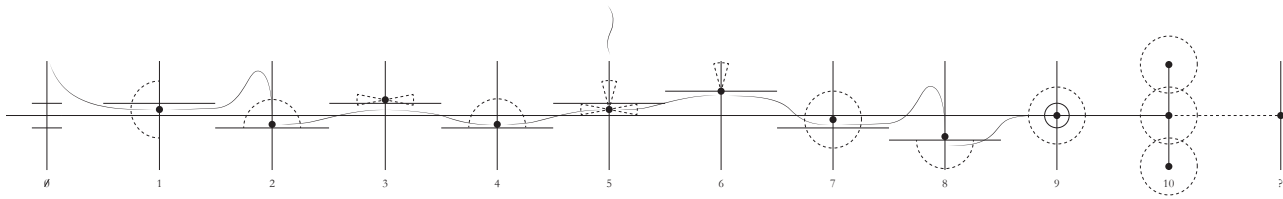
Rightful territorial claim

Own image



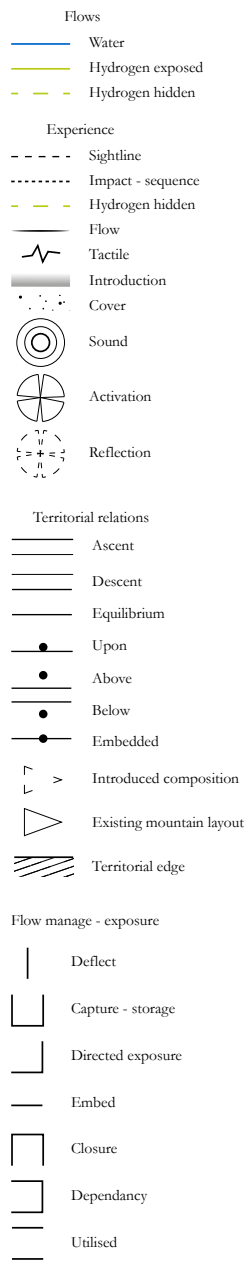


Integration



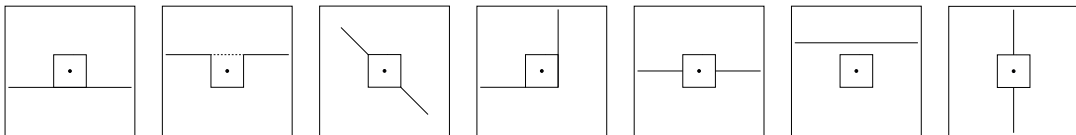
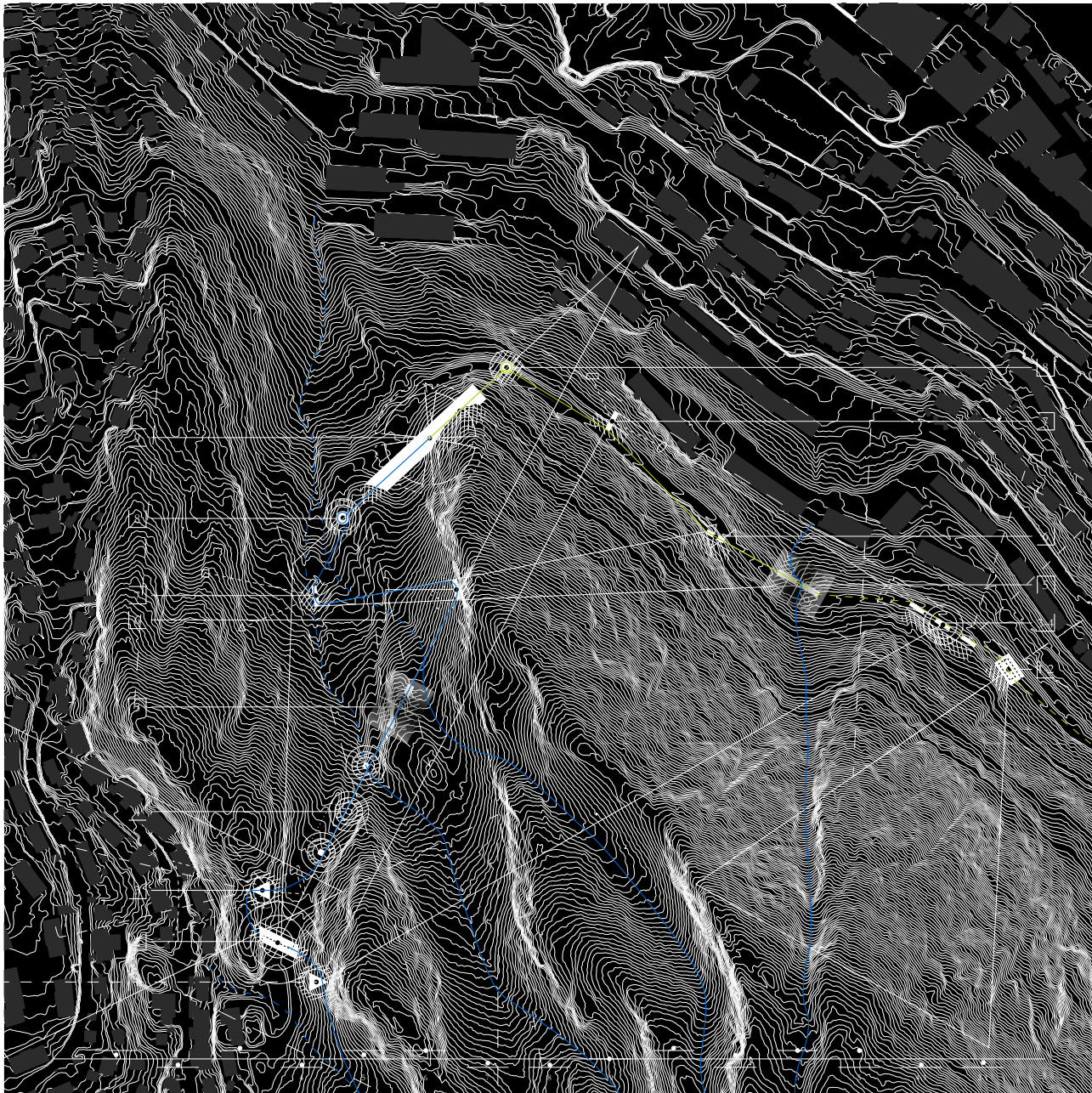
### The path's system

As described above entails the new bath house typology a series of interventions placed across the landscape. These interventions are placed along triangular patterns derived from the mountains original position and its continuous exposure to the climate in Bergen. Within this pattern the existing flow of water and the created flow of hydrogen are steered and exposed using the placed interventions. Each intervention takes its individual position dependant on the landscape, the managing system and its relational field to fully expose the territory and all it contains to the visitor. Resulting from this position its form is determined as either block, triangle or circle. Within this form each element exposes specific entities by means of embodied and sensory relations. The initial four elements of either side introduce and expose the visitor to the current situation of the city and its energy position. The following element either punctures or bridges the mountain and completely blocks all senses as means of closure however, immediately followed by the introduction of the new elements. The next two elements similarly introduce and expose the present factors within their existence, to make the visitor aware of its territorial positioning and the requirements needed for its utilisation. The last and circular interventions are the collectors and full exposer of the flows present on this specific mountain. Their collection and storage provides the central element a continuous supply of fresh water and hydrogen activated in the central element. This element positioned central in the mountain, precisely in line with the division of the city. The building not only connects both sides but also activates by means of its exposed machine. The bar itself is not only a bath house but also the element which coalesces and exposes the flows and itself as a machine powering the energy transition.

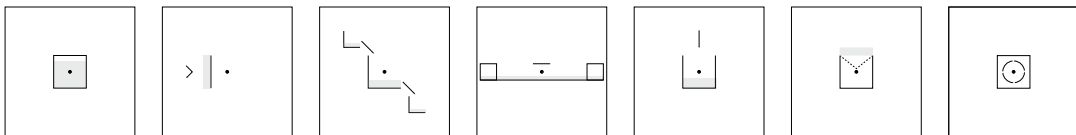


The fragmented bath house  
Own work

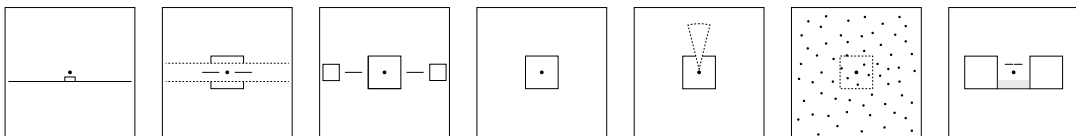




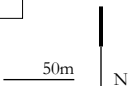
The landscape



The managing system

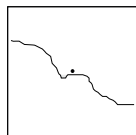
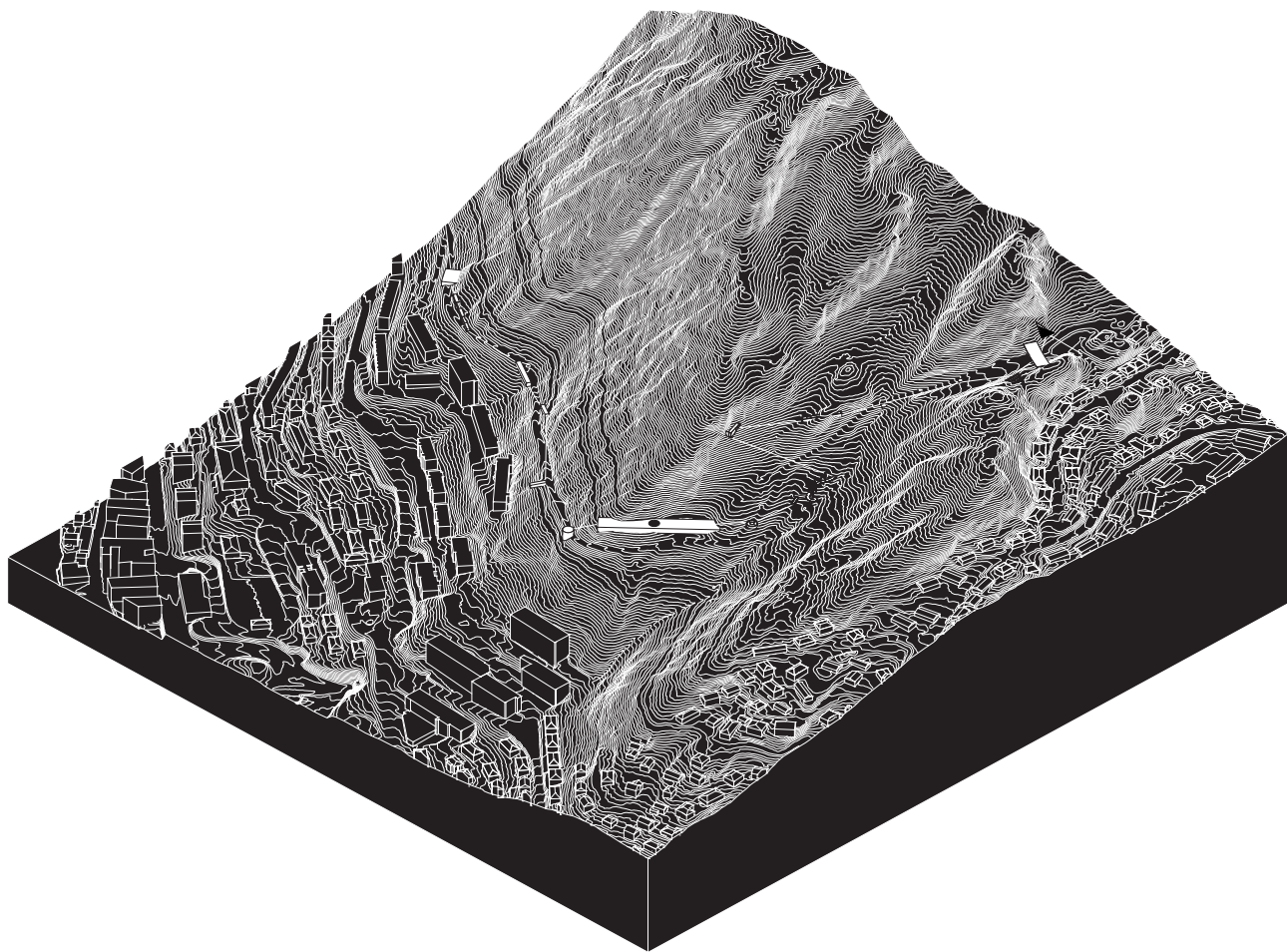


Relational field

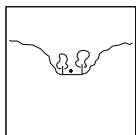




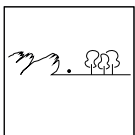




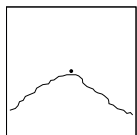
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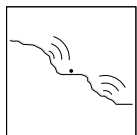
Enclosed



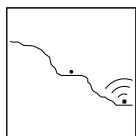
Hard - Soft



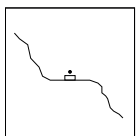
Opened



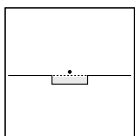
Sound



Noise



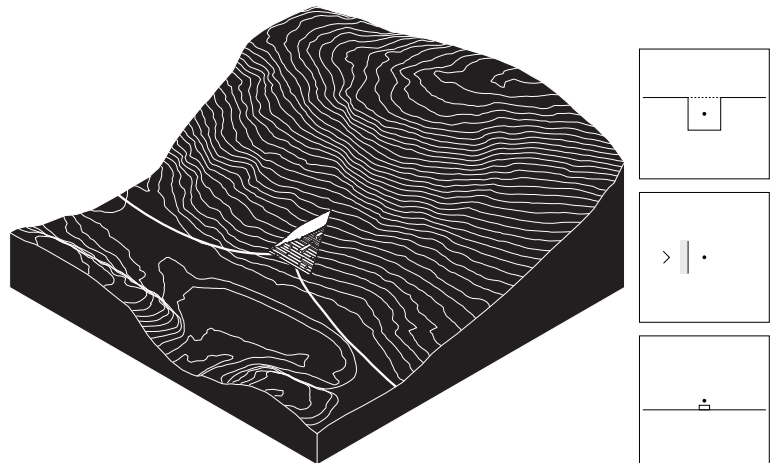
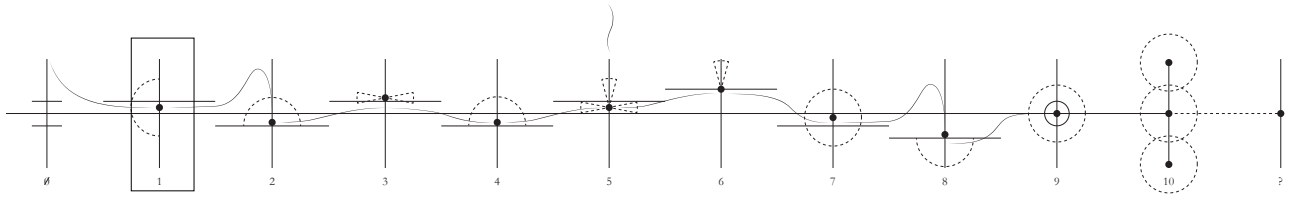
Displayed



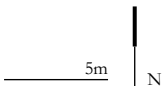
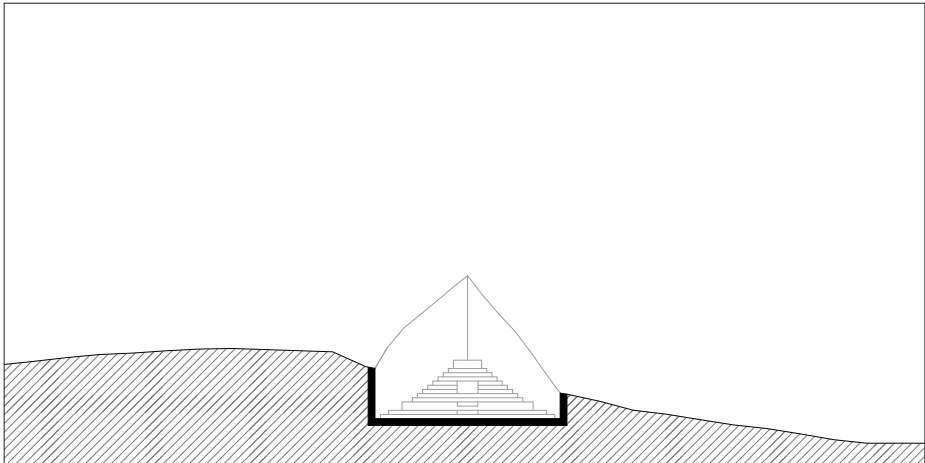
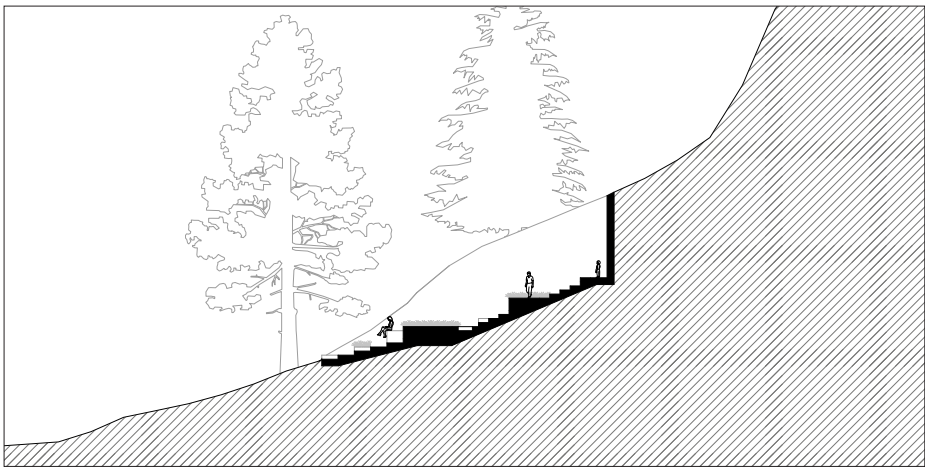
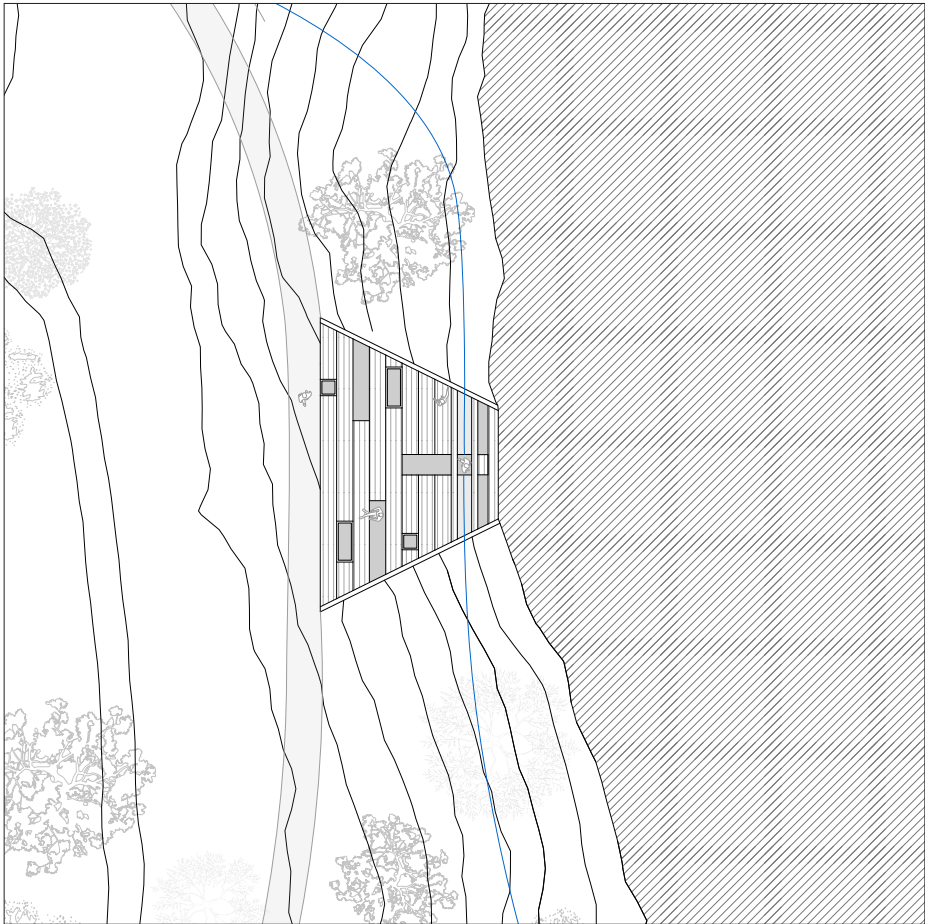
Passage

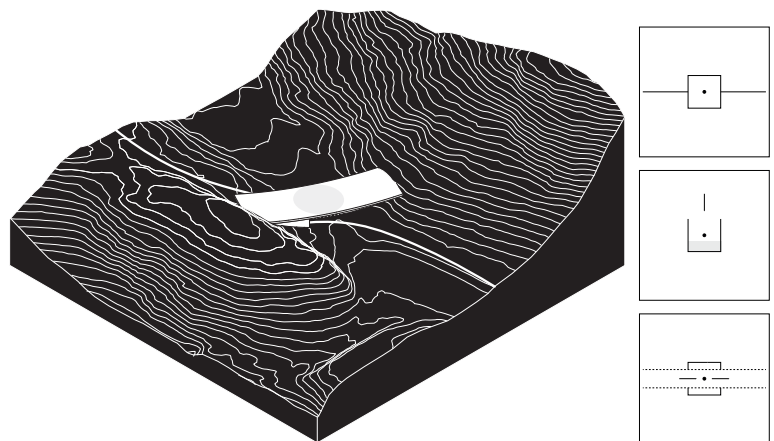
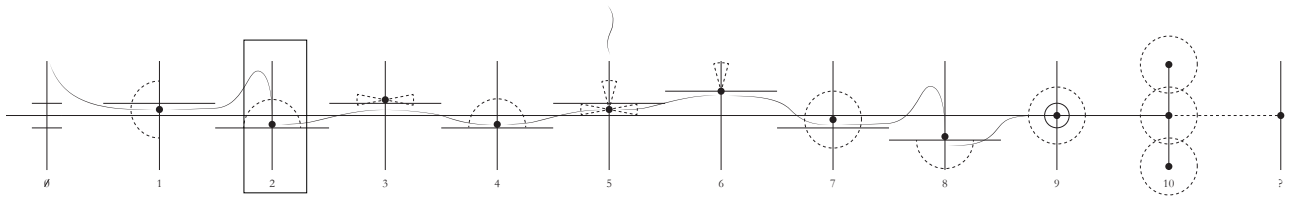


Views

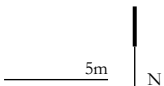
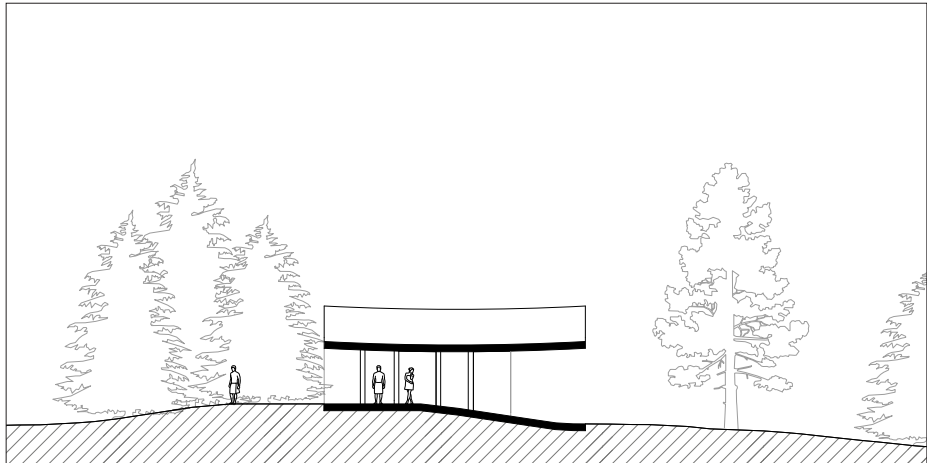
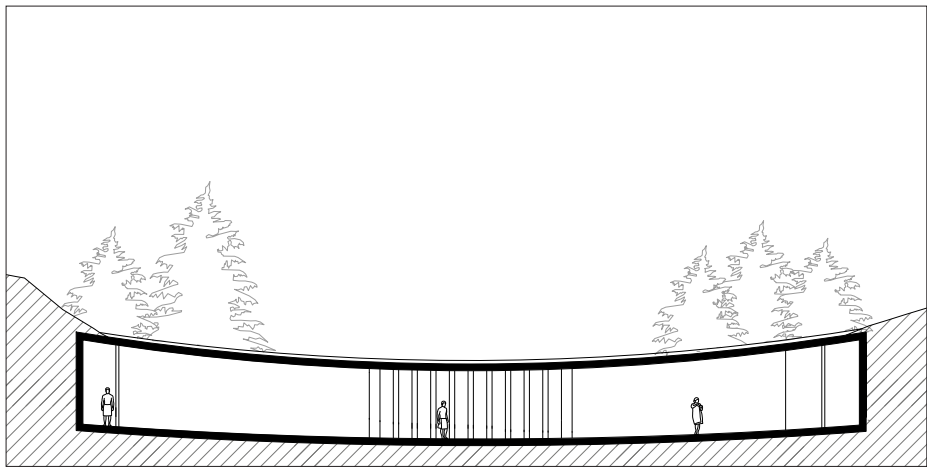
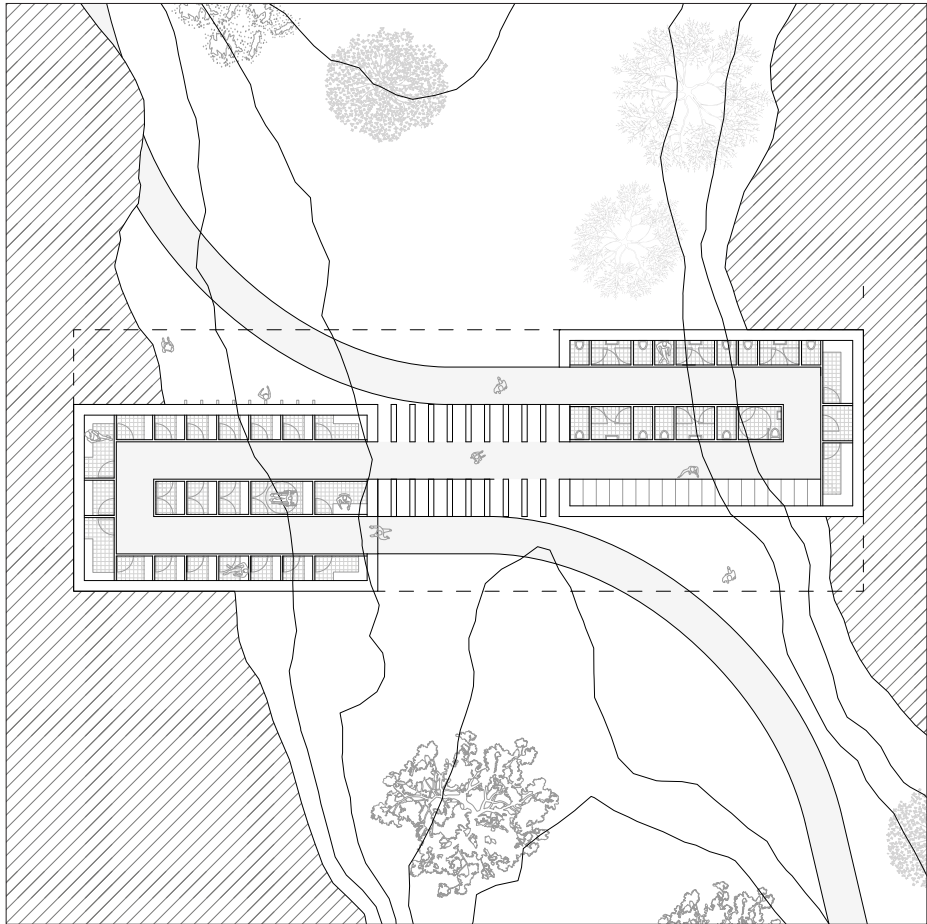


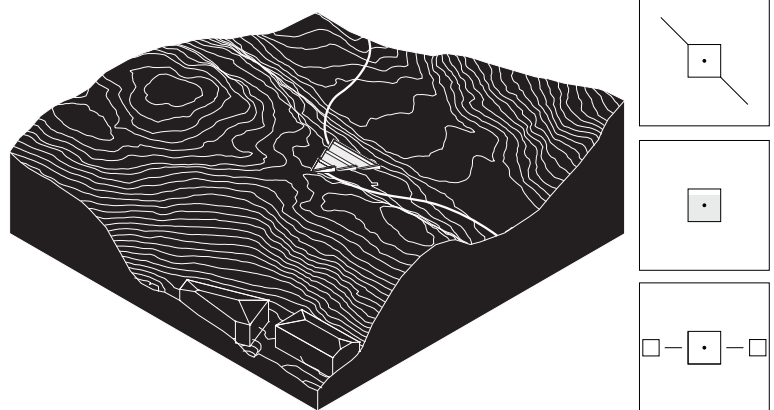
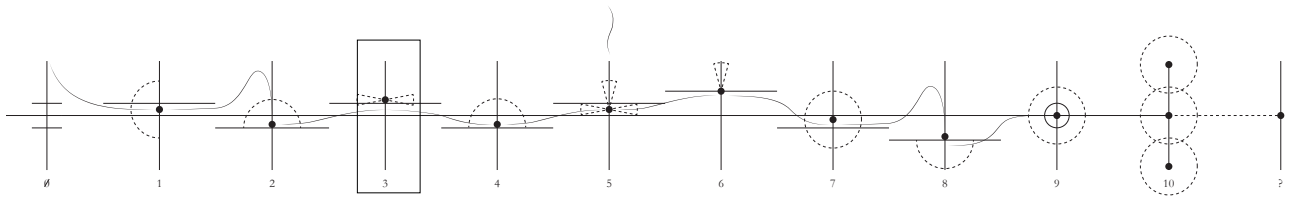
Viewing platform – Display - Exposure  
Own work



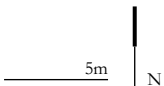
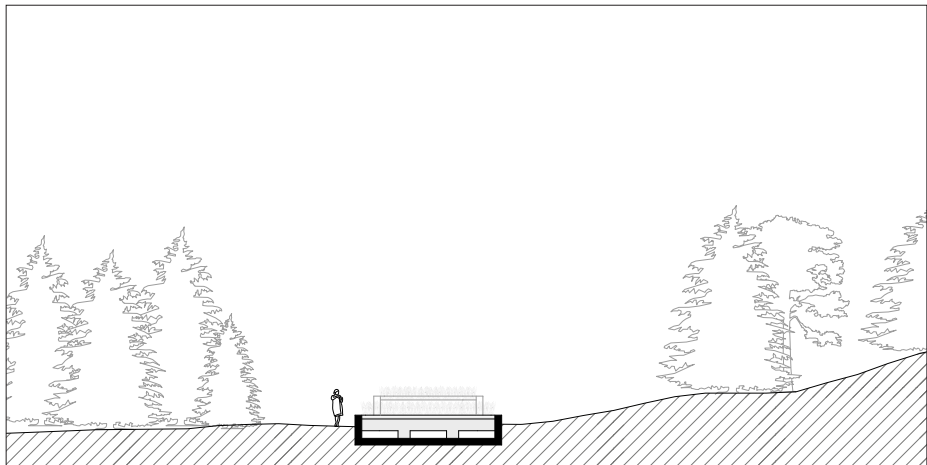
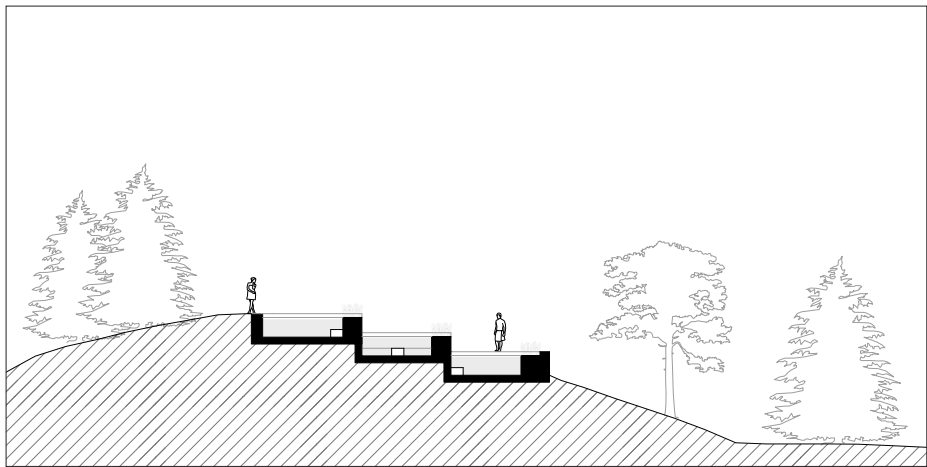
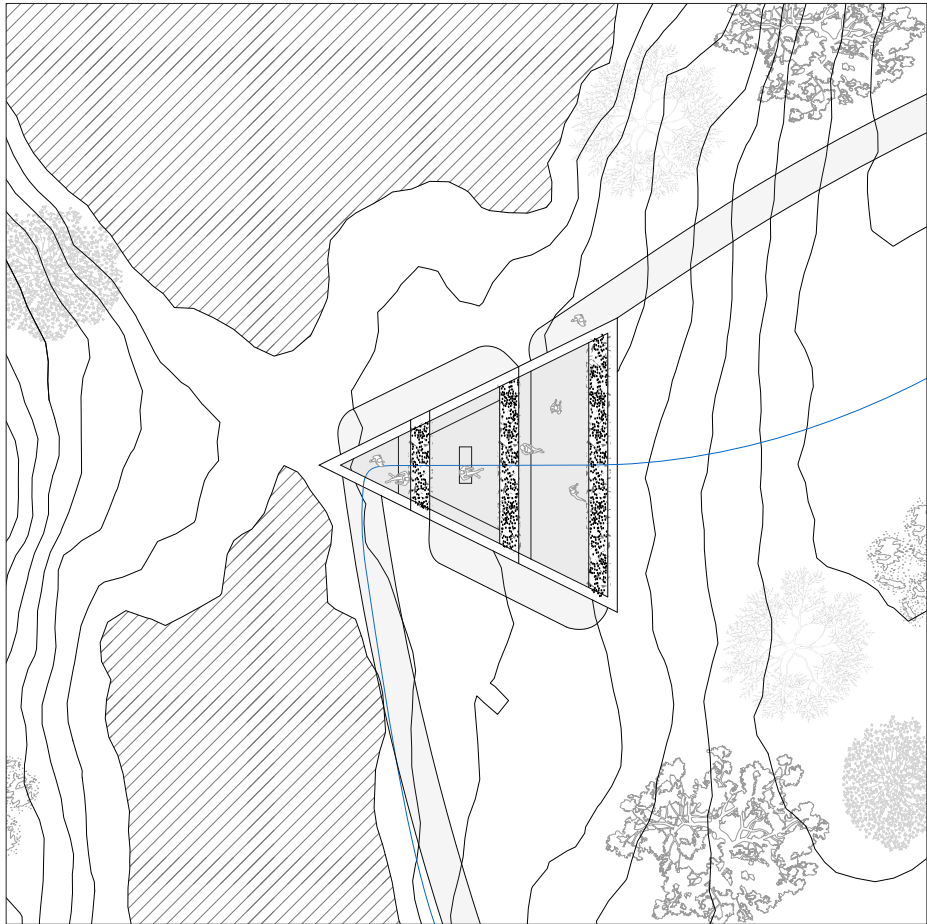


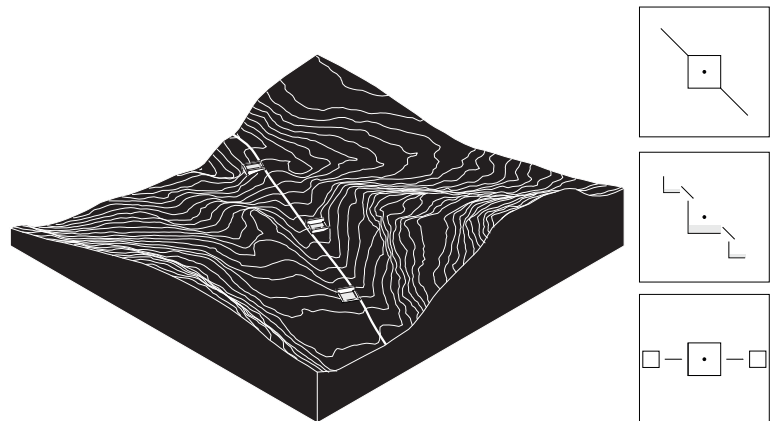
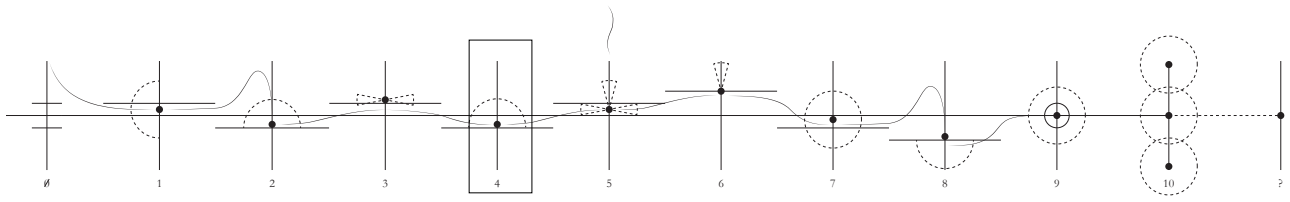
Entrance – Recognition - Exposure  
Own work





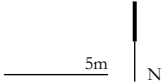
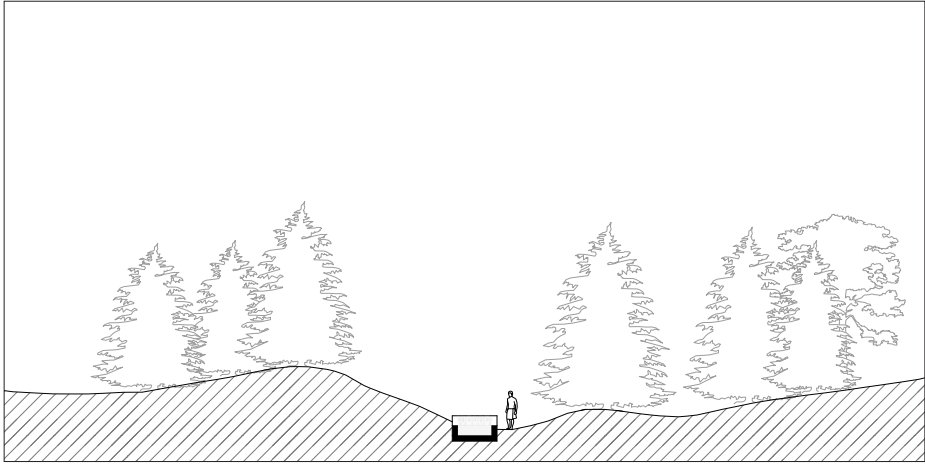
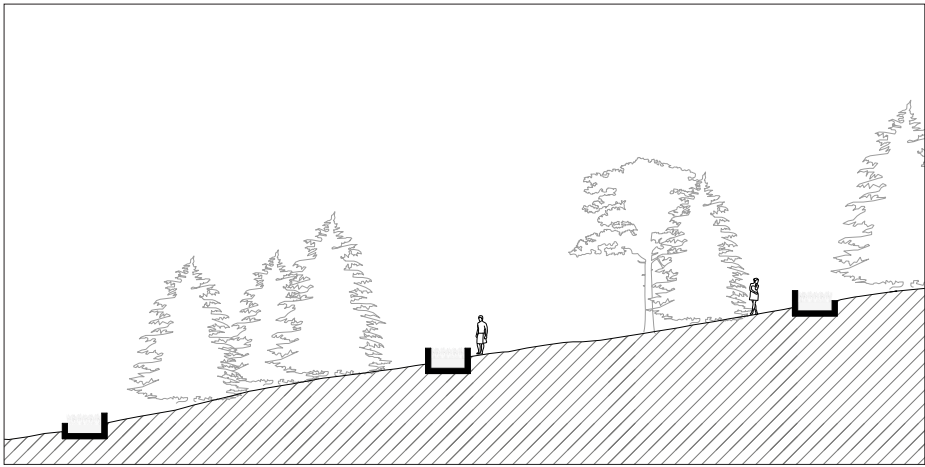
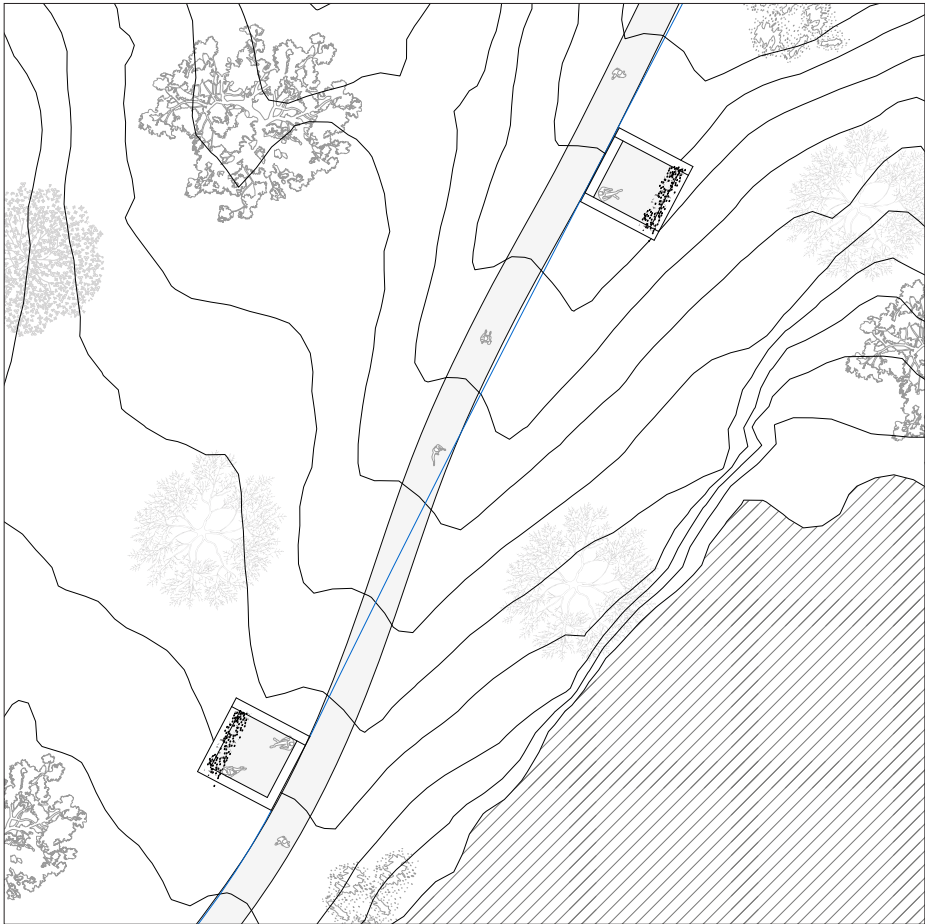
Sight bath – Recognition - Exposure  
Own work





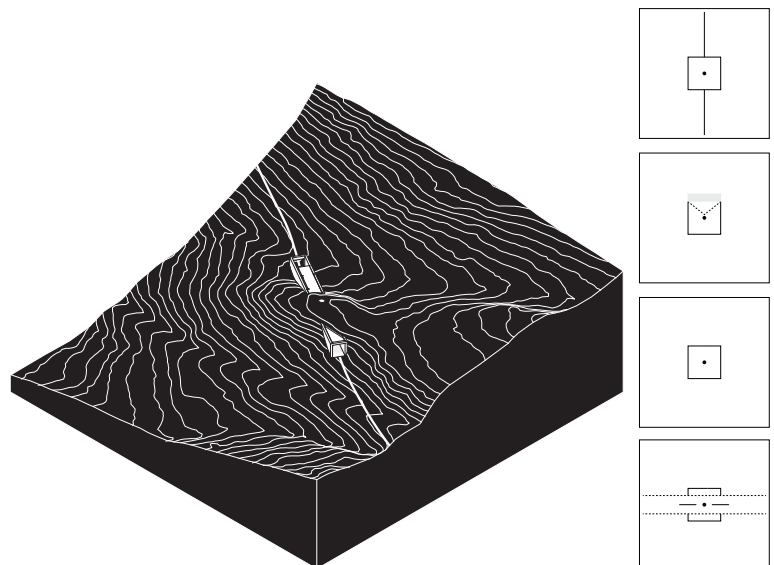
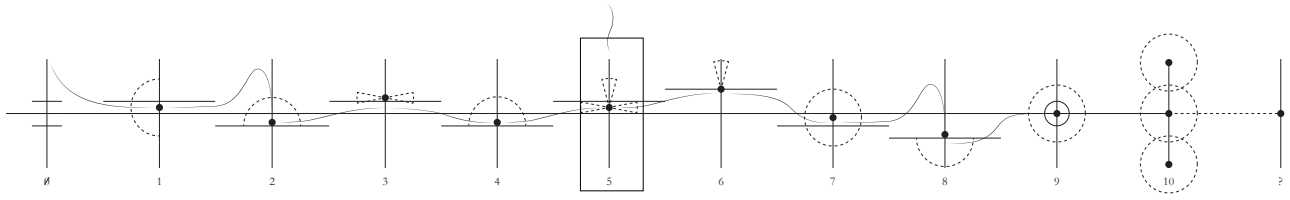
Sound bath – Recognition - Exposure  
Own work



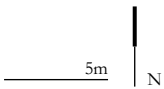
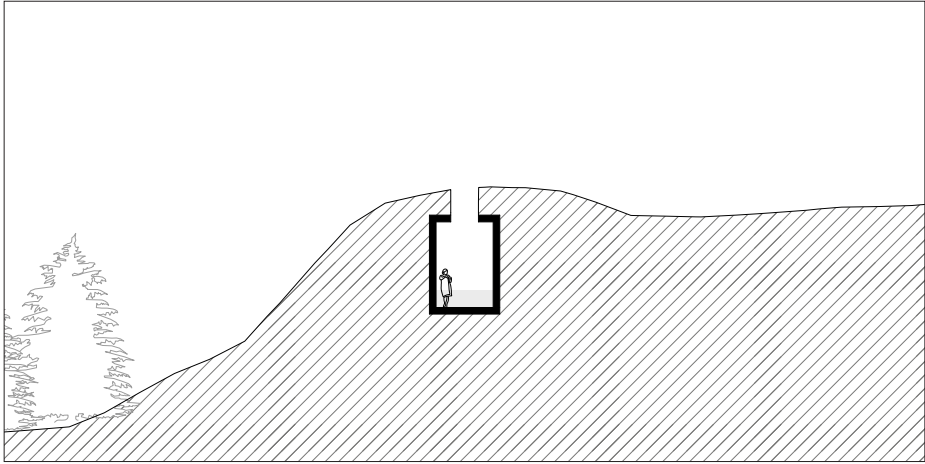
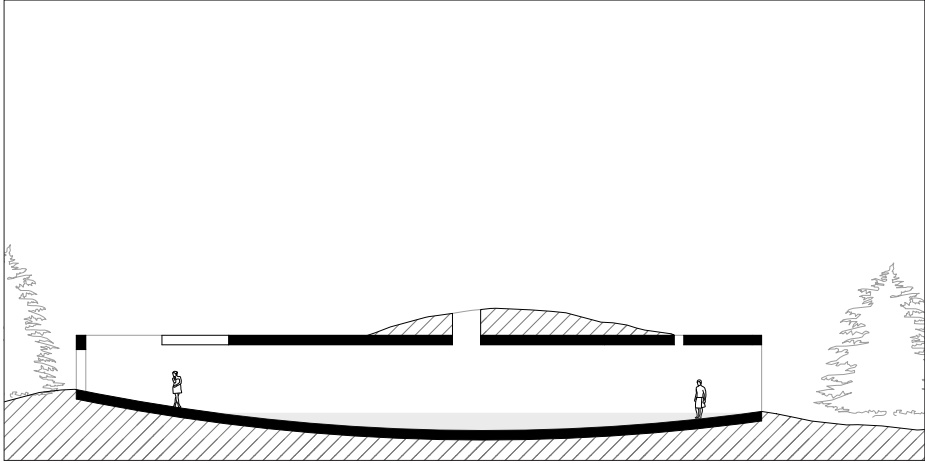
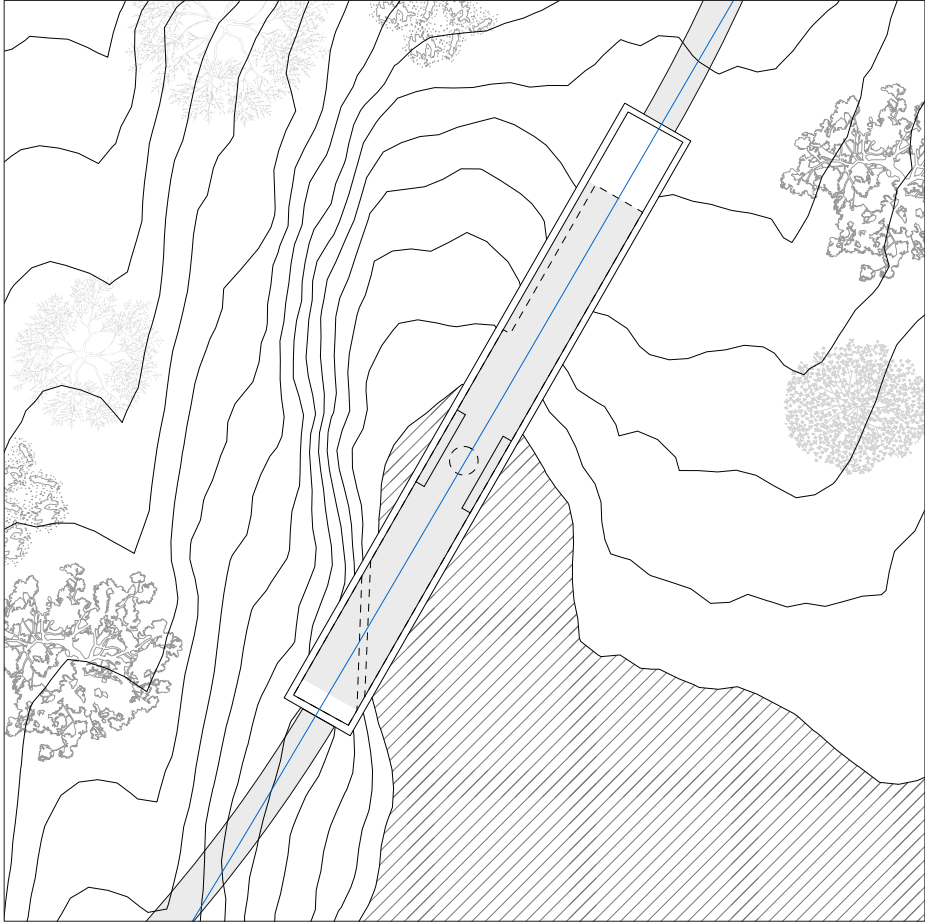


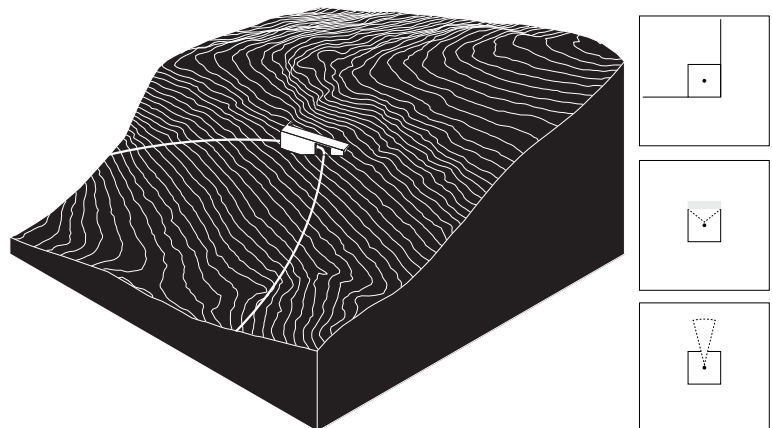
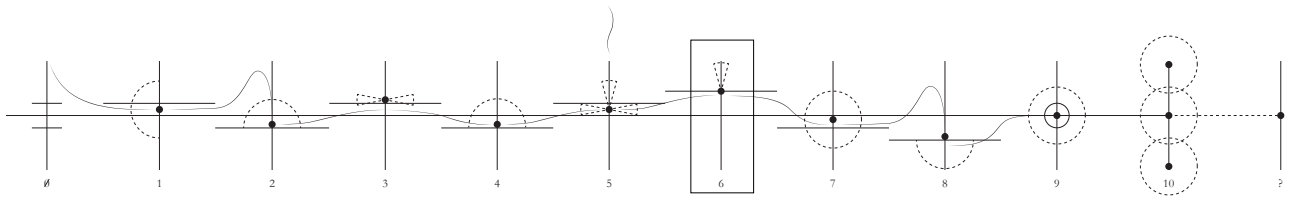






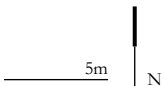
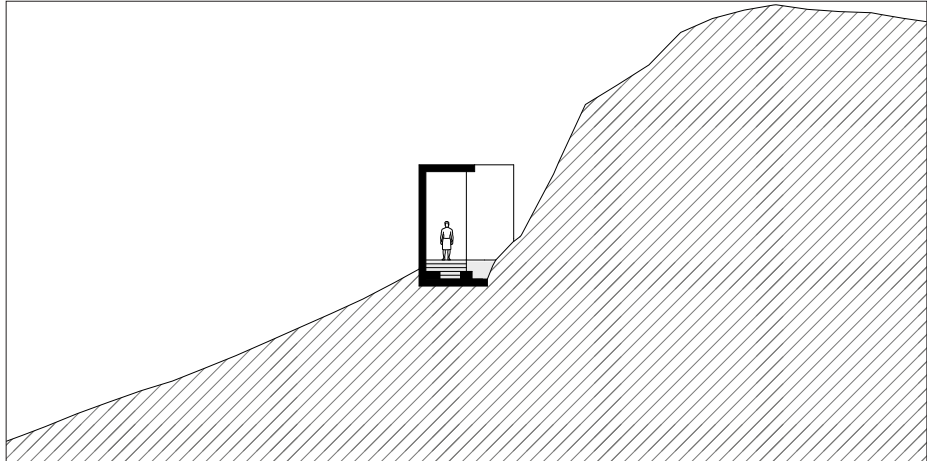
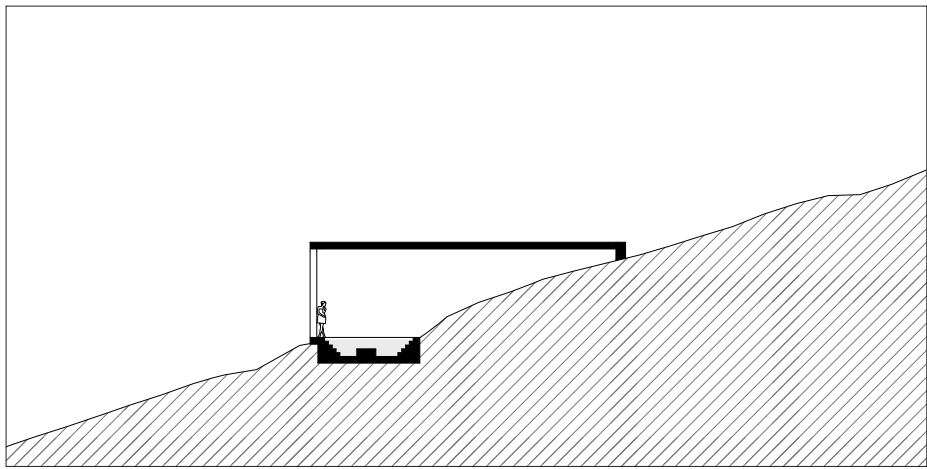
Tunnel – Closure - Introduction - Exposure  
Own work

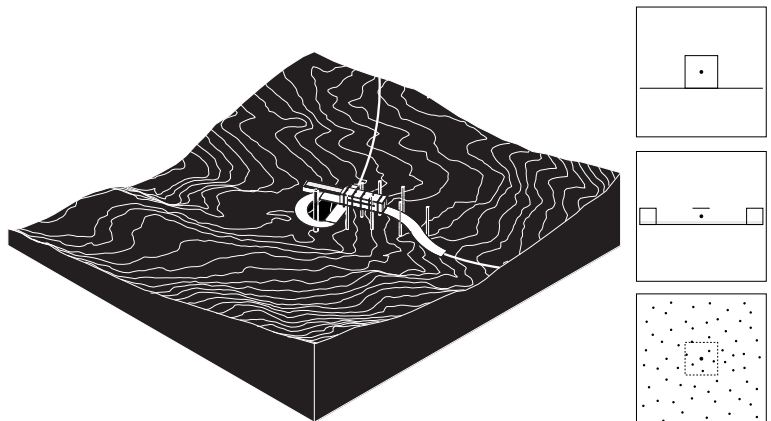
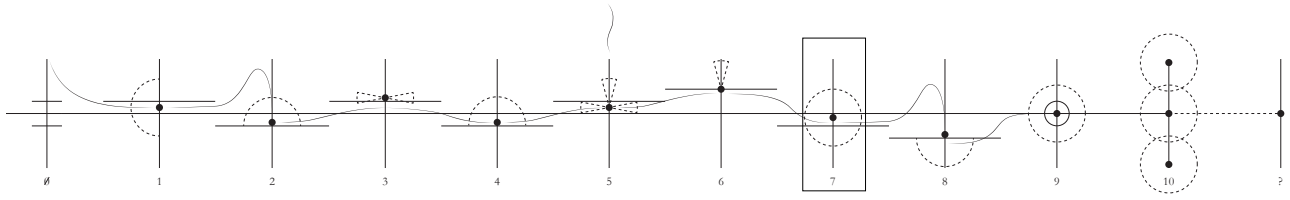




Mountain bath – Introduction - Exposure  
Own work

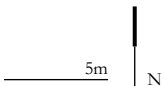
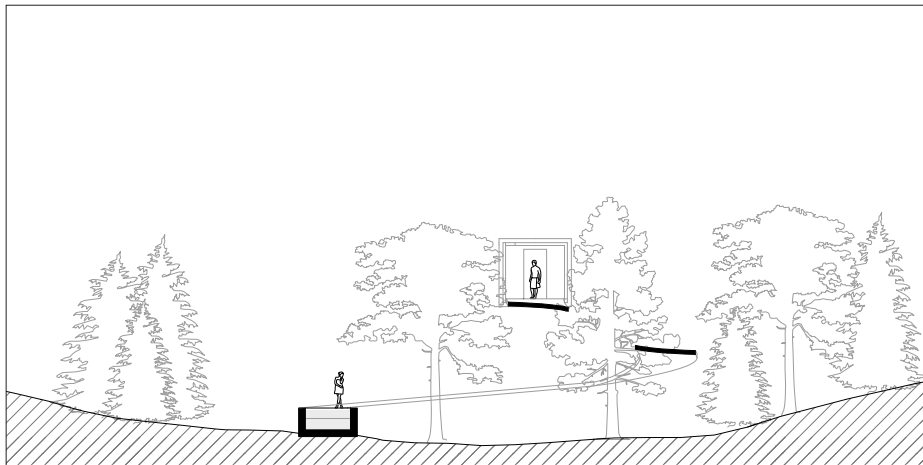
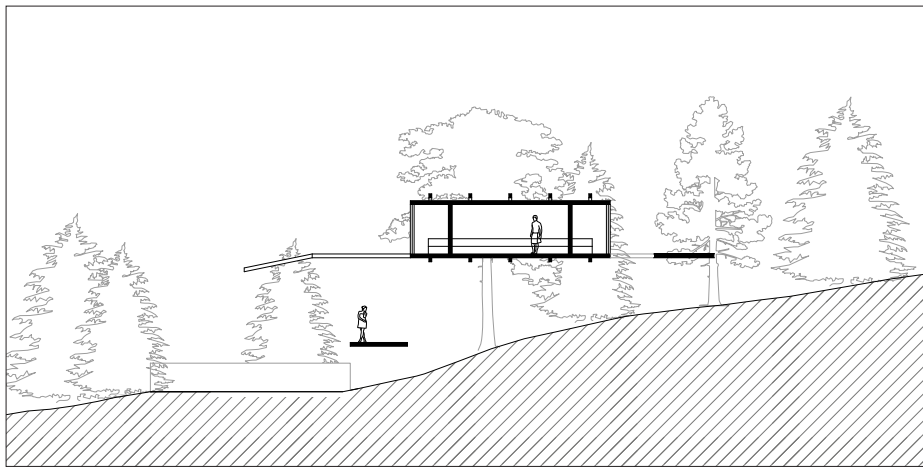
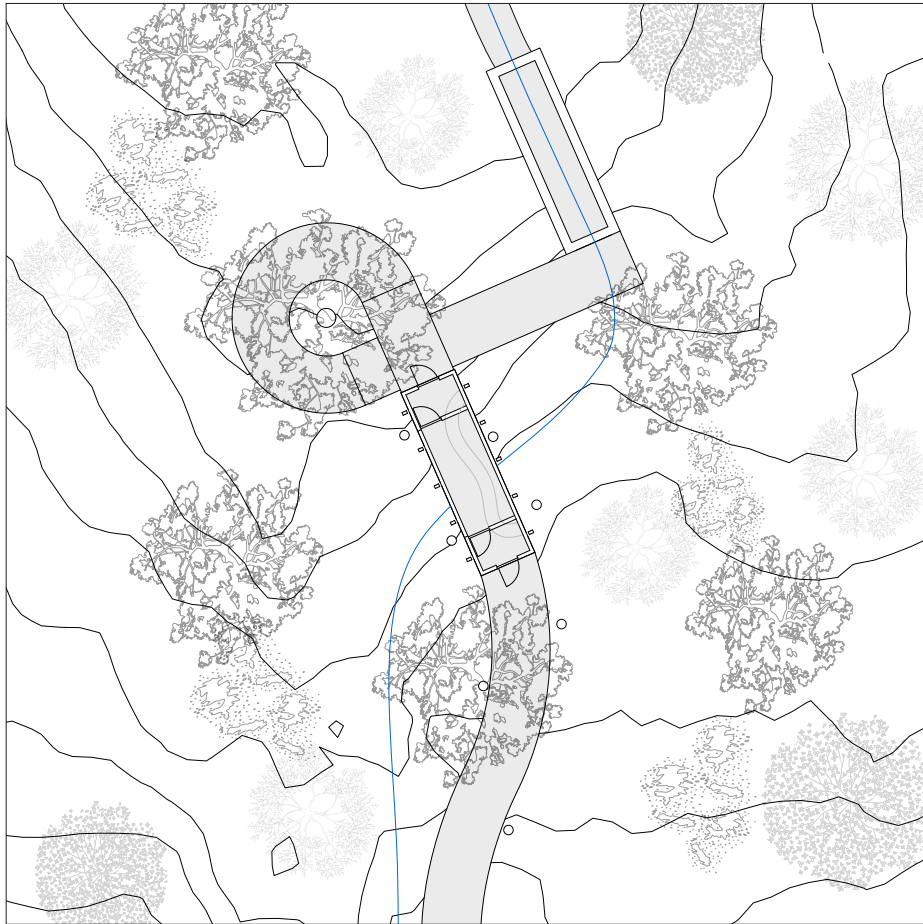


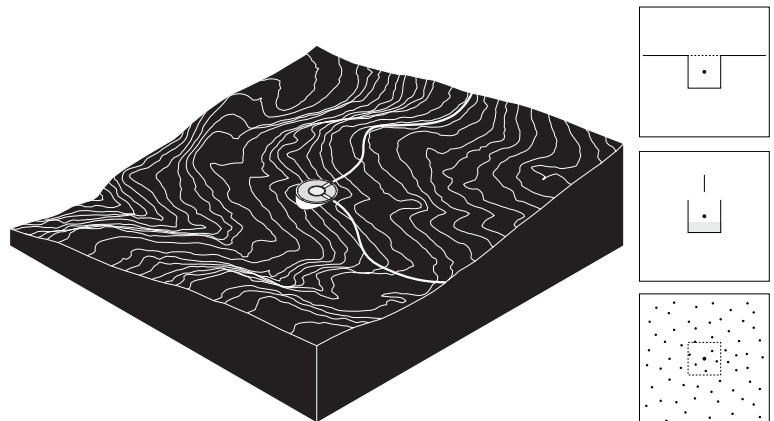
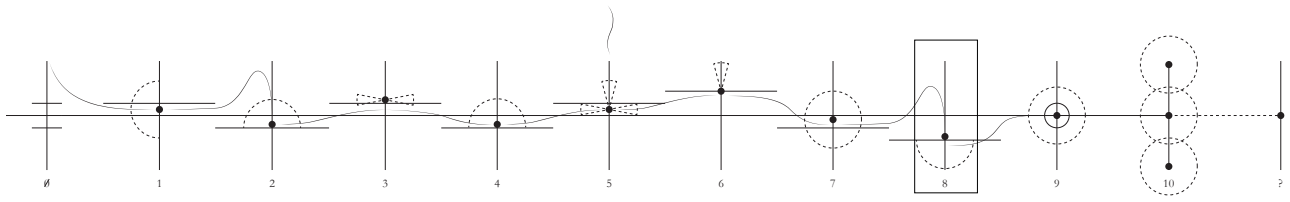




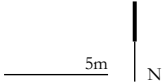
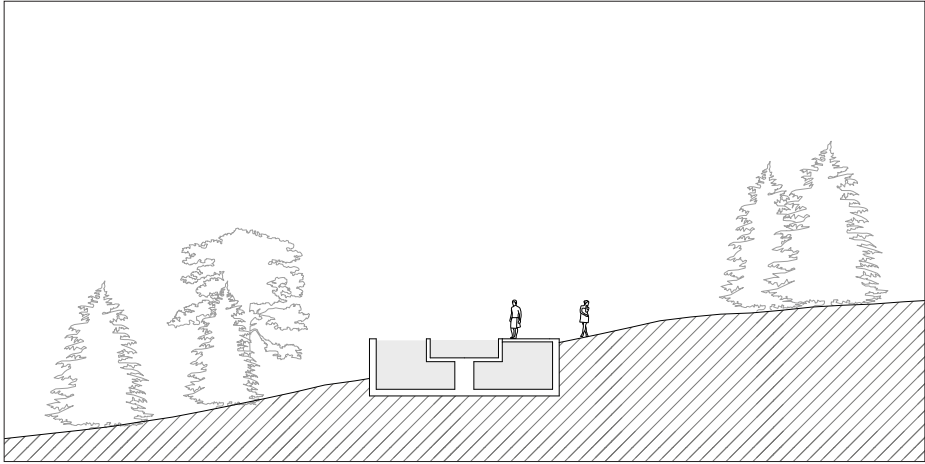
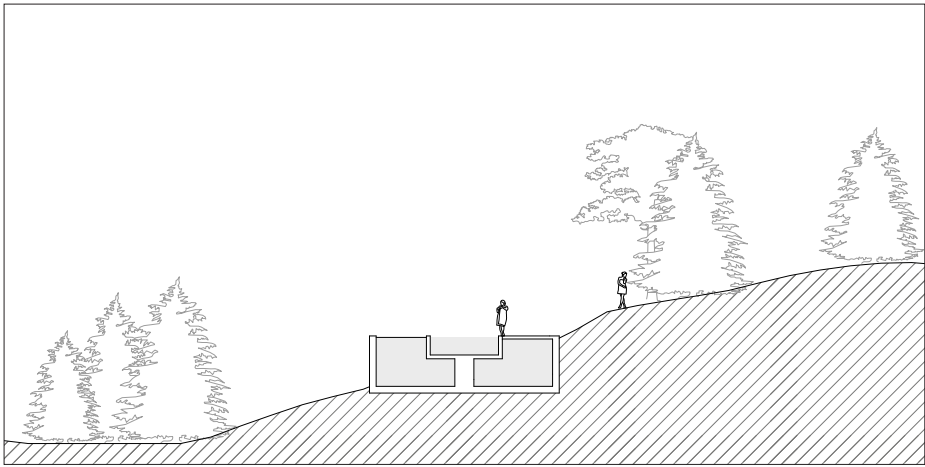
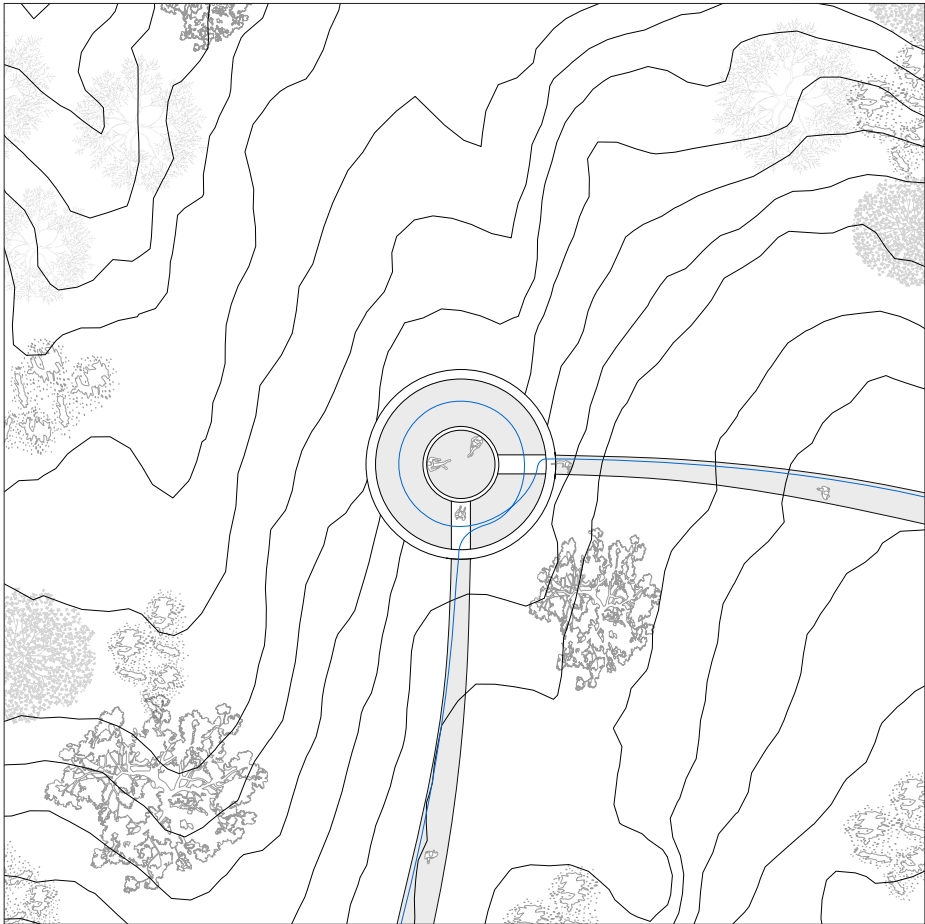
Nature sauna – Introduction - Exposure  
Own work





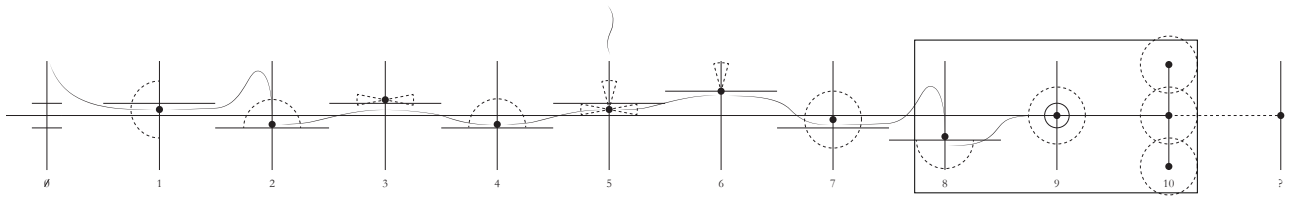


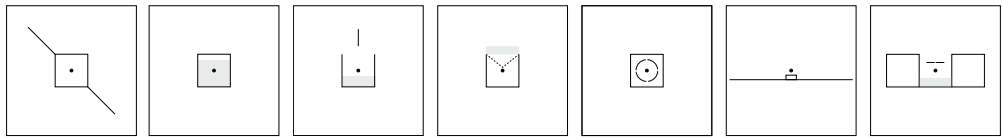
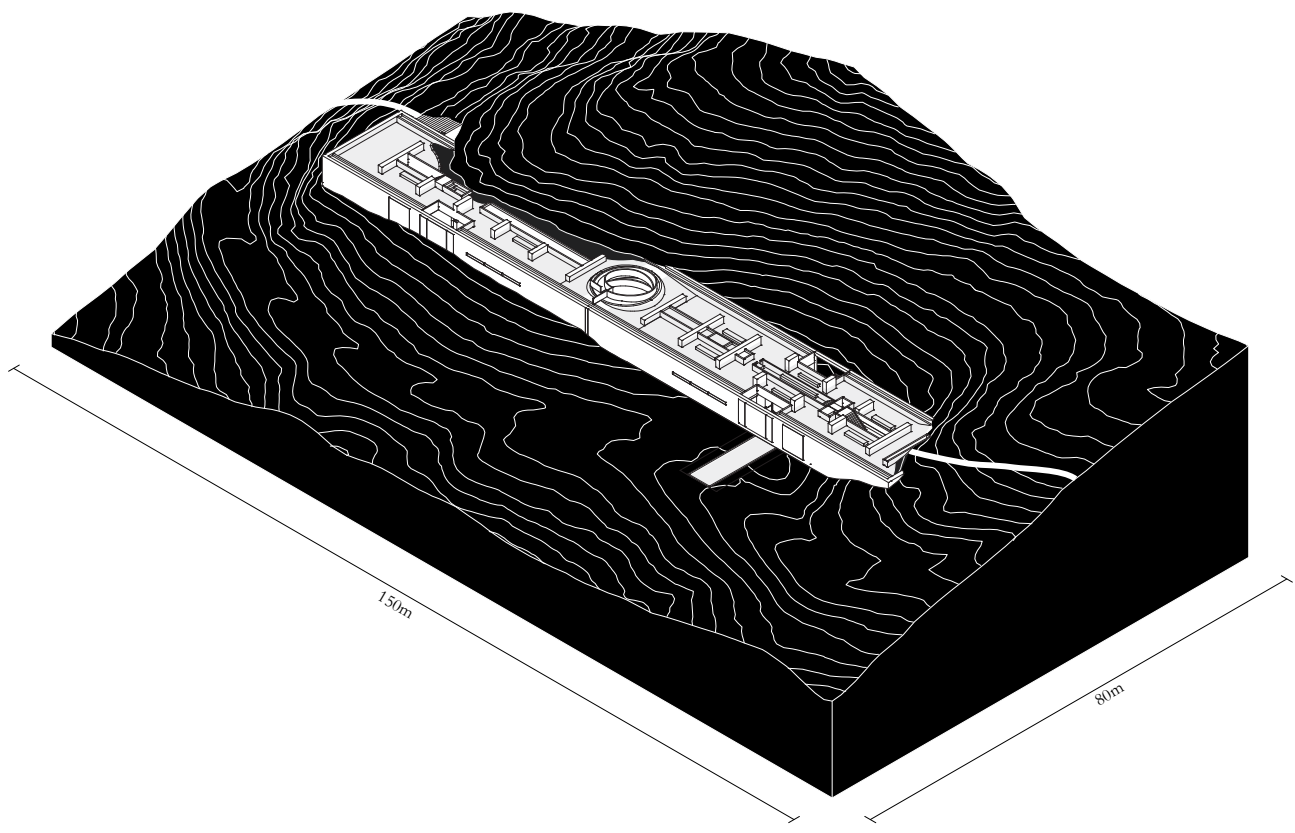
Water storage – Introduction - Exposure  
Own work





Activation



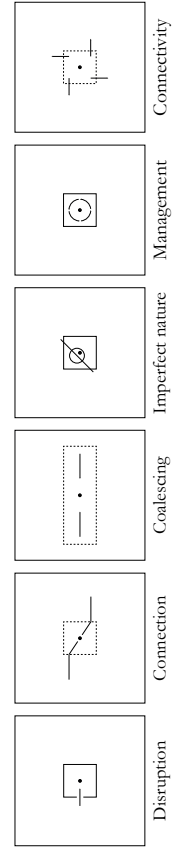


### The façade

The façade of the building exposes the different relations between flows and territory within the same element. The bar expresses to be forced in the mountain from one side to bridge a gap and rest upon a hill. These different expressions of the bar relate to the energy consuming production of hydrogen however, also the flowing of the water from the mountain. The composition of windows relates to the machine embedded within the building. Its long stretched windows expose the directions of the flow, while its large openings show the result of the machine and our current climate position to the visitor. The enclosed parts of the façade are the active machine spaces and therefore direct the views of the visitor inward.

### Connective disruption

Own work





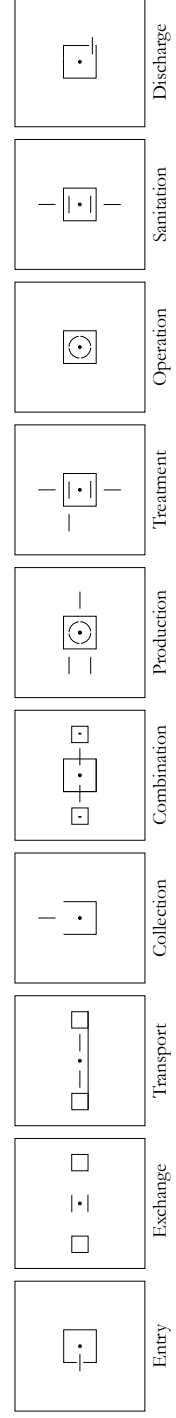


## Flow management

The placement of baths and rooms in and around the building directly result from the management of flows directed by the machine. The machine utilises the flows in eight different steps: accumulation, exchange, transportation, combination, production, processing, operation and discharge. The elements and baths relating to the operations of the machine are more enclosed and inward directed spaces, while the operation and transportation spaces are opened to its surroundings. This sequence experienced by the visitor exposes either the process, the results or constant variables which the machine, people and the surroundings are faced with. Additionally, the water running down the mountain not captured in the system hits the side of the building, in term filling a bath directly related to the amount of precipitation. At the end of the cycle the waste water is returned to its original heading; towards the sea.

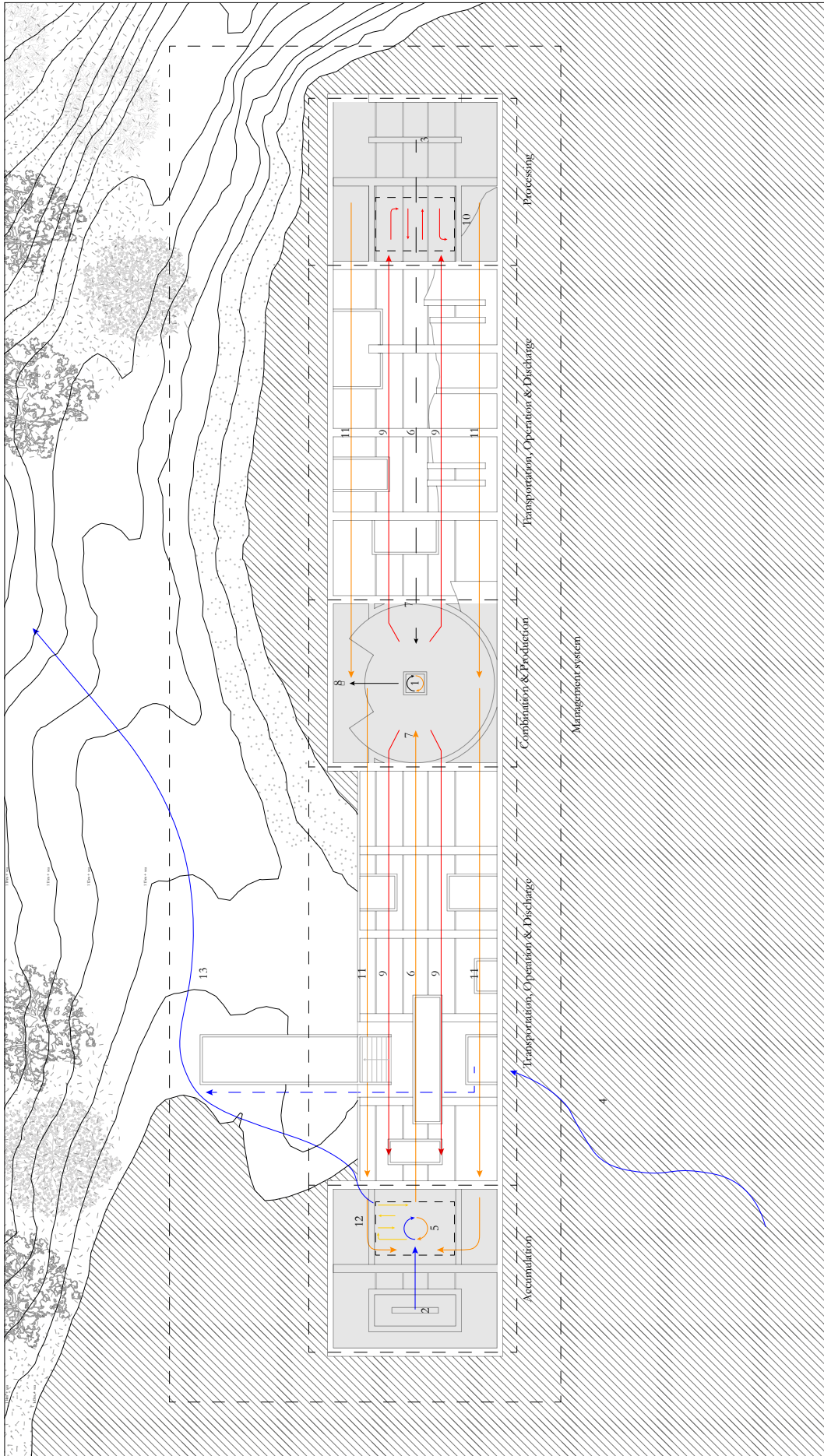
## Legend management floor

1. Fuel cell
2. Water entry
3. Hydrogen entry
4. Precipitation
5. Wastewater heat exchange
6. Flow transportation
7. Entry activator
8. 'Waste' Consumption
9. Operation
10. Treatment
11. Discharge
12. Sanitation
13. 'Waste' water



Flow management

Own work

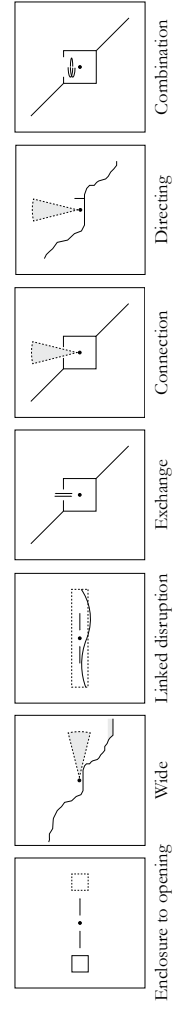


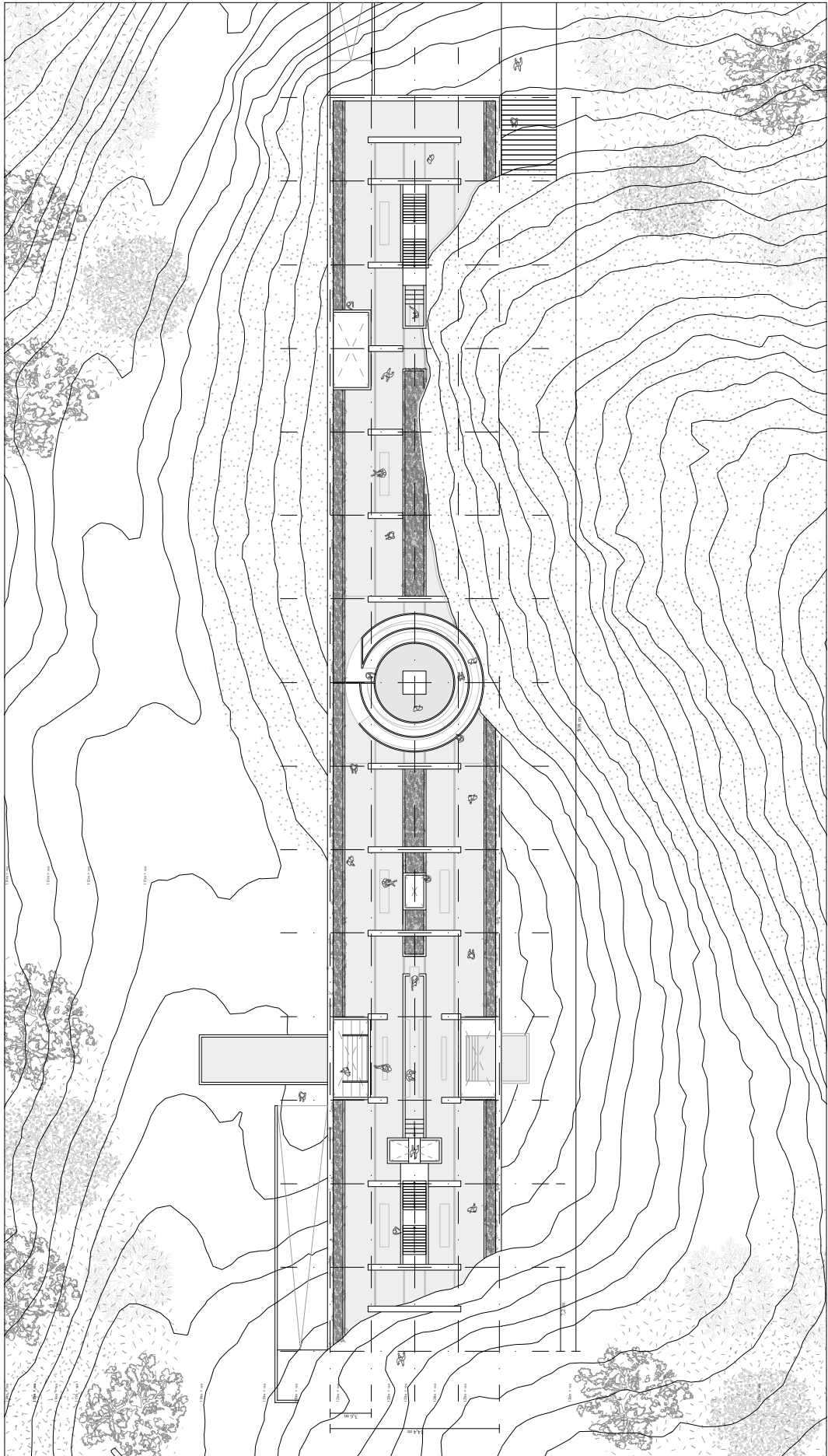
### The rooftop approach

The rooftop of the building is simultaneously its entrance. The roof experienced as a walking pool completely exposed to its surroundings, yet with a highlighted linear direction towards its centre. The shallow depth of the pool allows it to be walked in however, forces the visitor into a slow walk to take in the surroundings. The roof and its movement space offer various moments of rest and opening by means of its exceeding walls each framing a different view including one towards the sea. Additionally, the roof features different openings through which connections can be established with the lower floors, simultaneously as been done through the exchange of fresh and discharged water.

### Flow management

Own work









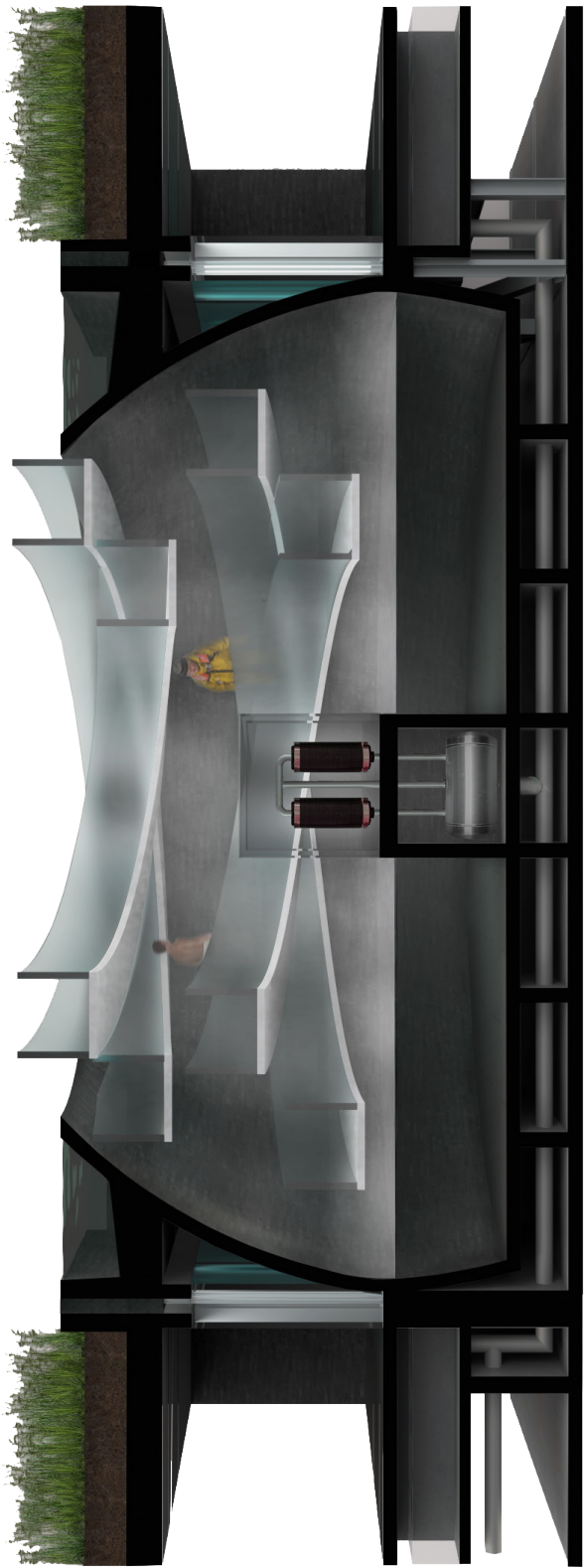










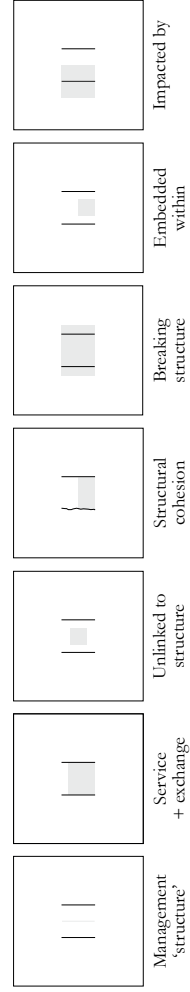


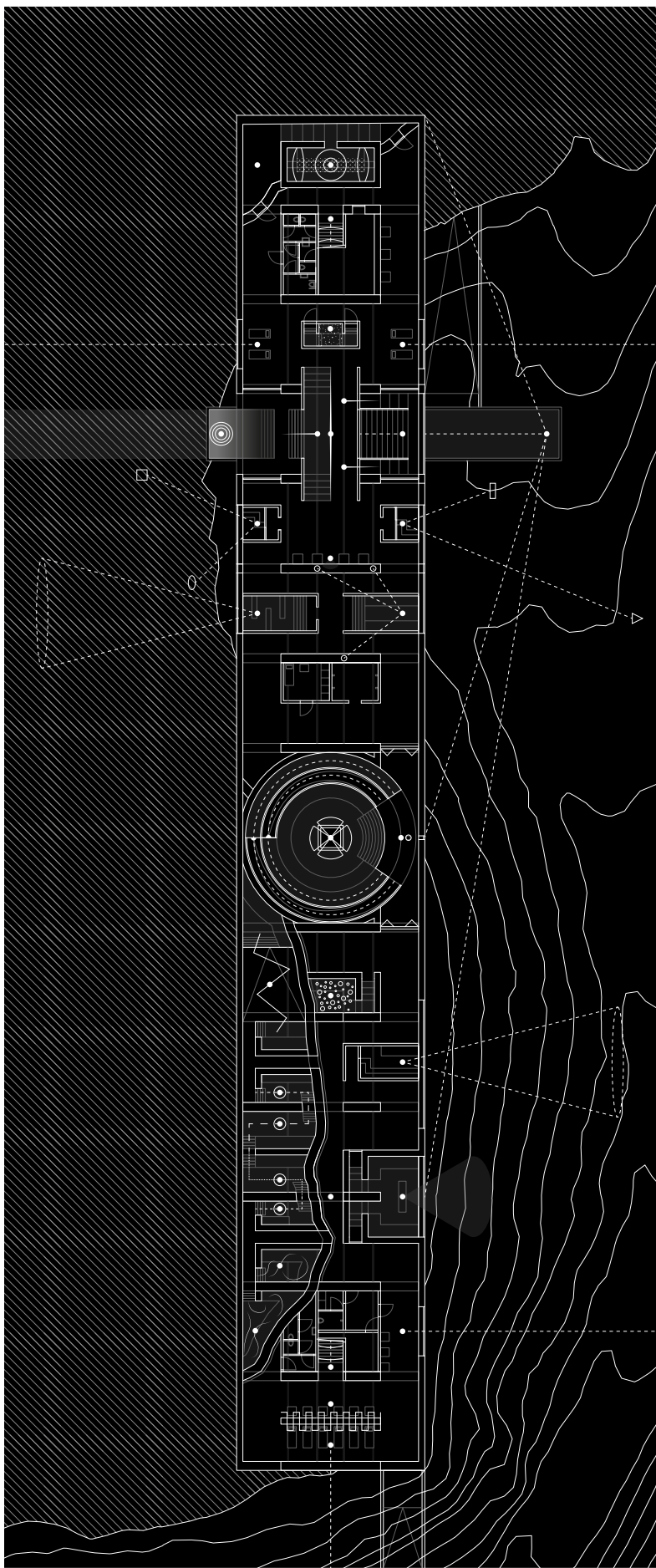
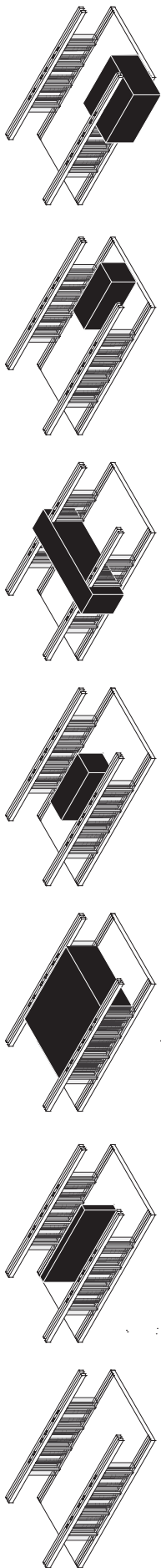
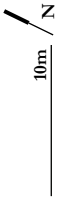
**Sensory exposure**

The different baths and saunas within the bar address different relations and dependencies to the existing structure. The addressed relations provide the different baths and saunas with possibilities to either expose the active parts of the machine, or the results of the machine by means of internally or externally directed views. Within the bar and the different baths these moments of exposure are addressed through different sensory experiences ranging from hard and long lasting, by means of the touch of the rock. However, also more delicate and environmentally dependant such as the constant precipitation Bergen is known for.

**Sensory plan and structure**

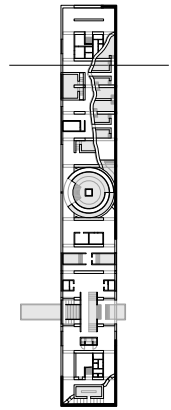
Own work





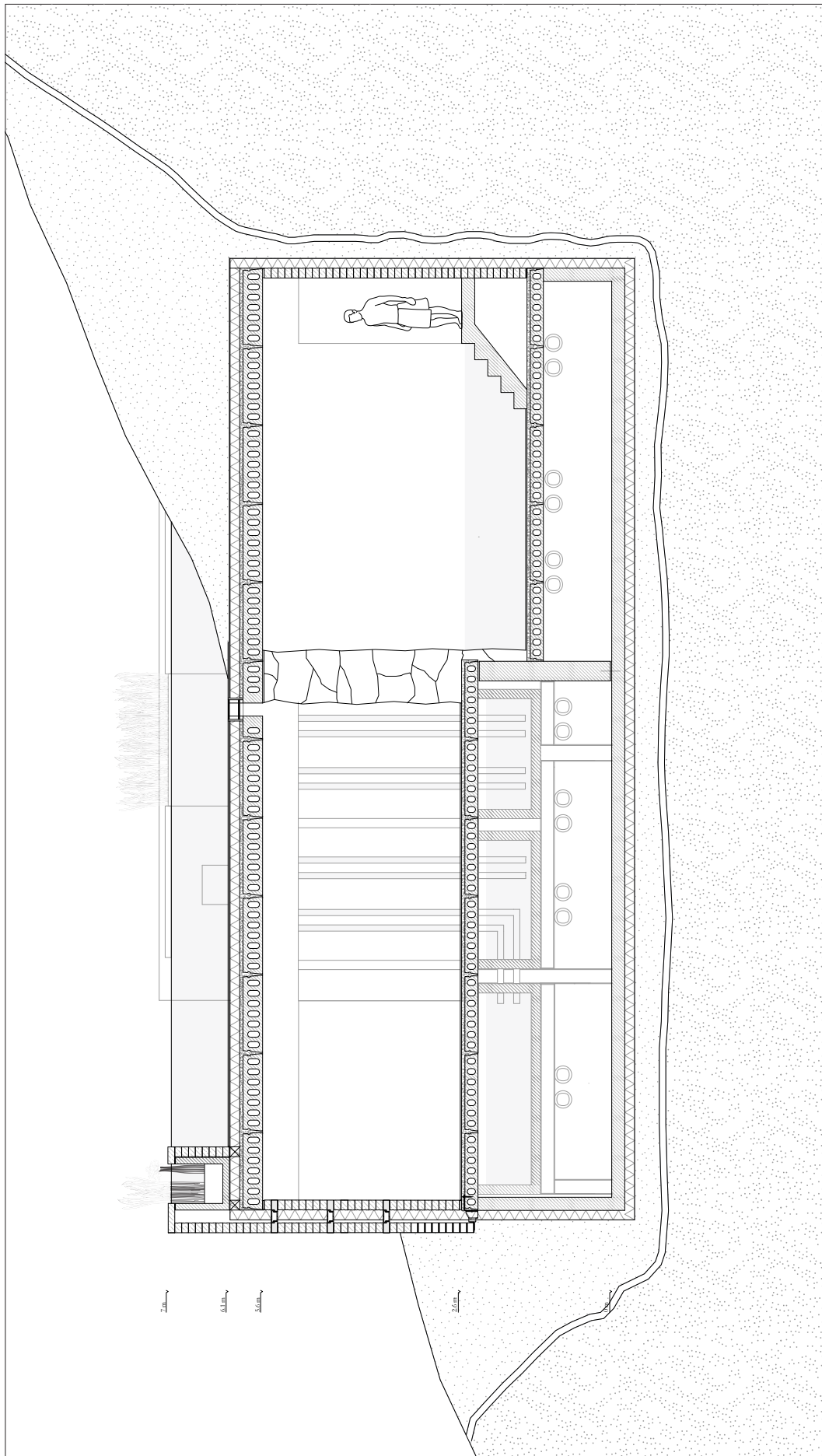






Mountain section  
Own work



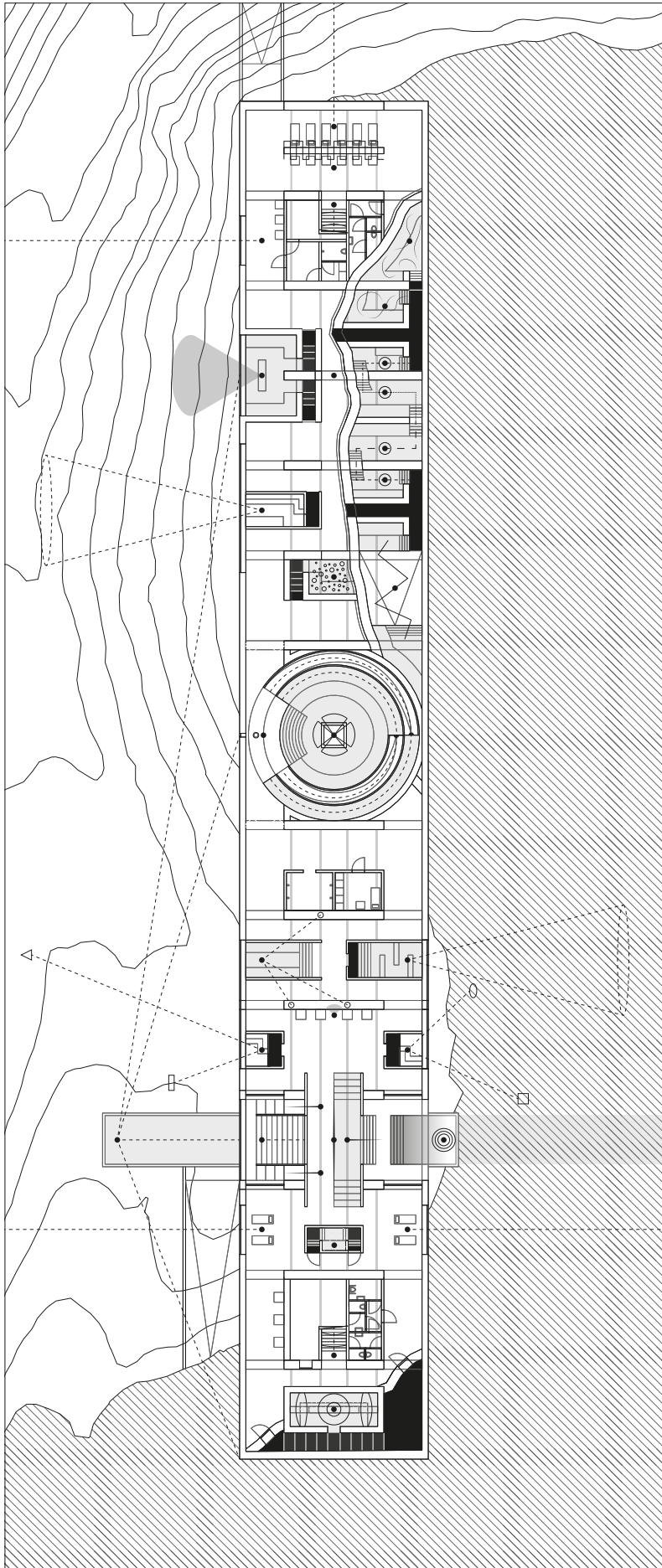


2m

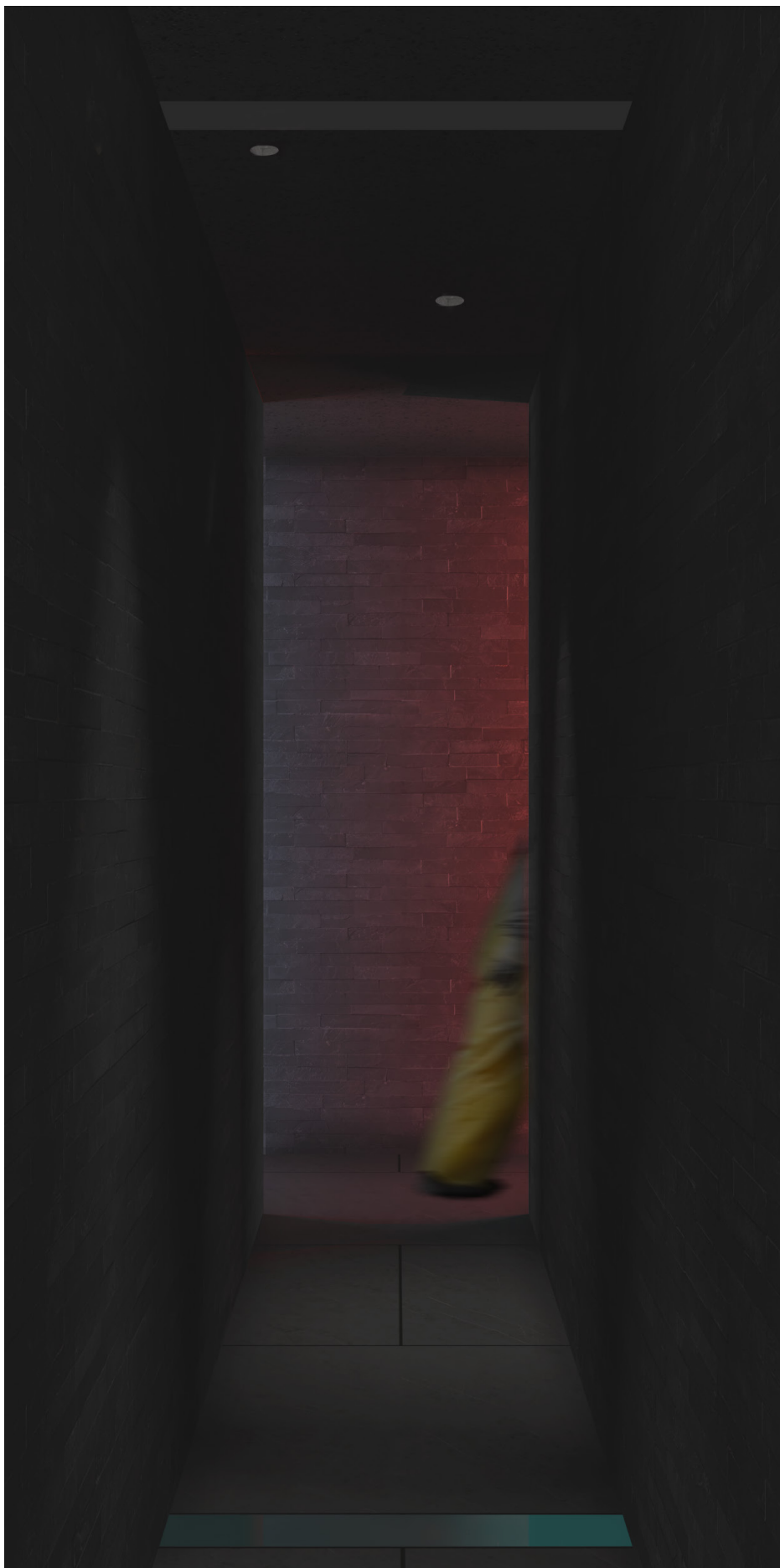










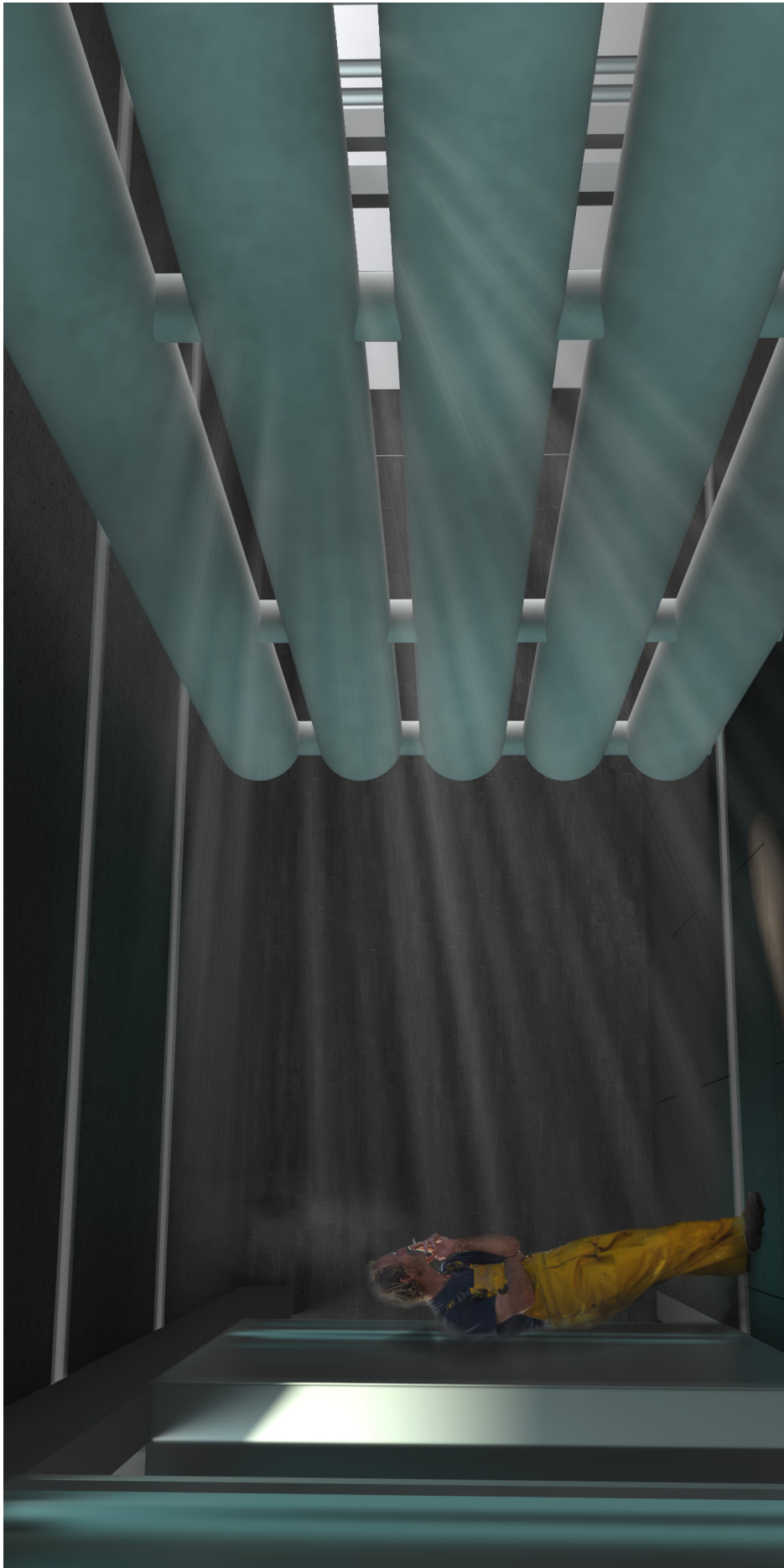




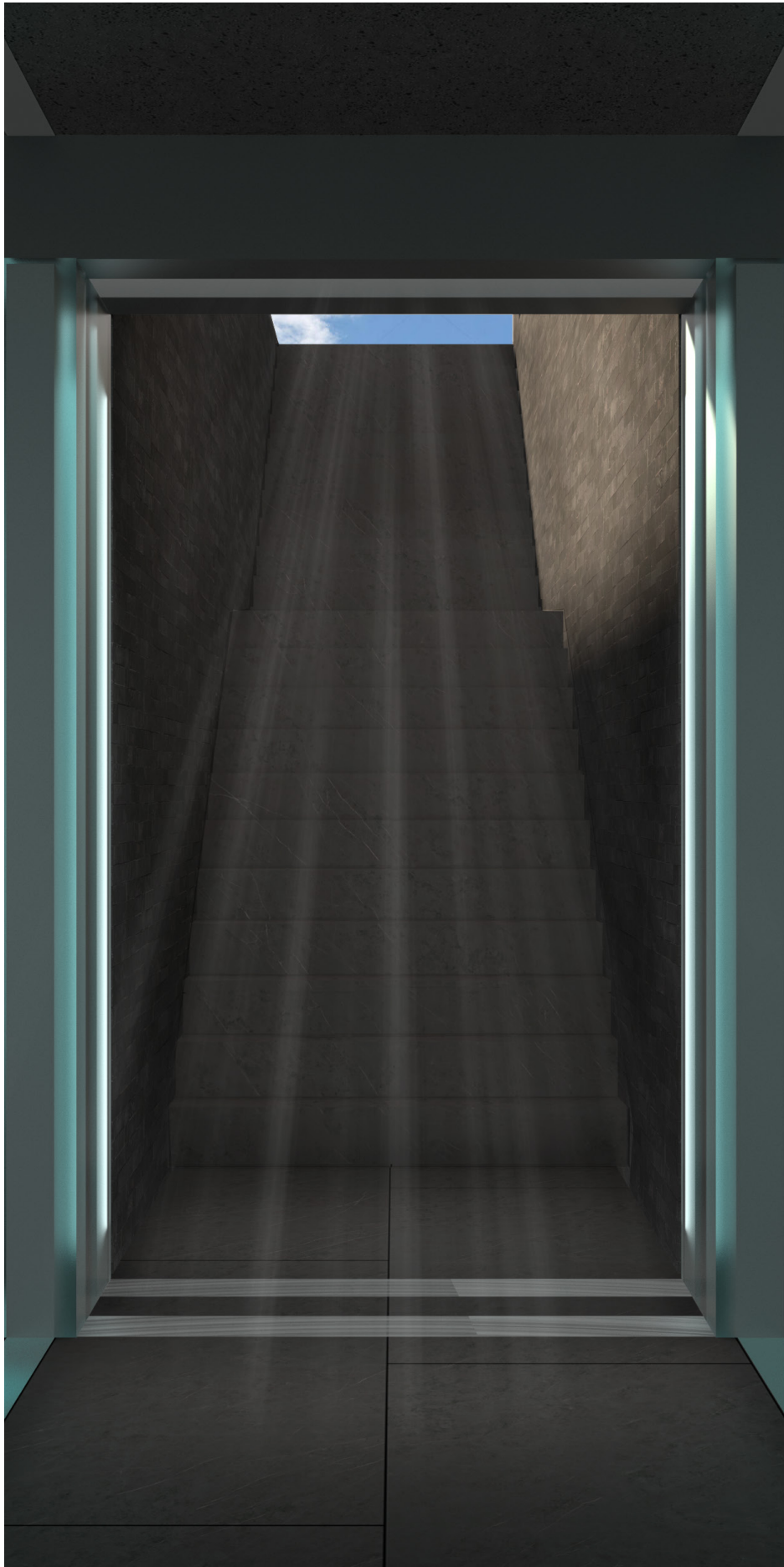


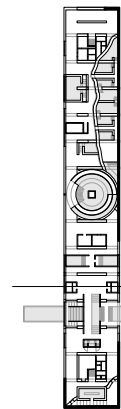




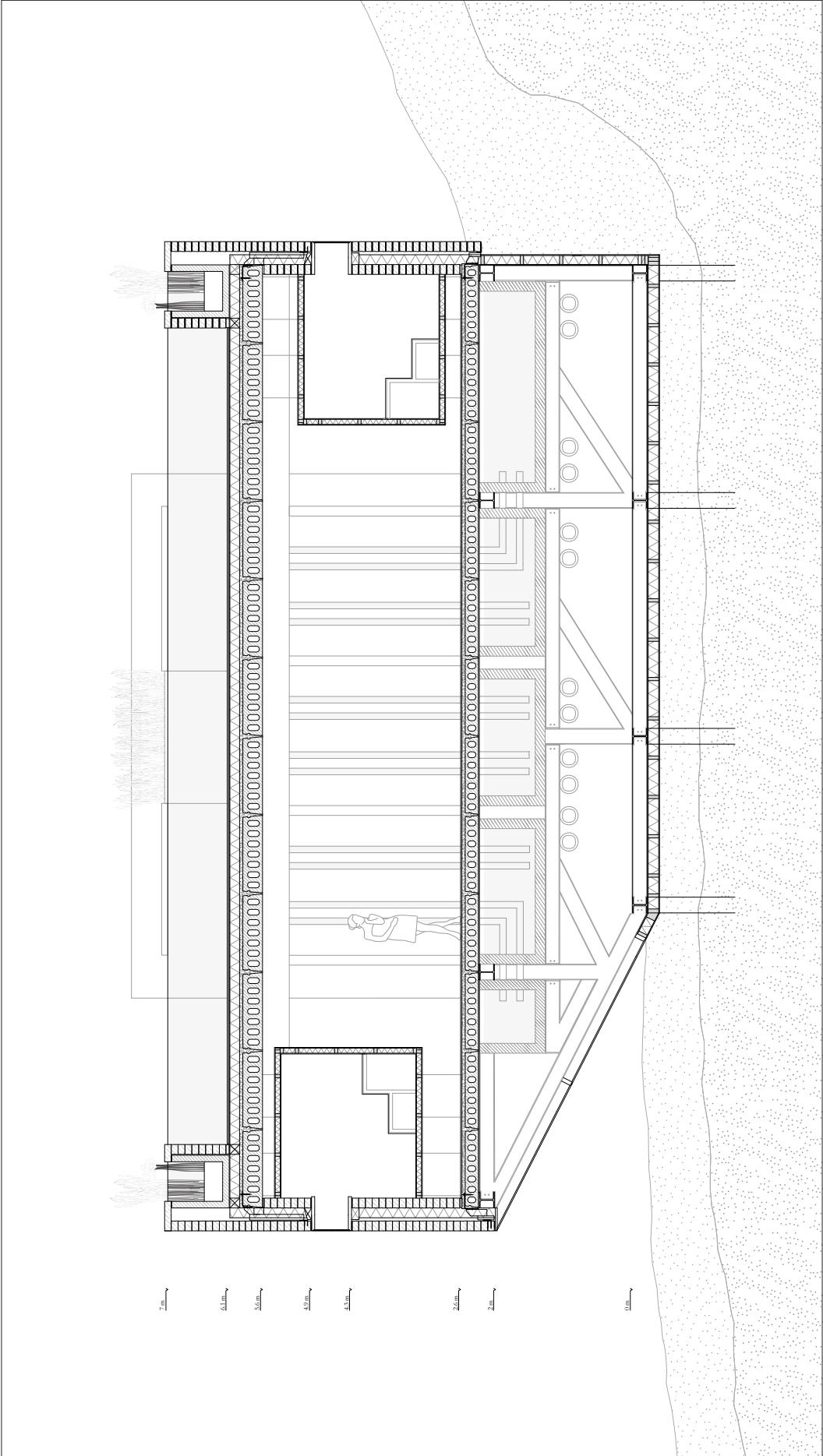








Sauna section  
Own work



2m



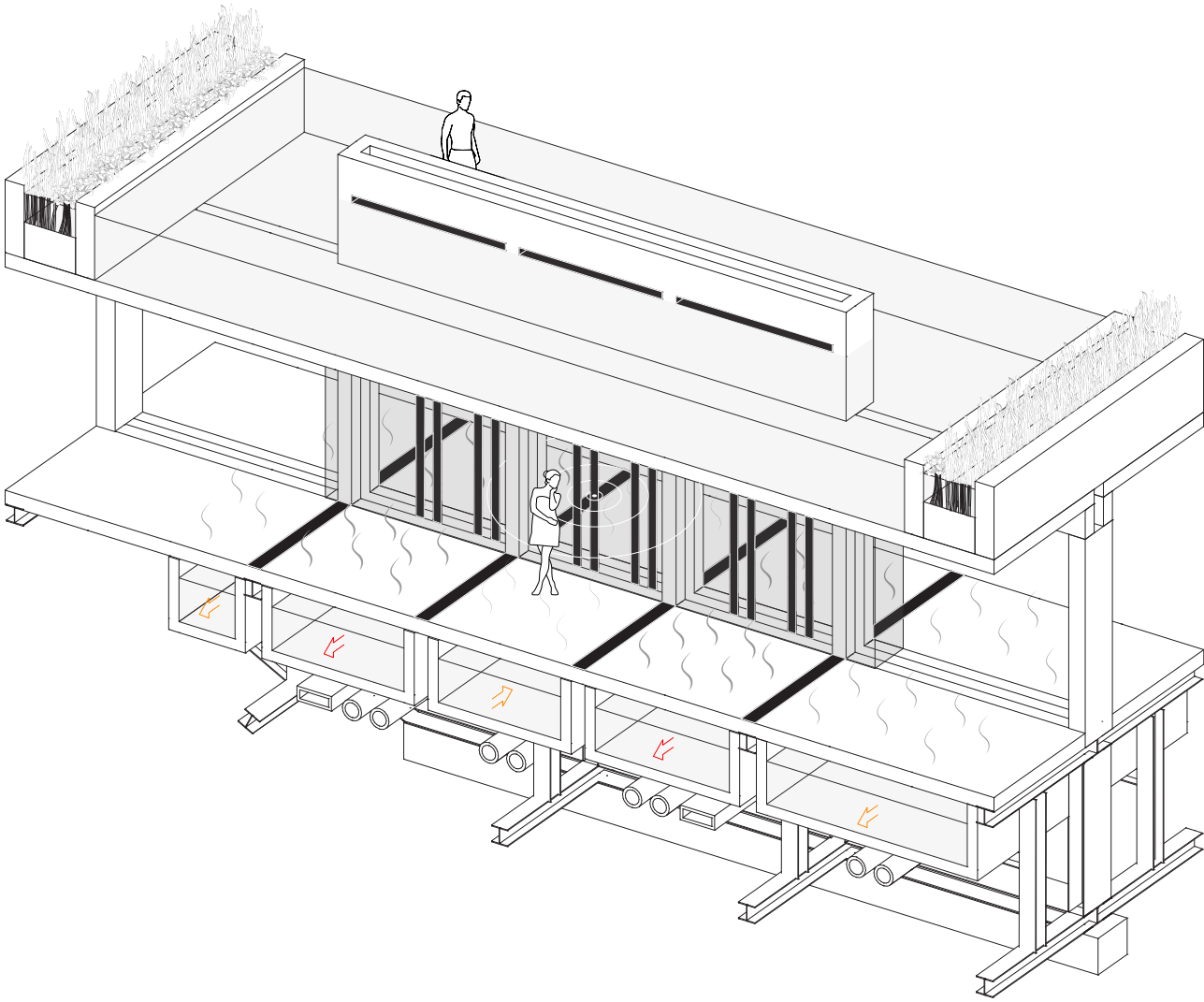




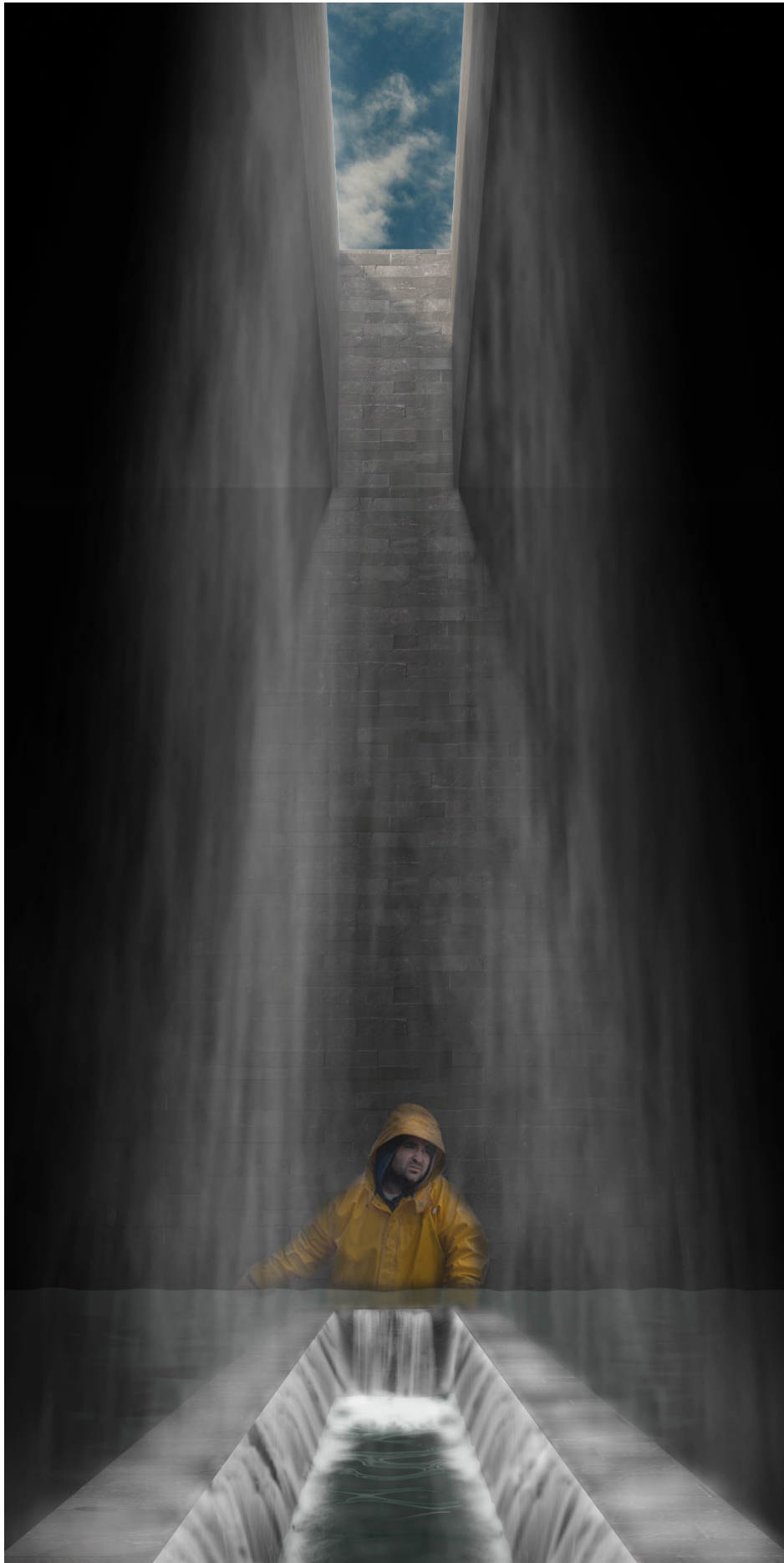






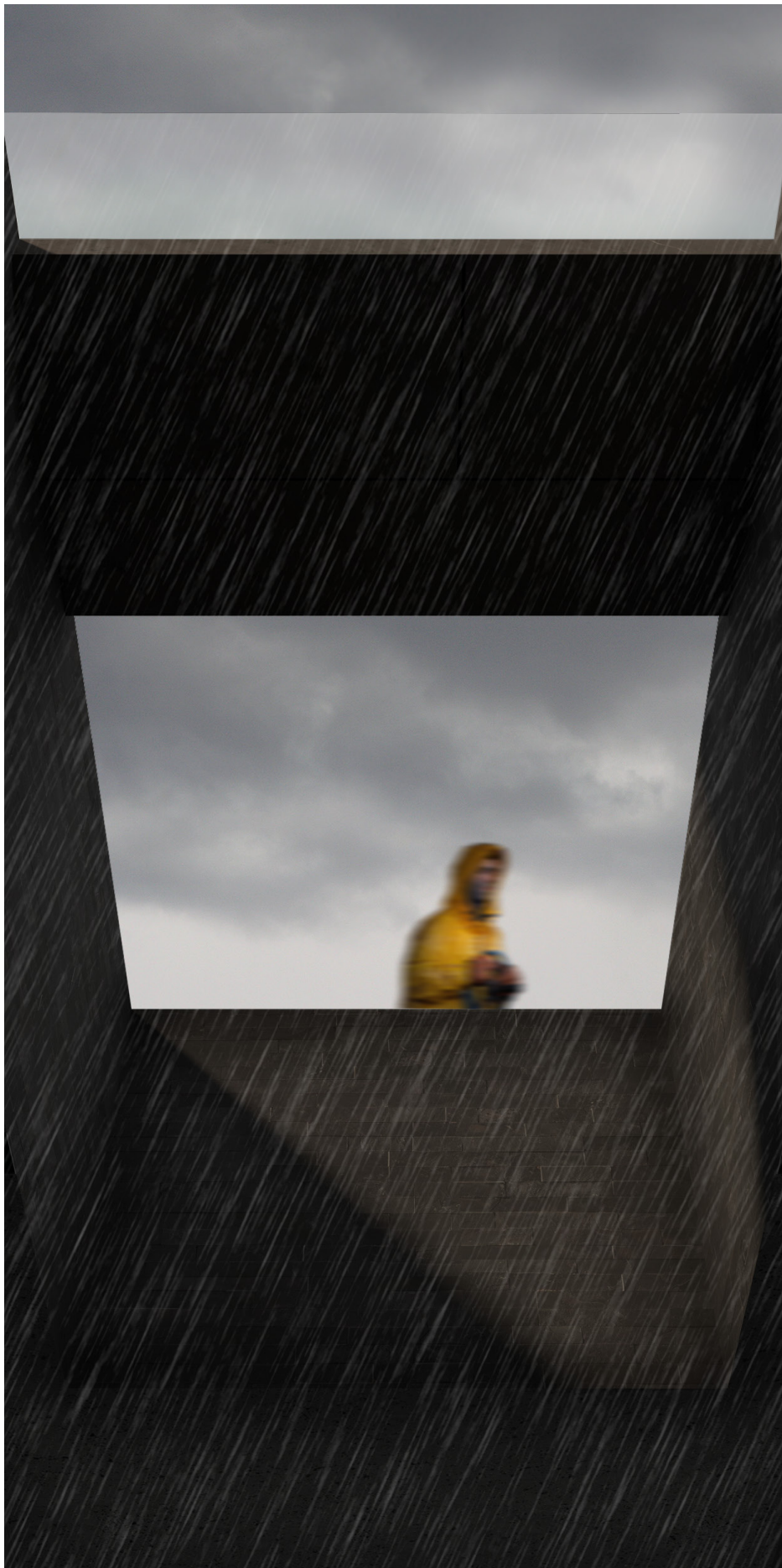


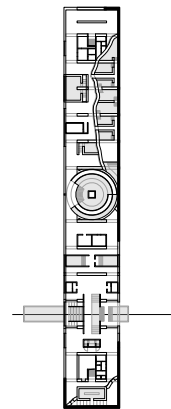




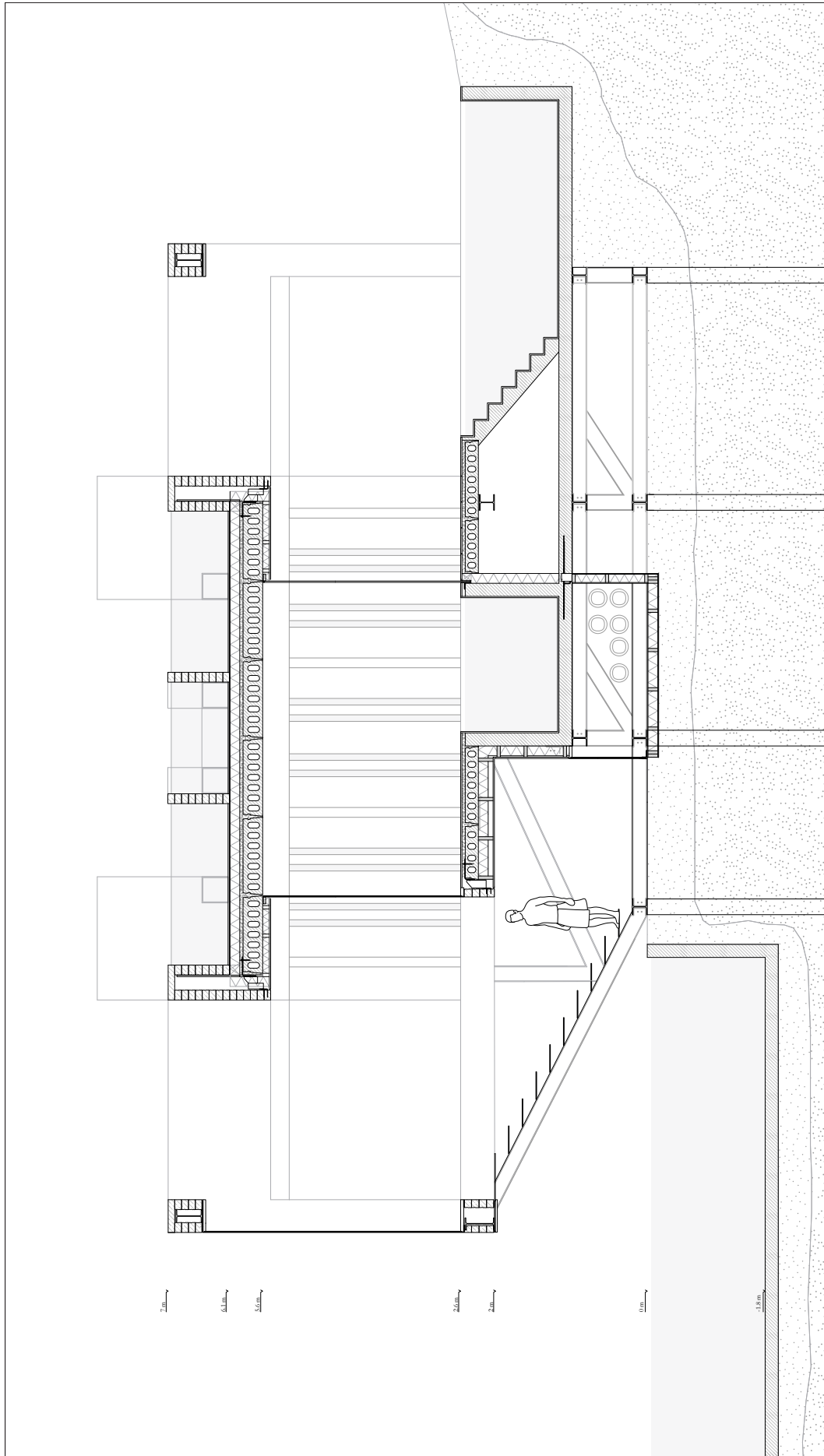






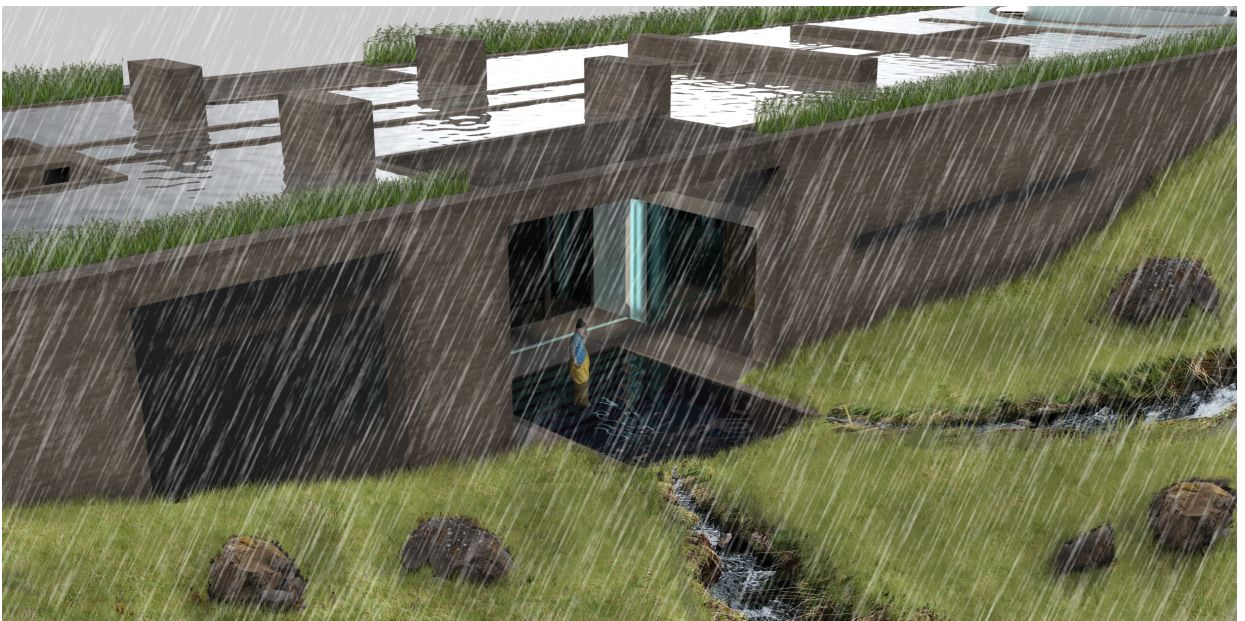
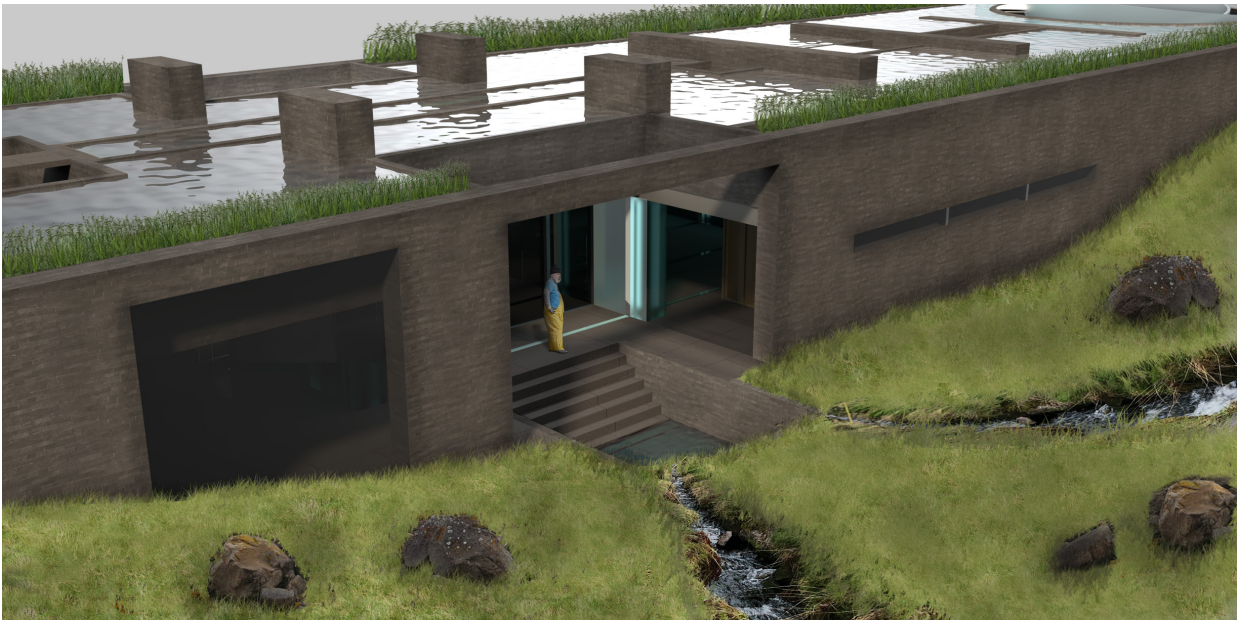
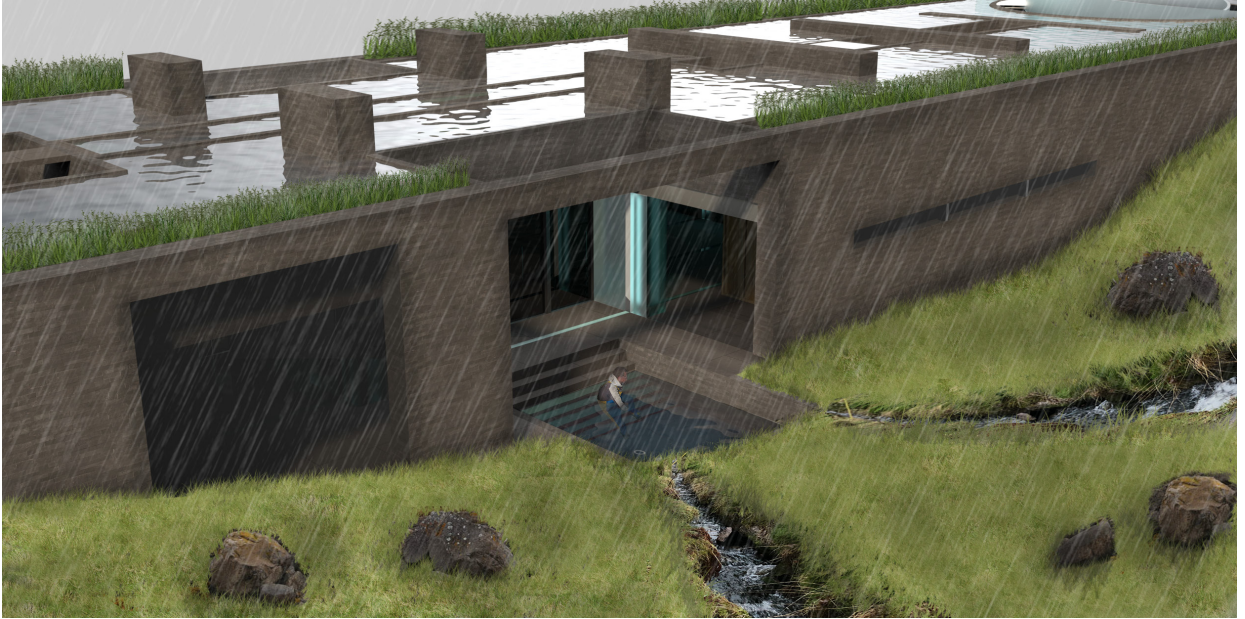


Passage section  
Own work













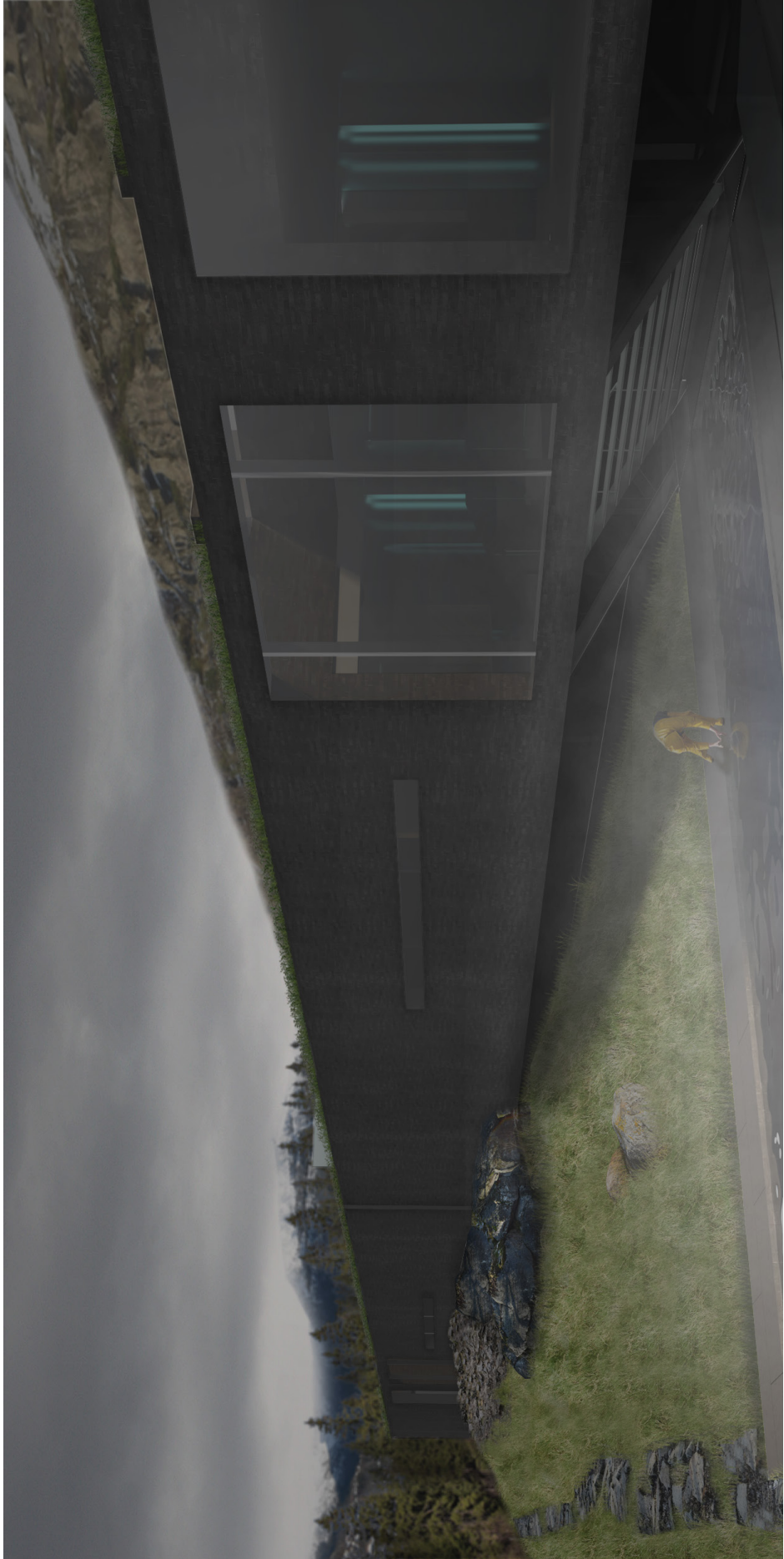




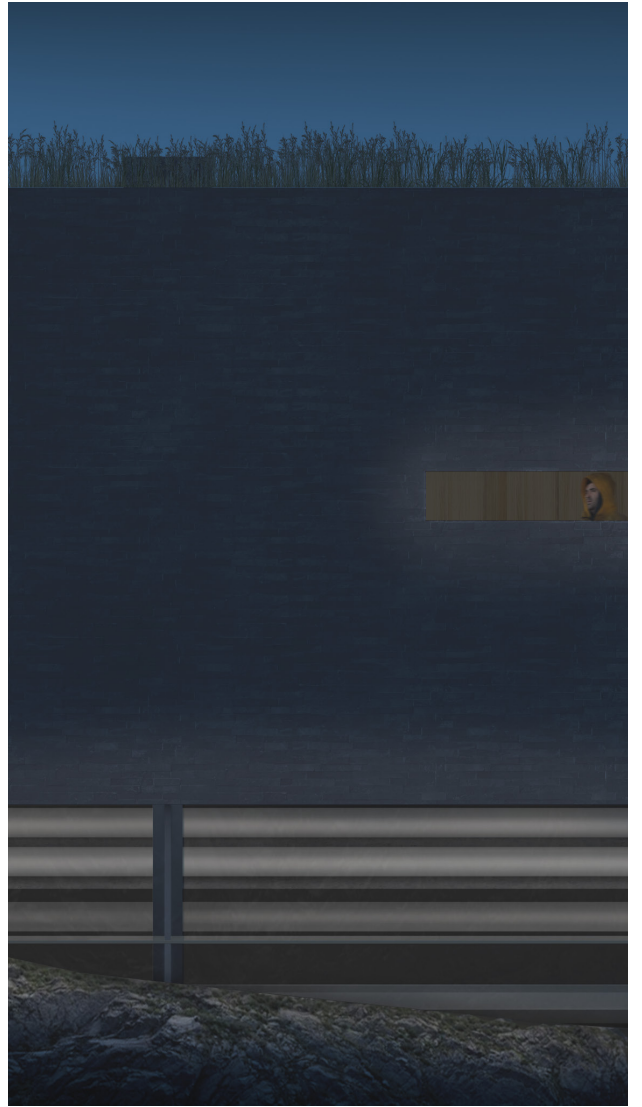






















Post-activation

### **Multi scalar reflection**

The project has departed from research conducted on the crises situations within the context of the North Sea, imposed by the industries of oil and fishing. The industries impose these multi scalar crises situations by means of climatic, territorial and social injustice, collectively named as structural injustice. This oppressing injustice leaves an unbalance and uncertainty on the crises situations.

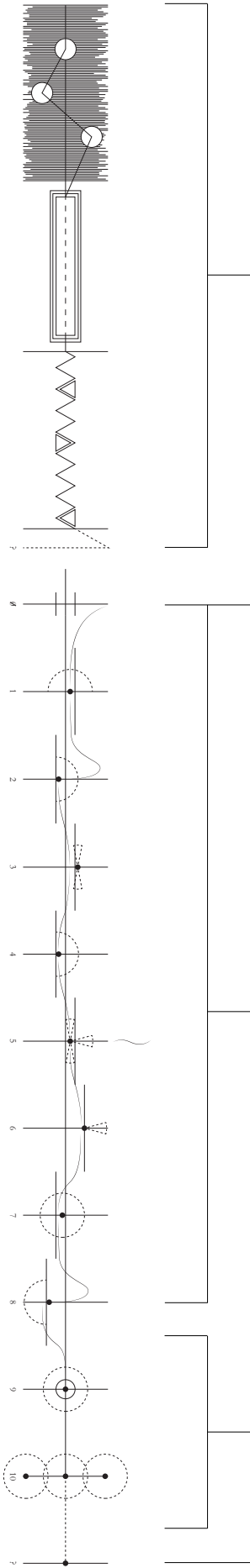
The project proposes a new kind of industry to act against this multi scalar structural injustice by means of three interventions, acting within and exposing of the production and utilisation of hydrogen. All elements within their specific location both derive and provide benefits to their surroundings.

The element of the bath house has been furthest developed because of its combination, activation and exposure of all flows within the system while embedding a social and cultural function. The typology of the bath house has been redesigned to allow for the utilisation and exposure of site specificities in its first case along the path leading up to the central activator. The path and the interventions along the path address various territorial and flow management relations while being embedded within a strong relational field. This allows all elements to collectively expose all territorial specificities and direct its flows towards the central combining element.

The central element being not only the combiner and activator of flows, but also the element of provocation to make the visitor reflect on their own position within the dependency of industries and the energy transition. Additionally the element exposes all requirements needed to power the similar energy transition.

The approach of the new industry to integrate its site of existence and provide mutual benefit from present territorial specificities is unlike the known and imposing industries. The approach of integration by means of the exposure of different specificities, combined to create moments of action and reflection coalesces man, machine and territory to unwind structural injustice.

Because of the projects dependency towards the various site specificities existing within its specific territory the project by itself does not allow full transposability. However, the approach taken through the project by means of the combination of territorial specificities with the goal of an energy transition can be transposed throughout the North Sea. Although, the combination of the production of hydrogen with the function of bathing is closely related to the context of Bergen. Other possibilities of the new kind of industry should therefore relate to the specificities within their own context for the empowering of the energy transition through a sustainable and emission free energy production linked with a social and cultural activity of its site of existence.



### Structural injustice

