

Kusfeld. Gardens in the sea

Speculative masterplan for Kuźnica
that challenges humankind's relationship with nature
and revises disaster-prevention in areas
prone to climate changes

COLOPHON

"Kusfeld. Gardens in the sea"
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P R E F A C E

“Stories communicate. They display certain perspectives and they tell their audiences what their creator believes or thinks about a subject, a topic, or an idea. Sometimes, when people try to express an opinion about something they believe deeply, they argue about who’s right or wrong, or what others should or shouldn’t do. But an argument usually doesn’t go very far, because people polarize, standing up for beliefs without really listening to anyone else. A story can be much more effective than an argument, because a story can draw you in, make you feel how a character might feel, and if someone’s listening to your story, feeling your story, they might just change their minds about a topic or an issue. In a world that constantly argues for the sake of entertainment and politics, stories highlight intersections of the human experience, instead of digging into our differences. And one way to promote social change is to listen”

Anita Gonzalez, head of Theatre Studies at the University of Michigan’s School
<https://courses.edx.org/courses/course-v1:MichiganX+Storytelling101x+3T2019/>

KEYWORDS

Kusfeld, Hel Peninsula, Kuźnica, Hel, sea level, sea-level rise, Baltic Sea, storytelling, Puck Bay, architectural project, sea, Noah's Ark 2.0, Anthropocene, Poland, buoyancy, awareness, policy-making, architectural festival, Living Wall, masterplan, tourism, climate changes, Ashley Dawson, Extreme Cities

All the struggle, the extortion invested into precisely constructed buildings, the materials, the costs, the energy, the carbon, everything composed with this idea that it will last forever, it all amounts to a feeling that nature is intruding, taking over. It didn't strike me how misguided humankind's relationship with nature became until I crossed my paths with Kuźnica - 600 people settlement located on the at the polish seaside. Kùsfeld, cause that is its original, Kashubian name („kuss” meaning a kiss, „feld” meaning field, piece of land – Kùsfeld – kissing point) embodies all the contradictions of present-day. With its complexity of matters it provides enough motivation for reflective discourse - one that could raise the standard of the debate on this subject – undertaking, that could be deepened by an activist, writer, thinker, critic, artisan and a curator, or someone who is allocated as combination of all above mentioned, namely, contemporary architect. Why Kuźnica can be treated as educational opportunity and might lead to new type of tourism and concept of being?

Today Kuźnica is first and foremost a sea resort. Intensively visited during the summer season it becomes a harsh microcosm in winter. Luckily the temperature raises, causing the touristic season to quickly extend. Lasting from mid June till September back in the days, today boarding houses start to be steadily rented already from April with some loners to spend their free time in Kuźnica till late October. However, the very same reason of quickly heating up weather might soon stop relatively firm, progressing economy. Because of its immediate surroundings Kuźnica is positioned at the vanguard of climate and social change - from the side of the sea the dunes are slowly being absorbed by the power of the Baltic Sea which requires significant, artificial supplies of sand, and from the side of the Puck Bay, to protect the settlement from anticipated floodings, local government decided to build a 2.5m high wall. However, further developments on this topic were stopped by a locally signed petition. Residents were afraid that blocking the view towards the Puck Bay will stop guests from coming. The latest agreement is that Kufeld will be provided with movable, inflatable barriers that are used only in case of emergency. Is it however going to be functioning solution?

To begin with, we need to look at policy making. As Ashley Dawson states in his book “Extreme cities” smart planning toward more adaptable interventions in the context of climate chaos will rather create zones of exclusion for those who won't be able to afford living in urban fortresses. In the times of disinterested capitalist culture where money is the main driver of growth it is the case of an extreme city where the attention lies. And although there are more and more people living in the cities we shall not forget about those living in smaller communities. There is no city without the countryside. The question to urban planners, architects, designers, politics and all of those who care is then - what can we do to stop this process of irreversible neglect, how can we avoid trading in authenticity for vast urbanization that no-one is even able to control or understand anymore. Dawson's theory can be perfectly demonstrated with the case of Fairbourne, 850 people community in Wales. It is the first place in the world to be decommissioned as a result of climate changes. It is a precedent. Here it is, a first case ever when the government decides to make an inhabited settlement be extinct by the sea. And why is this place, that has not been flooded since 70 years, suddenly surrendered? Easy, cold calculation. Instead of spending millions of pounds into expensive defensive systems that anyway do not provide guarantee against catastrophic invasion, British government rather invests it into less risky business. Residents of Fairbourne were asked to move out, otherwise a process of relocation will sooner or later take place. Bitter enough, some 1500 km to the East, on the narrowest part of the Hel Peninsula, in Kuźnica the

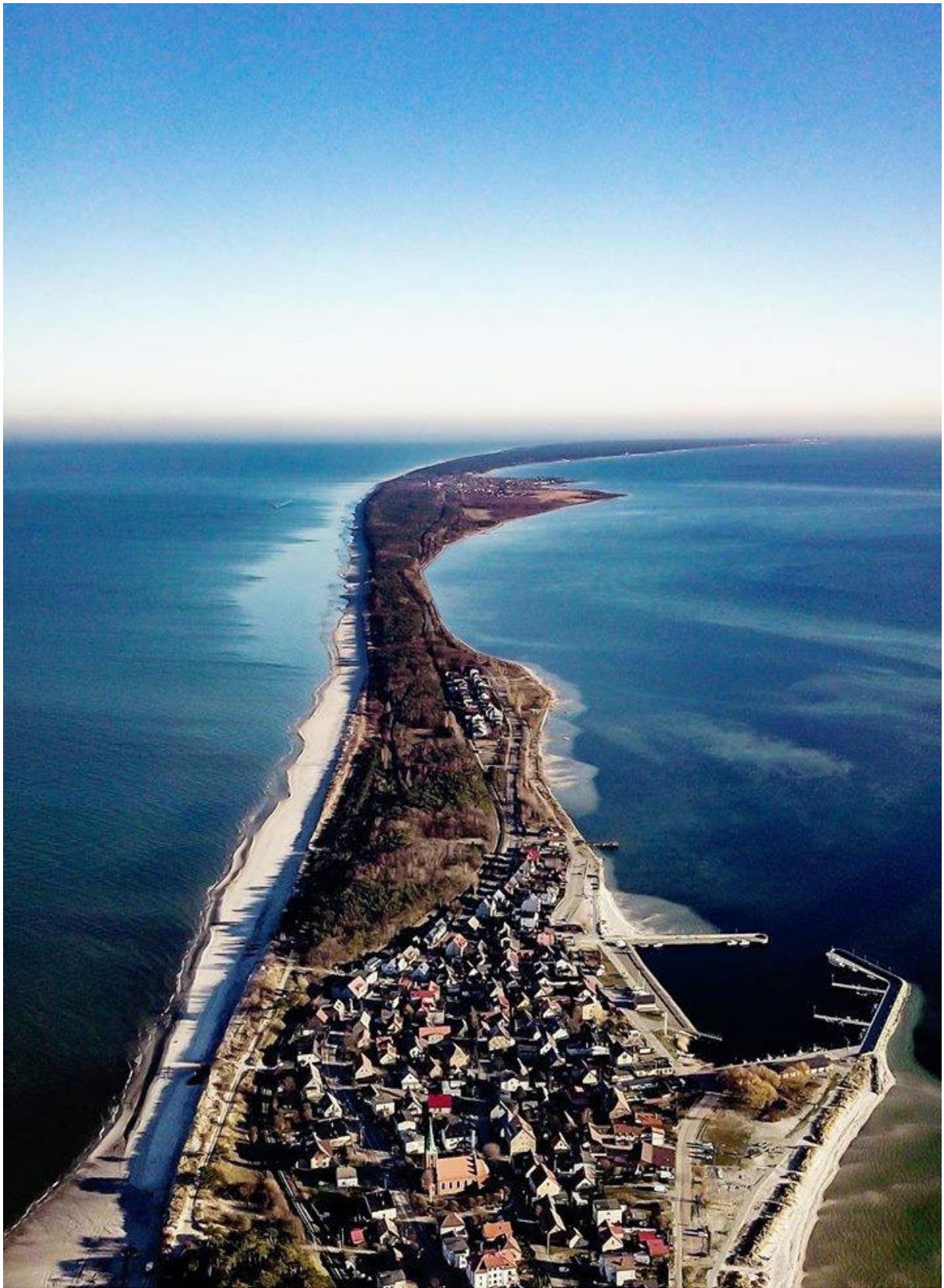
residents rejected new safety measure proposed by the government. Was declining the project of protective wall a good decision or will this mean that sooner or later Kuźnica will share the fate of its Welsh precursor? Is Kuźnica, with their inflatable barriers, going to keep their authentic and almost remote atmosphere while being save from the sea level rising? Or, will, as the name of the settlements poetically suggests, Puck Bay and Baltic Sea kiss, making Kusfeld the very first polish settlement that will be drowned when the sea level rises? How to create a productive balance between territories, between localism and policy-making? I find the comfort in the words spoken by Henk Ovink, Dutch Special Envoy for International Water Affairs who said: "Tackling water safety is unthinkable without public participation and an integrated approach in which different interests are taken into account. The problems only arise when spatial quality is seen as an optional luxury. If we focus exclusively on safety, then we will lose the battle. It will only work if we have safety and quality, with an inclusive, design-driven process in which an integrated long-term approach leads directly to integrated projects in the here and now, and in which that mix is continuously being made. Inclusive, integrated, long-term, short-term, innovative and transparent so that we can learn and be held accountable. That seems complex but it is simply necessary." What role architecture can play in such processes? Through the series of small scale interventions and landscape installations not only guests but first and foremost local inhabitants can experience the nature from a different perspective. With the topic of sustainability having its momentum, a festival, exhibition and workshops organized around such infrastructure allow to profoundly get involved into the surroundings one is in.

Climate changes are an exponential process. Bigger the changes, faster the consequences. Because of that places like Kuźnica might be extinct in the course of two, three generations. The future is yet to be defined. A new balance must be found between the relations, processes, flows and multiple forces of the location. Looking at the origins of Kusfeld's urban tissue and translating it into a future-proof Masterplan the rhythm was found in the form of the original fishing enclaves. The historical spatial arrangement of Kusfeld was based on the natural heights and connective lines in the landscape: a place without roads, with transportation routes formed in the transversal, lower parts of land that made it possible to drag boats between the open sea and the waters of the Puck Bay. At the time when the core part of the village was being formed, the buildings were mostly situated on a few higher spots which were not attacked by storm waves. As a consequence of such grouping of the houses, located between the passes periodically broken by water, a unique island-like fishermen's settlement has been created. Later this was traversed by a road and a railway line, and an artificial harbor was added. Future Kusfeld is also a place without roads and comes into being as an archipelago of gardens in the sea. Based on the urban set-up of the village it foresees 24 island-like enclaves, small groupings of 5 to 10 houses, natural human scale, just like in Blue Zones- places where people can prosper and live longer. All together they enclose the communal residential space with its daily rituals making inhabitants the future monks of Kusfeld. And yet it is a final vision that needs a blueprint. With the Noah's Ark 2.0 masterplan as a trigger and navigation instrument, it all starts with the the prototype- architectural focus of the project. The chosen place is the most vulnerable part of Kusfeld. The cluster of 8 houses is located only 1.2 meters above the current sea level. It is a pilot project, the first of the 24 gardens in the sea. It is a celebration of awareness and inspiration for local community to act.

Finally, we need to look for appropriate language. Phrases like sustainability or urban resiliency were firstly trivialized and then overused. For those with basic understanding of world's complexity and its capitalism-oriented organization they do not mean anything. Everything can be labeled sustainable or resilient. Buoyancy, however, as "the capability to float", as the contrast to gravity or as more metaphorical "lightness of the spirit/ cheerfulness" gives a very basic, physical term that is much closer to the authenticity observed in Kusfeld than some empty words abused in commercial presentation about defending systems for richest flood-risked cities in the world. The inhabitants of Kuźnica will be sooner or later left alone. And there won't be any resilient thinking when heavy mass of water will knock to their doors. It will be much simpler - swim or sink. Noah's Ark 2.0, a toolbox of solutions for disaster prevention that the local inhabitants can form in their backyards and/or local environment sets the mode for possibility of living in Kusfeld even when the sea level rises, but also ensures state of mental preparedness for possible relocation. With human lives at stake it is buoyancy - the very basic concept of floating, both in literal and symbolic sense, that is needed, not some sophisticated phrases that no one is able to understand or believe in anymore.

The project "Kusfeld, where the sea kisses the bay" elaborates on the complexity of every day in 21st century. Faced with the mass of global challenges, an ordinary human being sinks in the overflow of pervasive stimulus. Surrounded by lack of political culture, superficial revelations and elusive tempo individual loses against the wildly dispersing macrocosm. In the middle of this less and less comprehensible world there are however voices of things, small stories that usually fade away unheard. Stories of individuals - people, animals, plants, species, communities... some of them very loud, heard by everyone and everything, the others, although sometimes unique and relevant, pass by and disappear. The proposed intervention, spatial testimony, aspires to trigger emotions and cause one to react emotionally, physically and intellectually. It is not so much about the meaning of the form, rather the experience it generates and uncertainties it embraces. Because of changing nature of the site it also aims at discussion about temporality. Geopolitical framework an interrelations between natural processes and social flows are of the key importance. Design proposal underlines the importance of everyday - the beauty of ordinary. Why is the story of Kusfeld is such meaningful one? As Professor Anita Gonzalez, head of Theatre Studies at the University of Michigan's School says "One way to promote social change is to listen".

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https://www.instagram.com/b_a_l_t_y_k/

DEPARTURE POINTS

I

It firstly occurred to me, while reading about Fairbourne in Wales, settlement that will be decommissioned as the sea level rises, that this is a precedent and soon there will be many more cases when the government is not able or just does not want to invest more money into defending such locations. As opposite to The Netherlands, where most of the country is below sea level and know-how about water management is national export product it is actually these small, unimportant communities, like Fairbourne, that don't have enough political or economical power to protect themselves and stand at the vanguard of climate changes.

II

Though in a way obscure "nowadays" could be framed by following slogans - ongoing state of transition; "digital epoch"; relentless flow of technological consumption; illumination of 24/7 world; prevailing indifference; capitalist mirage - and finally - a time without time. Faced with the mass of global challenges, an ordinary human being sinks in the overflow of pervasive stimulus. Surrounded by lack of political culture, superficial revelations and elusive tempo individual loses against the wildly dispersing macrocosm. Processing disorders, depression, loneliness, technology-induced dysphoria - all these seem to already affect us and become even more challenging in the future. Everything is possible, yet there will always be more, better, larger, newer or just unlike.

III

In the middle of this less and less comprehensible world there are however voices of things, small stories that usually fade away unheard. Stories of individuals - people, animals, plants, species, communities... some of them very loud, heard by everyone and everything, the others, although sometimes very unique and relevant, pass by and disappear. In the era of radical climate changes and socio-spatial inequalities we accumulated enough intelligence, wisdom and motivation resources to rethink the concept of being. It's time to return to utopian thinking.

· MOTIVATION ·

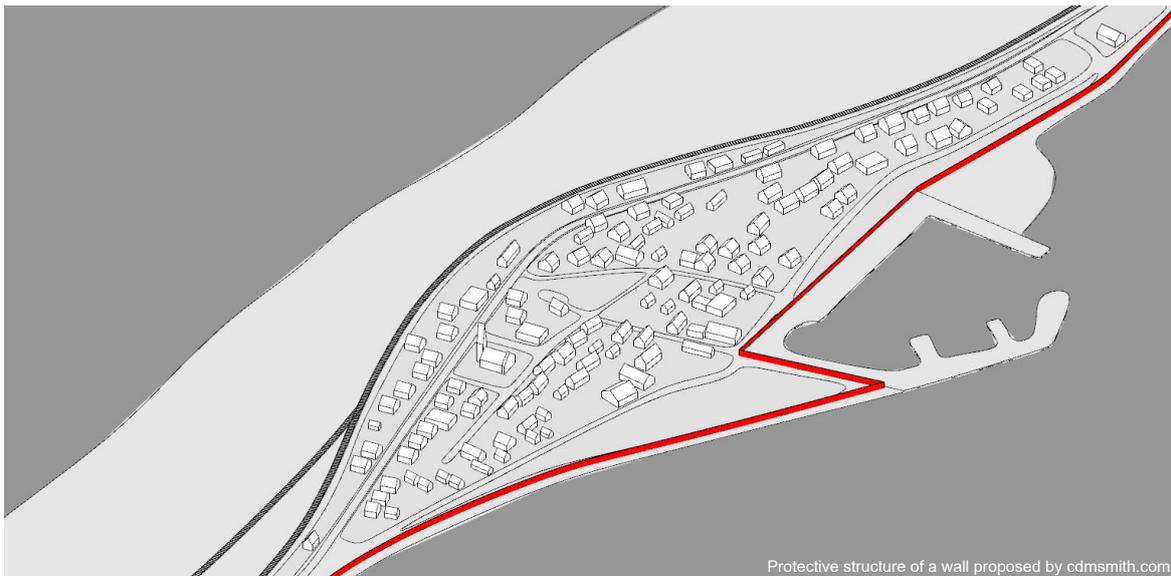
The underlying motivation behind studying this case in the wider context of similar settlements lies in the feel of urgency that some of our spatial identity fades away irreversibly. Either commercialized or forgotten. One way or the other but people tend to retrogress their sensitivity and cover it up with superficiality. It will never be all of human beings living in the cities unless we allow the rest to be extincted.

It seems however that the spirit of community is still vital in Kuźnica. The inhabitants signed a petition that blocked further developments on the protective wall. The latest agreement is that they will be provided with movable, inflatable floating barriers that are used only in case of emergency. Is it however going to be an end solution? Is Kuźnica going to keep their authentic and almost remote atmosphere? The future is yet to be defined. A new balance must be found between the relations, processes, flows and multiple forces of the location. How is changing environment influencing the social structure and economic organization? Why Kuźnica can be treated as educational opportunity and might lead to new concept of being? How to create a productive balance between territories, between natural and man-made, between human and non-human?

The story begins here.

· REFLECTION · METHODOLOGY ·

The unknown future of the study case leads the research to a specific design approach of developing different scenarios. Based on the desk research and series of interviews on the site it is to be concluded that one of the possible futures is a one in which the floating barrier will be applied as end solution and will resolve the issue. Consequently, new building permits will be handed over and last plots of the settlement might be overbuilt. In such case there is a high possibility that Kuźnica will maintain its authenticity because there is very few plots left and spatial plan does not allow high buildings. Kuźnica will never be flooded and climate changes won't change the course of Kuźnica's story.





· RELEVANCE ·

“...Architecture not only covers all fields of human activity; it must even be developed in all these fields at the same time. If not, we shall have only one sided, superficial results...”

“The humanizing of Architecture”, Alvar Aalto, Technology Review, 1940

Contemporary architect is facing a big challenge - how to keep the business running? It seems, after all, that soon none of his “classical”, old-school skills will be required. Algorithms are already producing basic floor-plan layouts, news about 3d-printed buildings are not even hitting the front pages of architectural web blogs and parametric design is a standard in every major architectural office. One can easily imagine that soon all the creative process will be replaced by another smart app that will design our dream house, most optimal working space or most efficient bridge structure. What will be then the position of an architect? Is the profession going to be extincted just like another species? What role could an architect play in the upcoming decades and what does it have to do with the process of humanizing architecture? The answer depends on the action of the main actors - designers themselves should be aware and take initiative to position within rapidly changing environment.

· SPECIFICATION OF THE ARCHITECTURAL
AND URBAN THEMES OF THE PROJECT ·

Variety of agents sets the interdisciplinary direction of the project. The so far discussed aspect cannot be considered from purely architectural point of view. The spatial implications of specified approaches require further studies of the landscape, ecology, geopolitics, sociology and economy. This, however can be addressed within the spectrum of architectural project since the space affects all of above mentioned fields. Consequently a possible interventions will be specified and the most appropriate direction will be further developed. Project aims at discussion about temporality. It is the consequence of the changing nature of the site. Geopolitical framework and interrelations between natural processes and social flows have to be considered. The intervention underlines the importance of everyday - the beauty of ordinary. Through empiric experience of places and local stories a narrative will be developed. Key locations (church, gatherings spot, monuments, local shops, public buildings etc.) of the settlement will be mapped. Gathered data will be translated into set of rules, framework of the project and worked out through scales, times and layers. Non-human and human agencies are to be considered equally. The proposed intervention, spatial testimony shall aspire to trigger emotions and cause one to react emotionally, physically and intellectually. It is not so much about the meaning of the form, rather the experience it generates. It embraces uncertainties.



<https://globalnews.ca/news/6268715/venice-flooding-barriers/>

Venice, November 2019



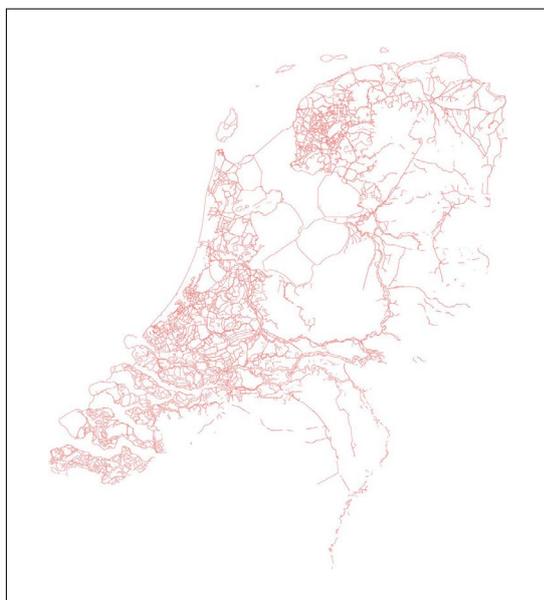
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Man swims across St. Mark's square as Venice hit wi...

<https://globalnews.ca/news/6268715/venice-flooding-barriers/>

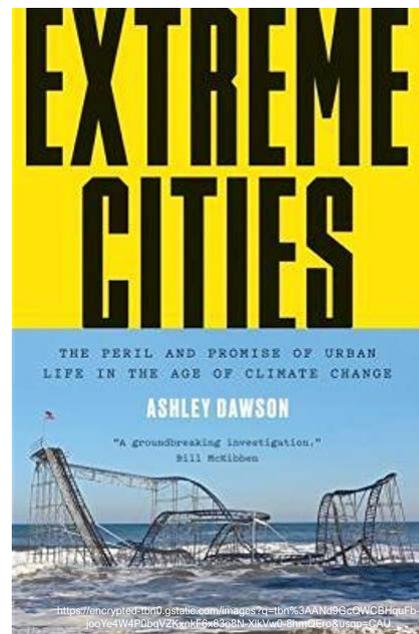


The Netherlands' dike network extends for over 22,000 kilometres

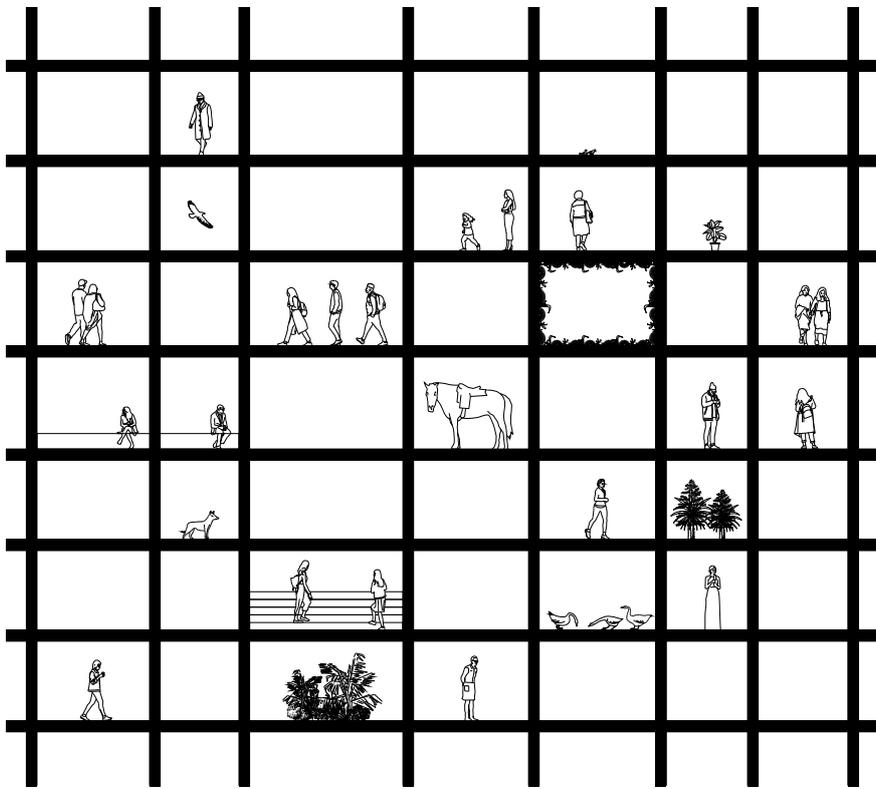


Dutch Dikes, Autor: Eric-Jan Pleijster

“Neither “smart” urbanism nor good design alone will provide safe harbour from the storms increasingly breaking on our shores. “Tactical urbanist” interventions, however noble, will remain isolated oases in the vast desert of neoliberal urbanization. We certainly need technology and planning to help adapt to the coming climate chaos, but under present social conditions, these tools are more likely to be employed by elites to create architectures of apartheid and exclusionary zones of refuge.”







story of habitats - collage

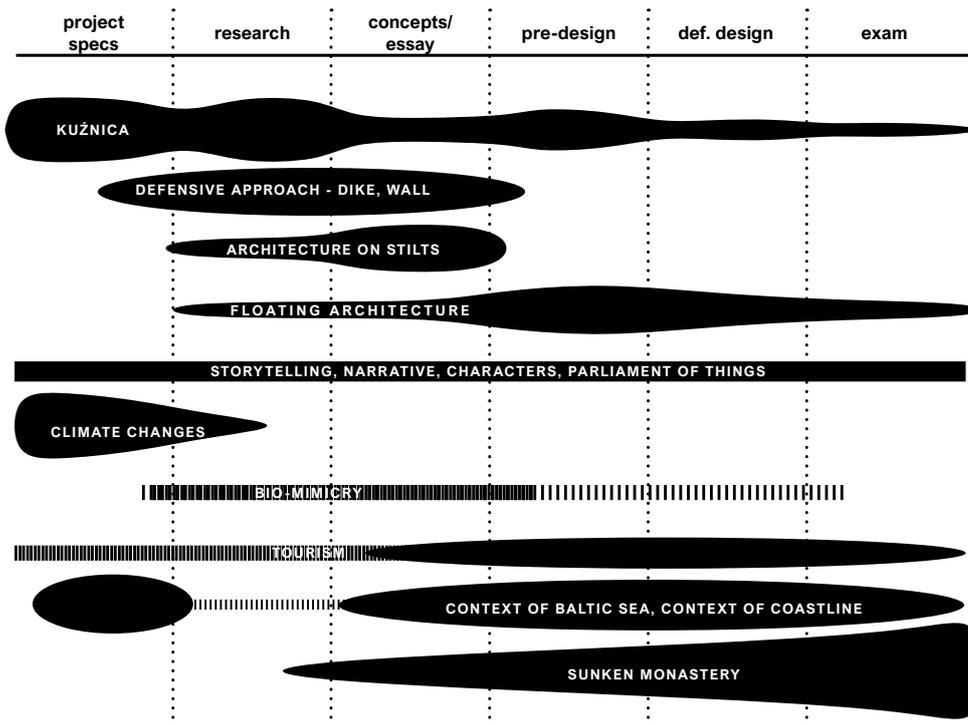
· H Y P O T H E S I S ·

“By 2050, as sea levels rise and fish stocks shift due to a warming ocean, one billion people who live in low-lying coastal areas will be at risk.”

WWF, Posted on 25 September 2019

As Ashley Dawson states in his book “Extreme cities” (see quote page 1) smart planning toward more adaptable interventions in the context of climate chaos will rather create zones of exclusion for those who won’t be able to afford living in urban fortresses. In the times of disinterested capitalist culture where money is the main driver of growth it is the case of an extreme city where the attention lies. And although there are more and more people living in the cities we shall not forget about those

living in smaller communities. In this regard I highly agree with Rem Koolhaas who states: “Our current obsession with only the city is highly irresponsible because you cannot understand the city without understanding the countryside”. Consequently, taking the precedent of Fairbourne as an example we can speculate that soon there will many other likewise settlements which will be abandoned by governments because of their low economical value. The question to urban planners, architects, designers, politics and all of those who care is then - what can we do to stop this process of irreversible neglect, how can we avoid trading in authenticity for vast urbanization that no-one is even able to control or understand anymore.



initial diagram of graduation process

CONTEXT RESEARCH



<https://trojmiasto.wyborcza.pl/trojmiasto/51,35612,24298641.html?i=0>



View towards the bay before — and after the intervention

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Hel Peninsula, a narrow strip of land at the polish coastline. In the XVth century it was only archipelago of islands. It was not until XVIII and XIX century that the accumulated sediment was not overflowed during the winter season and the integrity of the Peninsula has started to be maintained and preserved

by the fisherman and local authorities. Because of its immediate surroundings, one of the Peninsula’s settlements - Kuźnica is positioned at the vanguard of climate and social change. From the side of the bay the government decided to build a 2.5m high wall to protect the settlement from anticipated floodings. From the side of the sea the dunes are slowly being absorbed by the power of the Baltic Sea which requires significant, artificial supplies of sand. Kuźnica will be the very first polish settlement that will be drowned because of the global warming.

It seems however that the spirit of community is still vital in Kuźnica. The inhabitants signed a petition that blocked further developments on the protective wall. The latest agreement is that they will be provided with movable, inflatable floating barriers that are used only in case of emergency. Is it however going to be an end solution? Is Kuźnica going to keep their authentic and almost remote atmosphere? The future is yet to be defined. A new balance must be found between the relations, processes, flows and multiple forces of the location. How is changing environment influencing the social structure and economic organization? Why Kuźnica can be treated as educational opportunity and might lead to new concept of being? How to create a productive balance between territories, between natural and man-made, between human and non-human? The story begins here.

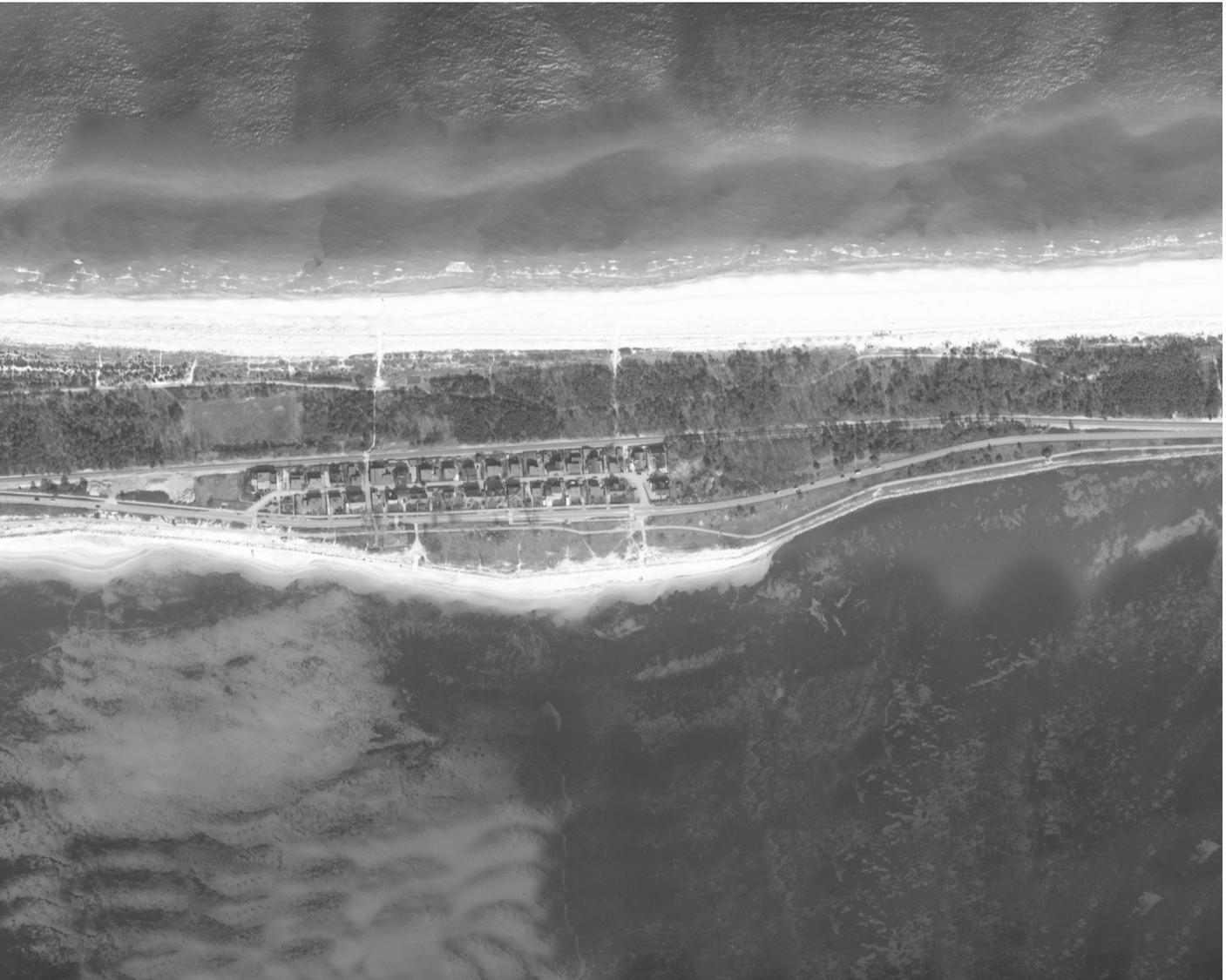
Kuźnica (Polish)
Kùsfeld (Kashubian)
Küsfeld (German)

'kuss' meaning a kiss
'feld' meaning field, piece of land
'Kusfeld' meaning a kissing point

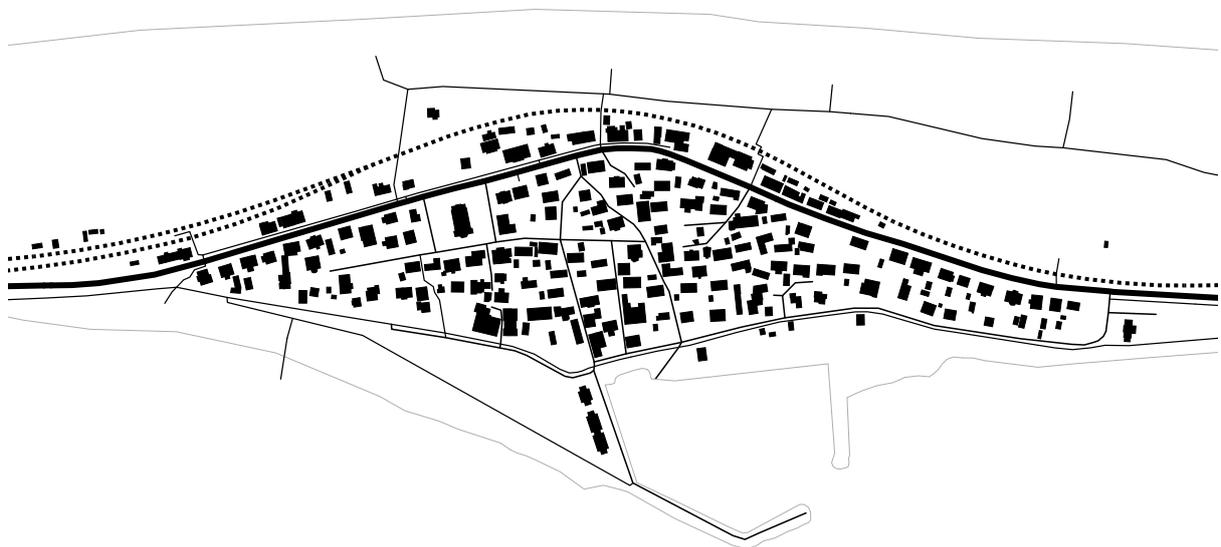


Arms of Kusfeld (source: https://upload.wikimedia.org/wikipedia/commons/e/eb/Ku%C5%BAnica_-_herb.PNG)

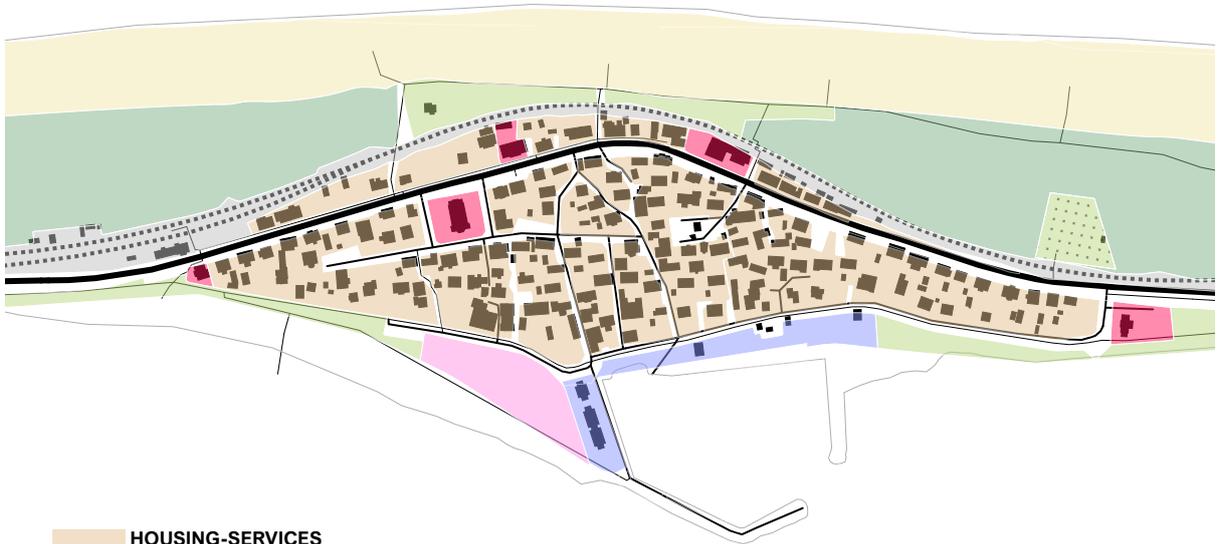




Kuźnica, Hel Peninsula (Satellite image from Google Earth)



- COASTLINE
- RAILWAY
- MAIN ROADS
- SECONDARY ROADS
- PATHS
- ■ BUILDINGS



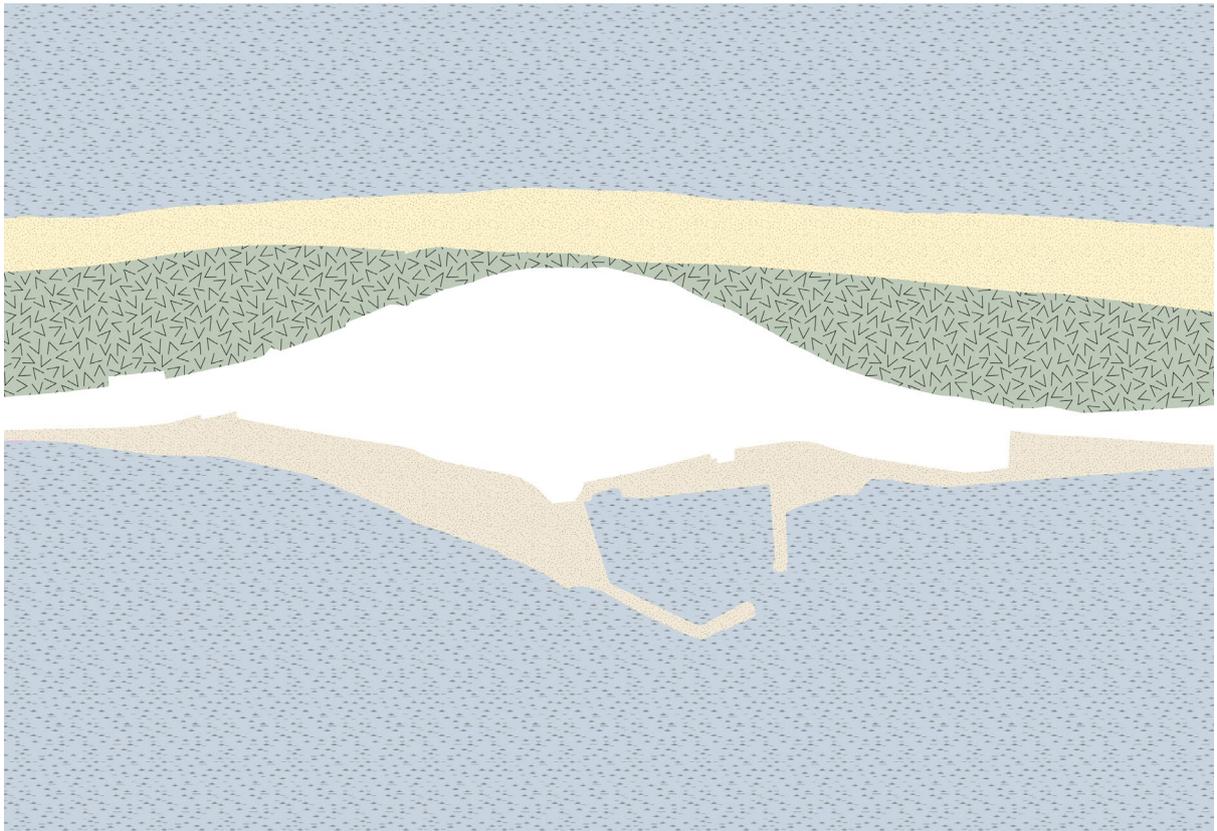
- HOUSING-SERVICES
- MARINA
- SERVICES
- SPORT AND RECREATION
- PLANNED GRENNERY
- FORESTS
- BEACH AND DUNES
- CEMETERY
- RAILWAY



Kusfeld nowadays



The historical spatial arrangement of Kufeld was based on the natural heights and connective lines in the landscape: a place without roads, with transportation routes formed in the transversal, lower parts of land that made it possible to drag boats between the open sea and the waters of the Puck Bay. At the time when the core part of the village was being formed, the buildings were mostly situated on a few higher spots which were not attacked by storm waves. As a consequence of such grouping of the houses, located between the passes periodically broken by water, a unique island-like fishermen's settlement has been created. Later this was traversed by a road and a railway line, and an artificial harbor was added. The historical spatial arrangement of the rural complex was acknowledged as unique and listed on the register of heritage sites.

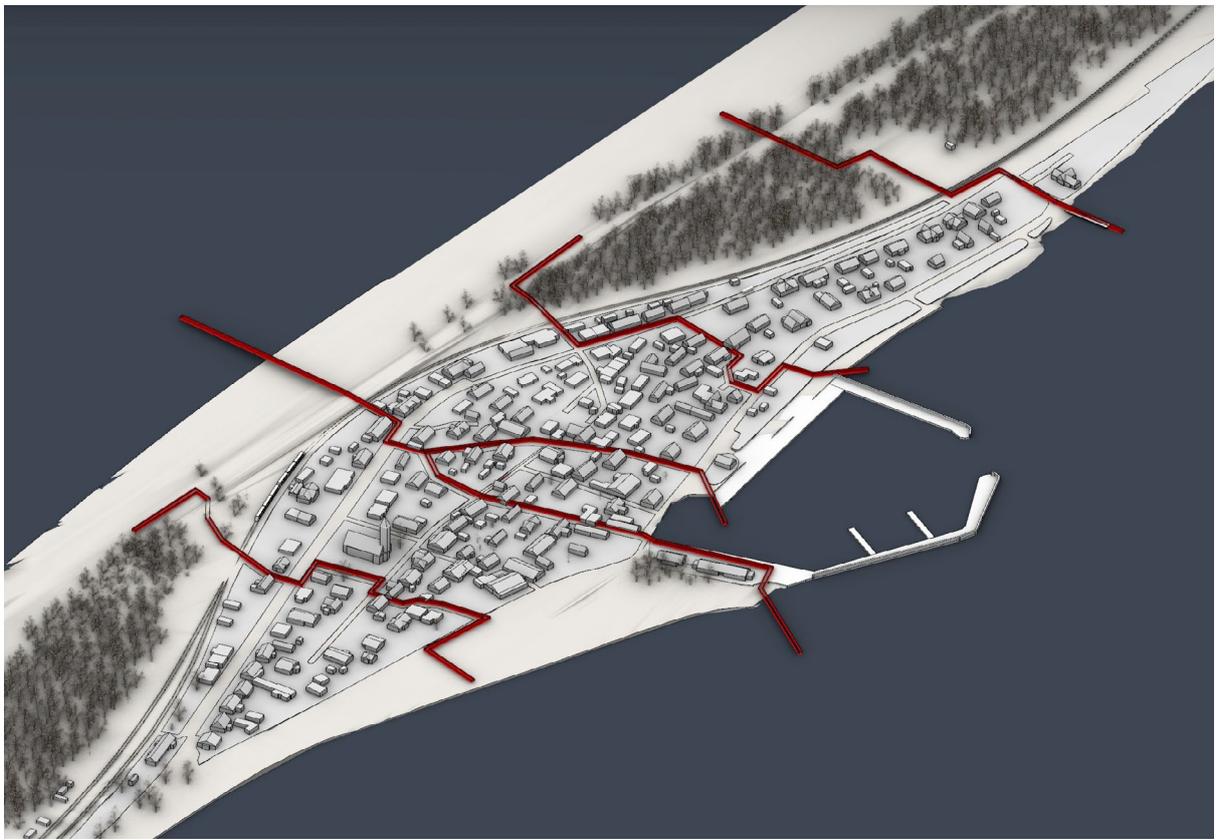


spatial arrangement

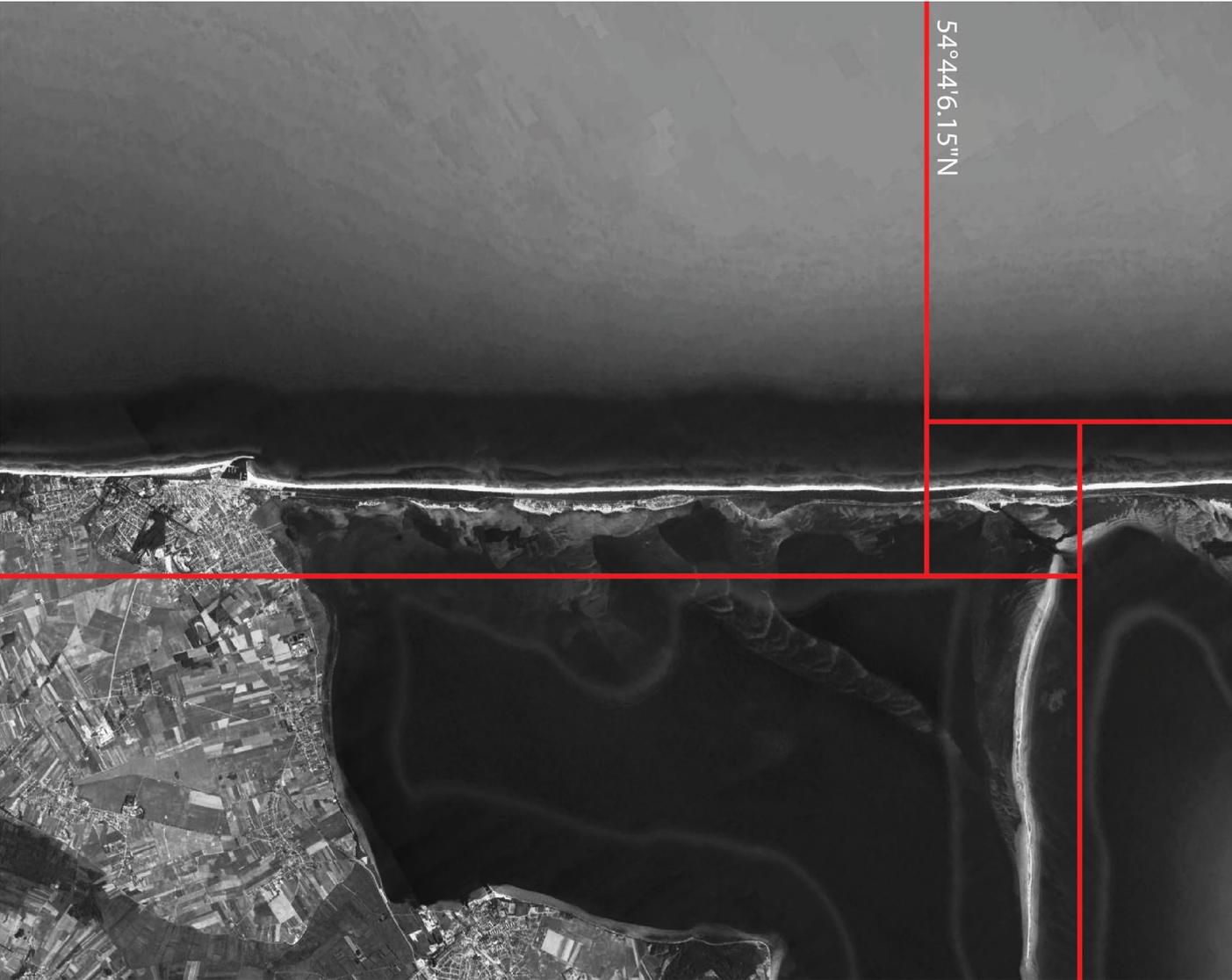


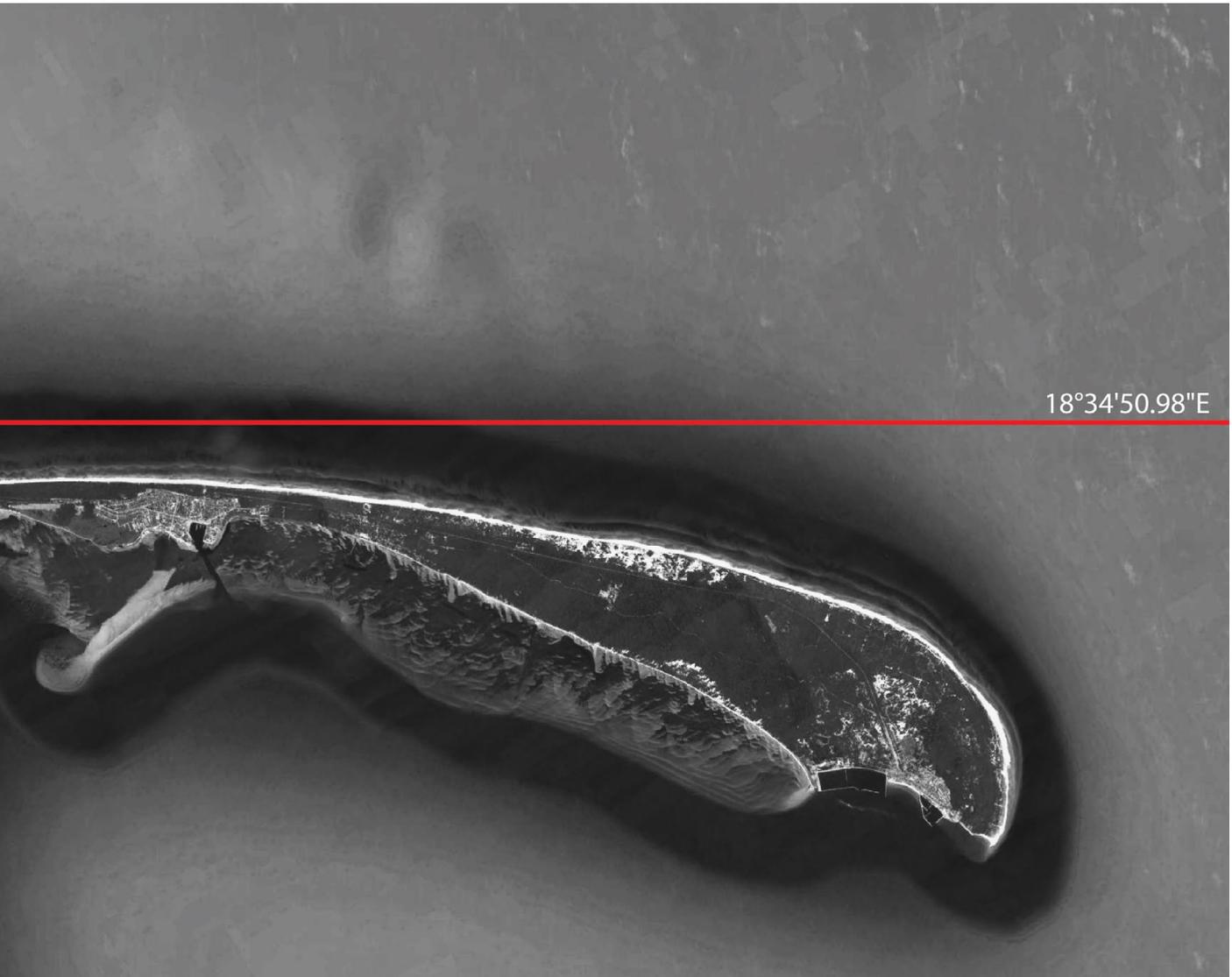
key locations

The historical spatial arrangement of the dwellings of The Kuźnica (Kashubian: Kusfeld) village is chaotic, as it was created spontaneously and was regulated only by the rules of customary law. Originally, the streets of Kuźnica were transportation routes formed in the transversal, lower parts of land that made it possible to drag boats between the open sea and the waters of the Puck Bay. At the time when the core part of the village was being formed, the buildings were mostly situated on a few higher spots which were not attacked by storm waves. As a consequence of such grouping of the houses, located between the passes periodically broken by water, a unique island-like fishermen's settlement has been created. The old division of the land into privately-owned plots, which has been preserved largely unchanged until the present day, did not provide space for public roads, which resulted in the lack of a typical street arrangement. Roads and streets used to be needless, as the inhabitants of the village did not use wheel (horse) means of transport. The basic transportation need was met by the narrow paths and passages, just wide enough to enter them with a net carrier or a fishing wheelbarrow. Today's road network and train line were only applied to the plan of the village in the 20th century. As, in general, they did not change the historical spatial arrangement, in 1979, pursuant to a decision of the Head of the Provincial Heritage Preservation Office, the rural complex in Kuźnica was entered into the register of heritage sites of the Gdansk Province.

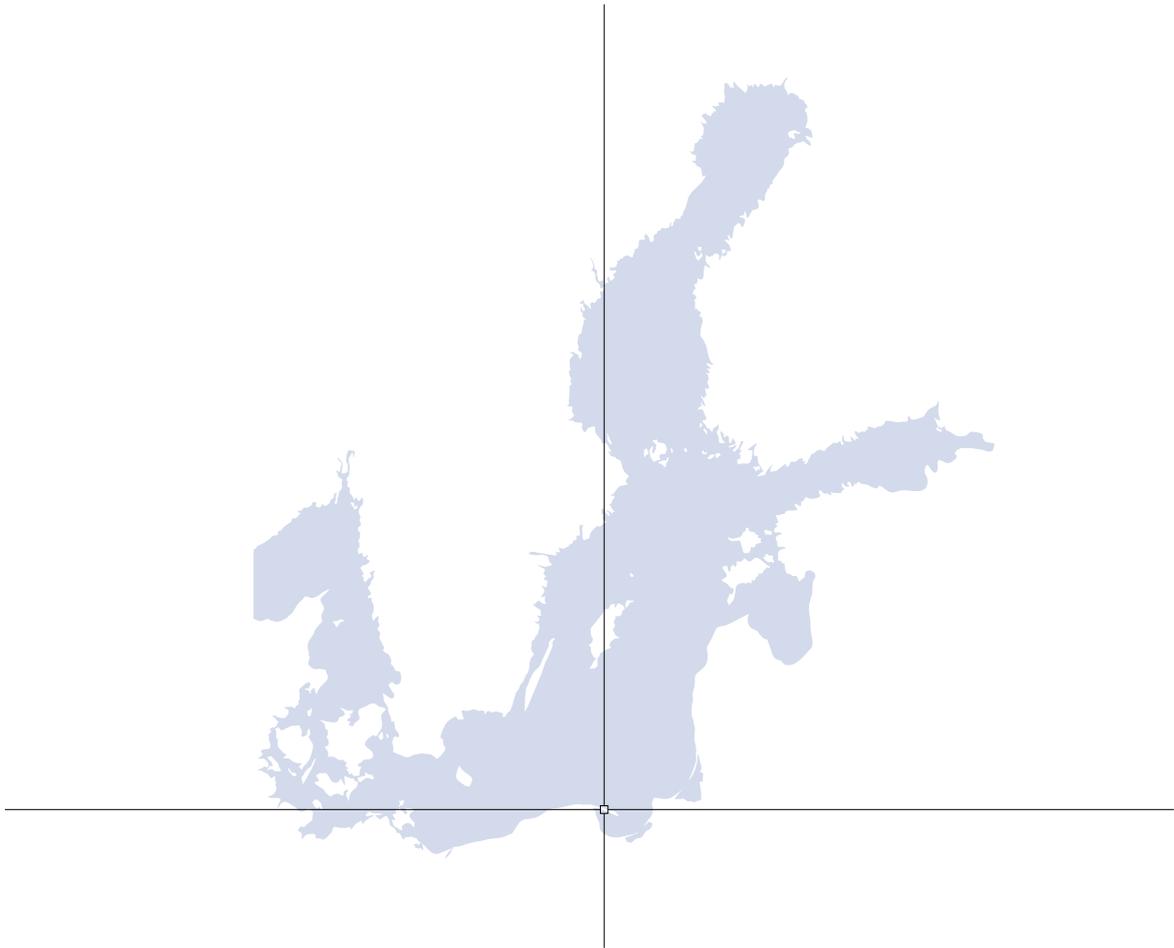


54°44'6.15"N

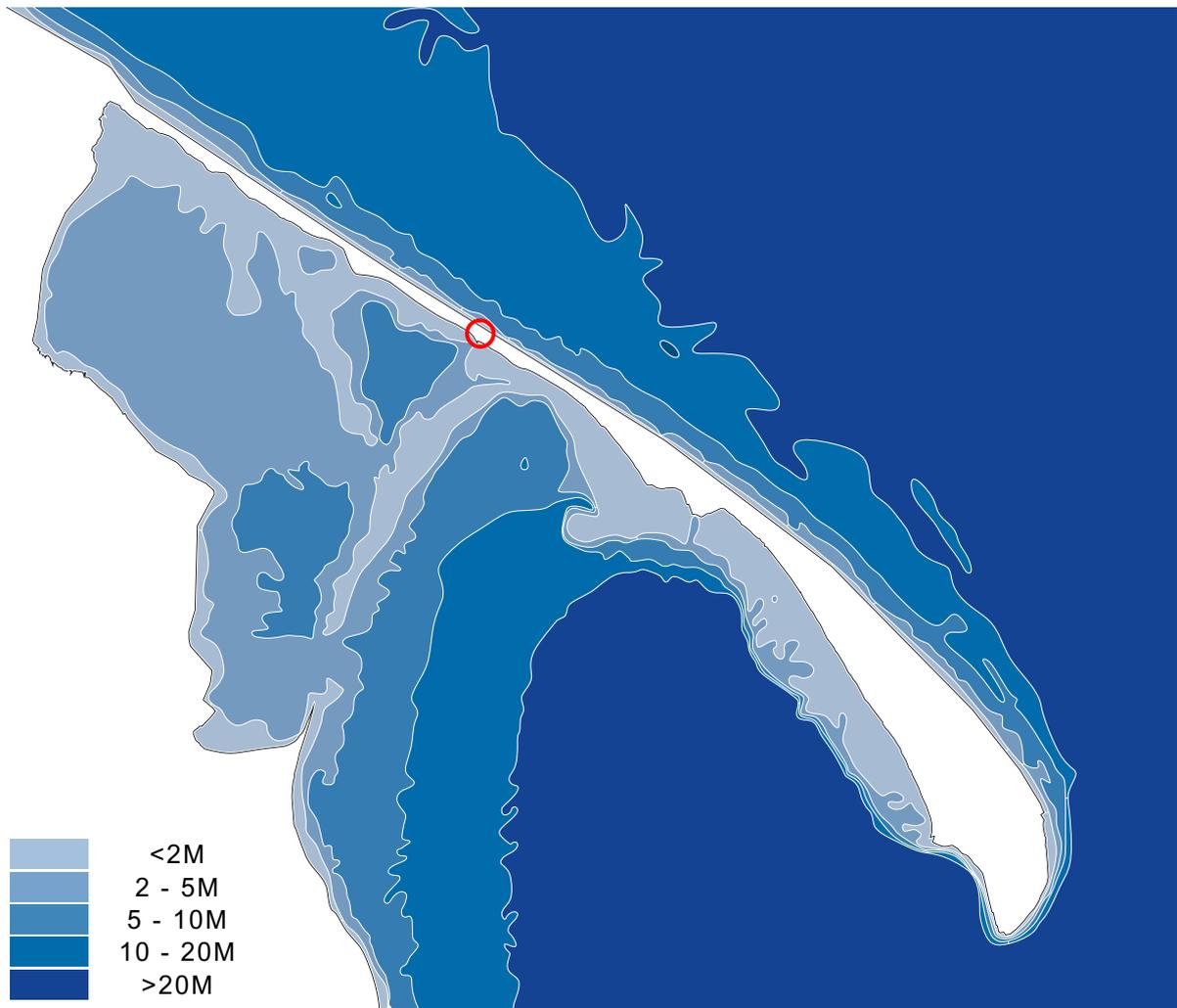




Hel Peninsula (Satellite image from Google Earth)



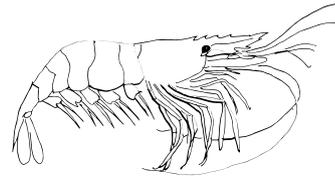
54°44'2.5" N 18°34'49.8" E |map of the Baltic Sea|



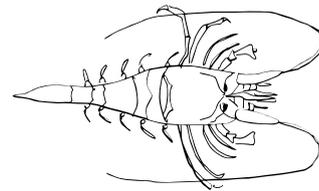
depth of the sea and the puck bay

The autonomy of the village could potentially be secured first and foremost by its location in the sea. Aquaculture could become the main source of the food production – mollusks, fish, crustaceans, algae, seaweed and other aquatic plants. But also all kind of mollusks farming – clams, mussels, scallops, oysters and abalones, stimulate the growth of seaweed – green, red and brown algae, that can be used for both gastronomical but also pharmaceutical purposes, but they also break the waves.

Baltic prawn, *Palaemon adspersus*, is a species of shrimp that is frequent in the Baltic Sea. It is up to 70 millimetres long, with a plain yellowish-grey body. In the Baltic Sea, it can tolerate salinities as low as 5‰, but it overwinters in deeper, more saline waters offshore.



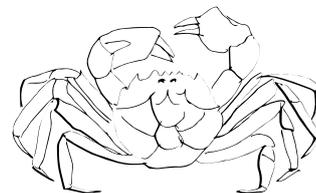
Sand shrimp, *Crangon crangon*, is a commercially important species of caridean shrimp found in the North Sea, Irish Sea, Baltic Sea, Mediterranean Sea and Black Sea. Adults live on or near the sea-floor especially in the shallow waters of estuaries or near the coast. It is generally highly abundant, and has a significant effect on the ecosystems where it lives.



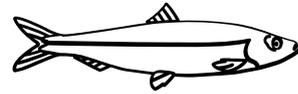
The blue mussel, *Mytilus edulis*, is a medium-sized edible marine bivalve mollusc. Blue mussels are filter feeders and play a vital role in estuaries by removing bacteria and toxins. *Mytilus edulis* is commonly harvested for food throughout the world, from both wild and farmed sources.



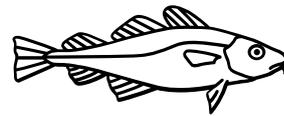
The Chinese mitten crab, *Eriocheir sinensis*, is a medium-sized burrowing crab that is named for its furry claws, which resemble mittens. It is native to rivers, estuaries and other coastal habitats of eastern Asia. It has also been introduced to Europe and North America where it is considered an invasive species.



Atlantic herring, *Clupea harengus*, is one of the most abundant fish species in the world. The small-sized herring in the inner parts of the Baltic Sea, which is also less fatty than the true Atlantic herring, is considered a distinct subspecies (*Clupea harengus membras*) ("**Baltic herring**").



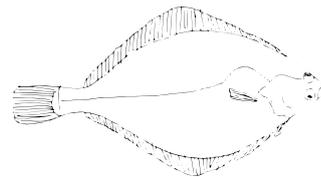
The Atlantic cod, *Gadus morhua*, is found in the western and eastern Atlantic Ocean, the Baltic Sea, the North Sea, Sea of the Hebrides, areas around Iceland and the Barents Sea. Atlantic cod are apex predators in the Baltic and adults are generally free from the concerns of predation.



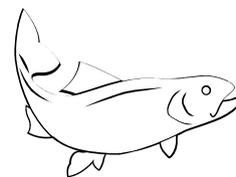
The garfish, *Belone belone*, also known as the garpike or sea needle, is a needlefish found in brackish and marine waters of the Atlantic Ocean, the Pacific Ocean and the Mediterranean, Caribbean, Black, and Baltic Seas. They frequently forage near to the shore and will hunt in and around natural or manmade features which interrupt tidal flows.



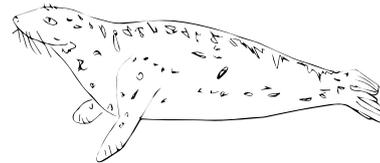
In the Baltic Sea, populations of European flounder are known to breed in shallow waters rather than the deep water typical of the species; these populations are known as **the Baltic flounder**, *Platichthys solemdali*. The Baltic flounder has steadily outcompeted the European flounder over the past 5,000 years due to a combination of natural and anthropogenic environmental changes.



The Baltic salmon, *Salmo salar*, is a species of ray-finned fish in the family Salmonidae. Most populations of this fish species are hatching in streams and rivers but moving out to sea as they grow where they mature, after which the adult fish seasonally move upstream again to spawn. The Baltic salmon is considered a very healthy food.



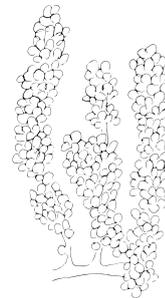
The grey seal, *Halichoerus grypus*, occurs in temperate and subarctic waters on both sides of the North Atlantic ocean. An isolated population exists in the Baltic Sea, forming the *H. grypus balticus* subspecies.



European searocket, *Cakile maritima*, is a succulent plant limited to growing on beaches, mostly saltwater ones. It is edible, boasting a strong flavor recalling horseradish or wasabi. To cope with the shifting sand, Sea Rocket puts down a long taproot that branches and helps stabilise the sand.

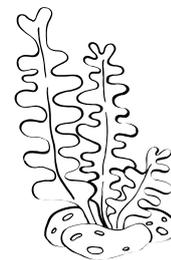


The sea grapes, *Caulerpa racemosa* and *Caulerpa lentillifera*, are species of edible green alga. They are found in many areas of shallow sea around the world. A plant of sea grape consists of a number of branches linked to stolons which are anchored to the sandy substrate. Both species are edible and very healthy- rich in fiber, proteins, minerals, folic acid, ascorbic acid, vitamin A, and vitamin B1.



Edible seaweed, or sea vegetables, are seaweeds that can be eaten. They may belong to one of several groups of multicellular algae: the red algae, green algae, and brown algae.

Seaweeds are also harvested or cultivated for the extraction of hydrocolloids. The gelling, water-retention, emulsifying and other physical properties are exploited by the food industry. Seaweed oil, also called Algae oil, is used for making food but also for biofuel, massage oil, soaps, and lotions.



SITE SURVEY





· SITE SURVEY · STAKEHOLDERS ·

Kuźnica (ger.Kussfeld, eng. kissing point [literal translation]) owes its name to the distinctive location - the narrowest part of the Hel Peninsula. Originating from 16th century, only as an island, the fisherman settlement firstly developed in the 18-19th century. Today Kuźnica is first and foremost a sea resort. Intensively visited during the summer season it becomes a harsh microcosm in winter. Luckily the temperature raises, causing the touristic season to quickly extend. Lasting from mid June till September back in the days, today boarding houses start to be steadily rented already in the beginning of May with some loners to spend their free time in Kuźnica till late October. However, the very same reason of quickly heating up weather might soon stop relatively firm, progressing economy.



· LOCAL COMMUNITY ·

Counting 628 people local community proved with their recent actions to be self-supportive and conflict-proof. The scale of the settlement allows to relatively easily keep track on changes and potential threats. Inhabitants seem to be open, honest and trustful. During empirical research on

site I had a chance to talk to local councillor, boarding house owner, fisherman, activist group member and watersport-equipment rental owner. All of them seemed to position good of the community over own interest and their actions are not or not only profit oriented.



· MARITIME

OFFICE GDYNIA · Meeting with the planners of seaside spatial developments department of maritime office in Gdynia gave me a profound insight into procedures and potential develop-

ments of the Hel Peninsula. Legally this is the office that approves all developments in the studied area and have insight into all inter-territorial implications of the designs. Open and keen to help they might provide with helpful insights into complex planning procedures. Bureaucratic nature of the office create a risk of unfeasibility, however administrative aspects should also be taken into account. Role of such stakeholder has to be carefully considered.

· PARLIAMENT OF THINGS ·

The variety of agents of studied location requires a unique approach in order to assure objective considerations. In this regard “The parliament of things” concept will be proposed. Man-made and natural domains are of the same importance. Stakeholders, fauna, flora, built environment and local flows have to be taken into account. Sea, dunes, forest, insects, birds, marine and land mammals, waves, sand, trees, flowers, grass - all those should play significant role in the design process.









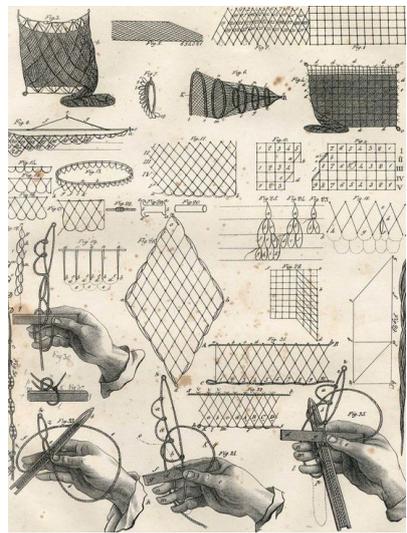
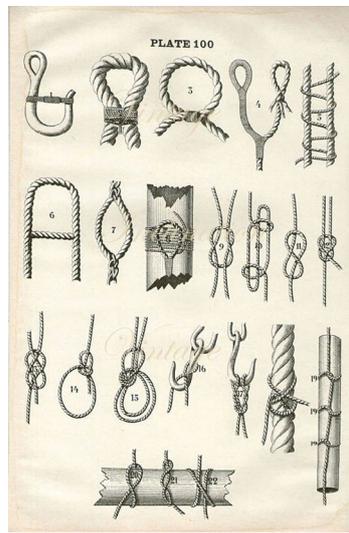
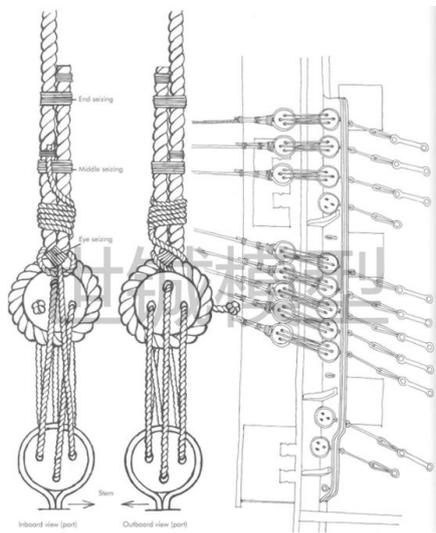








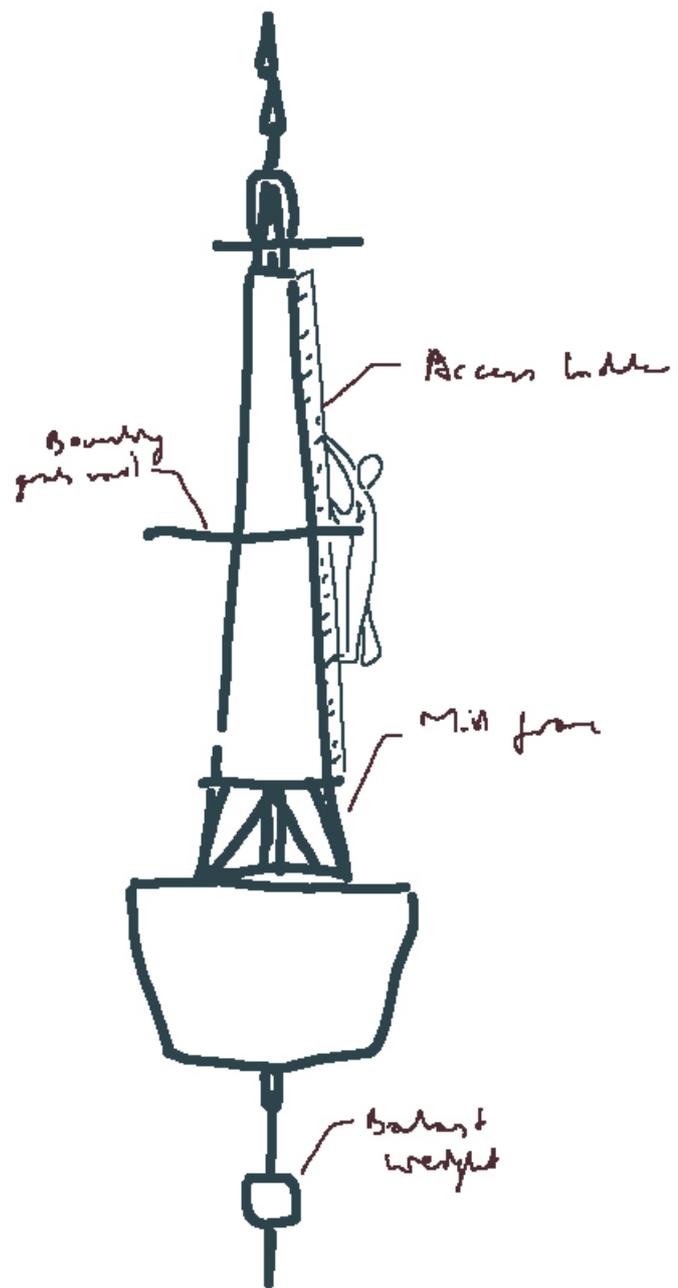
HARVEST MAP - MATERIALS



HARVEST MAP - CRAFTSMANSHIP









HARVEST MAP - PROGRAMMATIC ASPECTS

LOGBOOK

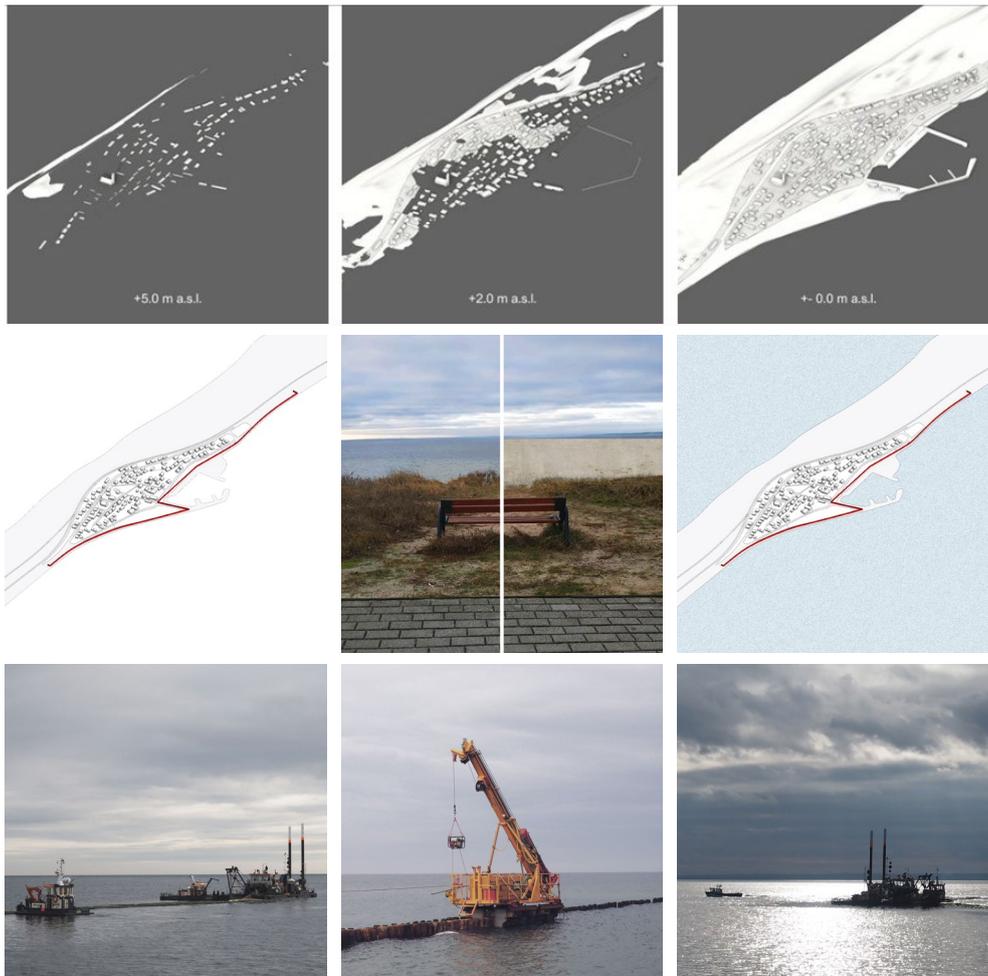
Odyssey of the graduation

RESEARCH BY DESIGN

“If you talk to anybody who knows about marine walls, they say there’s two types of walls: the walls that have fallen into the ocean and the ones that are going to fall into the ocean”

Marc Collins (former tourism minister of French Polynesia and founder of Oceanix)

<https://www.forbes.com/sites/wadeshepard/2019/10/23/waterworld-floating-cities-turn-hollywood-sci-fi-into-reality-as-sea-levels-rise/#2321c6d9655c>



In the end of 2018 the news broke about a potential wall that could be soon build in Kuźnica in order to protect it from anticipated floodings. It seems however that the spirit of community is still vital in Kuźnica. The inhabitants signed a petition that blocked further developments on the protective wall. The most feasible alternative is that they will be provided with movable, inflatable floating barriers that are used only in case of emergency. Is it however going to be an end solution? Is Kuźnica going to keep their authentic and almost remote atmosphere? We can all learn something new from this story happening on our watch.



XVth century



XXIth century

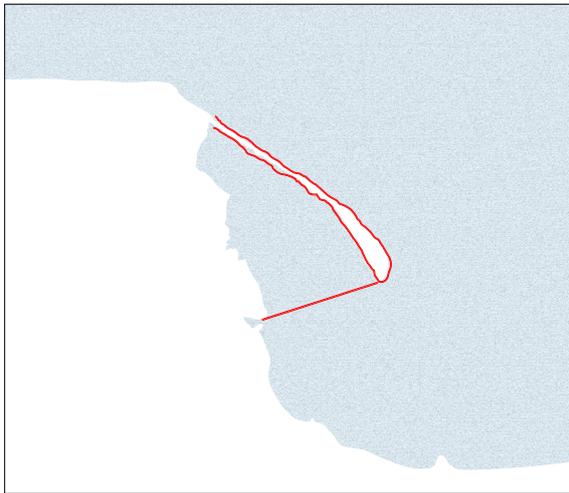
Scenario in which water will sooner or later drastically affect the lifestyle of inhabitants has to be considered. Concluded from local studies and desk research it is however not the anticipated flooding from the side of the bay that is to be considered the most crucial threat but it is first and foremost the force of the Baltic Sea that might reach the built environment through the beach entrances or just over the relatively weak nature of the local dunes.

Secondly, it is the ground water, that is already now seasonally flooding basements of buildings. When this accepted as a challenge there are three actual threats to be considered parallel. In such circumstances there are several scenarios to be further discussed. Since Kuźnica is the weakest part of the pen-

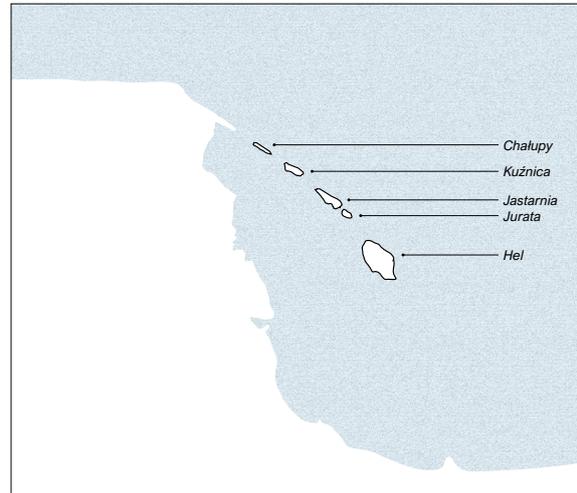
insula it would be the first one that has to be protected to not interrupt the spatial organization of the whole. This would mean a defending - a new strategy towards a defense system for the settlement of Kuźnica, consequently for the whole Hel Peninsula could be applied.

The Netherlands is perfect example how well designed system of dikes might protect people from floodings. Learning from the Dutch one could speculate that a proper defensive structure could be an end solution for the Peninsula. Either shortening the shore line or building dikes around the whole Peninsula would cost a lot of money, but if done properly could save many lives and guard the spatial integrity of the place.

Since investment into defensive system for the



Defend Peninsula?



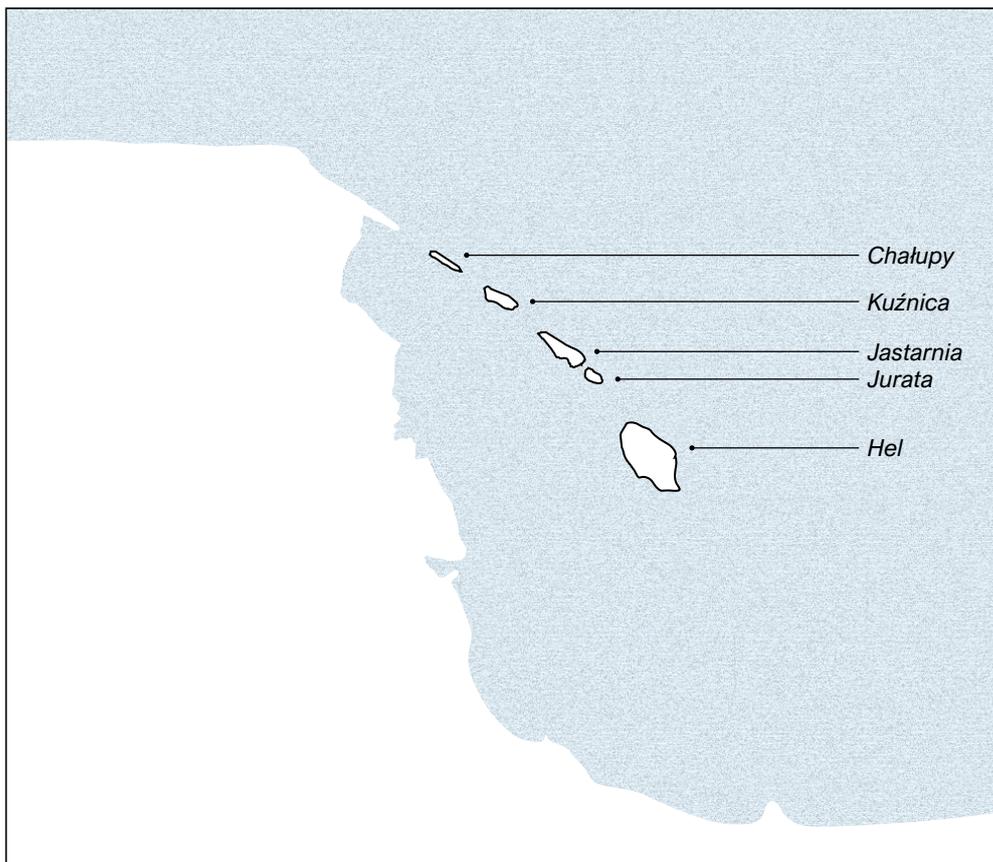
Hel Archipelago -> Towards theme parks

whole Peninsula are too far infeasible one could further speculate that an inspiration from the past could be drawn and all settlements on Hel could be separated from each other creating a series of islands that in order to maintain itself would have to profit from the tourism industry.

Investing vast amounts of money into defending a few islands would cause them to become an attraction for the tourist. One can speculate that in such a scenario theme park-like settlements would be developed. In order to meet the requirements for the high-class tourist (even those willing to get the authentic experience) a whole substructure of services would be required. Modern tourists need their luxuries so even when coming to a remote place a complex system of serving such persons is absolutely necessary.

This would make Kuźnica, Chalupy, Jastarnia, Jurata and Hel architectural machines with layers and layers of substructures in order to meet the high demands of clients.

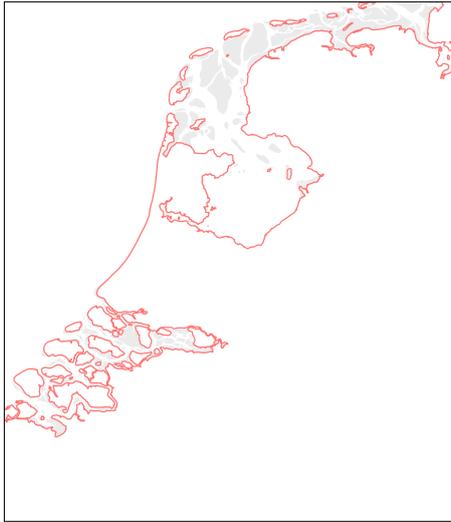
The question is if there is enough time and resources to pursue such an approach. Therefore alternatives have to be developed. One can consider an anticipated scenario of higher sea levels as very realistic and try to deal with that however keeping the same lifestyle. In this regard floating or "buildings on legs" can be studied. Lastly, one can adapt or even draw inspiration from these natural processes. Consequently, a relocation or different lifestyle would have to be taken into account. Some of the natural processes could be mimicked or a pioneering approach could be developed.



Hel Archipelago -> Towards theme parks



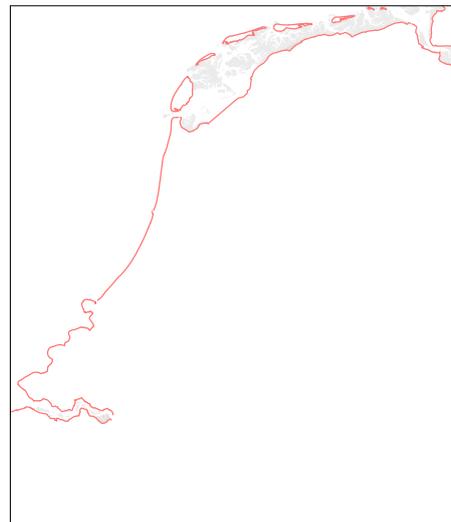
HEL ARCHIPELAGO - KUSFELD ISLAND



1500
2,600 km coast line



1950
1,600 km coast line



2000
880 km coast line

AFSLUITDIJK

Completed: 1932

Crest height in relation to the water level: 8.4 m

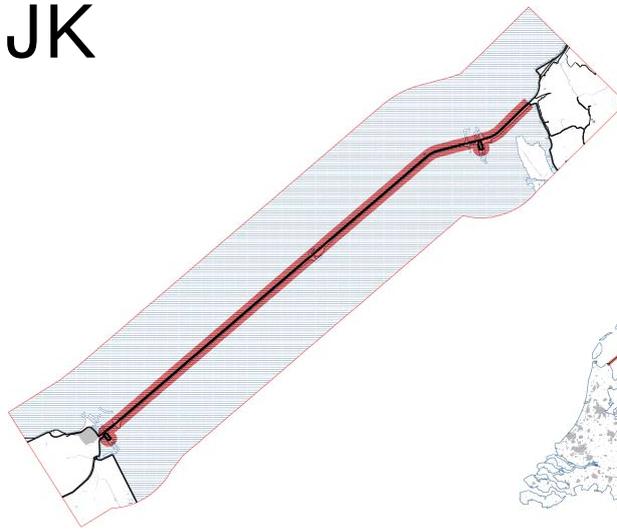
Dike length: 29.5 km

● Dike group: dams and storm surge barriers

Dike type: closed dam

Flood defence function: primary flood-defence structure

Route: Den Oever → Cornwerd

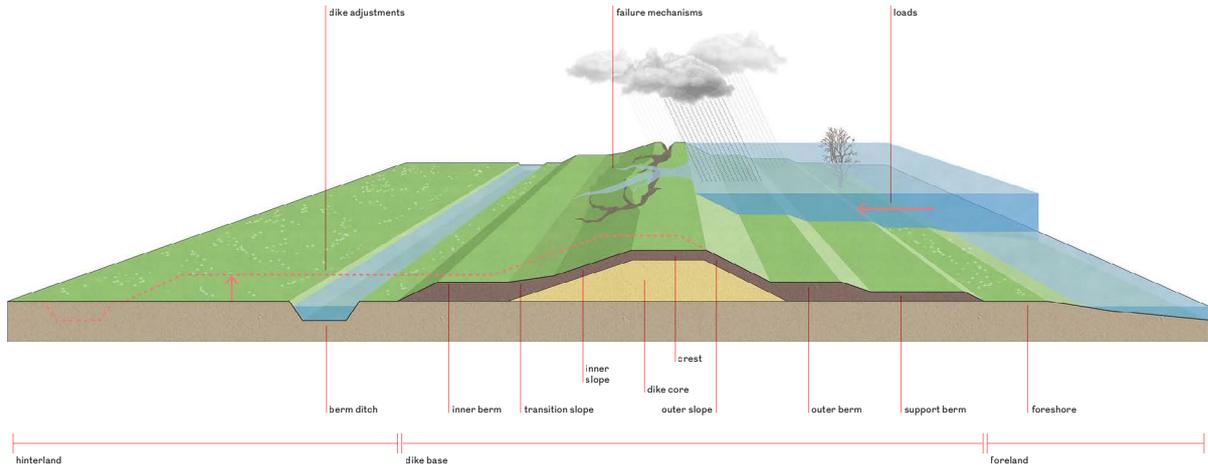


Dutch Dikes, Autor: Eric-Jan Pleijster

COST AFSLUITDIJK: \$710 MILLION

“A human life is a loss amounting to 5.6 million euros, an evacuee costs 10,000 euros”

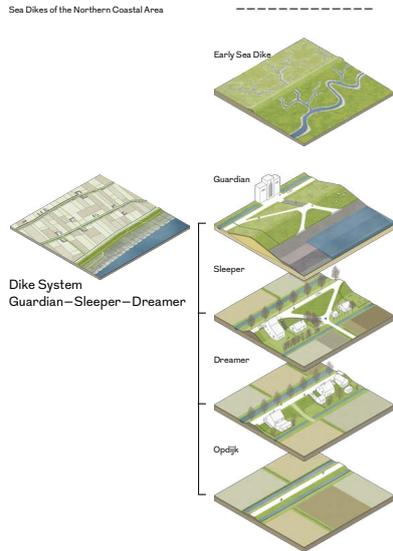
Beyond The Dikes - How The Dutch Work With Water | M. Steenhuis ; P. Meurs



understand the dike

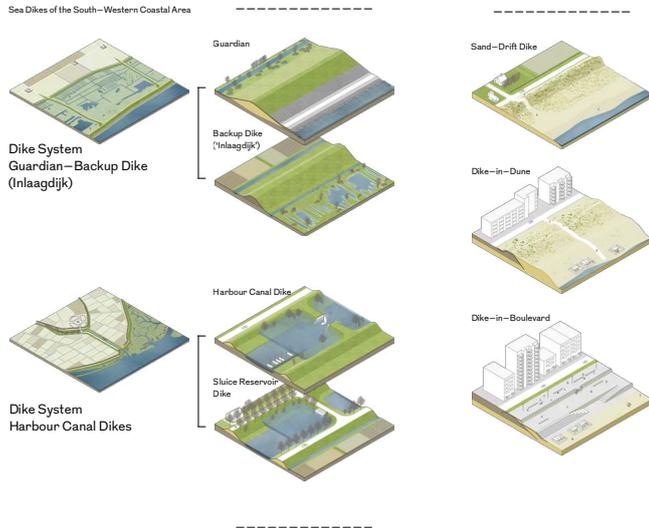
SEA DIKES

Sea Dikes of the Northern Coastal Area



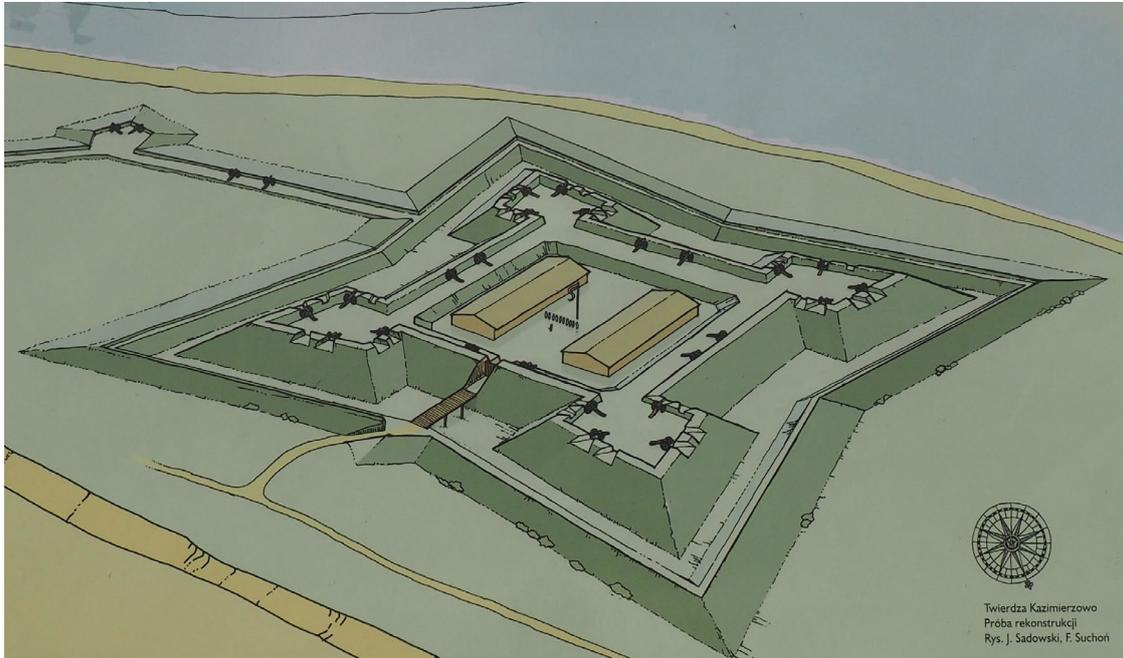
280

Sea Dikes of the South-Western Coastal Area



get to know the dike

KUSFELD FORTRESS

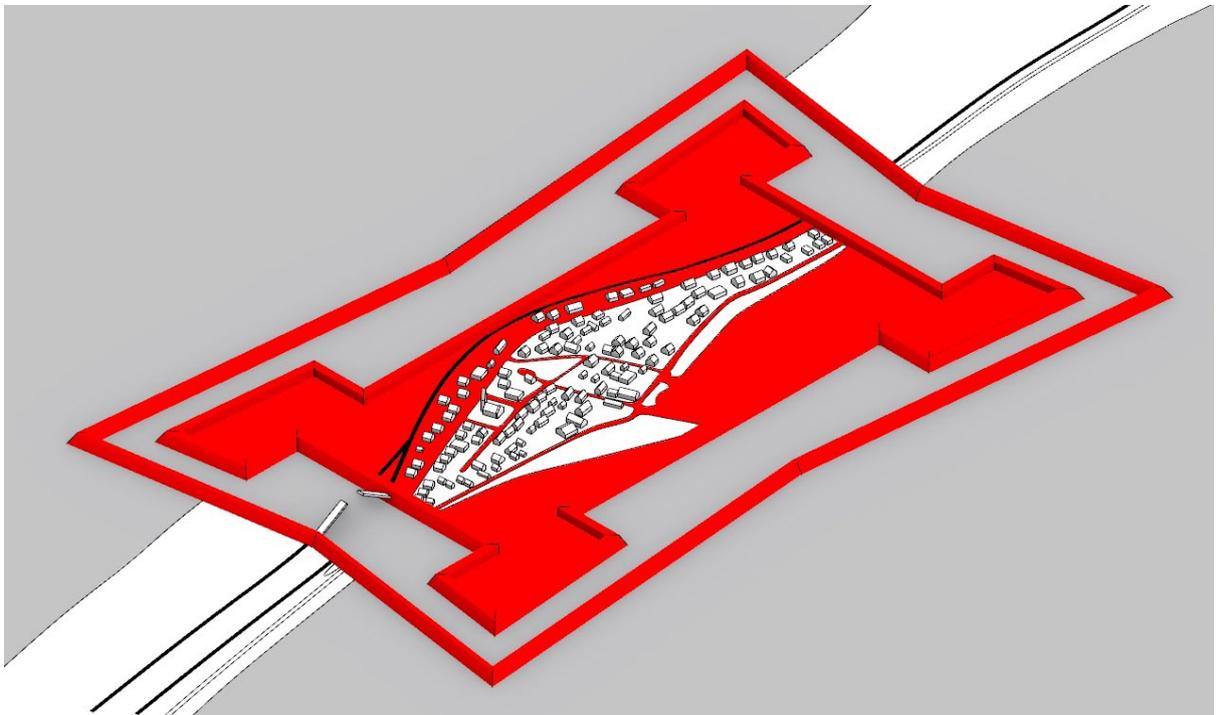


Fortress

The ambition to gain control over the Baltic's water as well as Polish-Swedish wars over king Vladislaus IV's heritage led to the creation of Polish Navy in the first half of the 17th century. The new fleet needed a new sea base, independent of Gdansk and deeper than Puck. The decision was made, therefore, to build a new naval port on the Hel Peninsula together with defensive fortifications. The port and fortress of Wladyslawowo were located opposite the fortress of Puck, in the eastern part of today's Chalupy village. The fortress of Kazimierzowo, positioned more eastwards, was built in 1635 and named to honor the king's brother. It was located in the area of the present hamlet Kuinica-Syberia, by a minor depth at a base of a chain of small islands called Sucha Rewa. The construction of the fortifica-

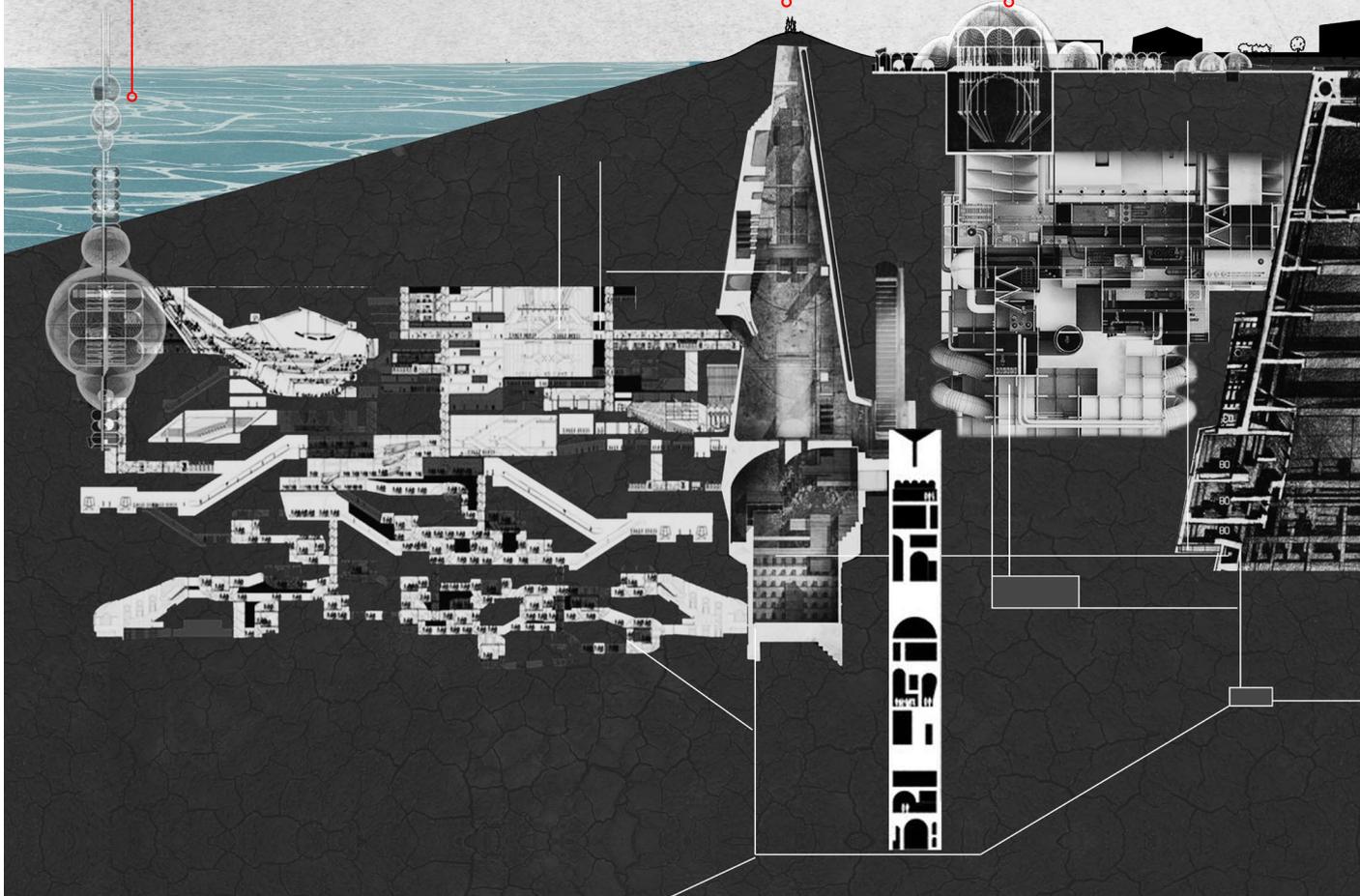
tions follows the old Dutch manner, i.e. it is made of earth embankments provided with a palisade and a moat. The place received the layout of a square, each side around 150m, with a bastion in every corner, equipped with artillery posts. The entrance gate faced the sea and was sheltered by the earthwork of the arsenal square. The fortifications were probably complemented with batteries moved out to the south-east. Additionally, efforts were made to retain and enlarge the canals created from overflowing storm waters on both sides of the fort.

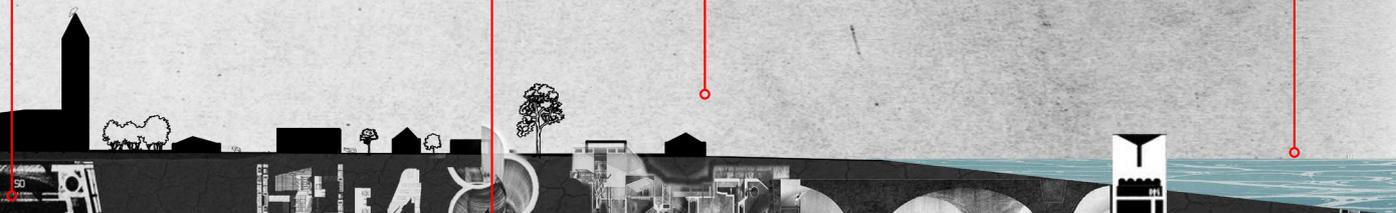
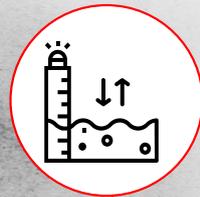
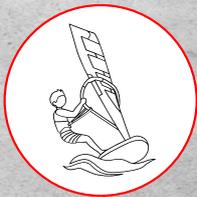
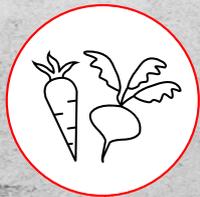
After the armistice with Sweden was signed in Sztumska Wies, the construction of warships was stopped, therefore the port and fortifications were not needed any longer. Because of lack of funds, in 1643 the crew was reduced, and later the fortifications were abandoned.

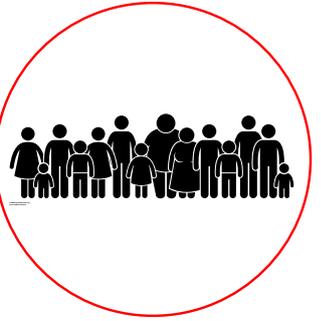
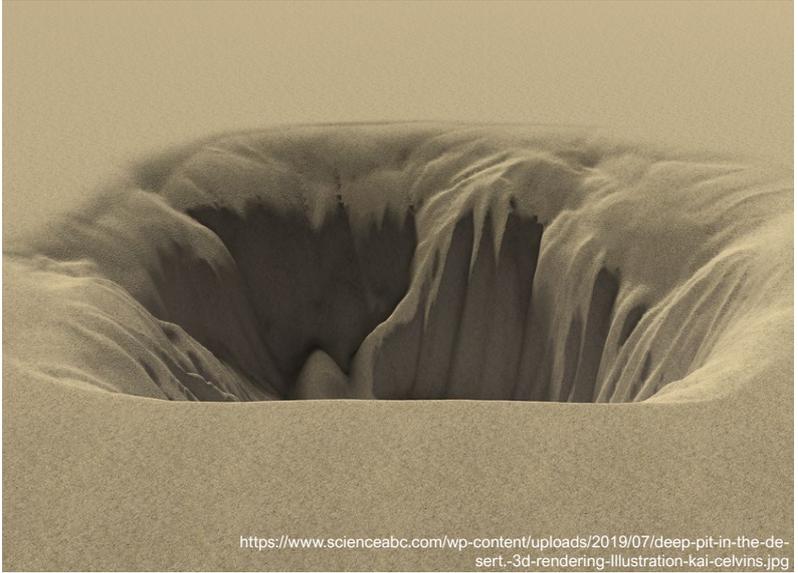
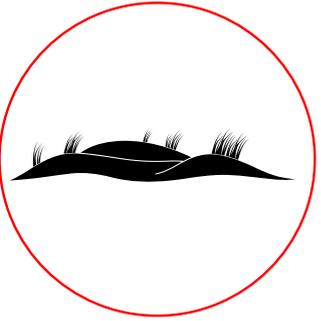
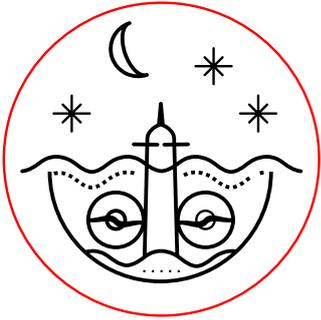


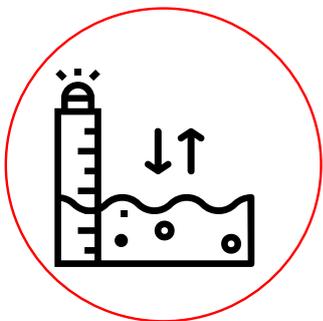
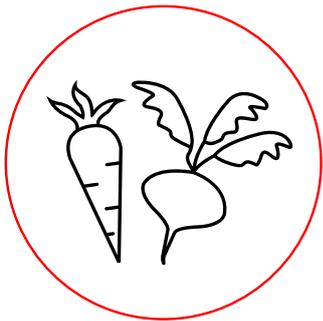
Kufeld Fortress

Investing vast amounts of money into defending few island would cause them to become attraction for the tourist. One can speculate that in such scenario theme park like settlements would be developed. In order to meet the requirements for the high class tourist (even those willing to get the authentic experience) a whole substructure of service would be required. Modern tourist needs his/her luxuries so even when coming to remote place complex system of serving such persona is absolutely necessary. This would make Kuźnica, Chałupy, Jastarnia, Jurata and Hel architectural machines with layers and layers of substructures in order to meet high demands of clients.



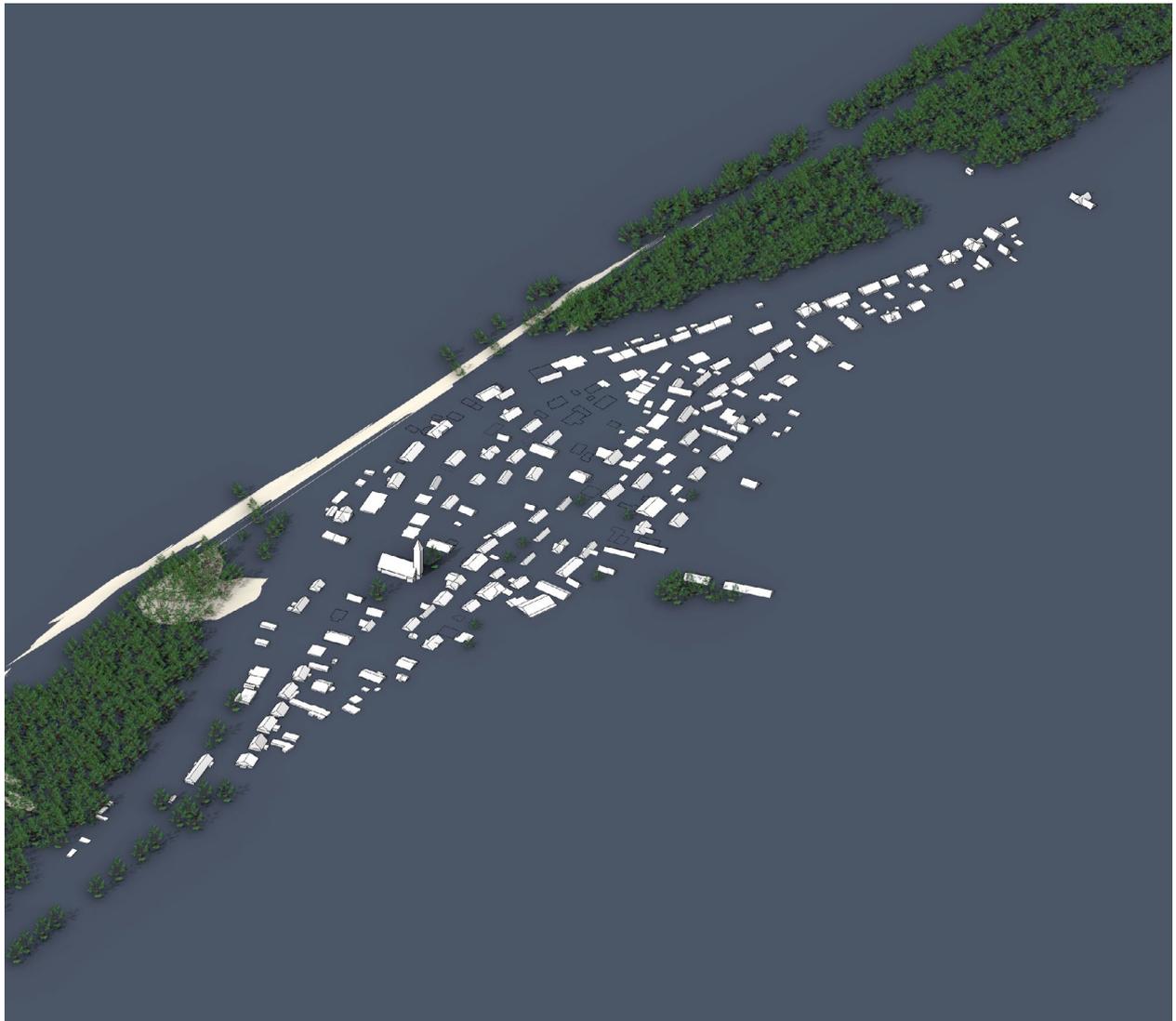








Bird eye perspective of Kusfeld



Kusfeld when sea level rises by 4 meters



Fot. Leszek Kucira





Collage of Noah's Ark

SUNKEN KUSFELD



SUNKEN KUSFELD



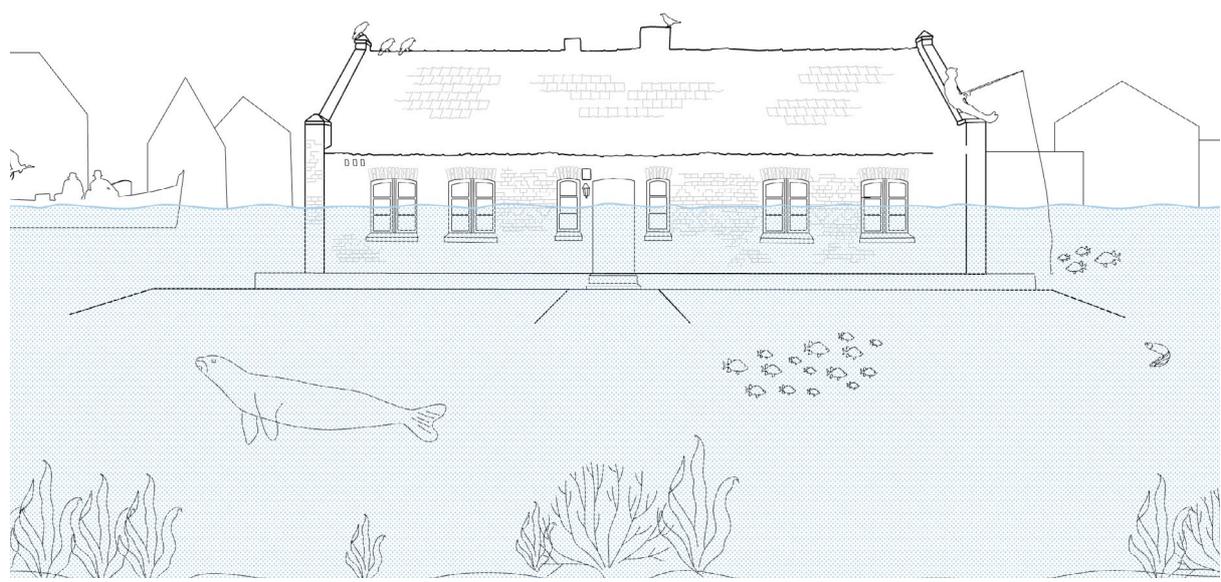
Kuźnica (German Küsfeld, Kashubian Kùsfeld, „kuss” meaning a kiss, „feld” meaning field, piece of land - Kùsfeld, where the sea kisses the bay) owes its name to the distinctive location - the narrowest part of the Hel Peninsula. Today Kuźnica is first and foremost a sea resort. Intensively visited during the summer season it becomes a harsh microcosm in winter. Luckily the temperature raises, causing the touristic season to quickly extend. Lasting from mid June till September back in the days, today boarding houses start to be steadily rented already in the beginning of May with some loners to spend their free time in Kuźnica till late October. However, the very

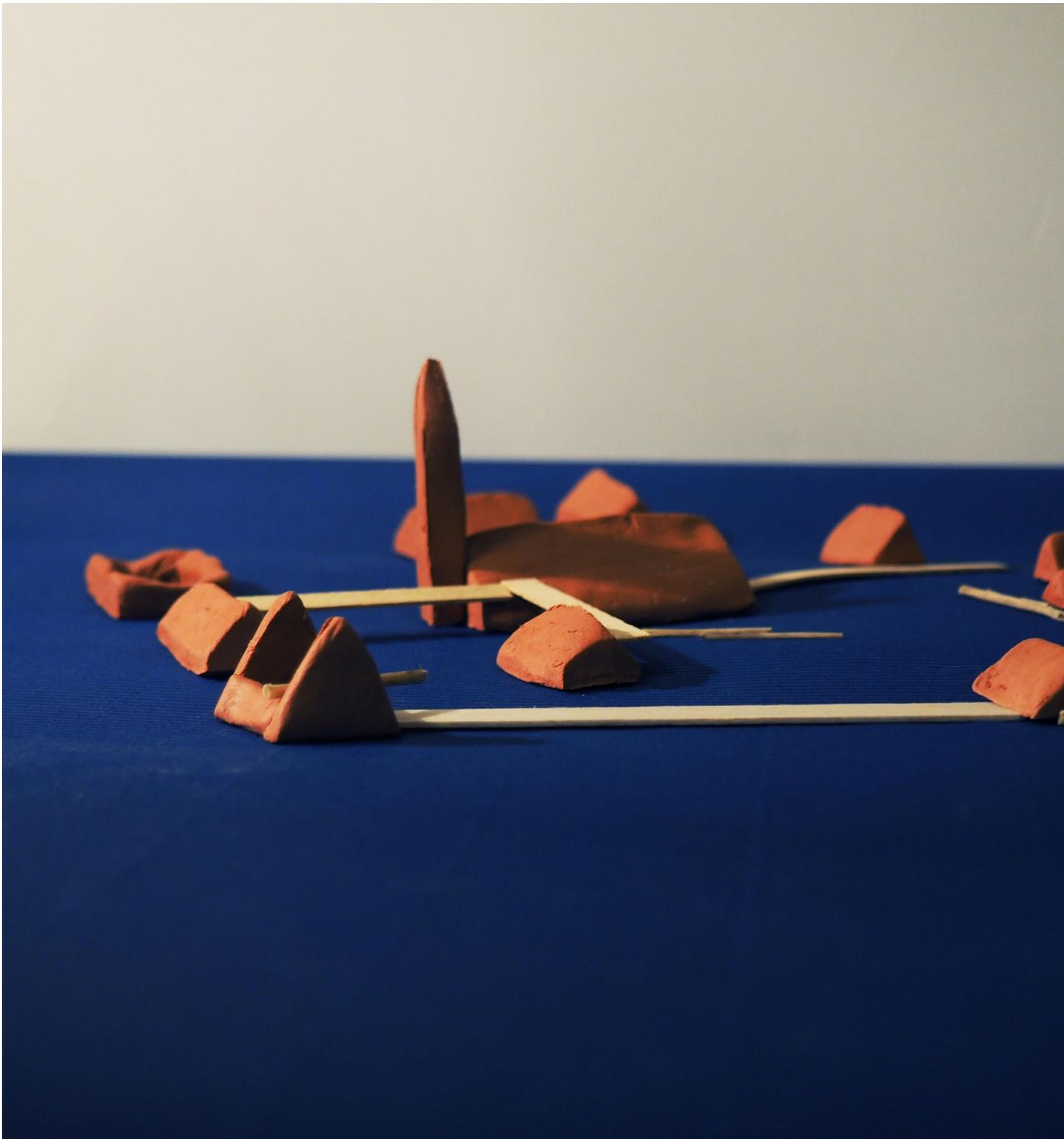
same reason of quickly heating up weather might soon stop relatively firm, progressing economy. What would happen if unprepared Kufeld would be suddenly flooded and the sea level would rise by 5 meters? Most of the buildings would fall apart, people would be evacuated or killed and only those who could adjust to new, harsh environment would stay at the location. One can speculate that the ruins of buildings would be used as a substructure for vernacular architecture and the “monks of Kufeld” - people who have the skills and willingness to leave in such environment would seek balance with fauna and flora.

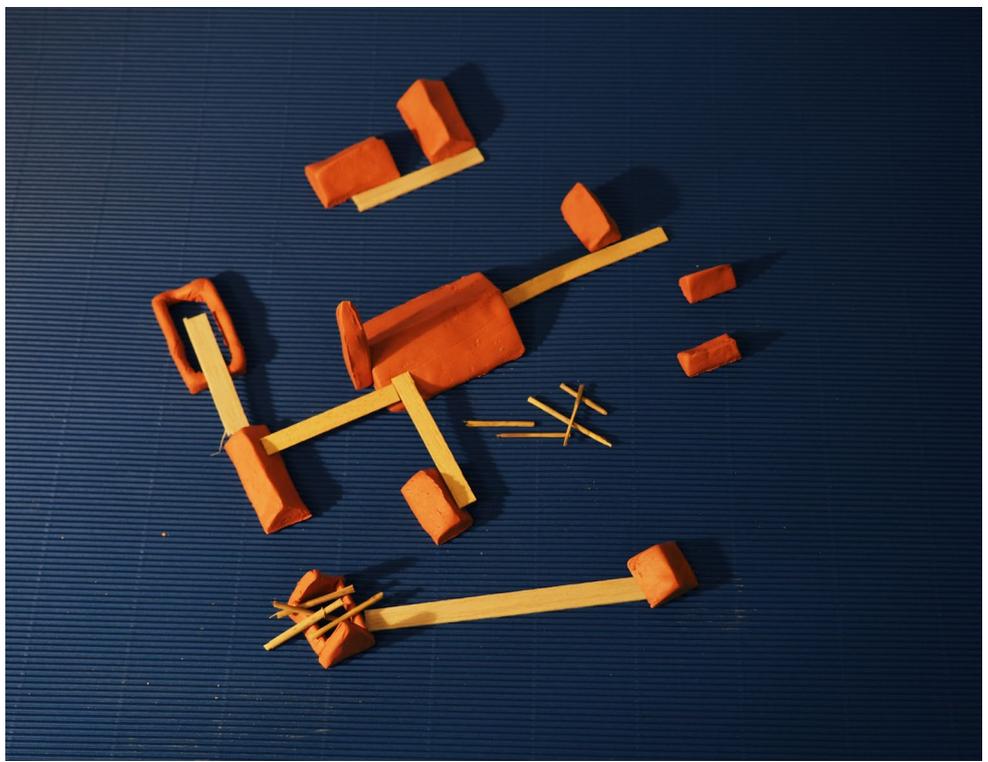


WHAT HAPPENS TO BUILT ENVIRONMENT?

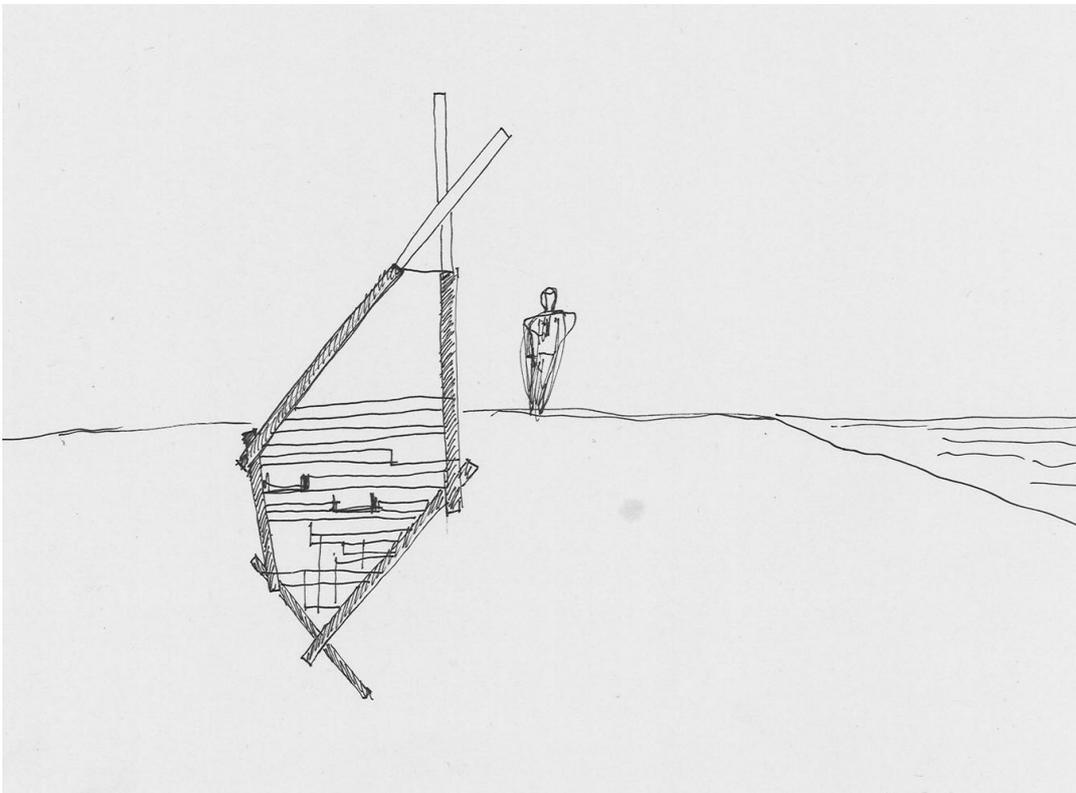
EVG
2012

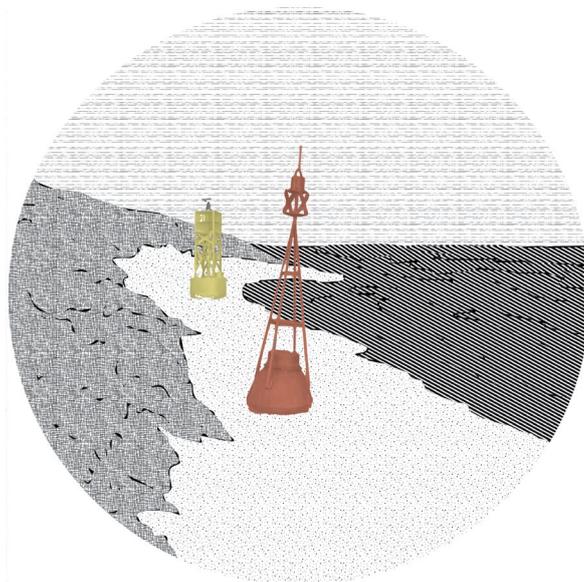






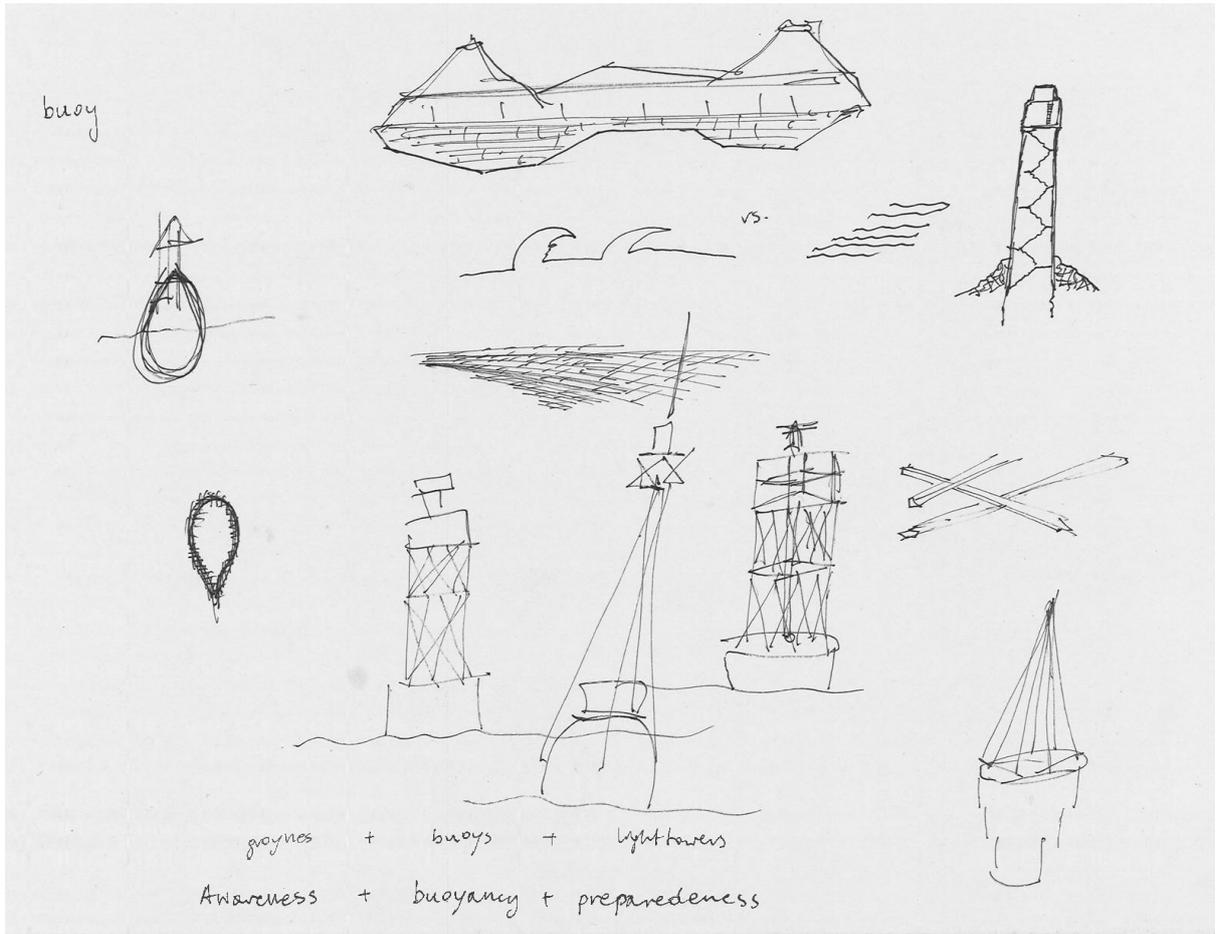
BUOYANCY





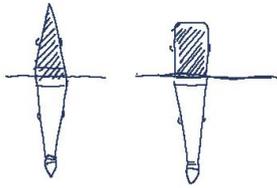
#buoyancy

I was thinking of very basic, shelter structures that are sunken in the sand - buoys that can protect tourist 2.0 (the one that comes to Kusfeld/Hel Peninsula to reconnect to nature rather than unsustainable luxuries) which would give me, as a designer, the possibility to discuss the future of Hel in the context of main industry which is tourism.

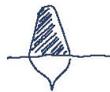


While looking at structures that can survive harsh weather conditions I arrived at buoys

CHANNEL BOOYS
TALL MUNS TALL CANS



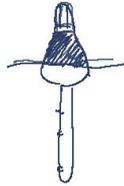
MUN BOOYS IRON SPAR BOOYS



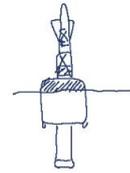
W



WINGING BUOY

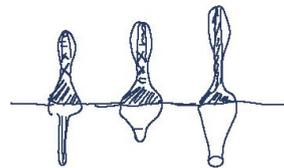


GAS LIGHTED BOOYS
COMPRESSED ACETYLENE



COMPRESSED OIL GAS

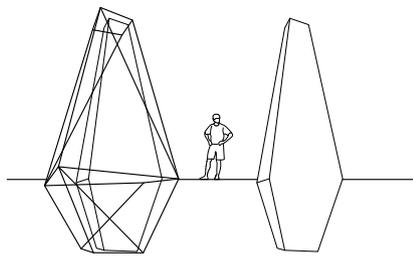
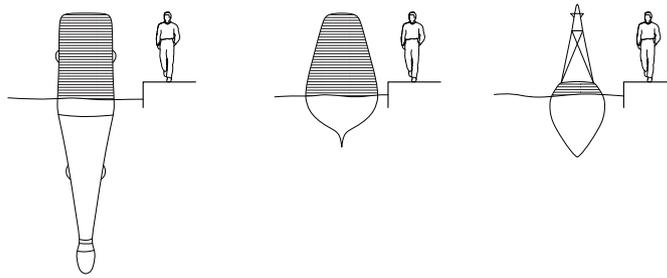
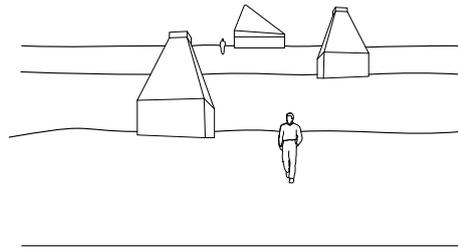
COMPRESSED ACETYLENE
LIGHTHOUSE SERVICE TYPES

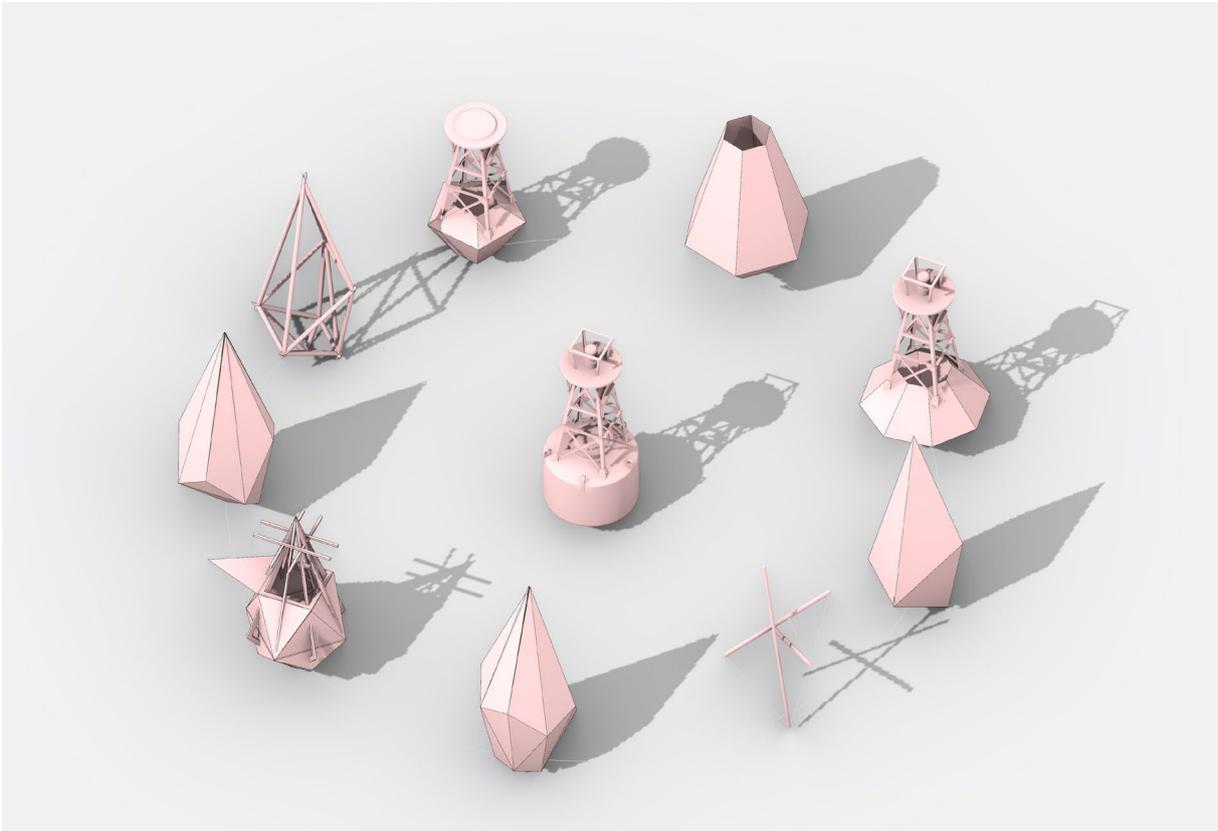


APPENDAGES

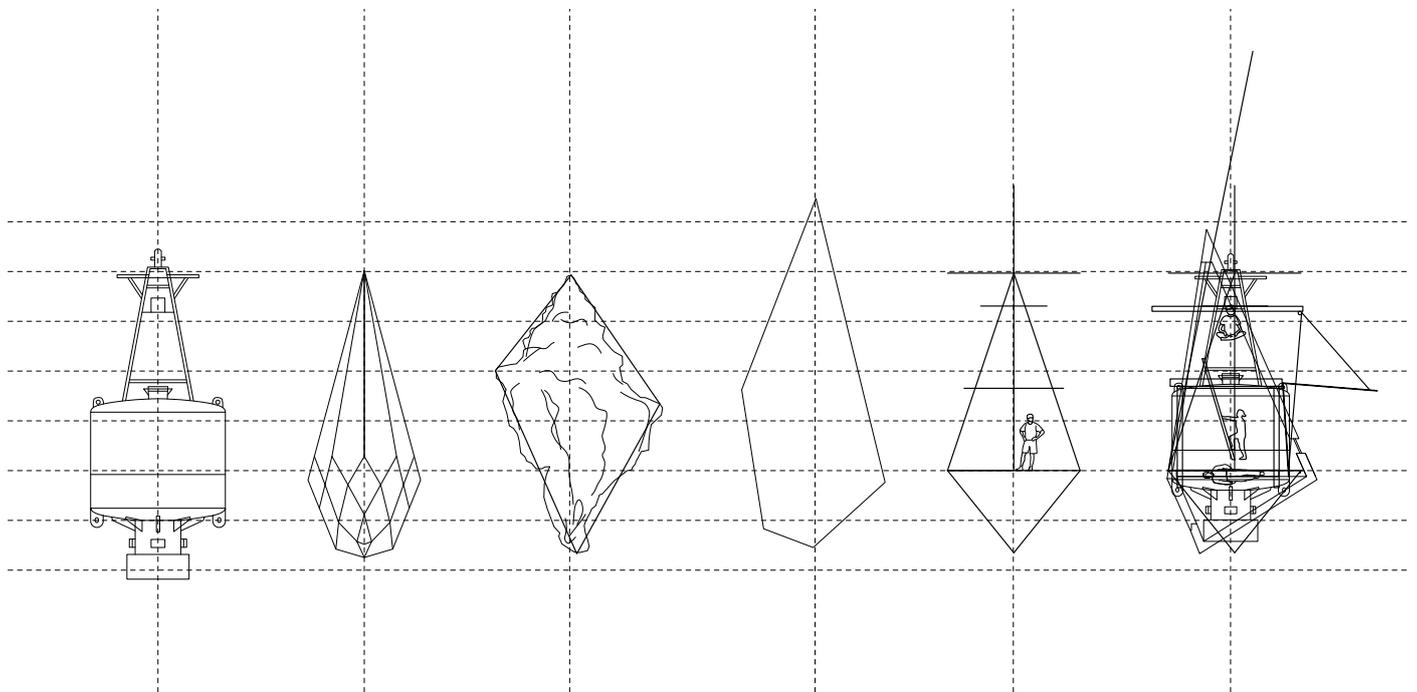
BALLAST BALL
CAST IRON SINKER

MUSHROOM ANCHOR
MODING BUOY





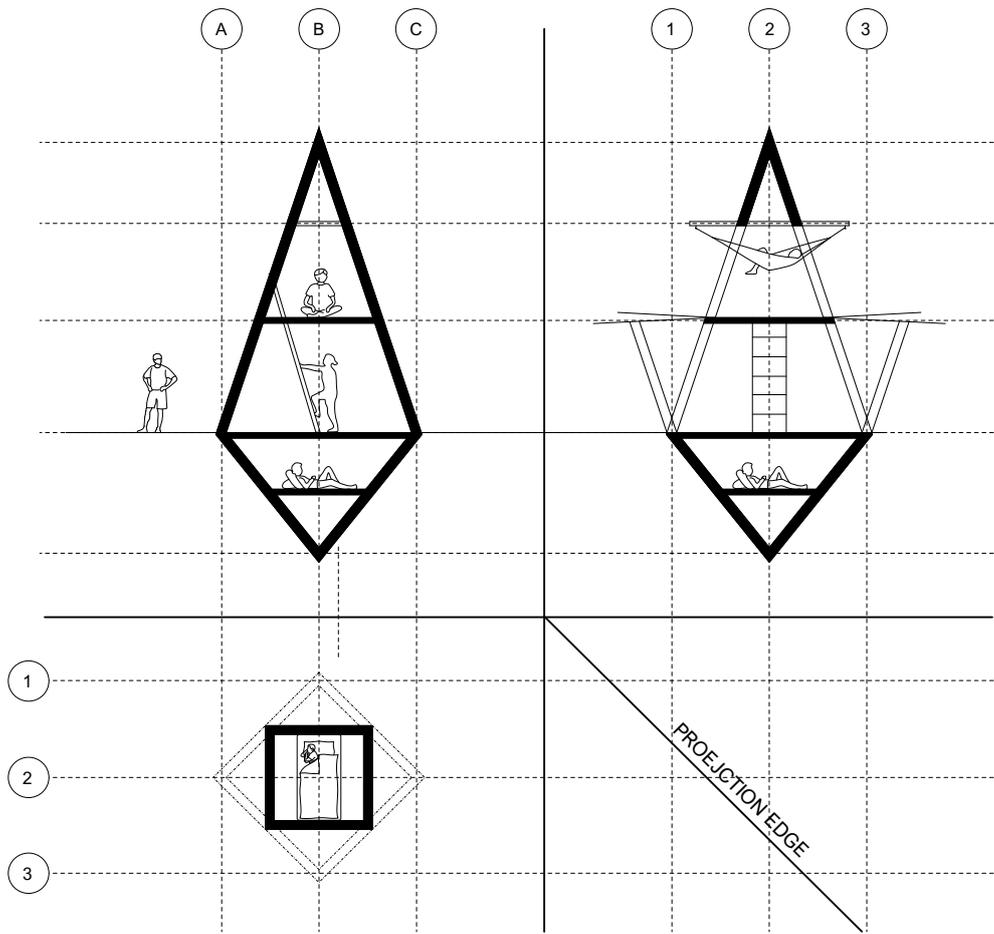
STRUCTURE



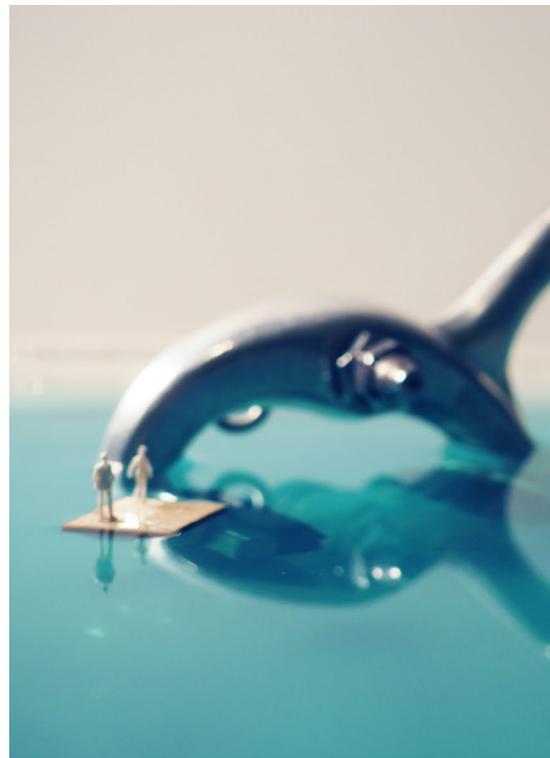
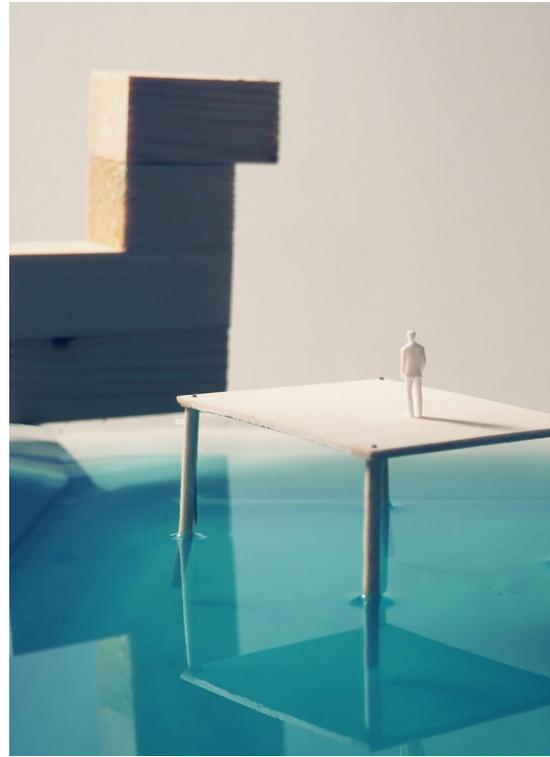
seclusion shelters
inhabitable spaces - seclusion cabins, observation huts,
contemplation shelters for a new type of tourist - one that
wants to reconnect to nature

FRONT VIEW

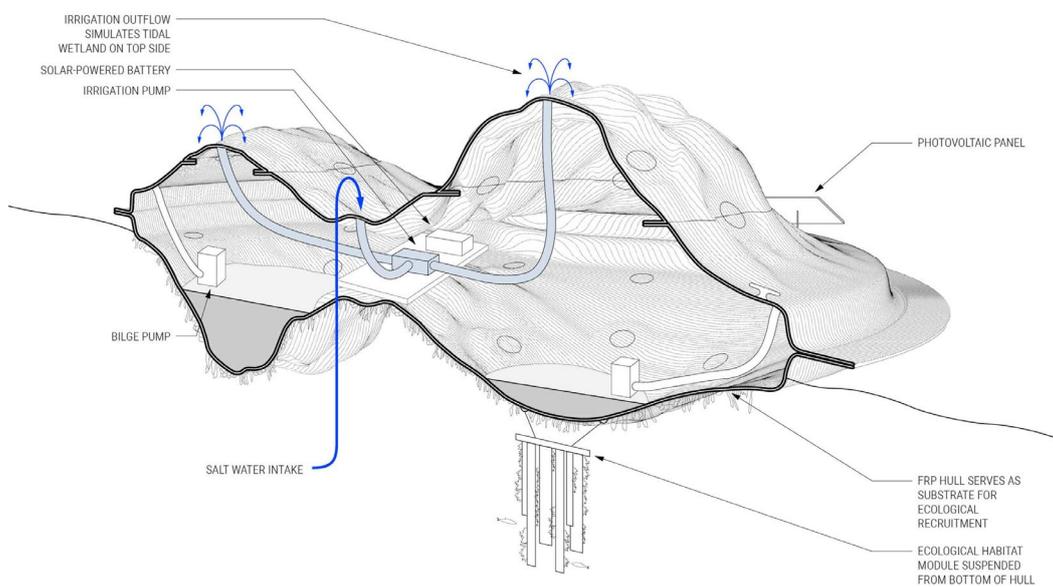
SIDE VIEW



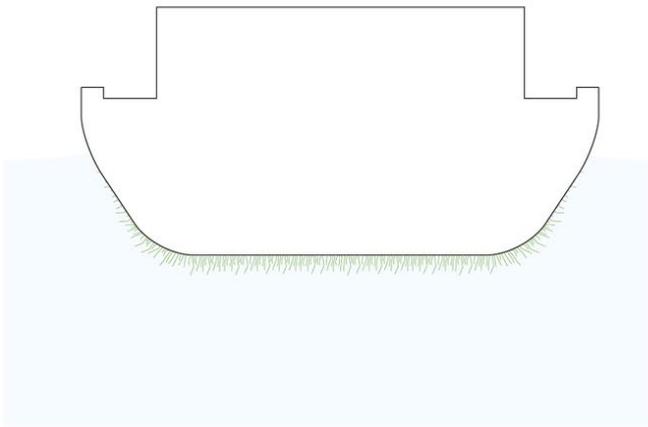
TOP VIEW





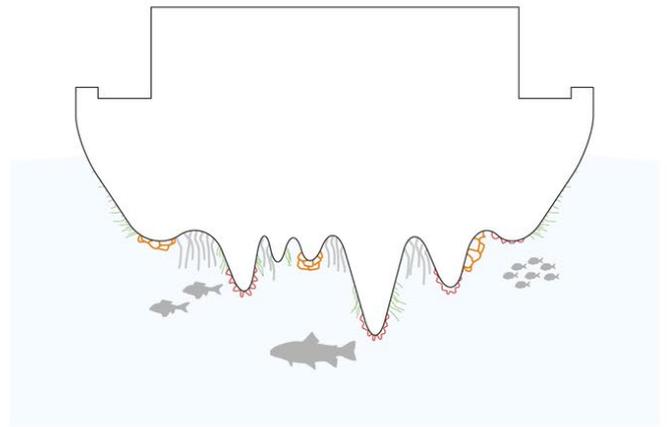


Floating future
 Margaret Ikeda and Evan Jones,
 architecture faculty at the California
 College of the Arts (CCA)



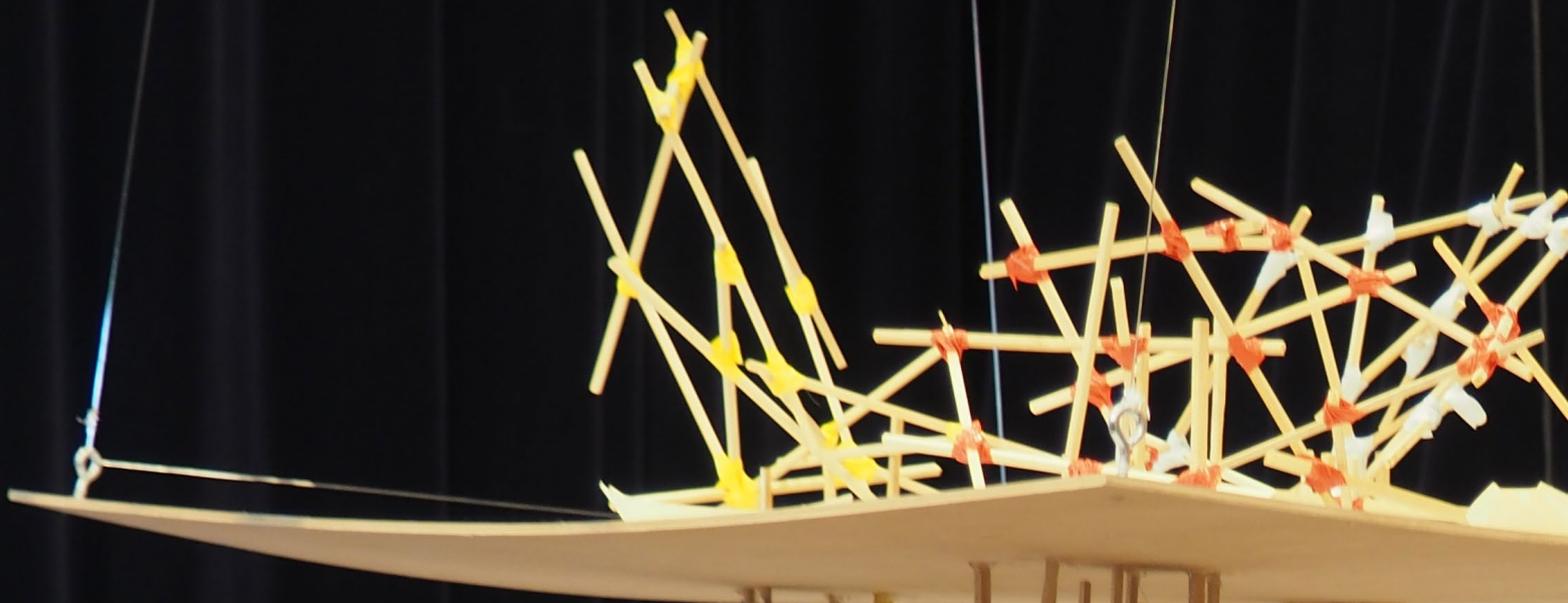
FLAT BOAT BOTTOM

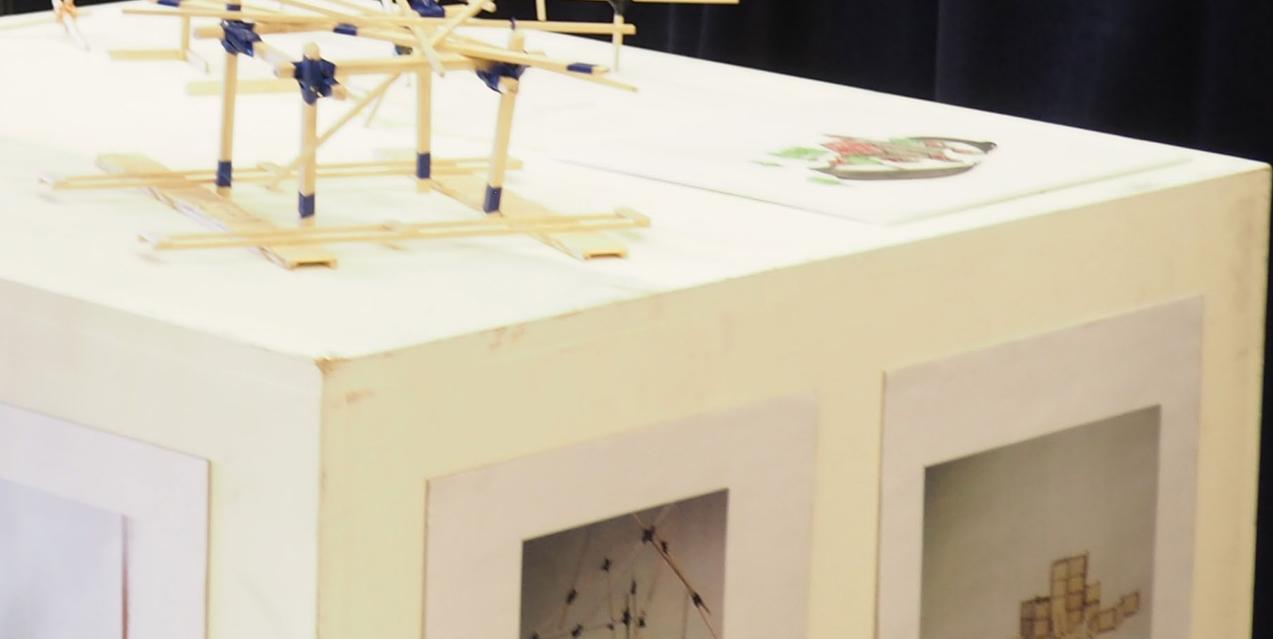
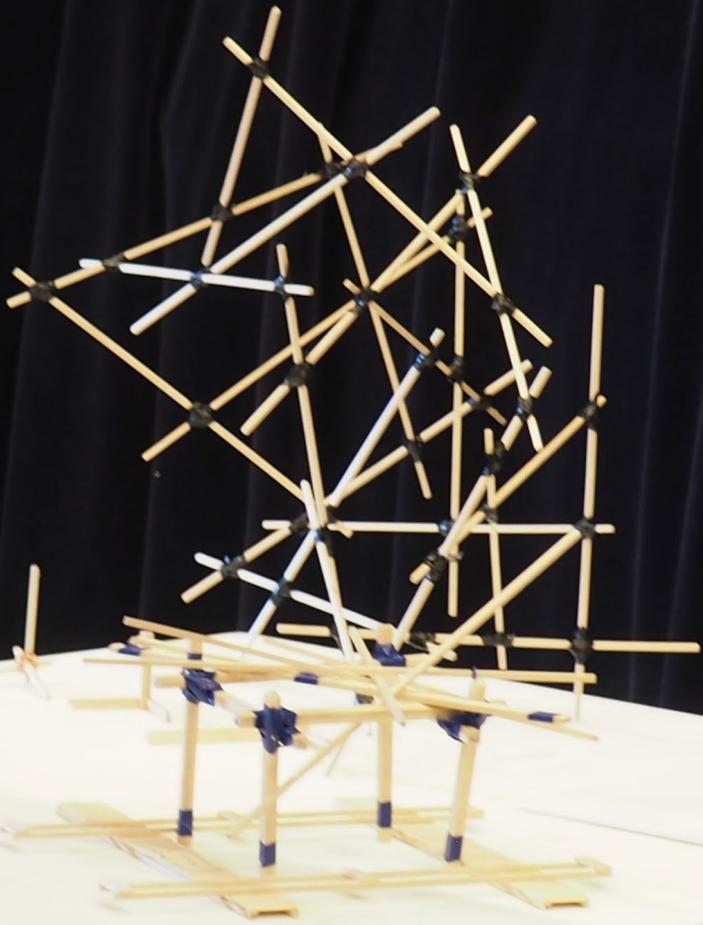
- Fouling communities are uniform and homogeneous, typically consisting of the most dominant invasive species.
- Fouling communities are often seen as a nuisance for boats and other waterfront structures, requiring regular cleaning and maintenance.



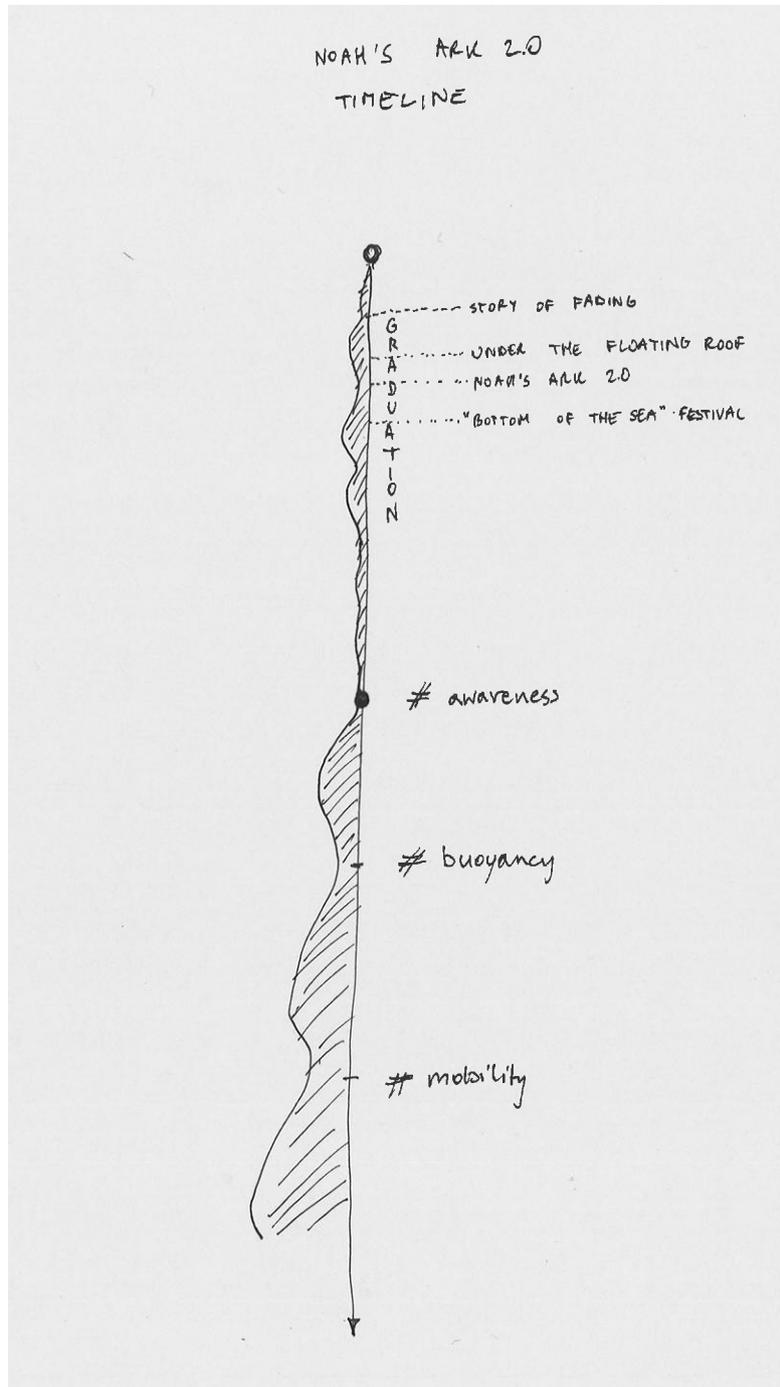
OPTIMIZED UPSIDE-DOWN BENTHOS

- Increased surface area provides more "real estate" for fouling communities to thrive.
- The fouling communities are more diverse, as smaller valleys provide refuge from predators for smaller species.
- Greater ecological diversity supports the food chain and enhances the broader ecology.
- Controlled growth of invertebrates could potentially perform as wave-attenuating "sponges," reducing the effects of waves and flooding on the coast.





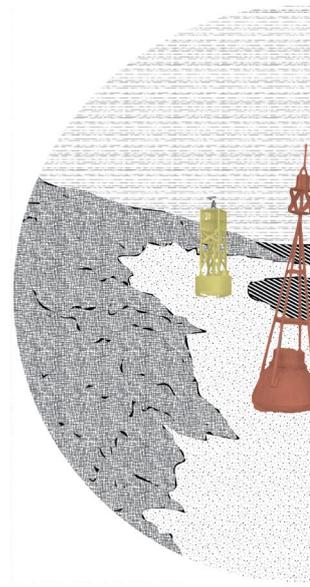
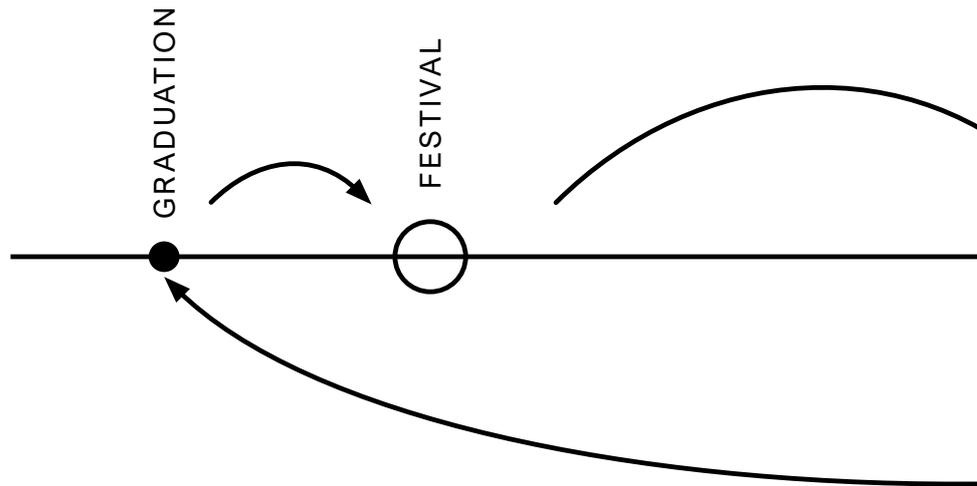
TIMELINE / PHASING



I followed the idea of the timeline. I would really like the graduation to be a tail of a bigger project. Therefore I defined 3 milestones that foresees project in a phased undertaking.

1. "Bottom of the sea" festival
2. Buoyant cabins
3. Vernacular ark

Whereas it could be three different interventions that chronologically come one after another, it could also be that the milestones help me discover certain aspects of the project - e.g. the festival - event architecture - could be all about accessibility (how to prepare the ground for the interventions, if one works in an open field how to make a base for the interventions that are going to be build in the air), secondly, buoyant cabins could be all about the use and function and then the final intervention would be interrelated and based on the discoveries of the previous.



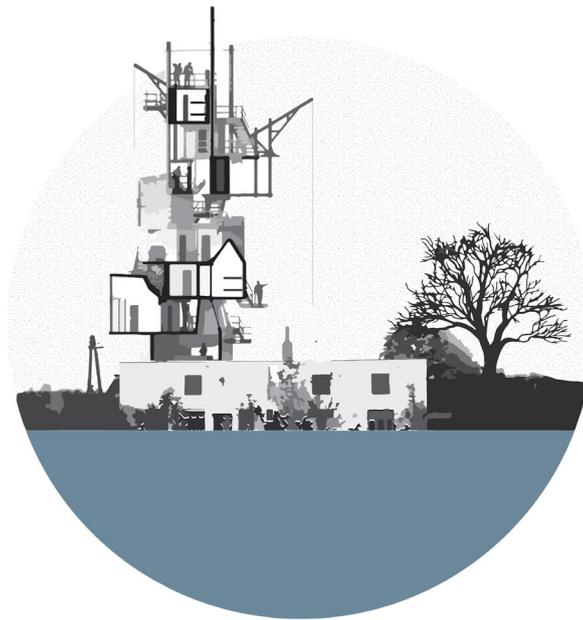
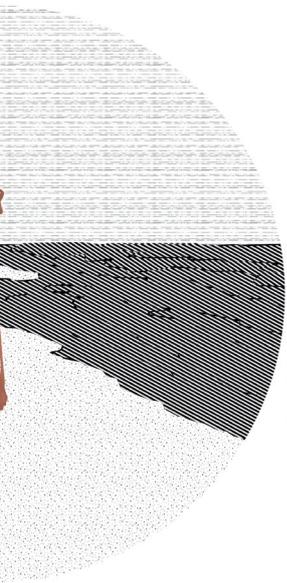
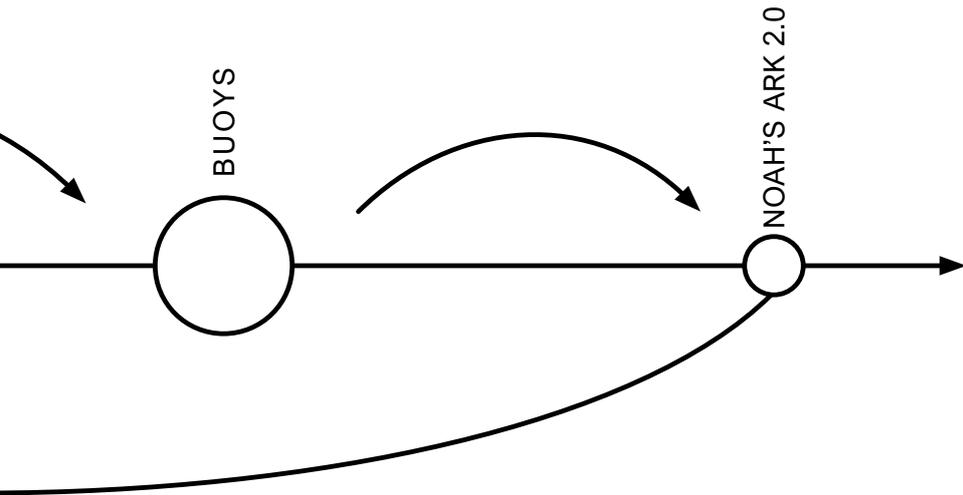
#accessibility #awareness #temporariness

architectural festival

infrastructure for event architecture,
 temporary interventions that collide
 with linear, spatial arrangement of
 nowadays Kusfeld

seclusion

inhabitable spaces
 observation huts,
 tethers for a new type
 wants to reco



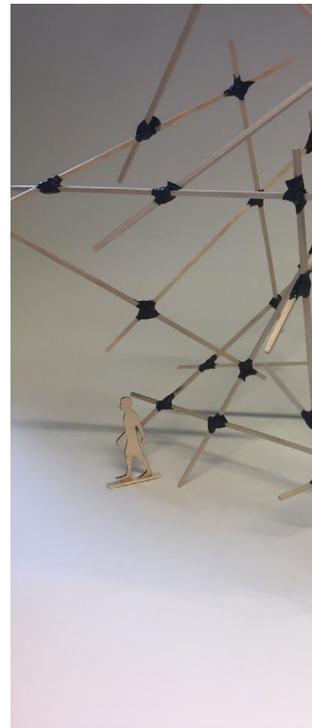
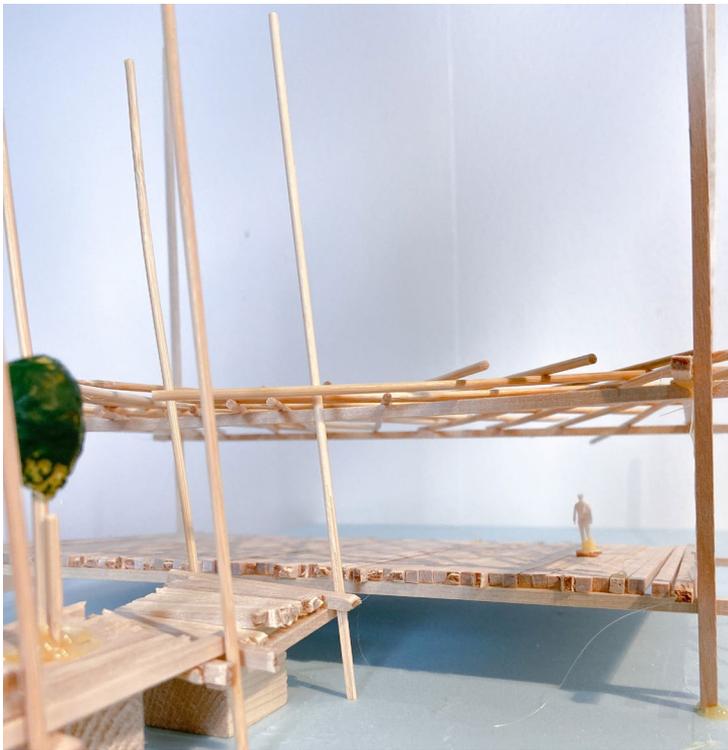
#mobility #preparedness #

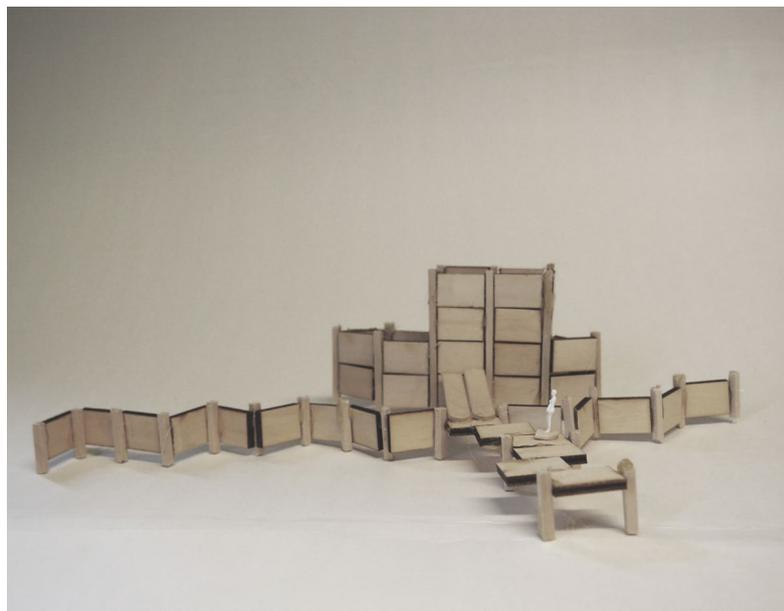
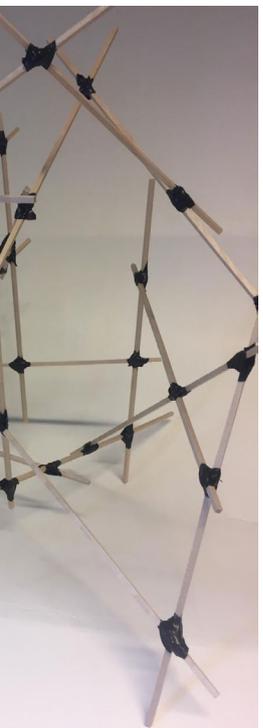
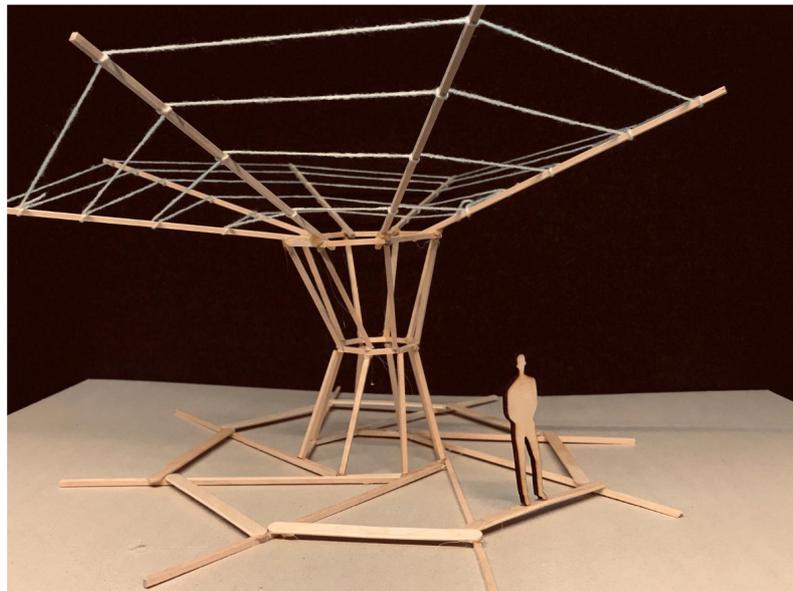
n shelters

s - seclusion cabins,
contemplation shel-
e of tourist - one that
connect to nature

noah's ark 2.0

vernacular, construction for the
scenario of steadily rising sea level,
vertical, architectural assemblage of
recycled, inhabitable objects







Fot. Kosycarz

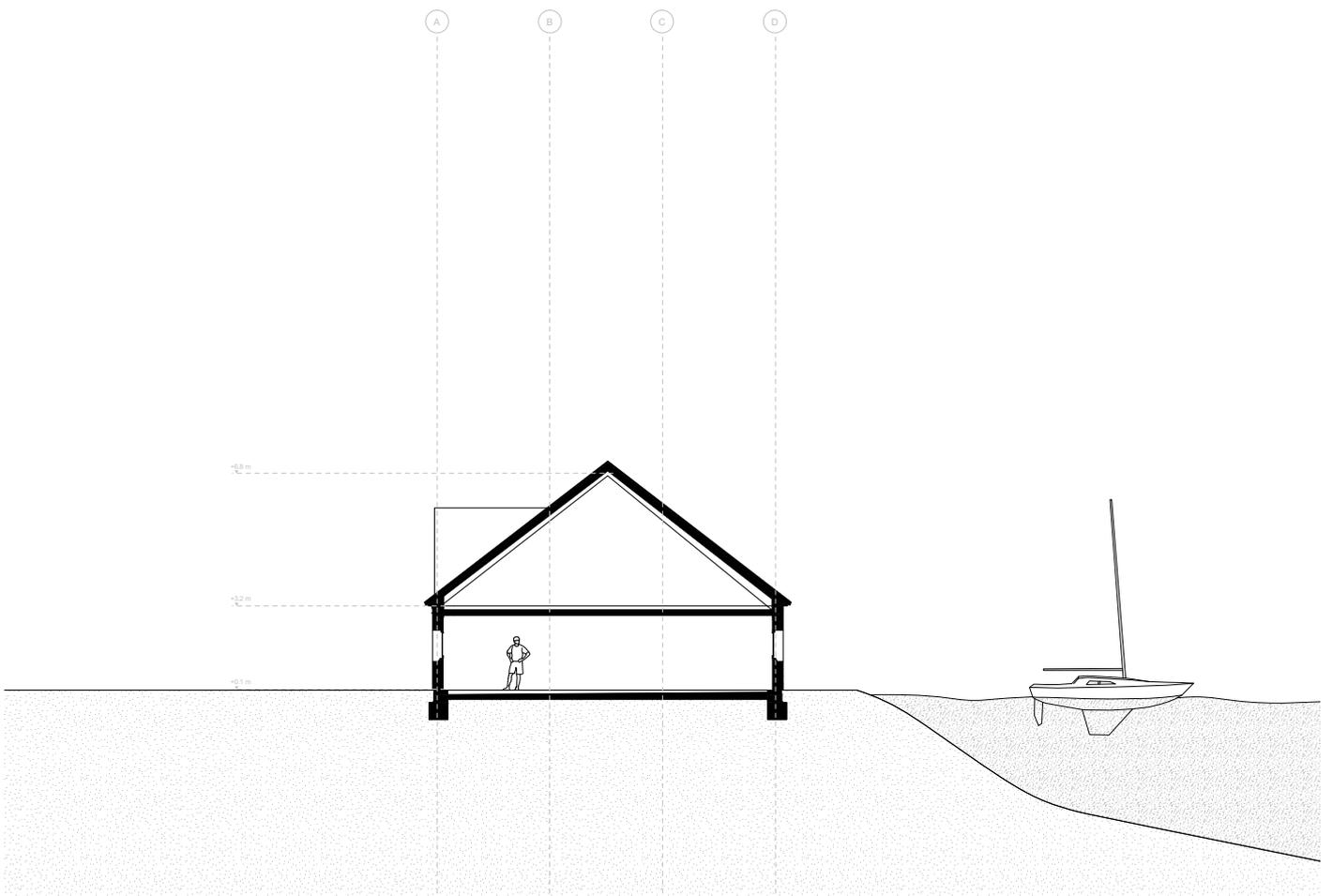


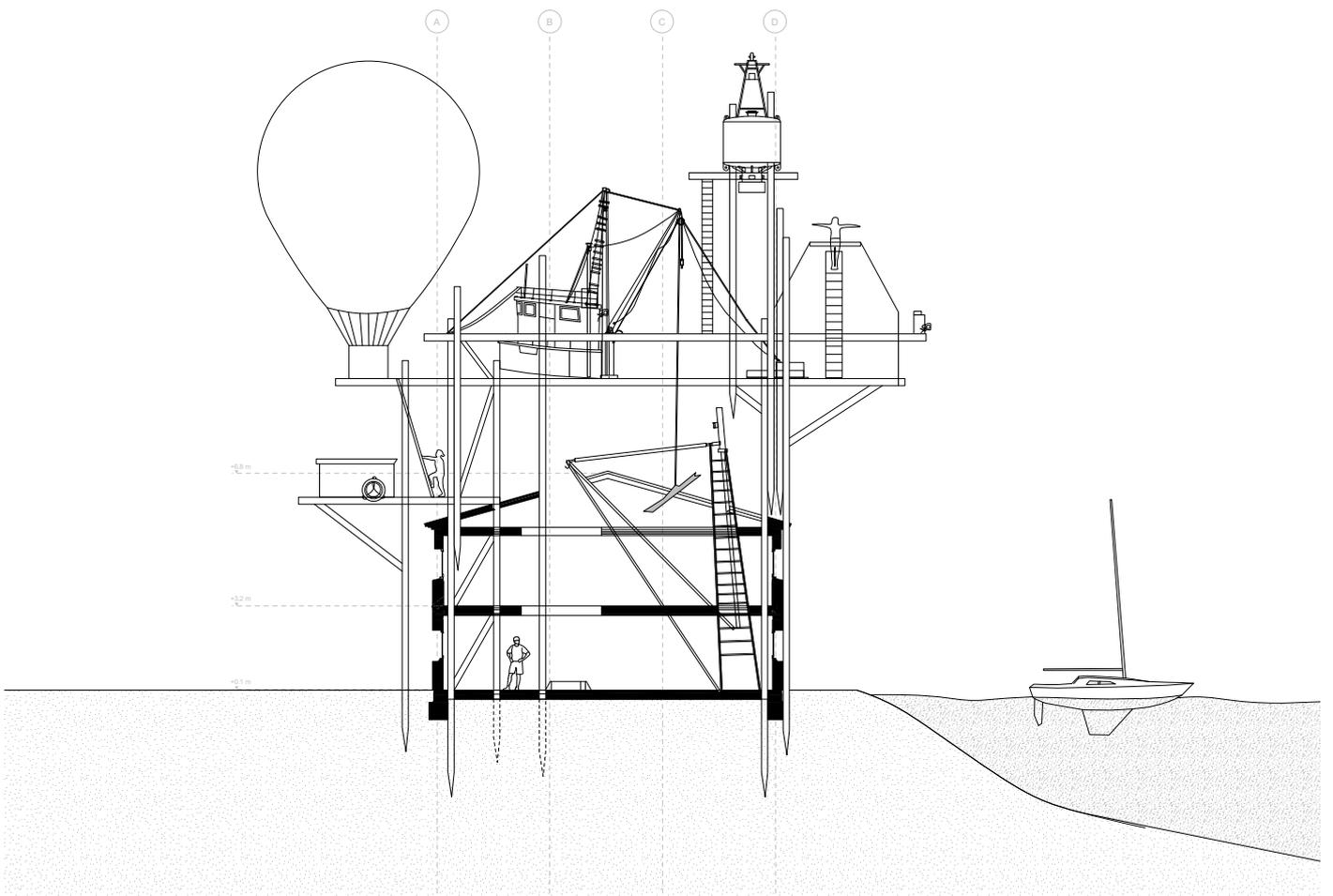
NIEZWYKLE
ZWYKLE ŻOŁCIA
KASZUB



#mobility

Mobility as the quality of being mobile, flexible , but also (sociology) the movement of people in a population, as from place to place, from job to job, or from one social class or level to another. This would be structures that allow the inhabitants of Kusfeld stay there even if the sea level rises, but also state of mental preparedness for possible relocation.







Kusfeld when sea level rises by 2 meters

KUSFELD when sea level rises + 2.0 m



Tadeusz Kantor, The Sea Concert

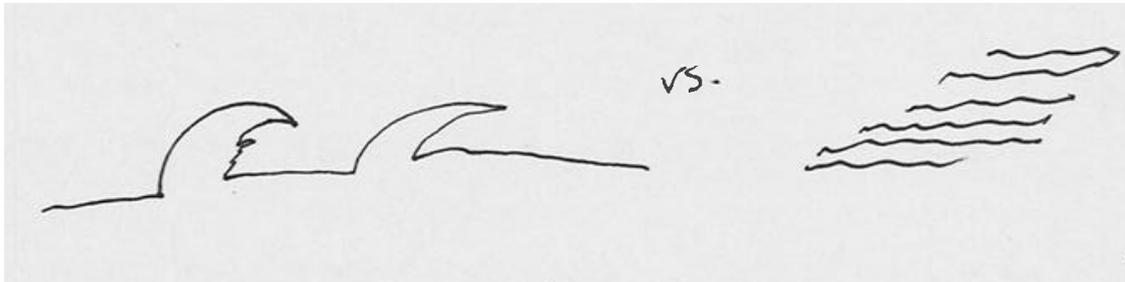
OBSERVING



Easter Sunday sunrise service, April 9, 1944, aboard the USS Duane

WAITING

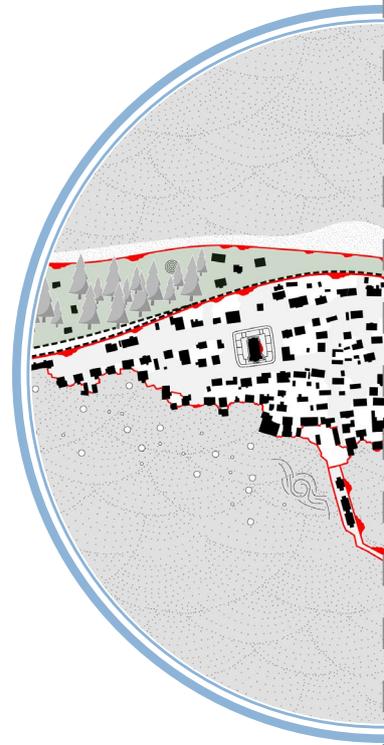
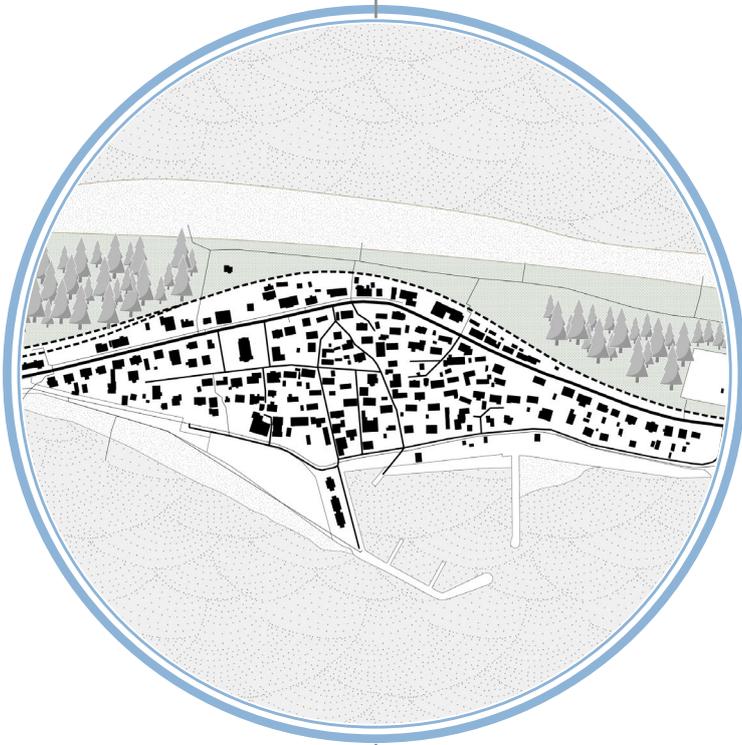




Harsh weather conditions vs. steadily (but exponential) sea level rise

This is something Anne Loes Nielsen. She is the partner of Defacto office in Rotterdam, working on projects in deltas and water-management context. She suggests that whatever elaborations I come up with it should always take two scenarios into account - quick but harsh storm, water breaking in, but then usually going away sooner or later =cleaning up, rebuilding and steadily see level rise which gives us time to observe, react upon and be prepared.



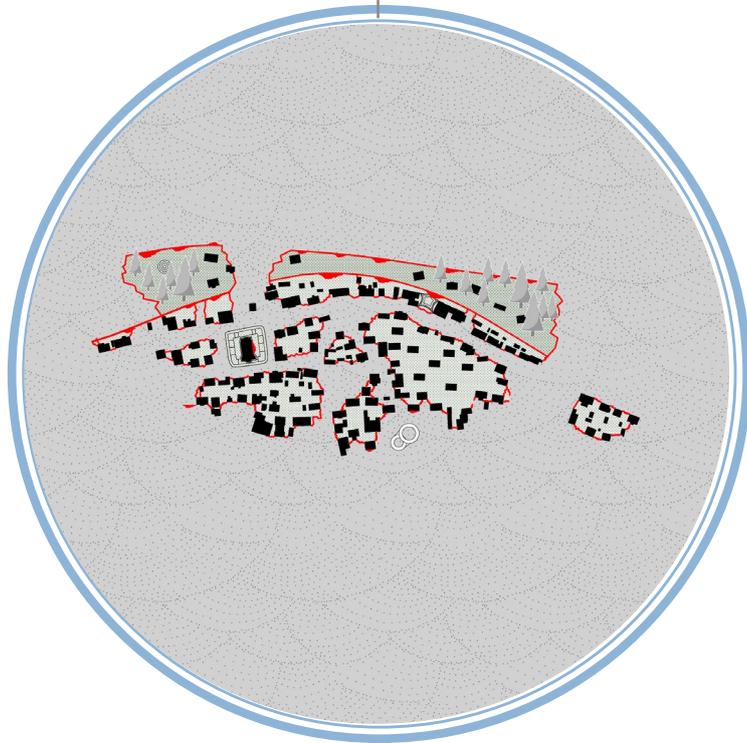
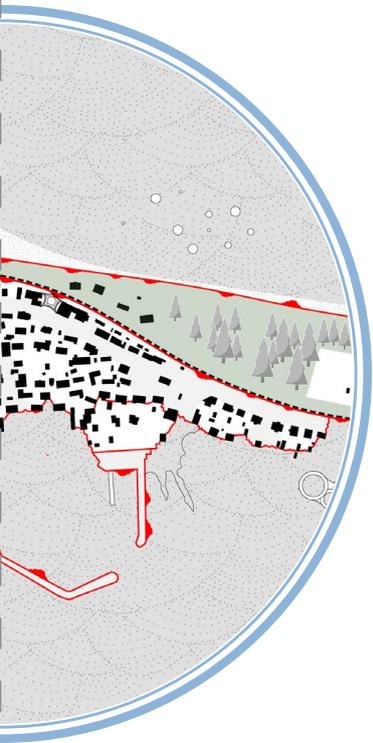


+21.0 a.s.l

+8.0 a.s.l

+3.0 a.s.l

Speculative masterplan for
humankind's relationship
and revises disaster-prevention in



for Kusfeld that challenges
relationship with nature
in areas prone to climate changes

LIVING WALL

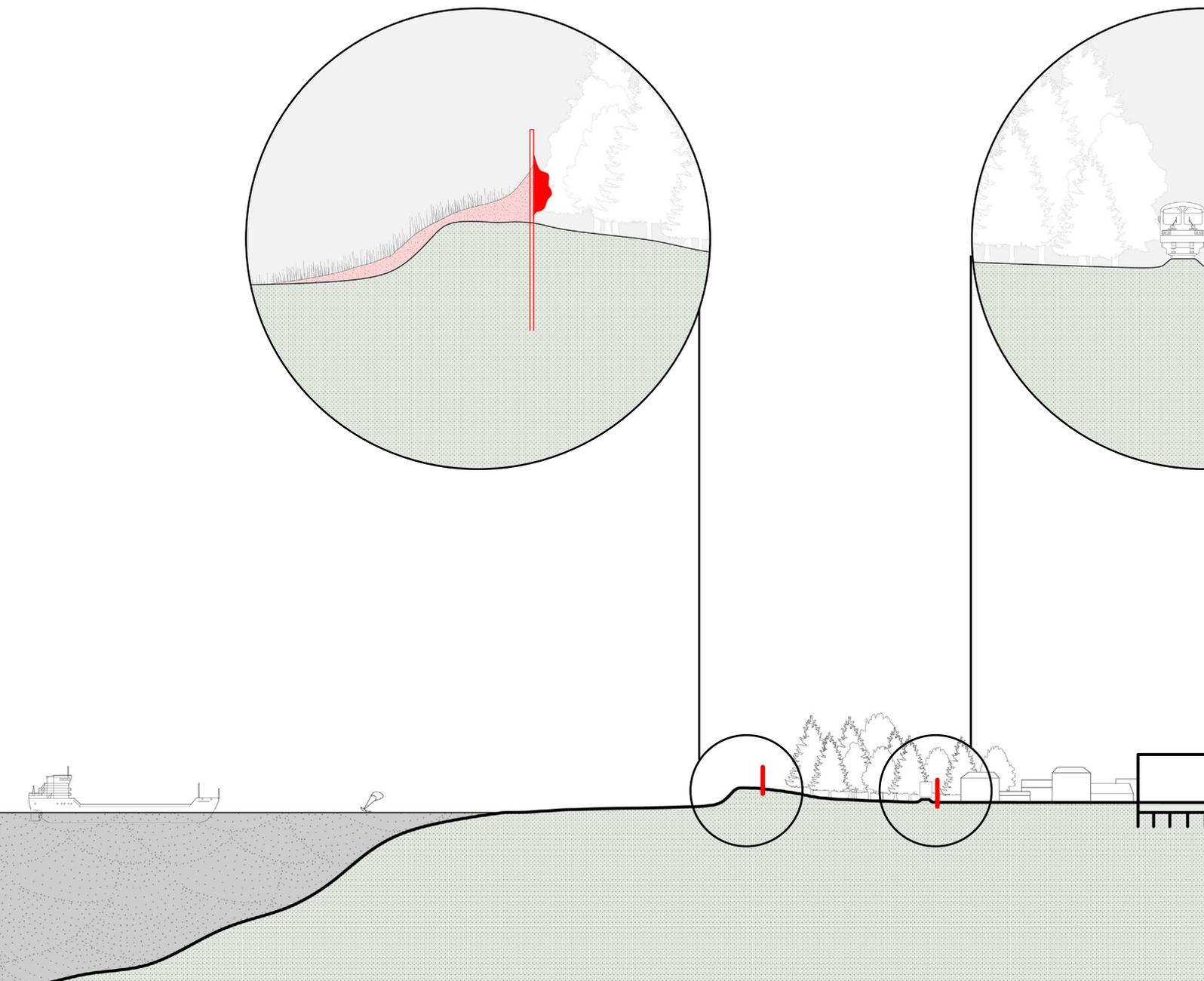
Walls are inherent part of seaside landscape. Rather than avoiding them, designers and residents of low lying coastal areas
Water Affairs: "Tackling water safety is unthinkable without public participation and an integrated approach in w
If we focus exclusively on safety, then we will lose the battle. It will only work if we have safety and quality, with a
here and now, and in which that mix is continuously being made. Inclusive, integrated, long-term, short-term, in
This is how embracing the element of a v

Wall as sand collector

Sand on the dunes is picked up by strong winds and carried away, that is why beaches has to be artificially refilled every season. Reinforcing the dunes with a wall would slow down this process, allow for more sand to collect and provide with infrastructure for hanging elements.

Wall as pro

Rail is the most sustainable way
could be the only way for tourist
insula. As the logistic key of the s
Raising a wall next to the railwa
and provide infrastructure



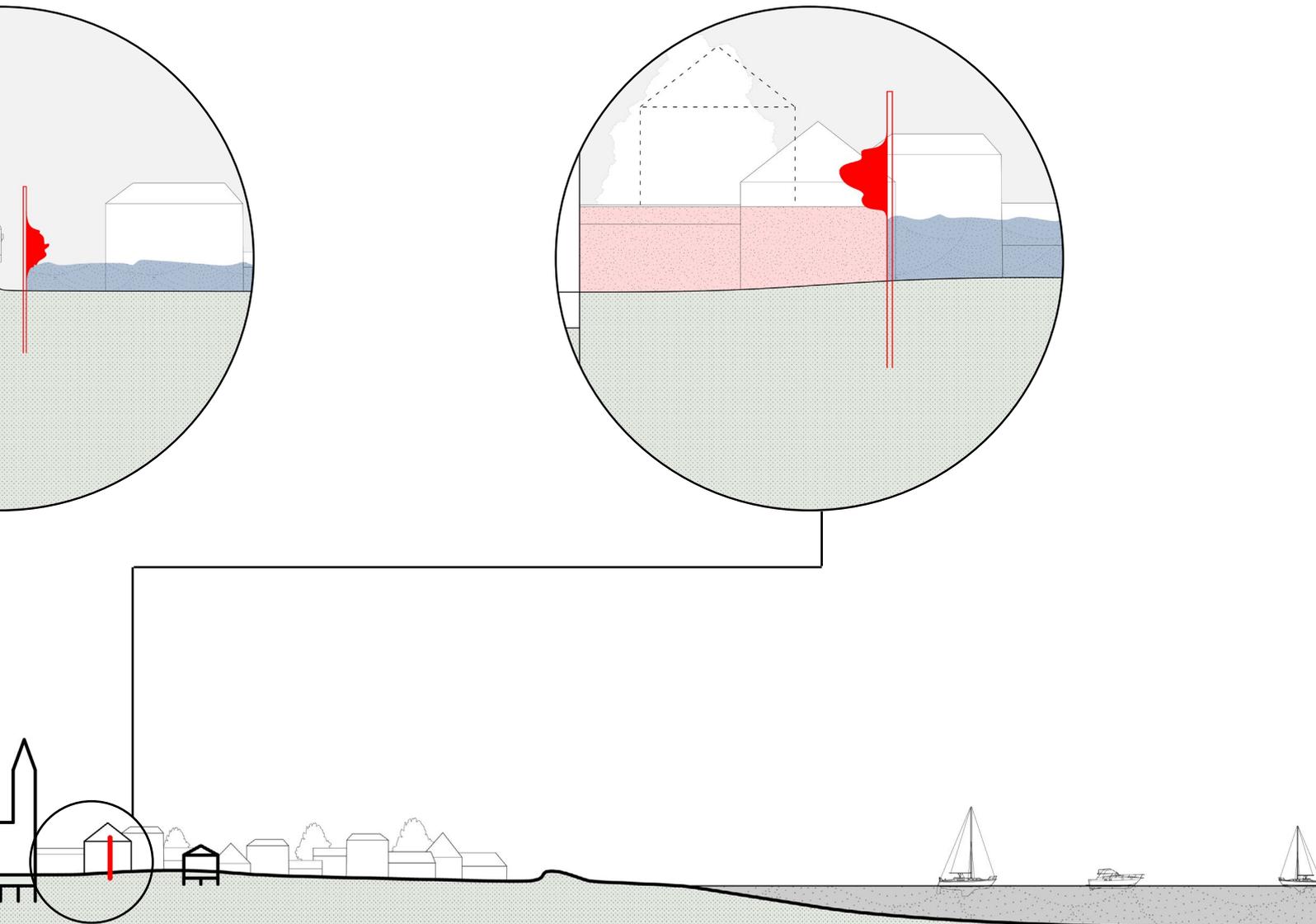
...s have to embrace the concept of it. Inspiration can be found in words said by Henk Ovink, Dutch Special Envoy for International ... which different interests are taken into account. The problems only arise when spatial quality is seen as an optional luxury. ... an inclusive, design-driven process in which an integrated long-term approach leads directly to integrated projects in the ... innovative and transparent so that we can learn and be held accountable. That seems complex but it is simply necessary." ... wall could be elaborated in the context of Kusfeld:

Precaution

... to get to Kusfeld, potentially it ... to reach locations at Hel Peninsula it should be well protected. ... y would create a sound-buffer ... e for hanging elements.

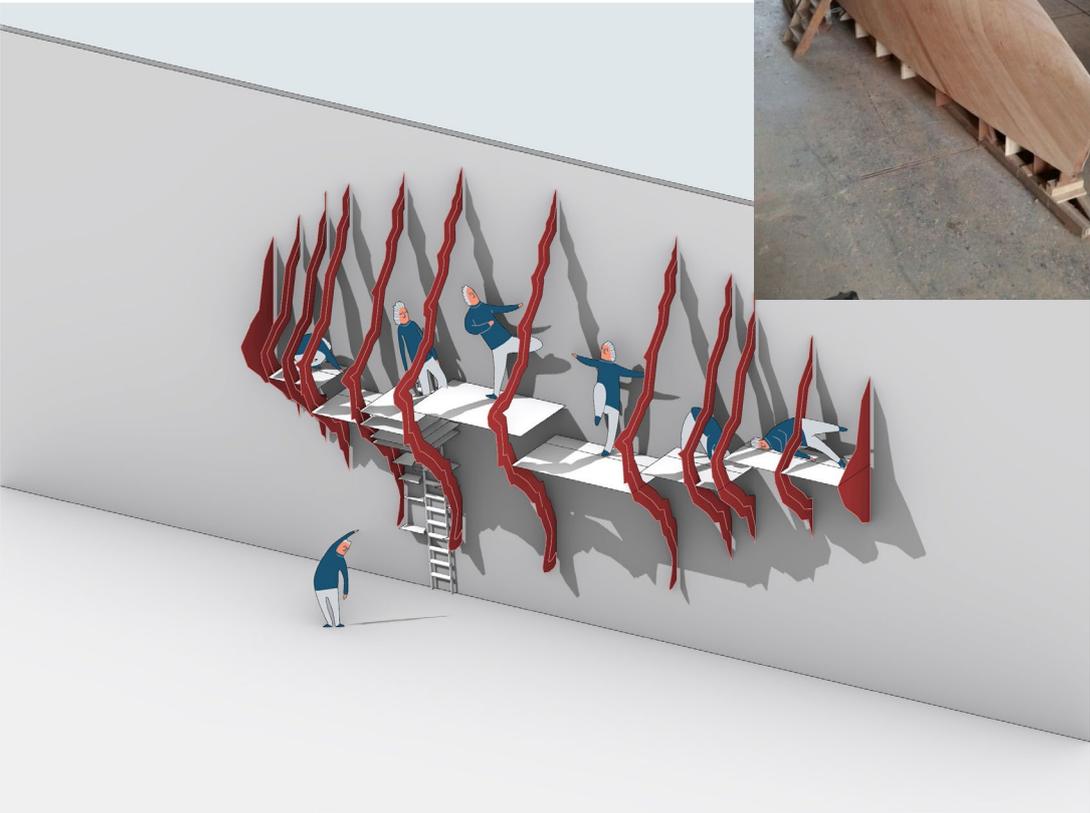
Wall as network

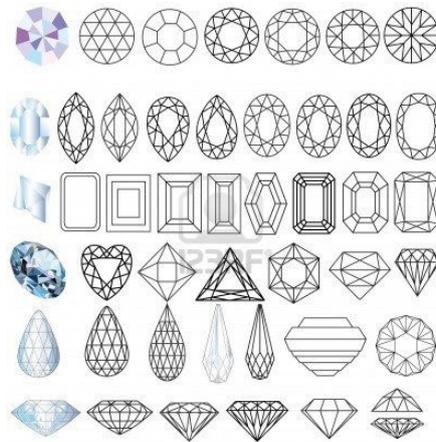
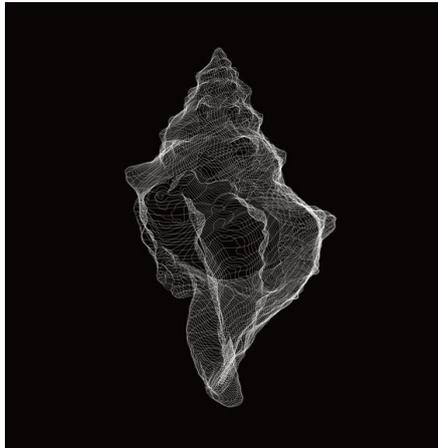
Kusfeld isn't different when it comes to fencing, we all tend to build protection around our properties, but what if houses and fencing would become a flood defense system? Filling in the gaps between the buildings with emergency walls would create a potential for small enclaves, internal courtyards, that could be filled with sand when sea level rises and become plateaus for future architecture



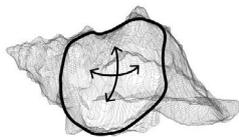


Living wall is response to the ever changing environment of Hel Peninsula and tourism as its main economy. It proposes elementary, inhabitable spaces that are hanged on a wall infrastructure - inherent element of flood-risked shoreline area. Initially served as spaces for new type of tourists, they could also provide small, off-grid dwellings or shelters in disaster areas. Living wall elaborates on the 'existence minimum', broadly discussed architectural discourse, offering yet another chance for less consumerism-driven way of being.



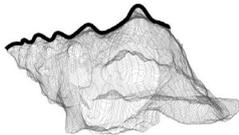


Form research also pointed me at diamond structures and shells



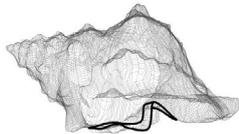
Curvature

Curvature lends strength to shell forms through the formal resistance of spherical and saddle forms and the ability of a single surface structures to deliver loads in multiple directions at the same time.



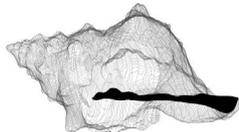
Corrugation

Corrugation of the surface transforms the plate structure into a series of hollow beams that vastly increase the spanning ability of the single surface and give direction to the applied forces



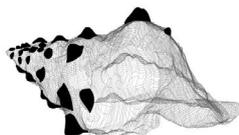
Distortion

Distortion of the surface adds strength to both the shell form and the corrugation by locking in stiffness and distributing the forces in different directions across the surface



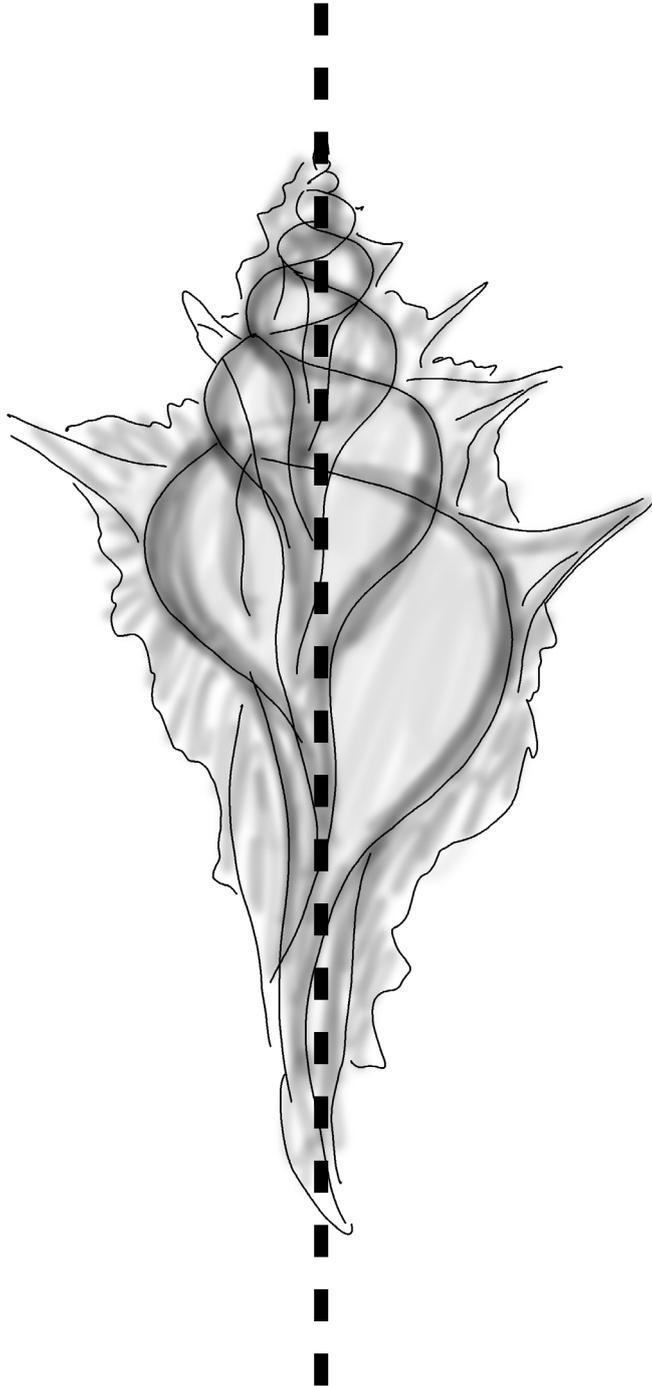
Stiffening

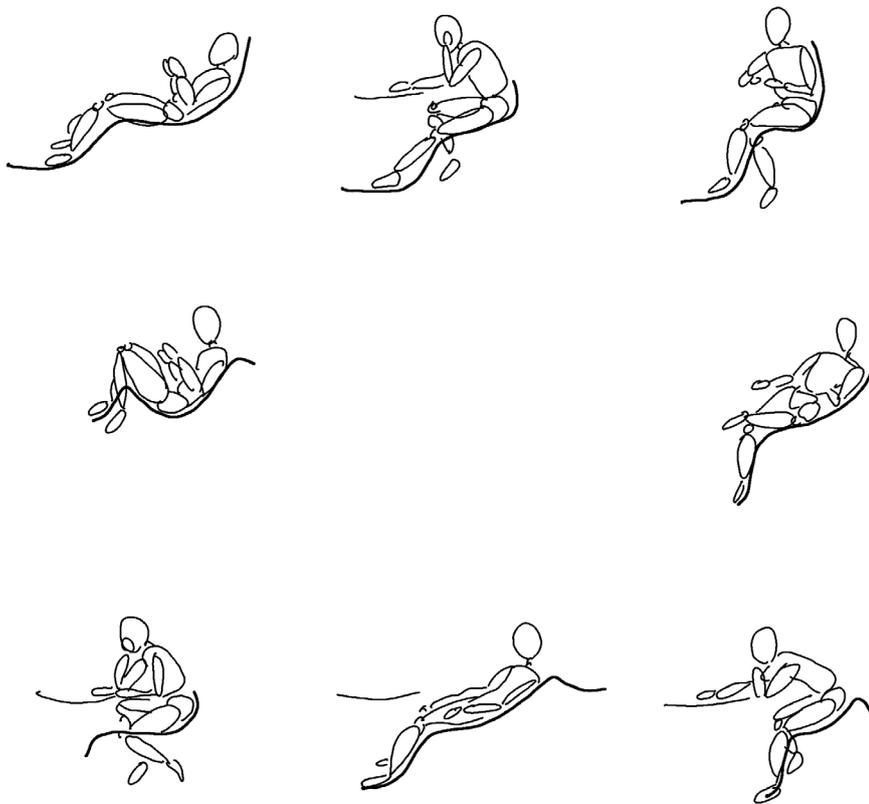
Torsion beams are created where the shells surface folds back on itself to make a hollow beam that often acts as a ring beam or core.



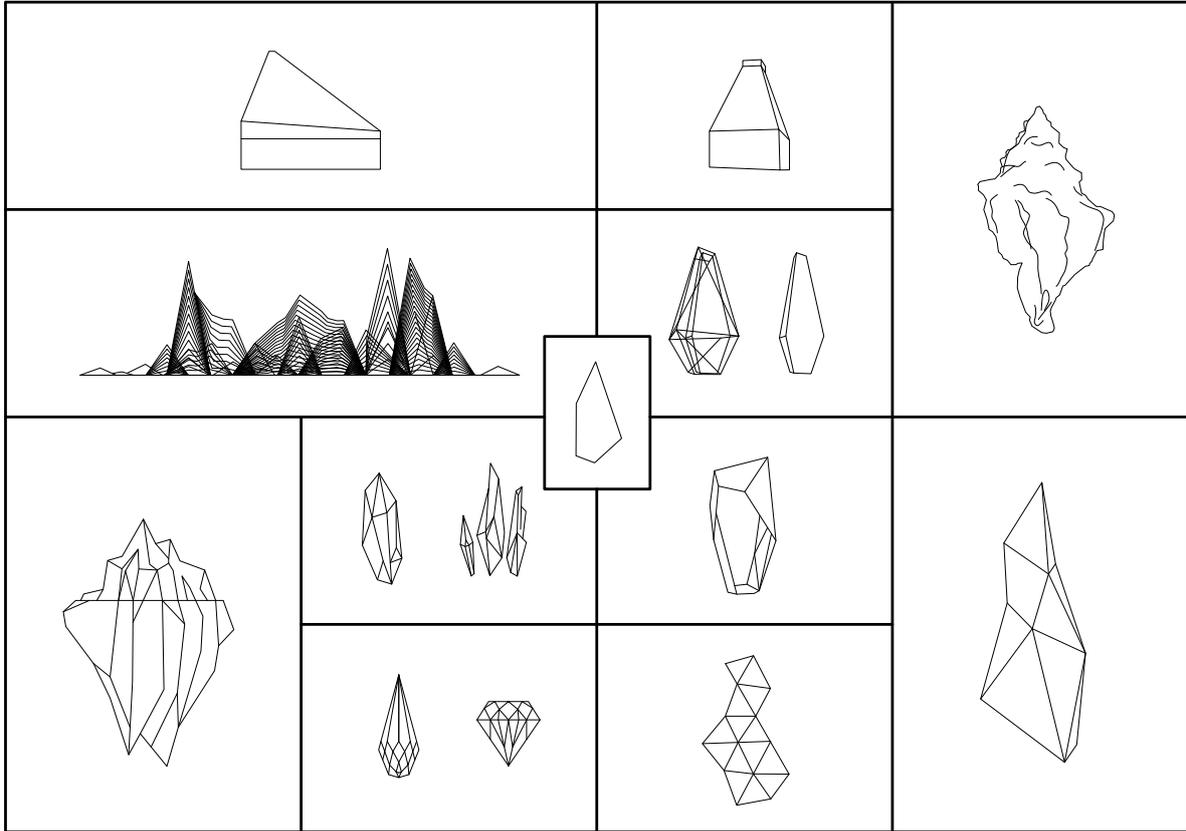
Nodules

Nodules rise up from the spherical form of the shell and the corrugation to add local stiffness that gives addition strength to the adjacent surface

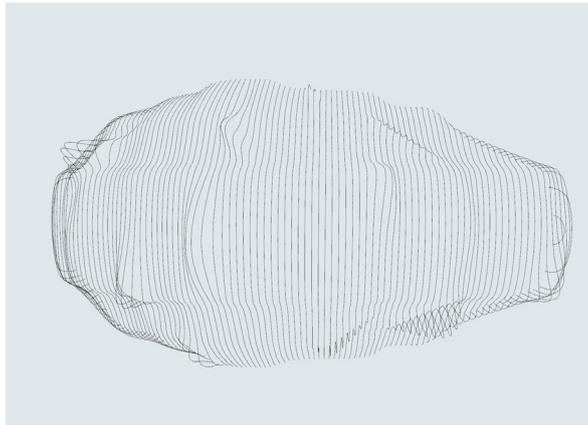
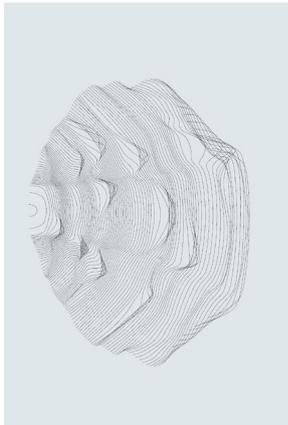
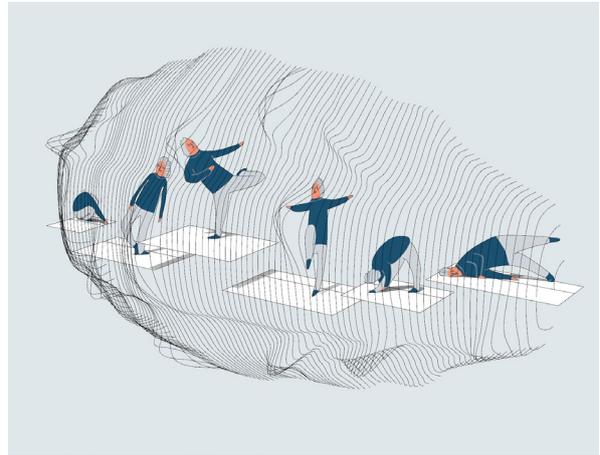




Following this fascinating study Living Wall mediates between analytical and intuitive process of a design in search for a minimal space for a shelter - the very basic concept of home - and looks spatial answer in loosely inspired form of a half-shelf - element that would perfectly find its application on a wall infrastructure.

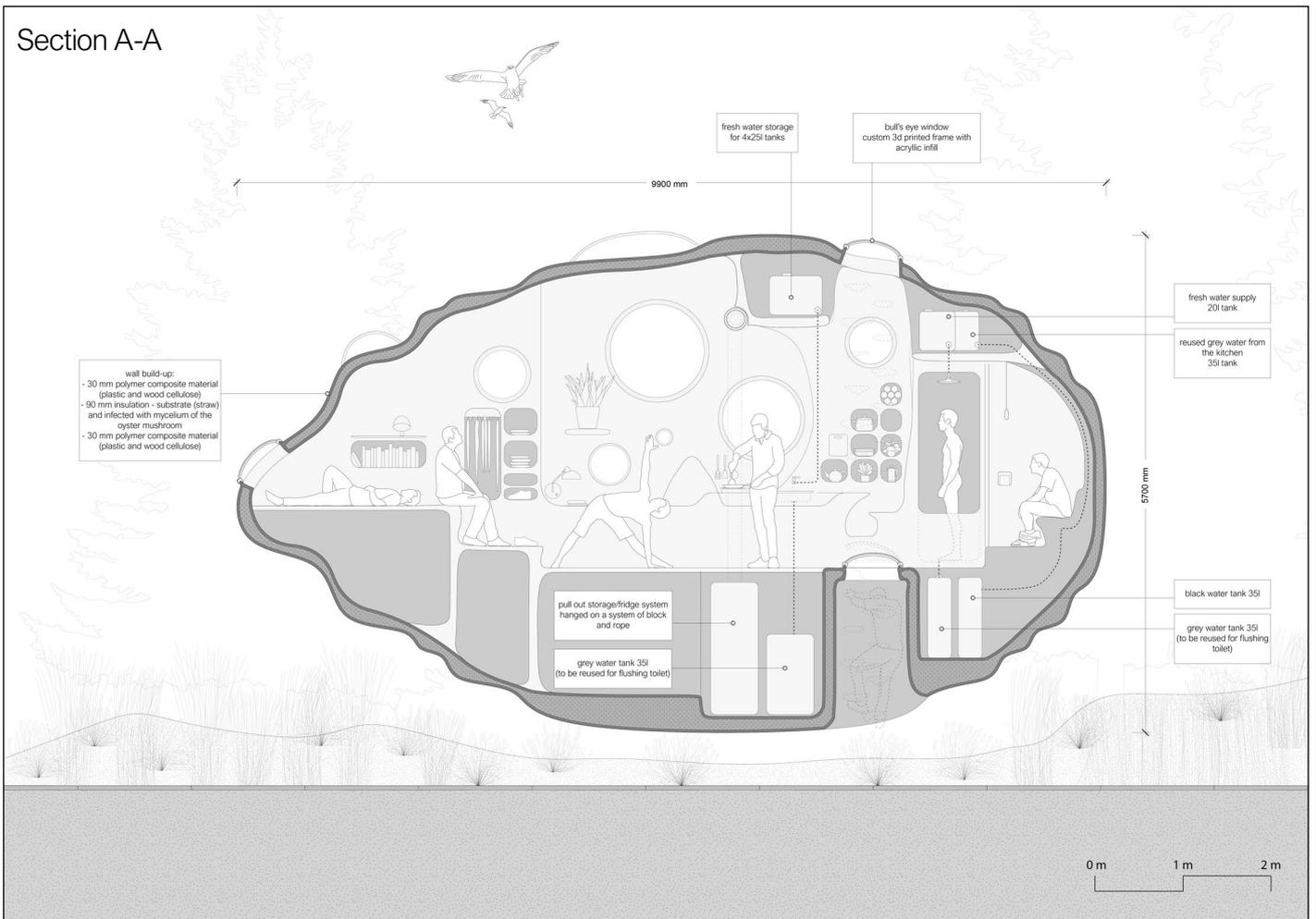


Form research led to the studies by Tonkin and Liu on shell lace structures. Architects of this London based practice elaborate in their book "The Evolution of shell lace structure" about the diversity of mollusks and their protective shells build with minimal material.

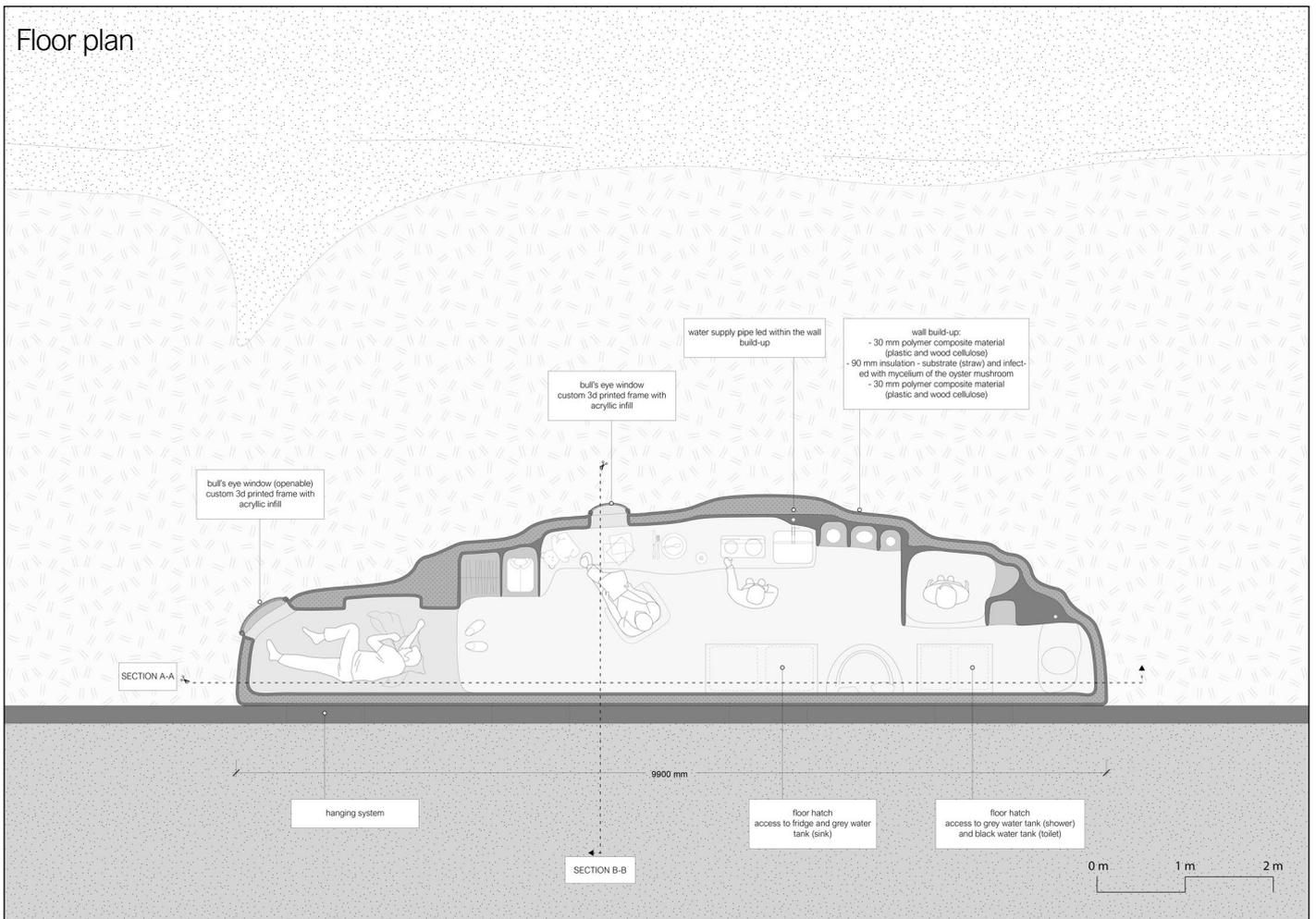


“Too often, in some melancholic appreciation of an object, we think of craft as a synonym for a rose-tinted past that can never be recuperated. But craft is an attitude; a way of doing things whose distinguishing attribute is taking pleasure in the life and resistance of materials and processes, and welcoming their implicit provocations to new ideas and forms.”(Tonkin, Liu) Living wall rejects the notion of right-angled architecture looking for spatial expression in more nature-inspired systems. With contemporary building techniques like 3d-printing at hand it enables to regain intuition while advancing production methods, increasing precision and developing craftsmanship of 21st century.

Section A-A

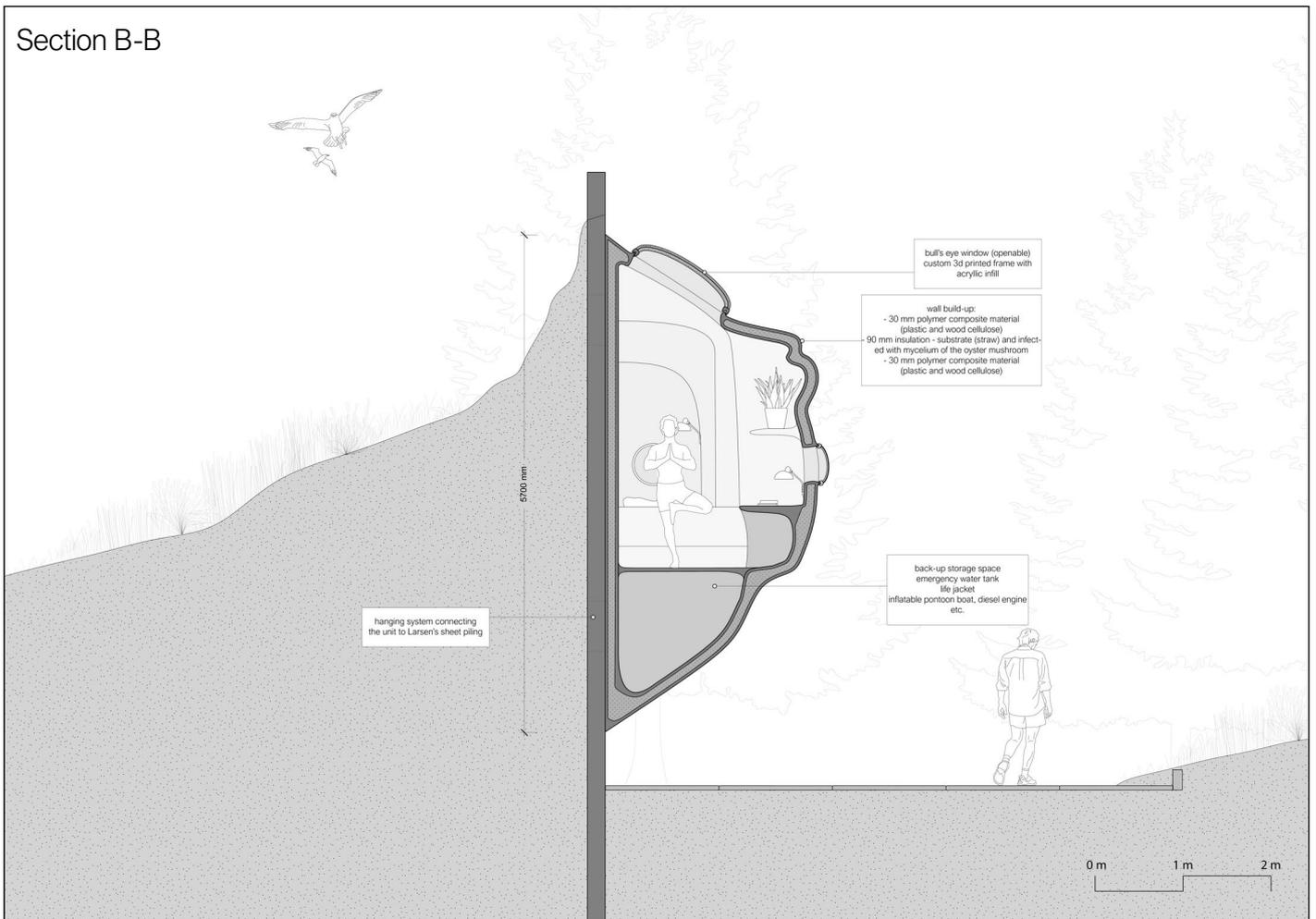


Floor plan





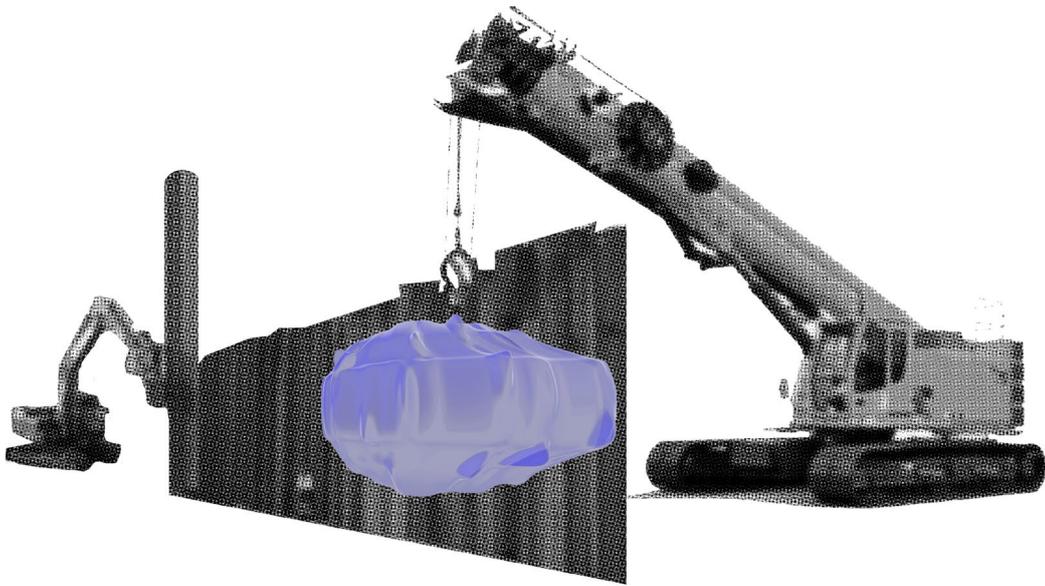
Section B-B





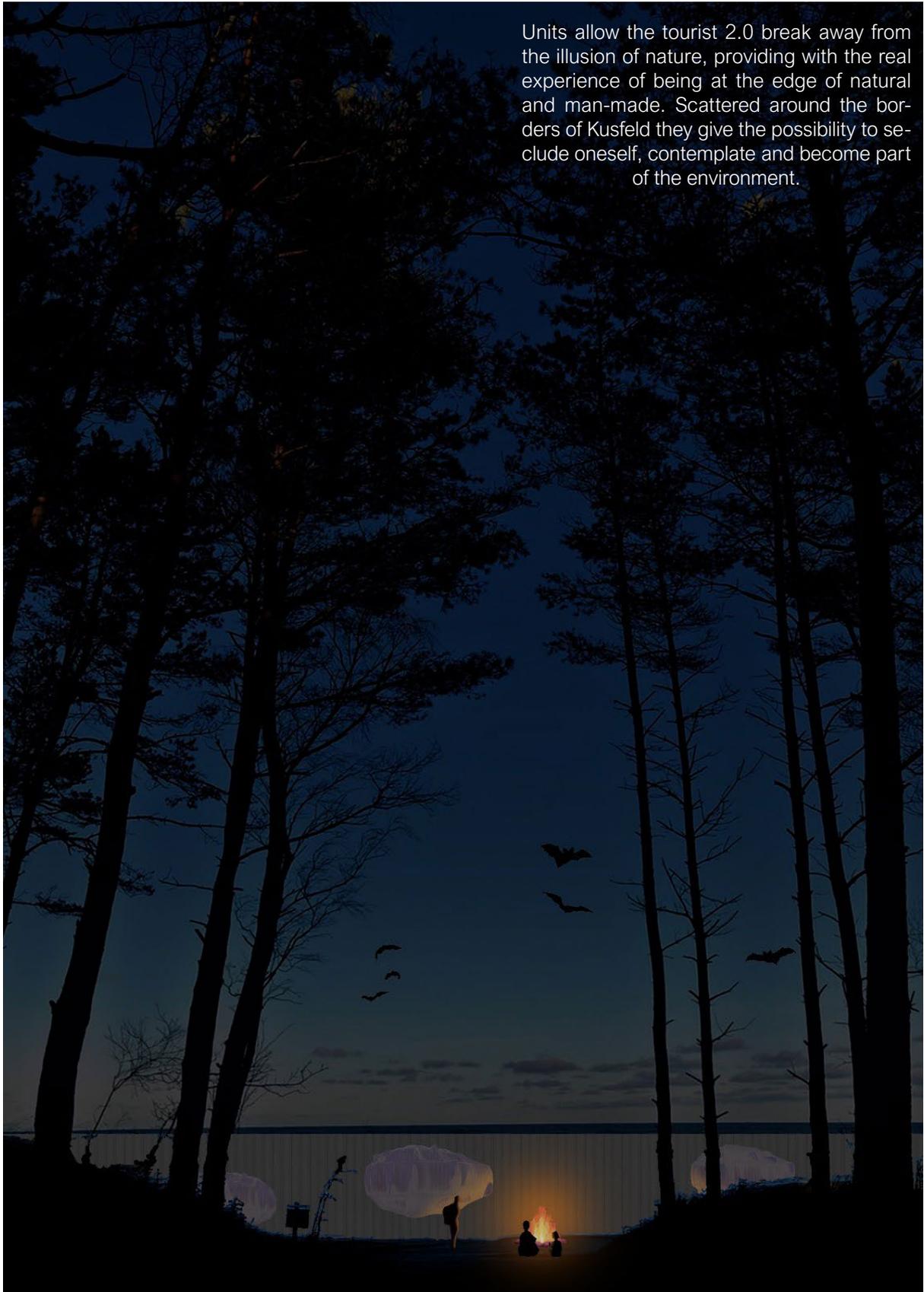
<https://www.mediamatic.net/nl/page/223025/filling-the-sample-of-the-3d-print-canal-house>

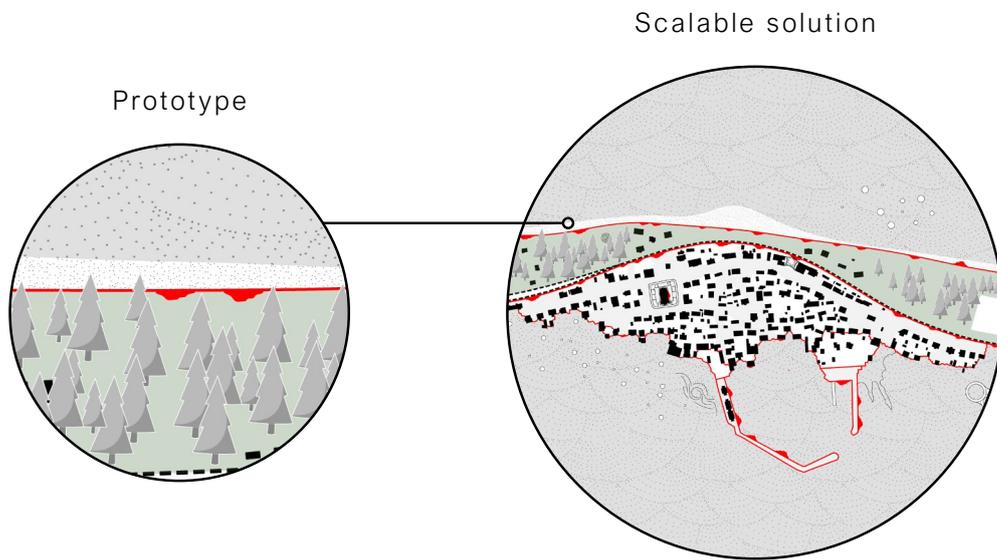
Printed from 30 mm thick mixture of a polymer and a wood cellulose both inside and outside the unit is thermally insulated by method developed and studied by DUS Architects which is: "by filling the piece with a substrate (straw) and infecting it with mycelium of the oyster mushroom. The mycelium starts to grow and in this way it 'glues' all the straw together. When it's fully grown, the mycelium insulates the piece." When outdated, print material can be entirely recycled in a shredder and re-printed into new designs.



Unit is pre-printed and hanged on the wall infrastructure by a crane and can be directly inhabited. It is off-grid meaning water supply is to be replenished by the inhabitant. 20-35l containers are part of the equipment and can be refilled in the local collective water tank. Simple concept of gravity for water flow and system of gray-water tanks that can be reused to flush the toilets and tanks allows for the most optimal, low-energy use of the unit. If required the unit can be provided with an facade-embedded solar panel providing the power for 13.5 kWh battery inside the shelter. Optimizing production process and amount of used material allows for the units to be a low-budget investment that could be started by the community, local government or crowd-funding initiative

Units allow the tourist 2.0 break away from the illusion of nature, providing with the real experience of being at the edge of natural and man-made. Scattered around the borders of Kusfeld they give the possibility to seclude oneself, contemplate and become part of the environment.





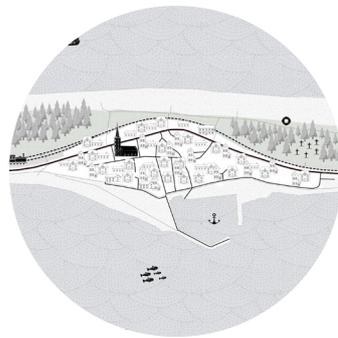
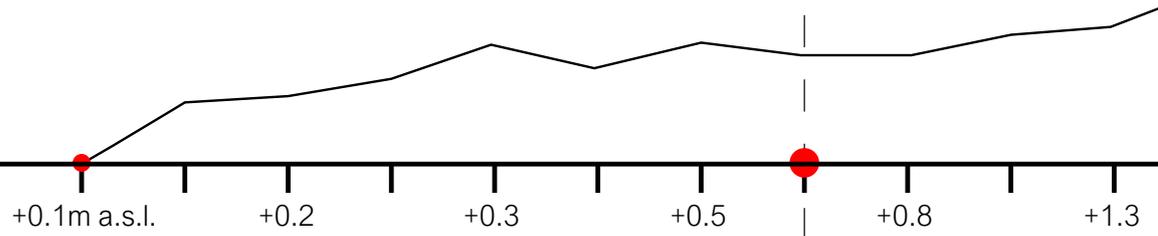
Imagined as a scalable solution, when first prototypes well worked out...
...it could be applied pretty much on any suitable wall

NOAH'S ARK 2.0

Noah

'Bottom of the sea' festival, is a series of two-fold interventions that react to authentic context of Kusfeld, yet making both local inhabitants and visitors aware about possible solutions for the sustainable future in flood-risked shore areas. It sets the mode for possibility of living in Kusfeld even when the sea level rises.

Living wall is responsive environment of Hel Peninsula economy. It proposes interventions that are hinged on the environment of flood-risked areas of tourist. It also elaborates 'minimum', broadly discussing offering yet another form of urbanism-driven



government

locals

maritime office

architect

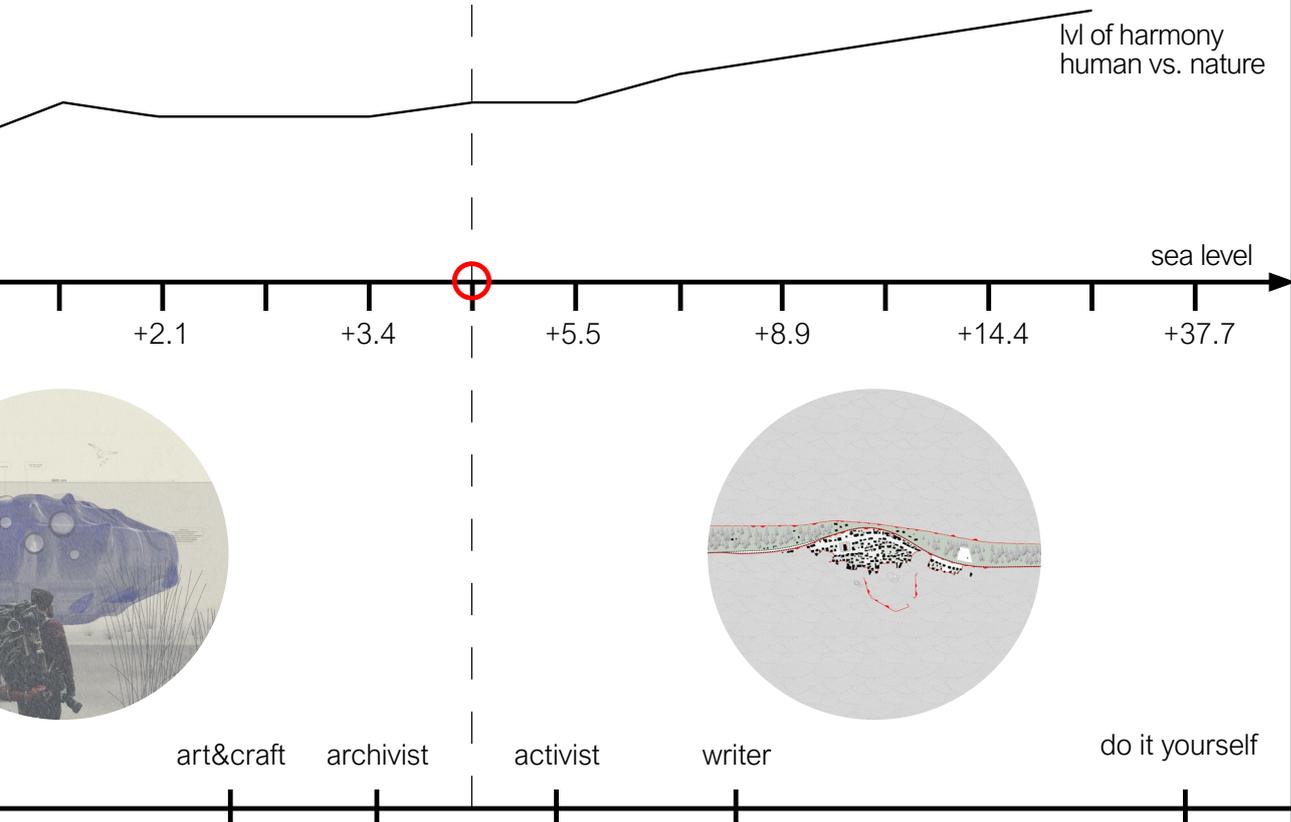
patrons

Following the idea of a timeline graduation project is treating a possible conclusion it kicks off with "Bottom of the sea" to act accordingly. Challenging their relationship with nature also secures the integrity of Peninsula and allows for

Noah's Ark 2.0

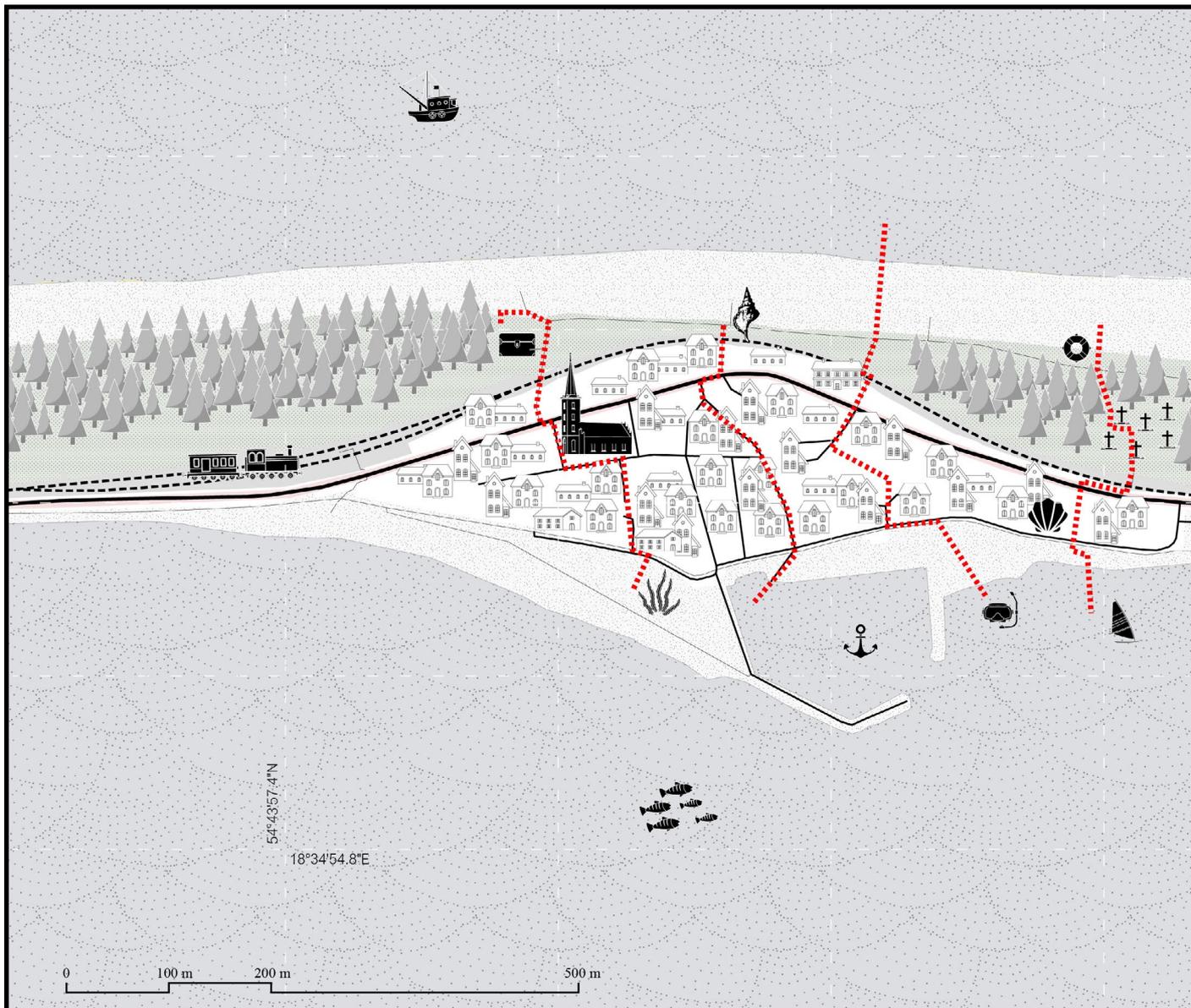
rise to the ever changing envi-
insula and tourism as its main
s elementary, inhabitable spac-
n a protective wall - inherent el-
d shoreline areas, for new type
oporates on the 'existence min-
ussed architectural discourse,
r chance for less consumer-
ven way of being.

Noah's Ark 2.0, a speculative masterplan is a blue-
print for Kusfeld of upcoming generations, settle-
ment affected by rising sea-level, climate changes
and new socio-economical models. It challenges
humankind's relationship with nature and revises di-
saster-prevention in areas prone to climate chang-
es. It also works as a trigger and navigation instru-
ments for other interventions.

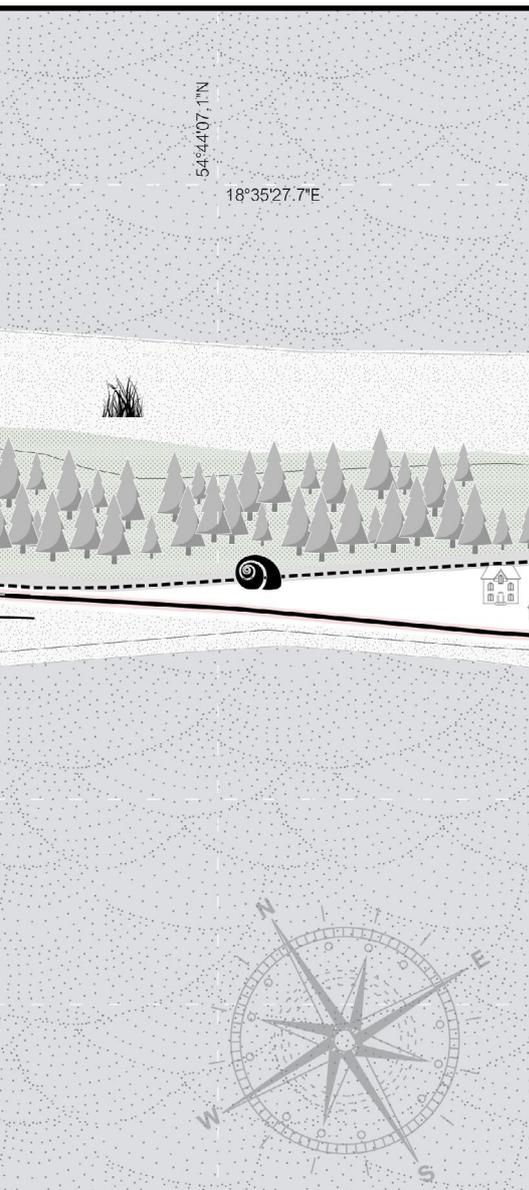


ated as a tail of expanded undertaking. With Noah's Ark 2.0 as
"festival" by raising awareness and inspiring local community
nature and proposing new model for tourism with Living Wall it
for Kusfeld to stay on the map even with sea level rising.

BOTTOM OF THE SEA FESTIVAL



'Bottom of the sea' festival, is a series of two-fold interventions that react to authentic context of Kusfeld, yet making both local inhabitants and visitors aware about possible solutions for the sustainable future in flood-risked shore areas. It sets the mode for possibility of living in Kusfeld even when the sea level rises.



“Bottom of the sea” festival

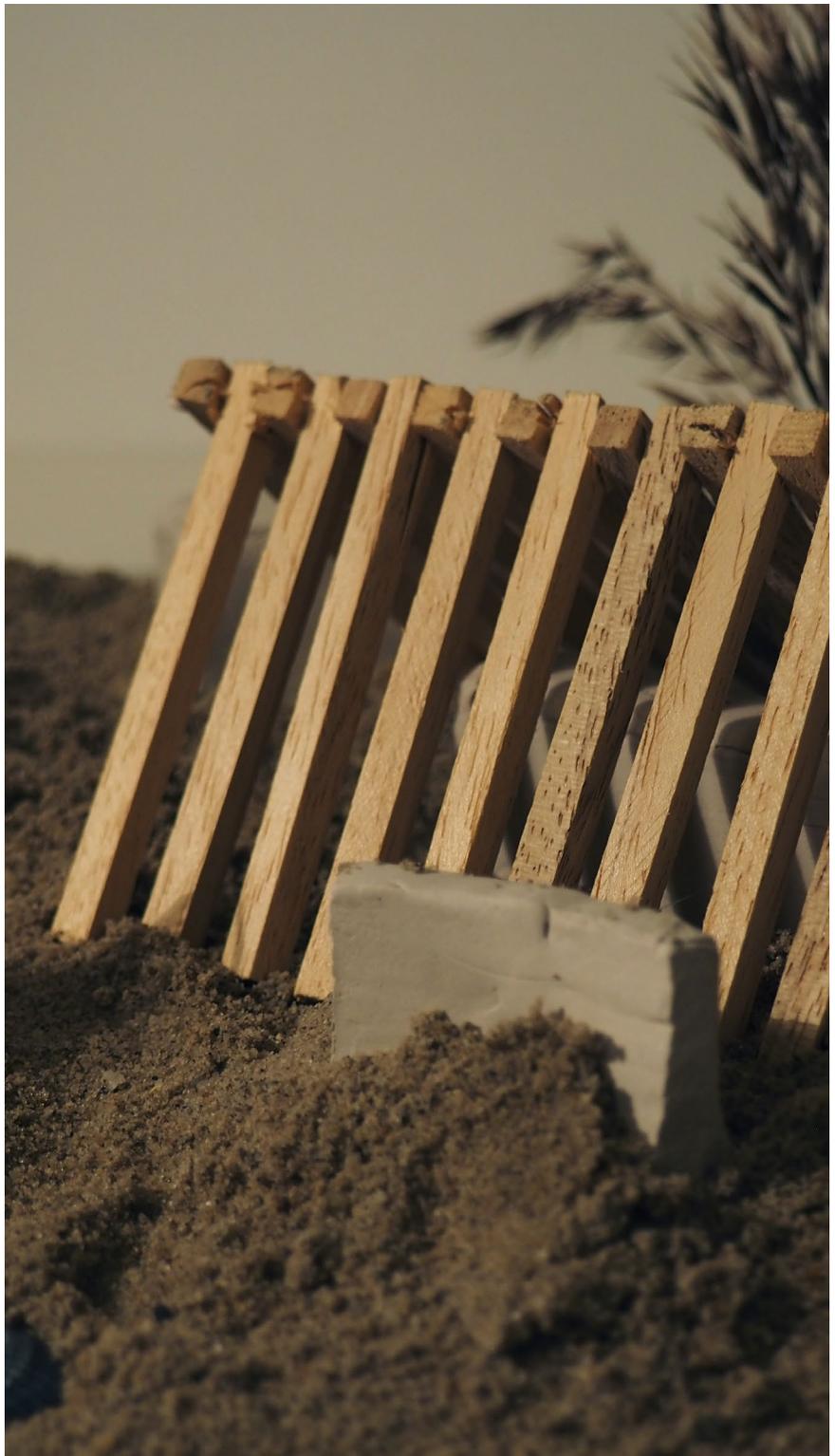
#accessibility #awareness #temporariness

	Church , as the main gathering spot it can work as an exchange hub. Small, scale, foldable, temporary, wooden standpoint create an every Sunday market.		Bio reef is the first trial on habitat regeneration. Dozens of bio rocks were positioned next to the “Small beach” of the bay allowing for local marine species to flourish again. How about snorkeling?
	Train station is beginning and end of every Kusfeld visitor's journey.		Emergency Vault , do you know how much food 600 people would need for 28 days? You can check in the underground storage on the Hill that goes as deep to the ground as the Church tower to the sky
	Fishing boats are to be seen on the horizon every morning, stay at Kusfeld gives the opportunity to try this almost vanished profession in its modern way		Clam , emergency wall that networks neighbors of Kusfeld into small enclaves, future islands. See how a flood protection can be assembled in short time.
	Harbor is a safe place for all the floating vehicles. It also a live exhibition of contemporary developments in shared mobility, incl. electrical ferries etc.		Seaweed playground , seaweed is the future of nutrition, this rack like structure can serve as a playground, wind protection and drying frame for the sea harvest.
	Snail , is a prototype of a hanging storage space. Located in the protective railway wall just behind the info-centre it contains supplies for the emergency state.		Hexaplex , prototype of a inhabitable unit on a small section of a Living Wall.
	Cemetery , place of reflection. Take a quiet walk, visit those who build this place and reflect upon the past and the future of Kusfeld.		Watersports , becoming not only the main activity, but for some even a way of transport. Learn how to kite, windsurf or just paddle properly at the sport-centre
	Fish used to be the main nutrition supply back in the days. Today they amount for only addition in our diets. See if u can catch one with a rod.		Marram grass , catching the sand at the frontline of a dune, this species is of big importance for the integrity of shoreline. Help us planting those along the sea.

'Bottom of the sea' festival, is a series of two-fold interventions that react to authentic context of Kusfeld, yet making both local inhabitants and visitors aware about possible solutions for the sustainable future in flood-risked shore areas. It sets the mode for possibility of living in Kusfeld even when the sea level rises.







SEAWEED PLAYGROUND

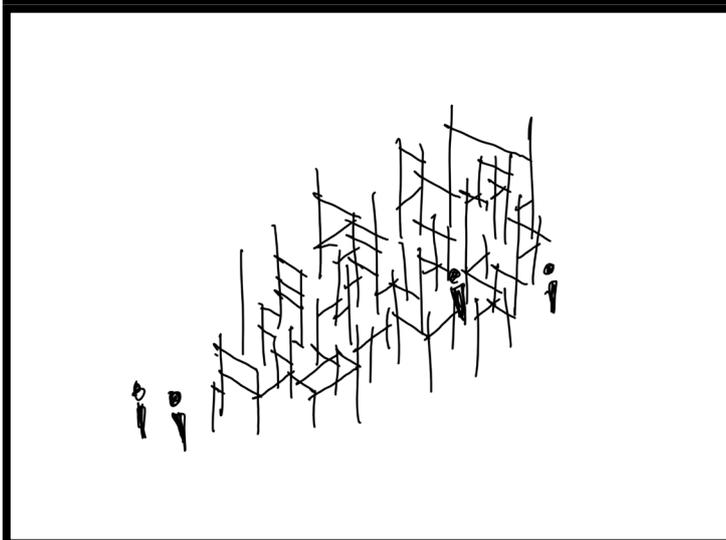


Seaweed playground

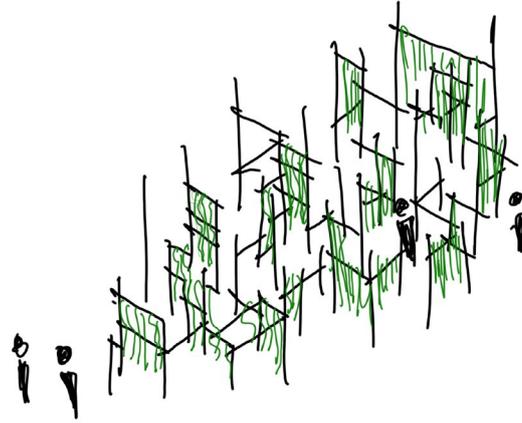
future of nutrition, the
ture can serve as a
protection and drying
harv



We'll be growing
tons by 2050

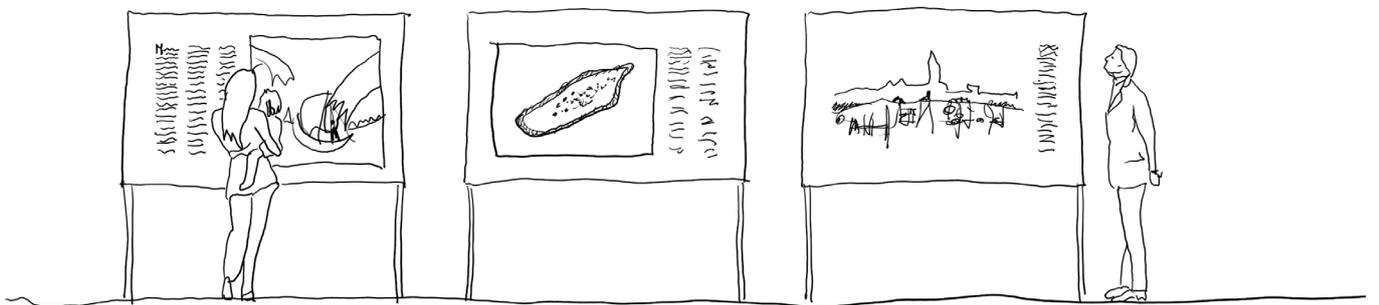


und, seaweed is the
this rack like struc-
a playground, wind
ng frame for the sea
vest.



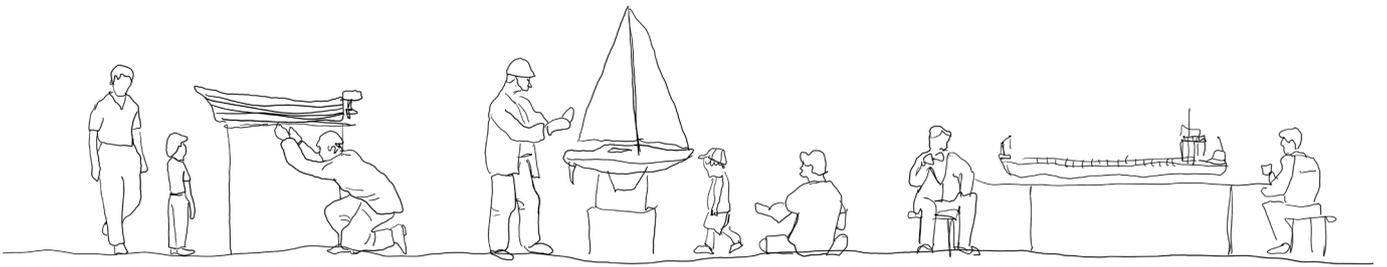
owing **500 million**
50,





1. EXIBITON

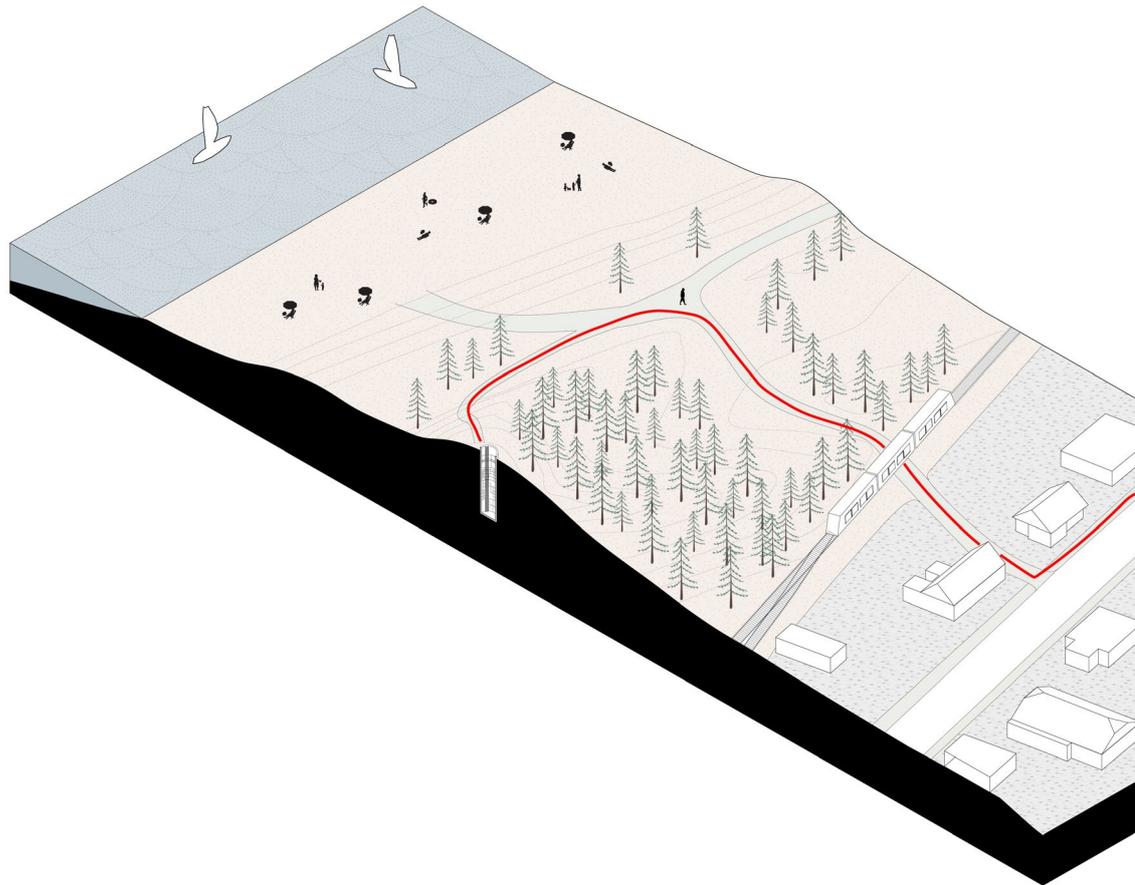
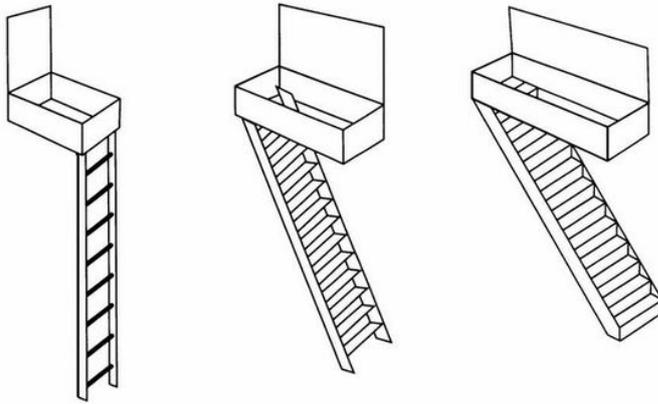
Purpose: raising awareness, sharing reflections
Possible location: church (as main location for community gatherings)



2. WORKSHOP

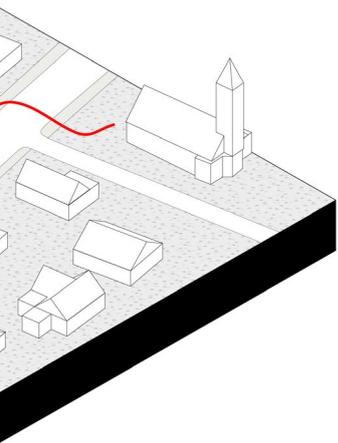
Purpose: reviving interest in boat buildings skills
Possible location: info centre as current art gallery and
workshop organizer and event holder

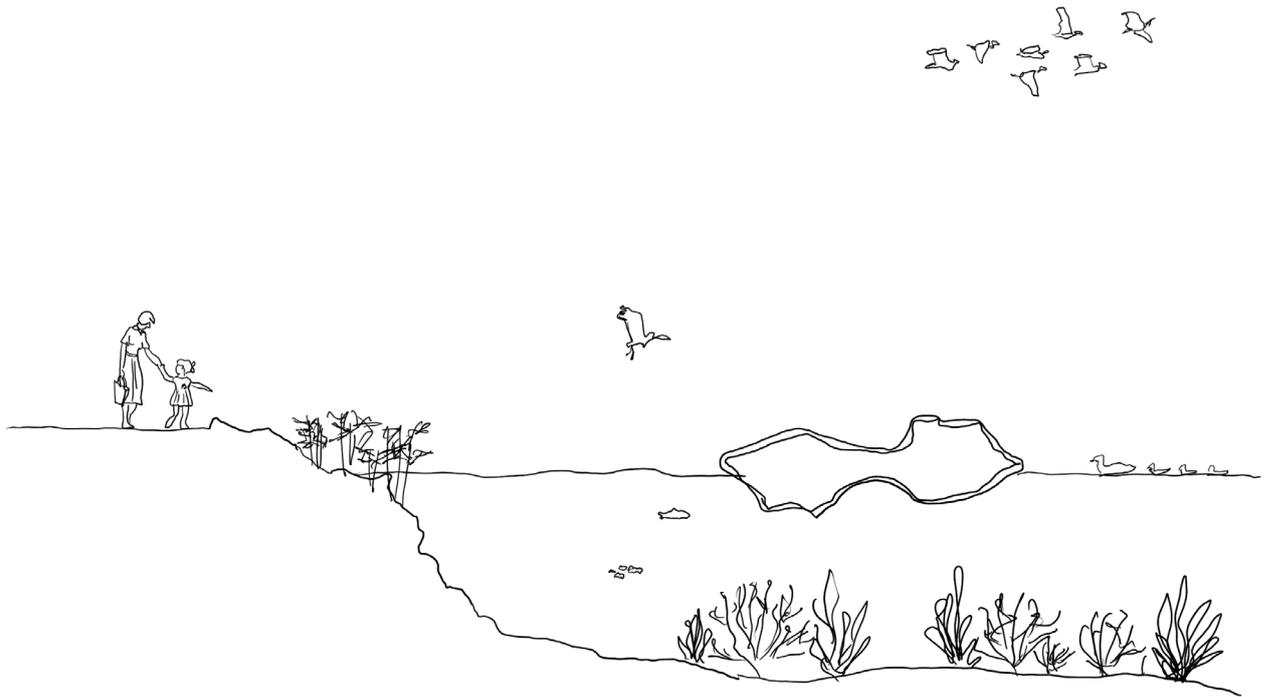
EMERGENCY VAULT





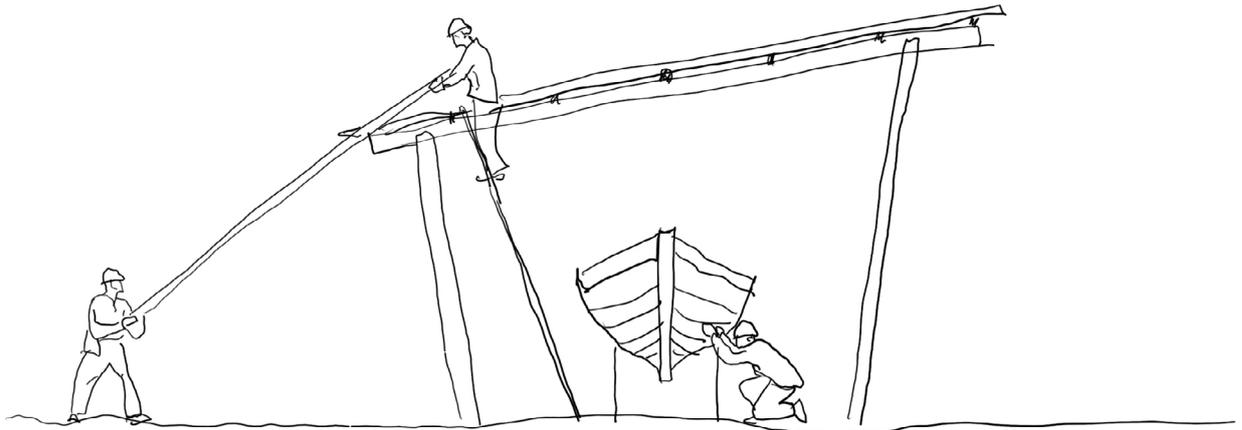
Emergency Vault, do you know how much food 600 people would need for 28 days? You can check in the underground storage on the Hill - highest point of Kusfeld, reaching up to 12 m a.s.l. Emergency vault goes as deep to the ground as the Church tower to the sky. Its main task to reinforce the hill and store the treasures of the Kusfeld community it is also the very last place several people could seek shelter. Building such structure would allow to examine several building techniques for air-tight spaces.





3. MOCK-UP

Purpose: skill transfer, experimenting
Possible location: bay as experiment field for floating structures



4. PAVILION

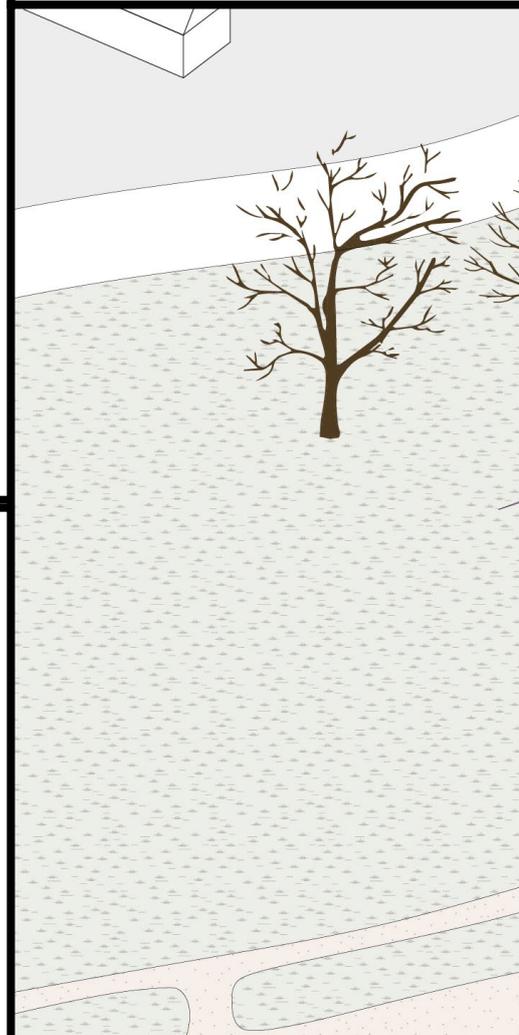
Purpose: trigger toward resilient thinking, revival of boat building skills, communal space

Possible location: symbolic location next to the harbour

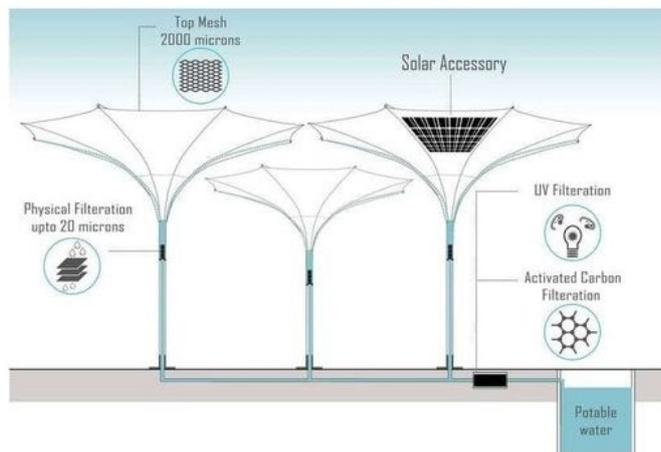
COLLECTIVE WATER TANK



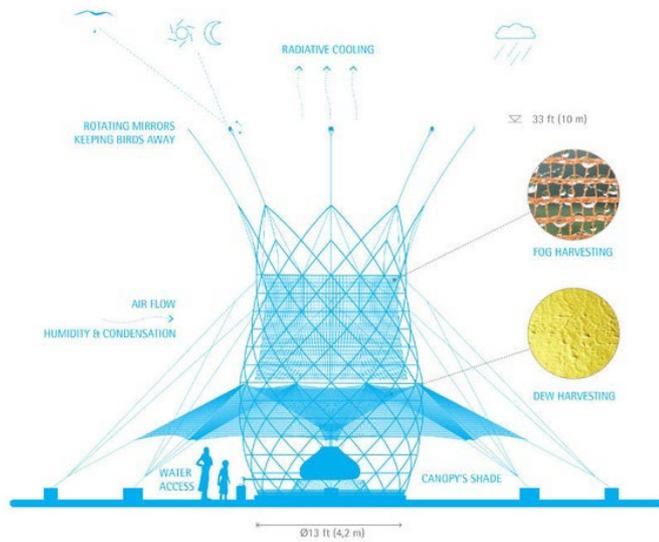
Collective water tank,
cept of stitched, recycle
both as a shading eleme
rain water, providing th
source for the users of Li



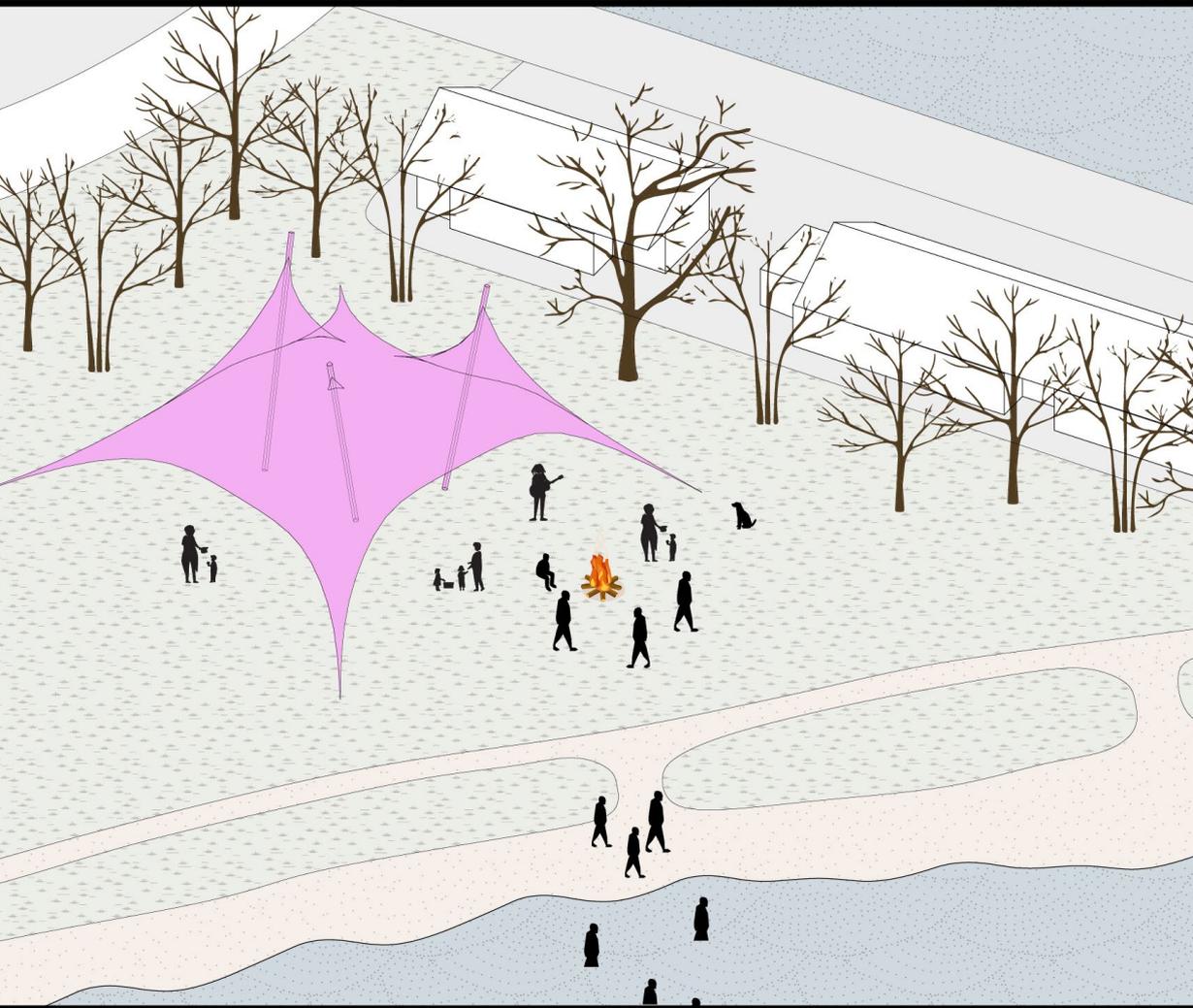
How it Works

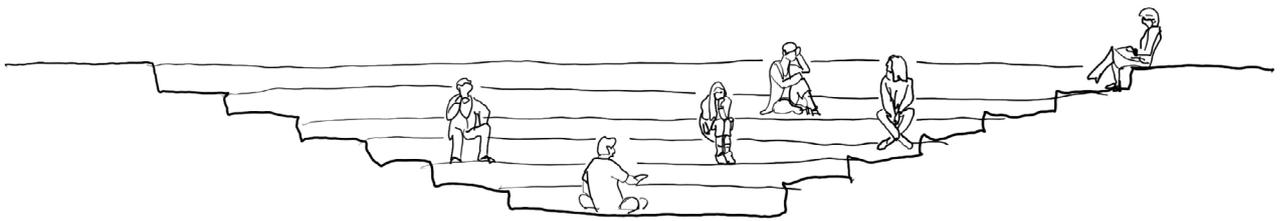


very simple con-
ed sails that work
ent but also collect
his necessary re-
iving Wall units



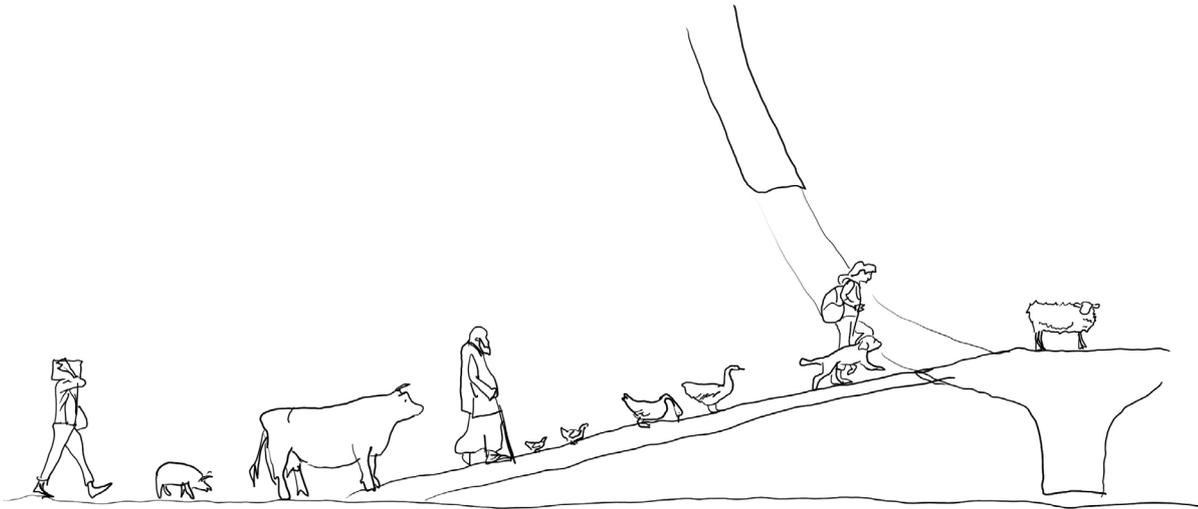
<https://www.wired.com/2015/01/architecture-and-vision-warkawater/#slide-id-1697291>





5. FORUM AND "BOTTOM OF THE SEA" FESTIVAL

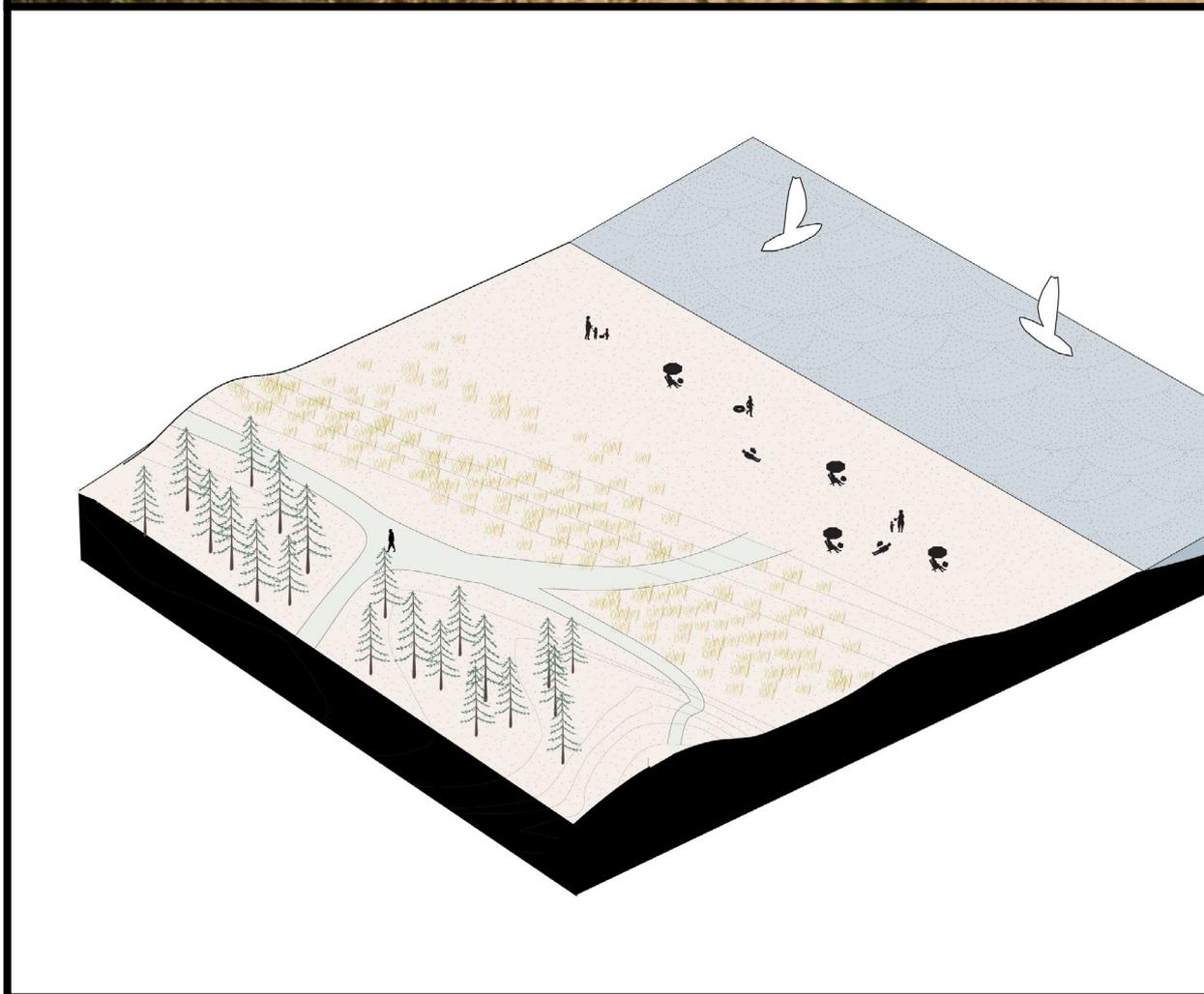
Purpose: communal space for the whole settlement
Possible location: higher dunes next to main entrance to the beach (+ 6-11 m a.s.l)



6. SANCTUARY

Purpose: resilient thinking, profound understanding
Possible location: higher dunes next to main entrance to the
beach (+ 6-11 m a.s.l)

MARRAM GRASS



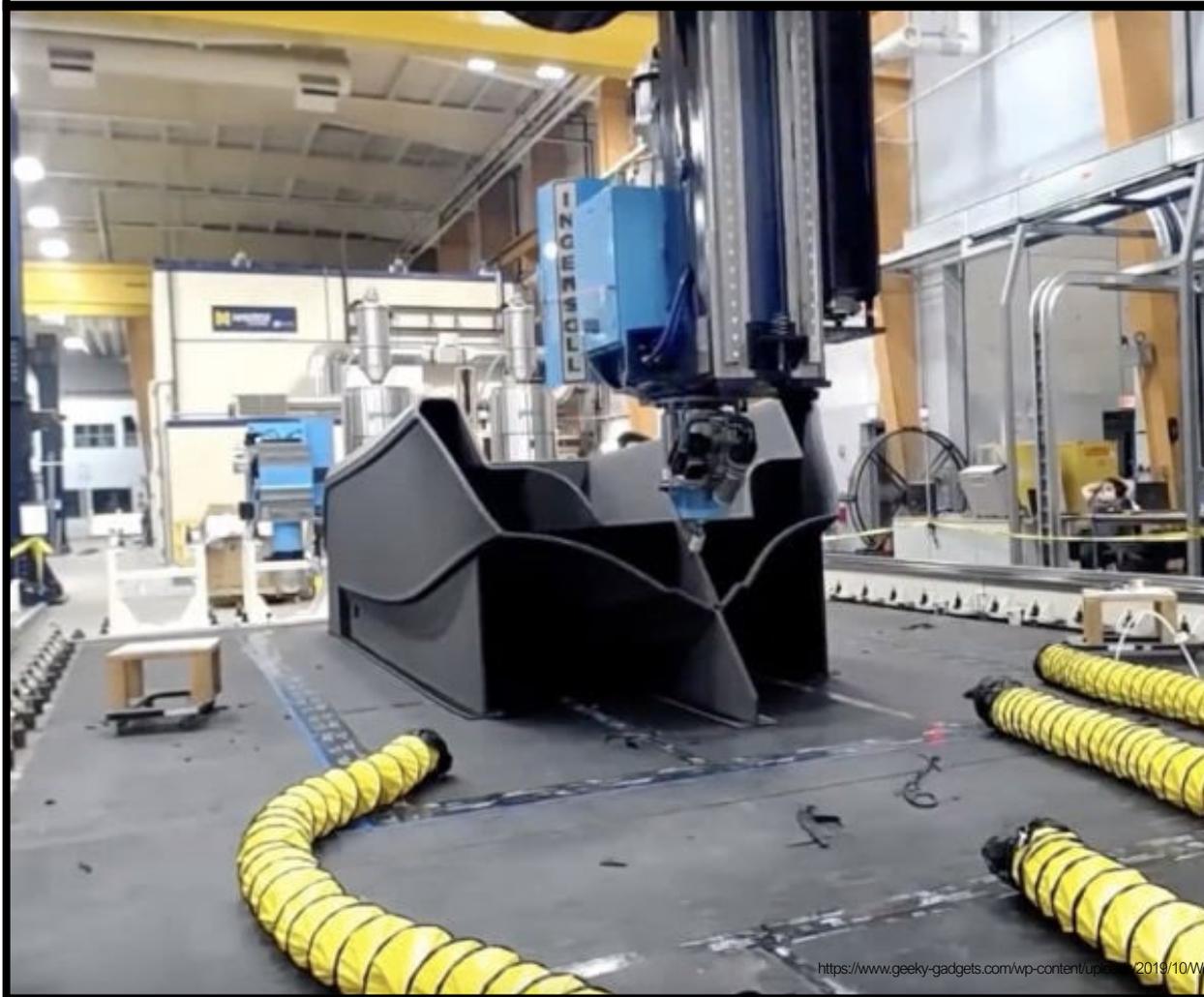


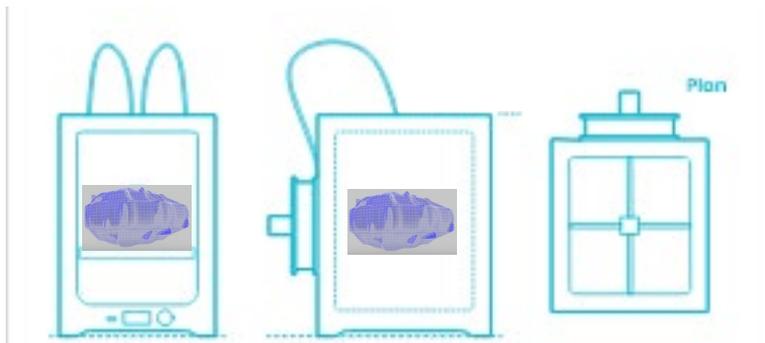
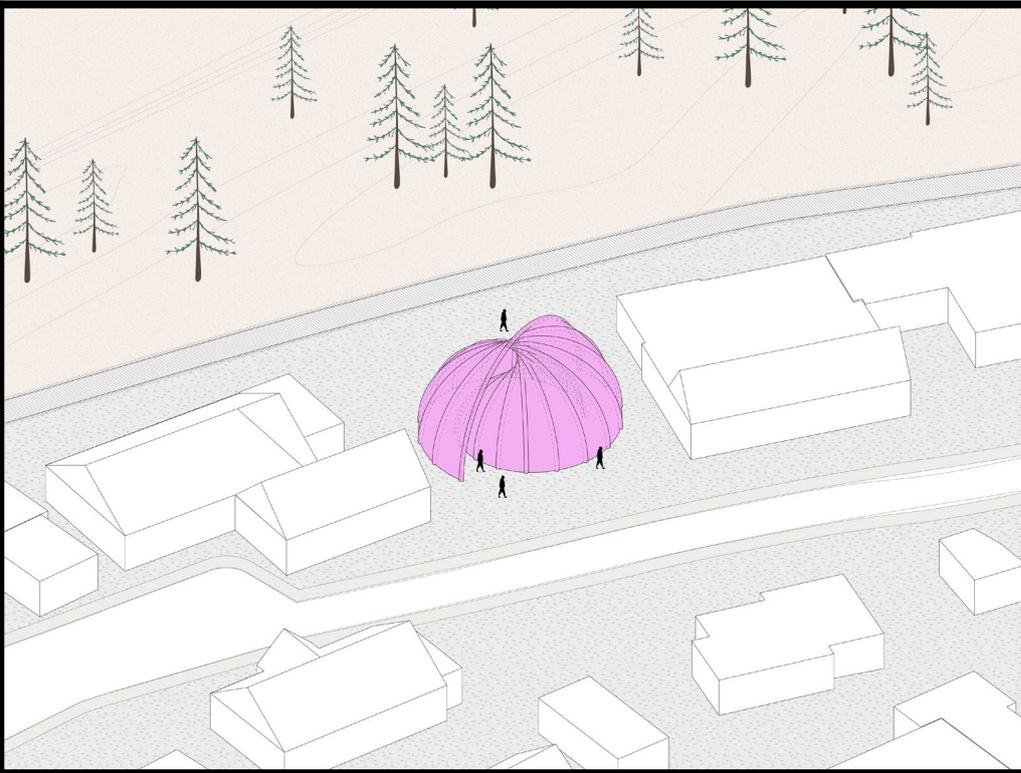
Ammophila is a genus of flowering plants consisting of two or three very similar species of grasses. The common names for these grasses include **marram grass**, bent grass, and beachgrass. These grasses are found almost exclusively on the first line of coastal sand dunes.

Marram grass, catching the sand at the frontline of a dune are of big importance for the integrity of shoreline. Help us planting those along the sea.

3D PRINTING WORKSHOP

Living wall units are pre-printed and hanged on location. **Printing workshop** could be located next to the old school, reviving the idea of learning new skills at this particular location. It is also optimally positioned in the context of Kusfeld and in terms of supplies - vicinity of road and railway. Contemporary 3d printers are able to print up to 30 meter long and few meter high objects with the minimum required materials.

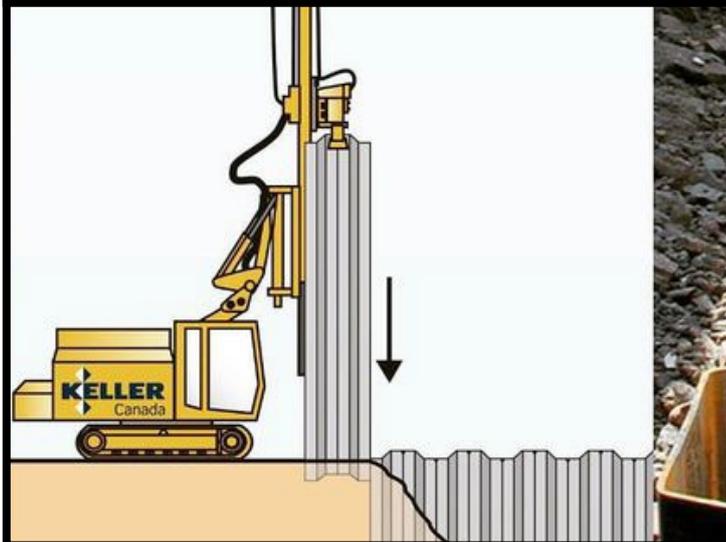
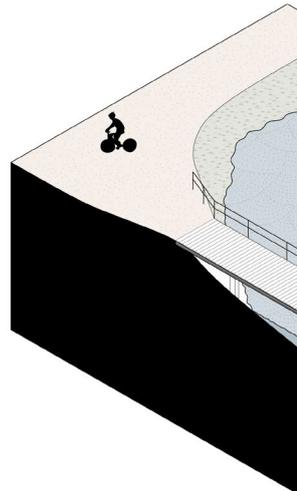




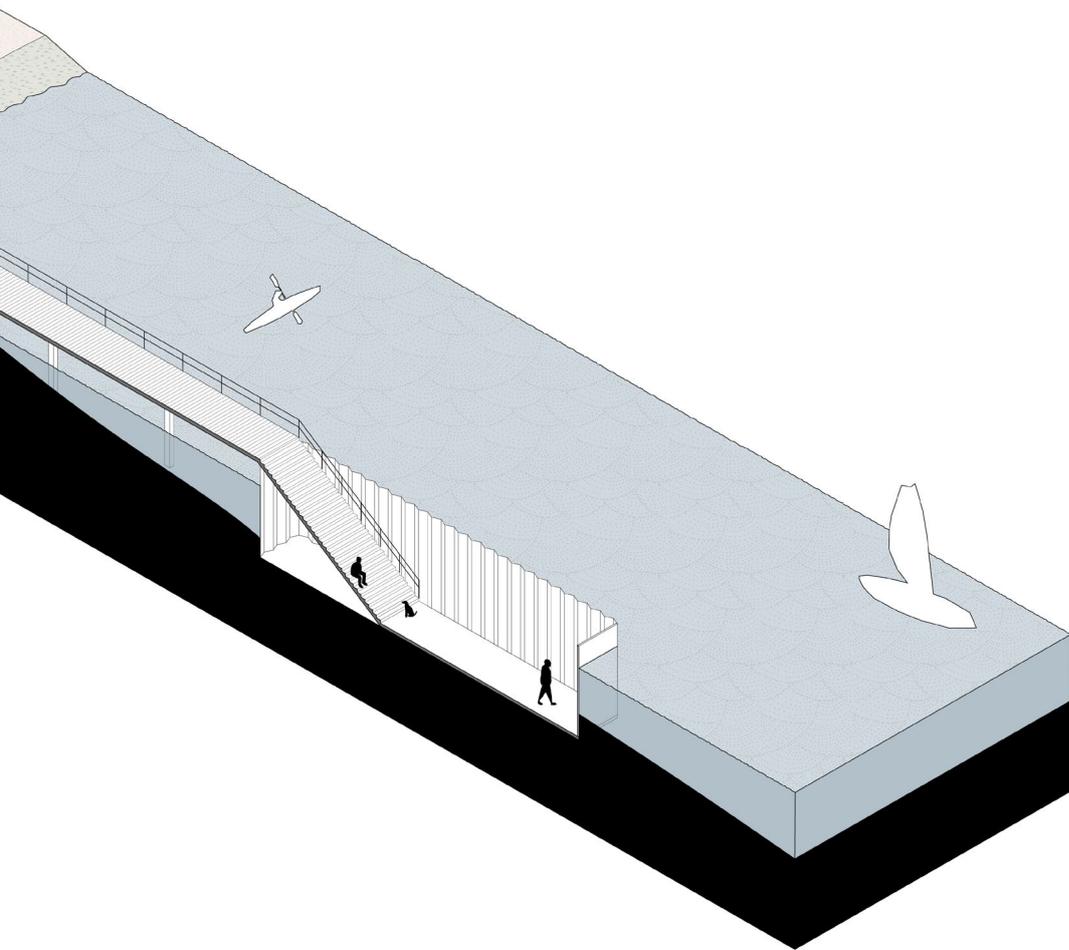
DRY DOCK

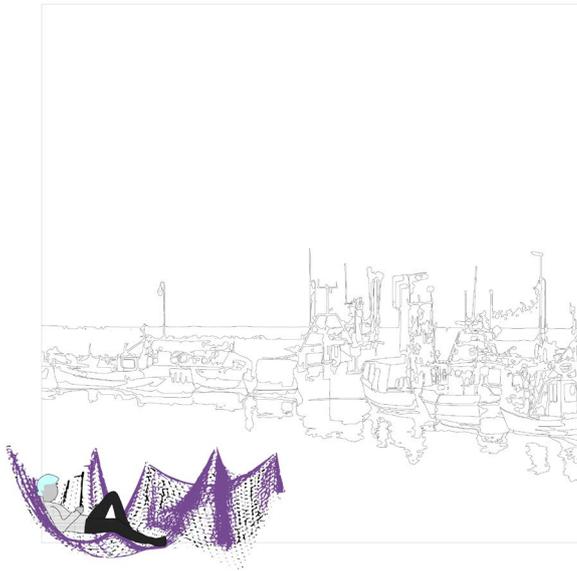


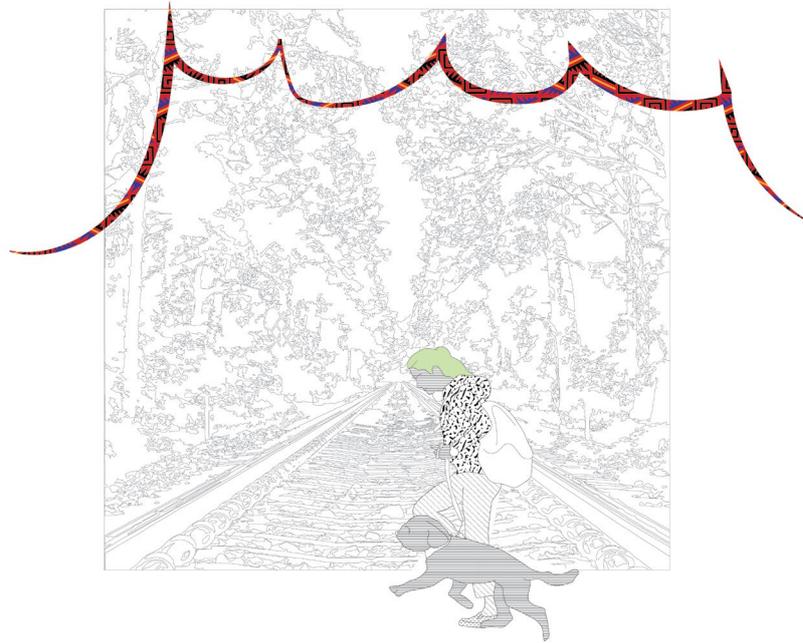
Dry dock
How does
center of K
under the
platform fo



– toolbox for imagination - How is it to be under the sea level?
the bottom of the sea look like? Located next to the cultural
Musfeld is Dry Dock - installation allowing the viewer to go down,
sea level and experience fearful forces of the Sea. It is also a
r the Festival exhibition.







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Kusfeld
Gardens in the sea





Scaffolding-like structures located on peripheries work as infrastructure for placing crates and cages needed for all kind of mollusks farming.



Square around the church becomes the main meeting space for gatherings - a local forum where the communal decision making is happening.



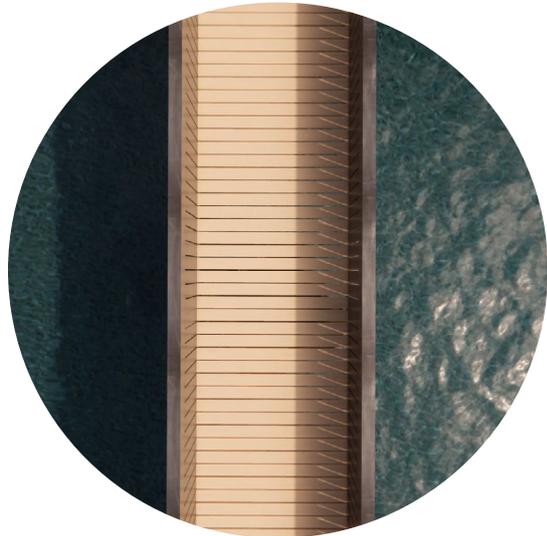
Overproduction of food, but also the stockpile for harsh seasons and emergency case is stored on the highest hill in a few meter deep, bunker-like vault.



The main street of Kusfeld becomes a Canal Grande. With its parking spots for boats it creates a floating market.

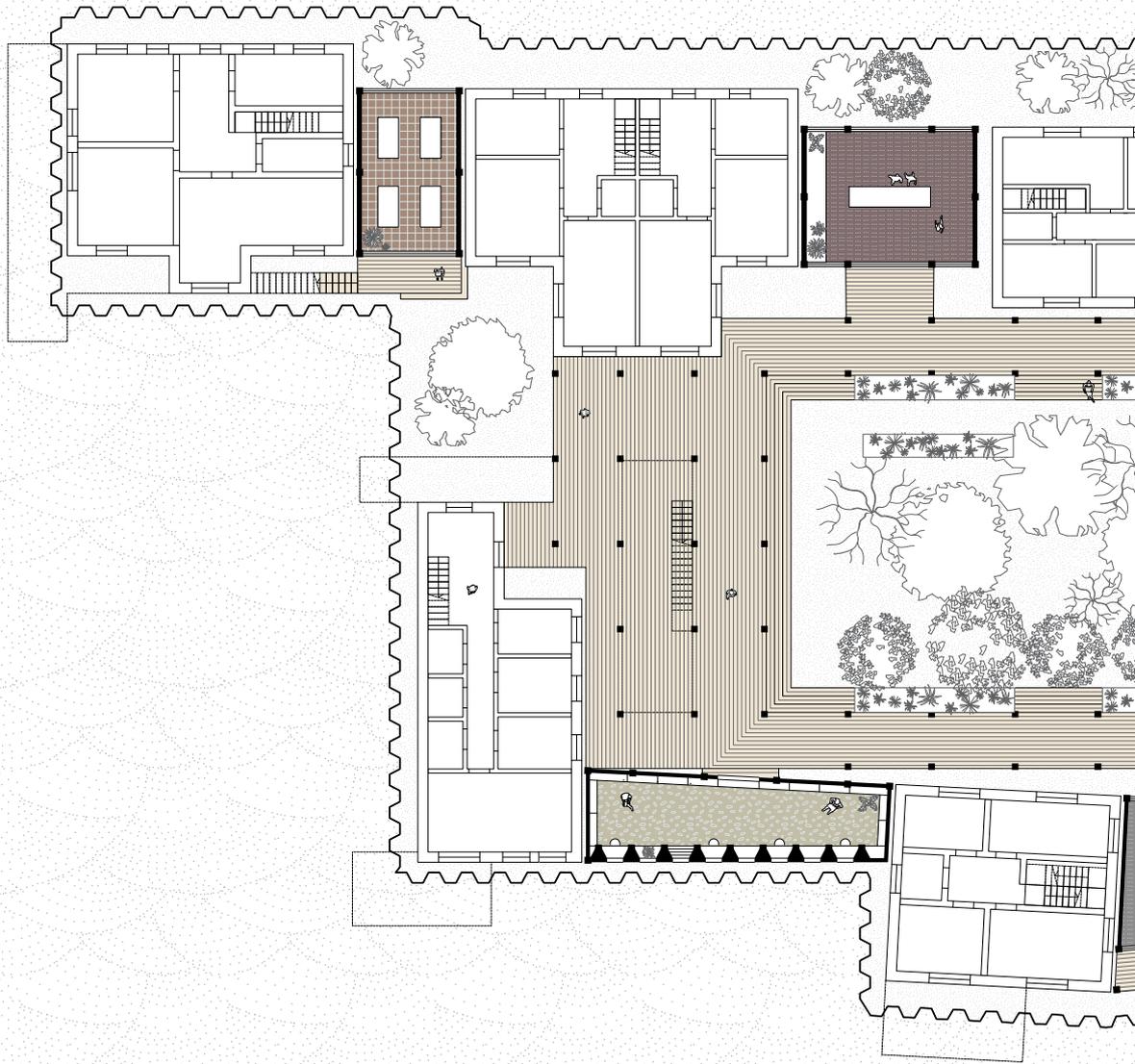


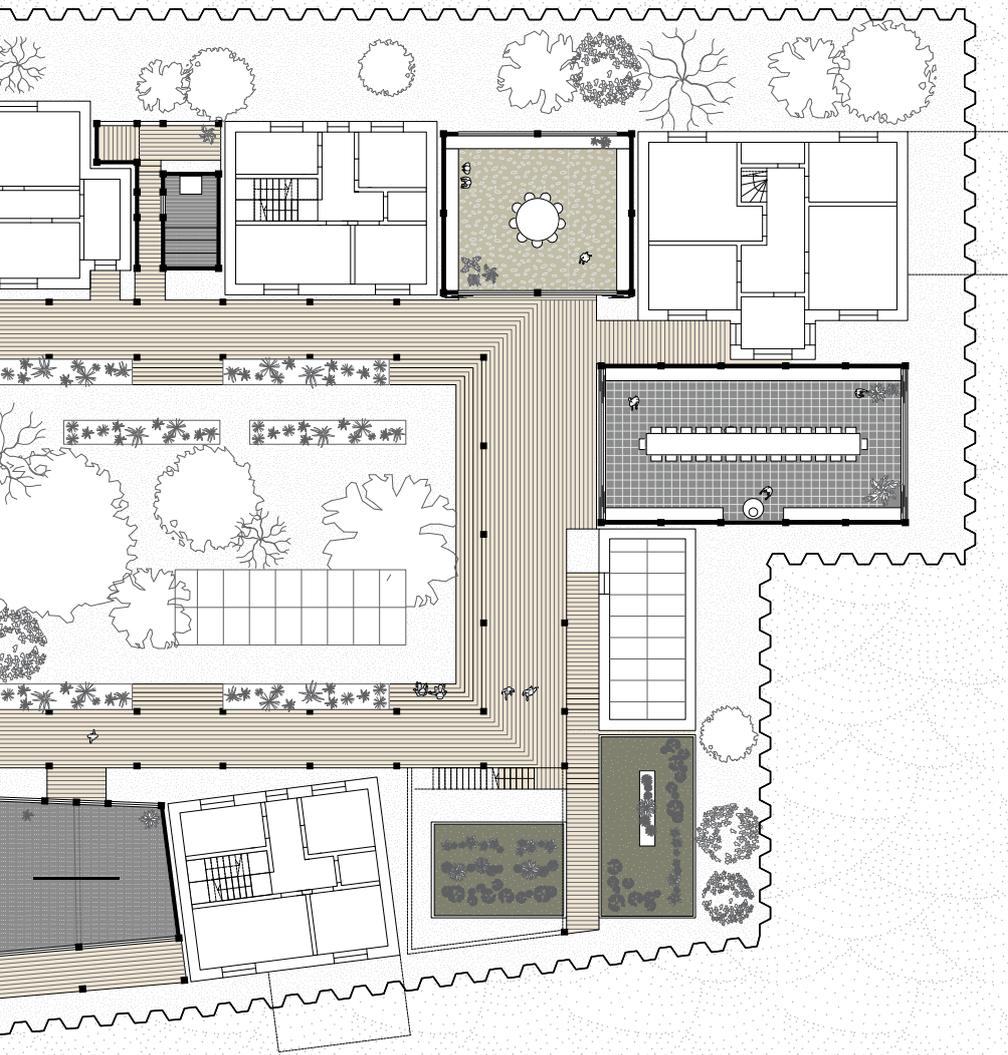
The pathways that join the islands create a moment for discovery and exchange. The system of bridges secures a safe network of the individual gardens.



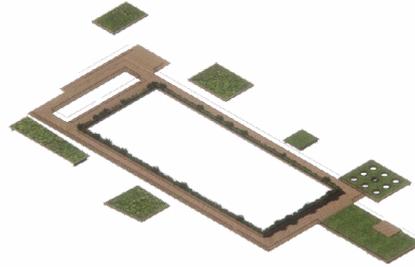
The cemetery serves as the public park and reflective space.







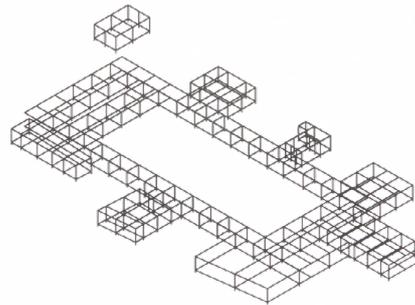
**WOODEN DECKING AND GREEN ROOFS
CREATING MULTI-LAYERED JOURNEY
THROUGH WHOLE ENSEMBLE**



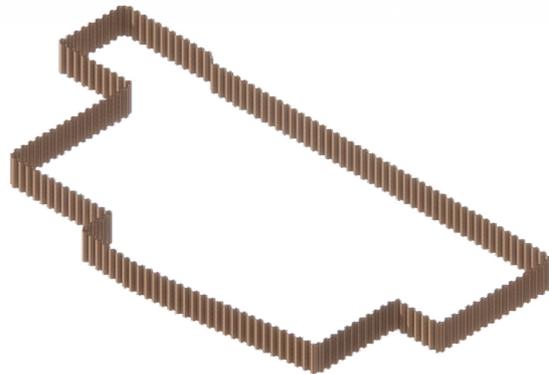
**HORTUS CONCLUSUS - ENCLOSED GARDEN
IN THE CENTERPIECE OF THE CLUSTER**



**ADDITIONAL STRUCTURE OF WOODEN BEAMS
AND COLUMNS PROVIDING LOAD-BEARING STRUC-
TURE FOR THE NEW ROOMS AND WALKWAYS**



**7 M DEEP SHEET PILING PRESSED
4 METERS DEEP INTO THE GROUND**



**EXISTING HOUSES OF THE RURAL
COMPLEX LOCATED ONLY 1.2 METERS
ABOVE CURRENT SEA LEVEL**

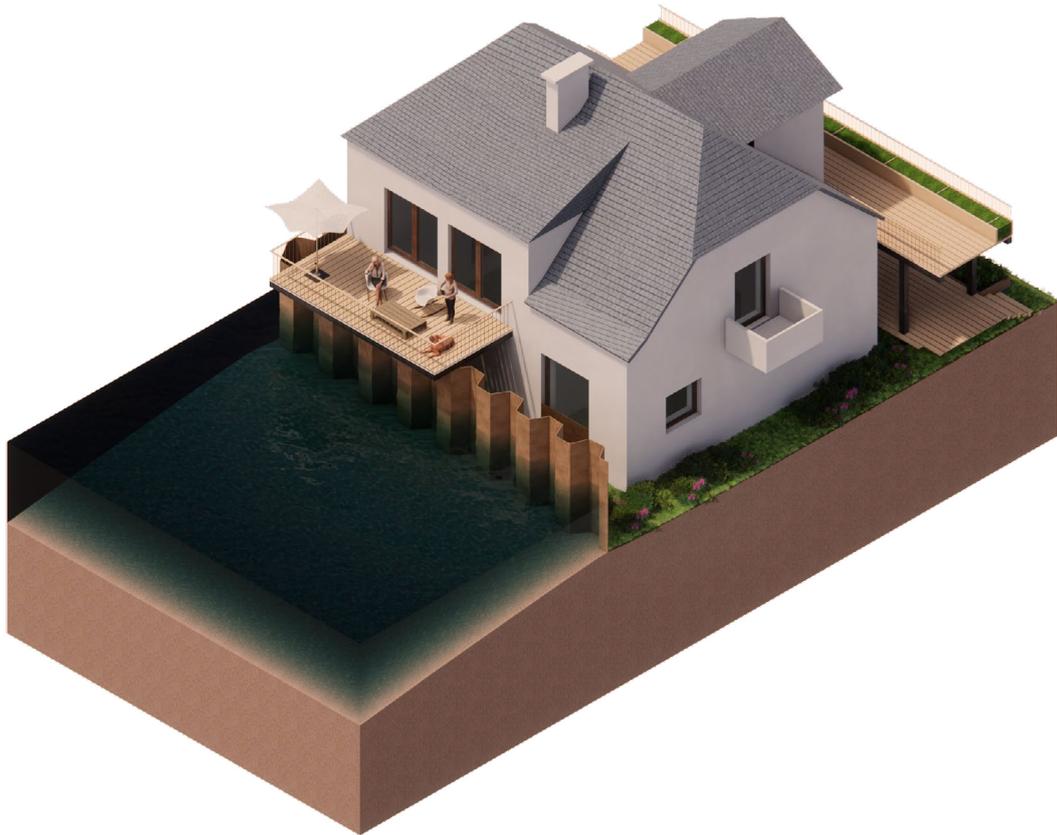


In current situation fences located on the plot boundaries are the symbol of privately owned land. Having very different architectural expression they divide the neighbors, rather than giving a feeling of community that is so present in Kusfeld. A new proposal- the cluster screen is a three-meter high barrier providing security even with the sea level rising up to several meters.

The construction of the wall itself is a most common method used in reinforcing embankments, allowing for usage of recycled elements. 7 meters long Larsen's sheet piles are brought to the location by standard lorry, fed by a crane to the specialized pressing machine that sits on the wall itself and precisely presses it 4 meters deep into the ground. This allows to both avoid the leakages caused by ground water and with a thickness of 30 mm is a safe barrier from harsh waters of the Sea for at least 150 years.



**ALL TOGETHER THEY ENCLOSE
DAILY RITUALS OF FUTURE KUSFELS**



The living premises would move to the first floor of the housing units, with possible remodeling of the houses. Opening up the attics would make the terrace a natural extension of the living space.



Process of wall installation and its future-proofness for raising sea level

Wall for the cluster I am elaborating on has a length of 300 m, the price is calculated based on 3 factors - mobilization costs (machinery and transport), cost of driving the sheet piles into the ground, cost of material per kg. Mobilization cost is based on the vicinity of the contractor - Gdańsk based contractor specified a price of 40.000 PLN = 9.000 EUR, driving piles into the ground = 20-25 EUR per m², cost of material per kg = 0.75 EUR.

At which depth do the deepwalls require to be pushed in?

Since the soil on the Hel Peninsula is mostly sandy it would require the sheet piles to be driven same height into the ground as they raise above the ground - 3m above, 3 m underground, all together sheet piles of 6 meters.

How much distance to stay away from homes when pushing in a deep wall (as it is done by vibrating equipment)?

Vibrating is only one method of driving sheet piles into the ground and may be harmful to the built environment when they located too close, and they may cause the densification of the loose ground (if this occurs), therefore statically pressing sheet piles would be preferred. This also allows to get very close to the buildigns - in my case it would be 1 meter from the facades.

How about seepage underneath the deep wall systems? Should there be continuous pumping to keep the enclaves dry?

One of the functions of sheet piles is to stop the groundwater from flowing, this is why it can be speculated that placing such wall would actually decrease the seepage undernath the buildings, however back-up system of drainage should be considered + possibility of pumping out water.

For how long will the steel be structurally reliable after decades of corrosion? Or is it corten-steel that protects itself against corrosion?

Using cor-ten steel in marine environments depends on the salinity of the water, sheet piles can structurally reliable for decades dependant on the thickness of the piles. It is to be considered that the predicted thickness loss in an extreme conditions (sea waves splashing into the wall) will be around 3,75 mm per 50 years, whereas when exposed to the ground/air it would be only around 0,6 mm per 50 years. Considering that I will work with sheet piles with a thickness of ca. 15-20 mm, they would be reliable for at least 100-150 years.

Based on the information an estimated cost of a 300 m wall can be calculated:

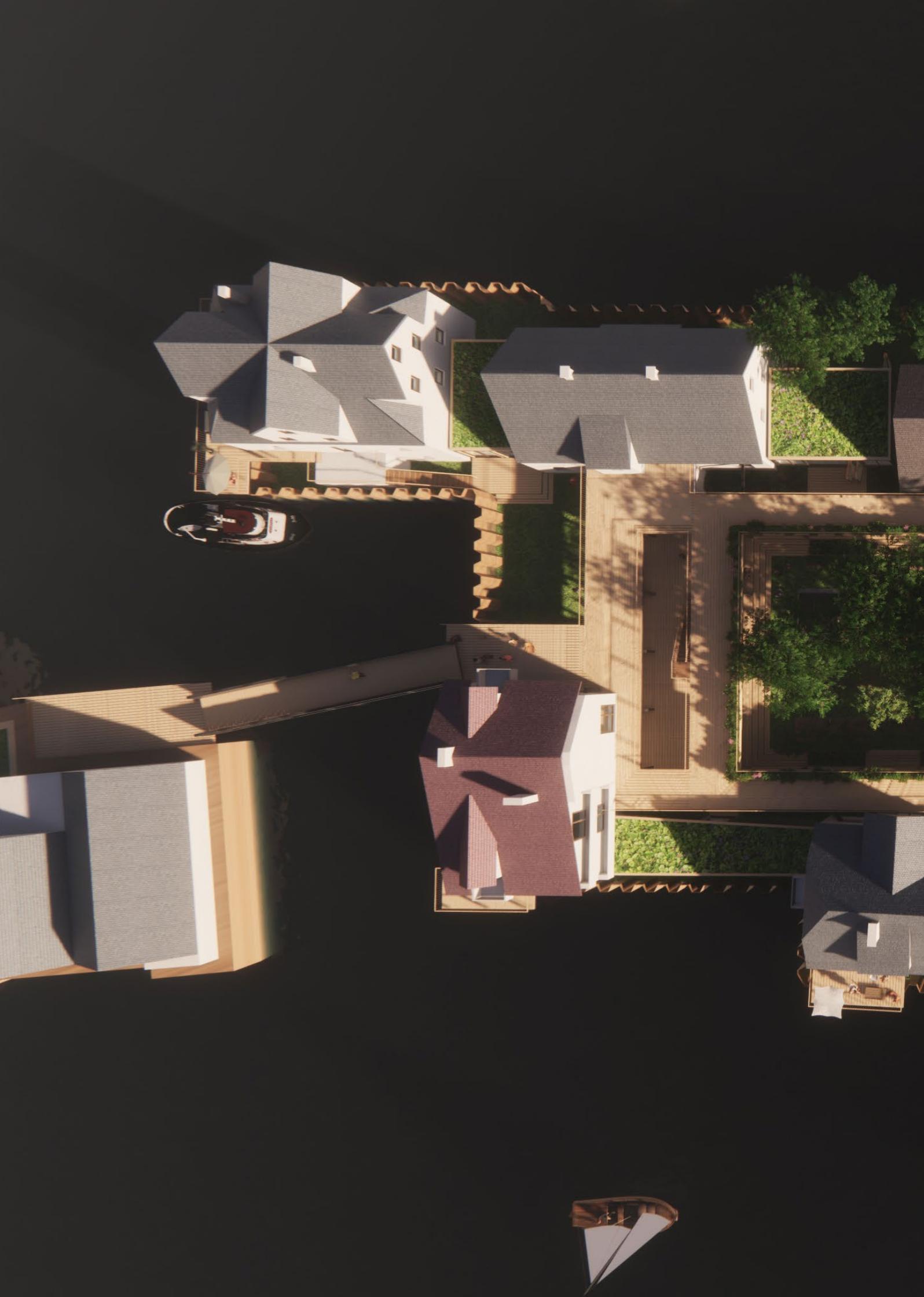
mobilization = 10.000 EUR

driving piles into the ground = 3m depth x 300 m = 900 m² = ca 20.000 EUR

cost of material = 0.75 EUR per kg x 1800 m² (ca. 150 kg/m²) = 200.000 EUR

And concluded that it is the cost material that defines the price in the major part, therefore source of it should be considered. Here the aspect of sheet piles plays the major role, since it is commonly used method in construction - recycled piles could be used. Furthermore, the more clusters would happen, lower the price of the materials would become.







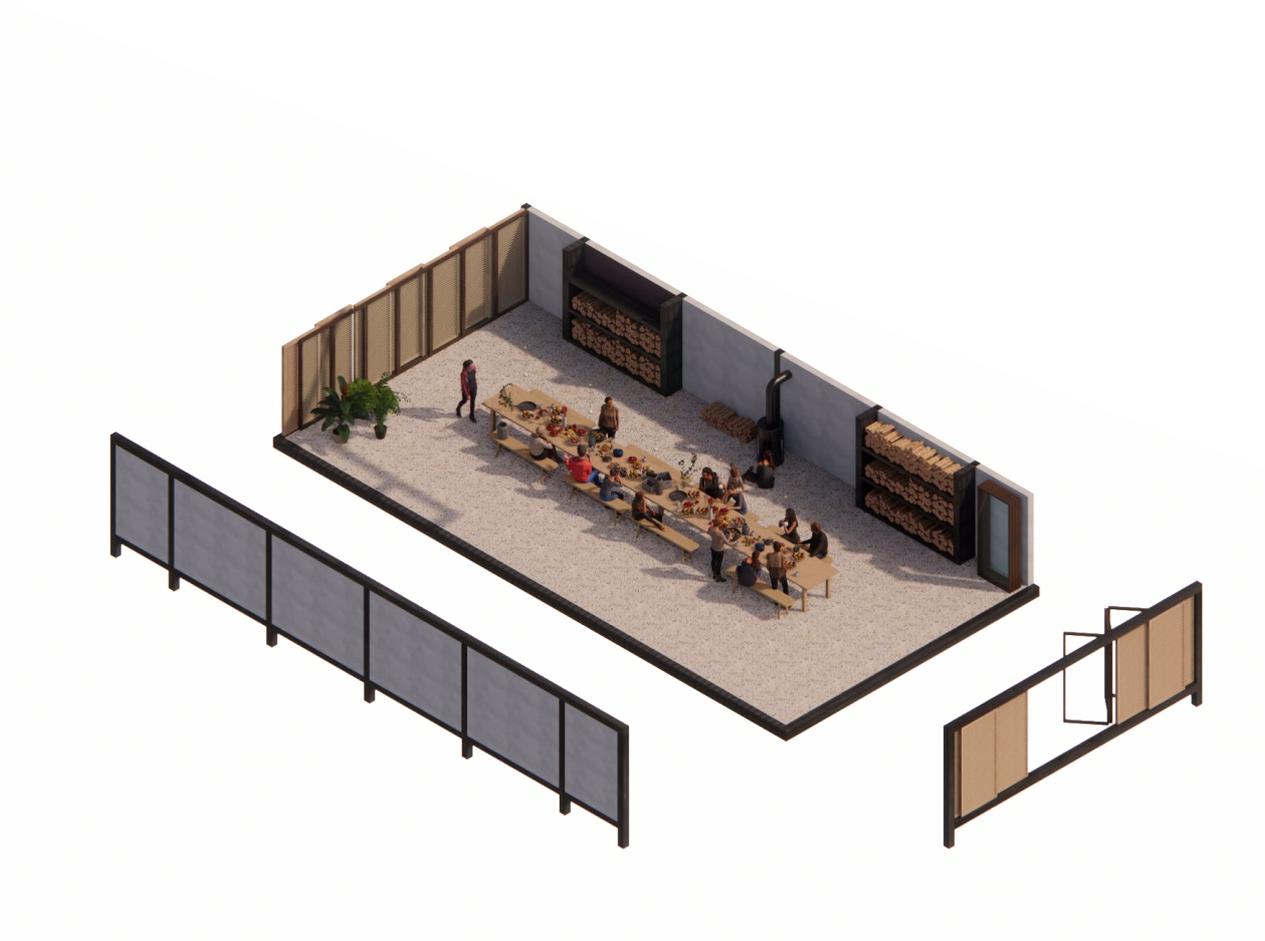


SCRIPTORIUM

-46 m²

-used as a library and a classroom



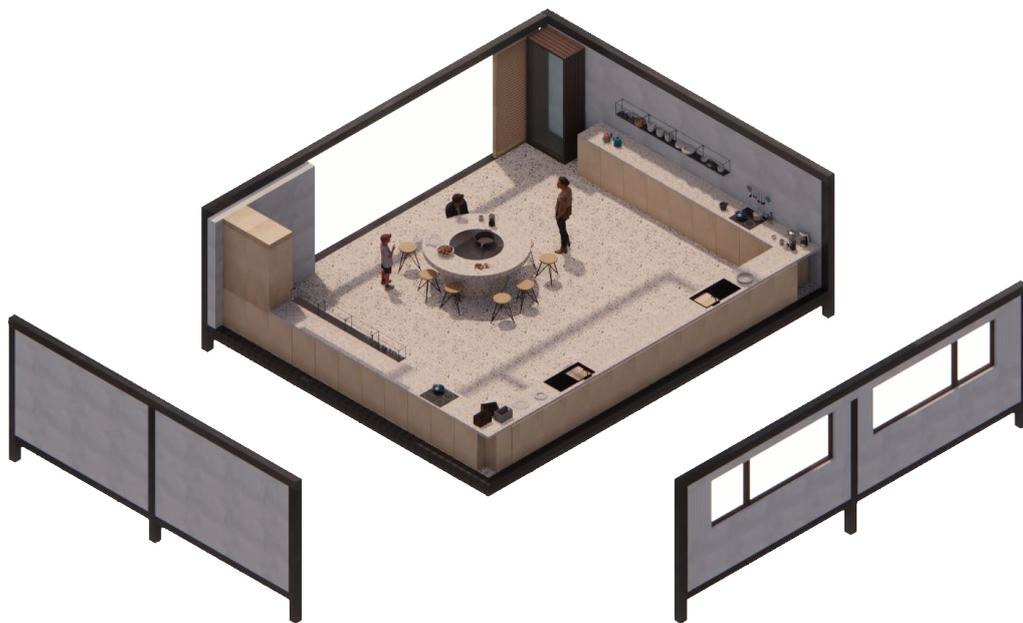


REFECTORY

-114 m²

-used as a gathering place and dining room





THE KITCHEN

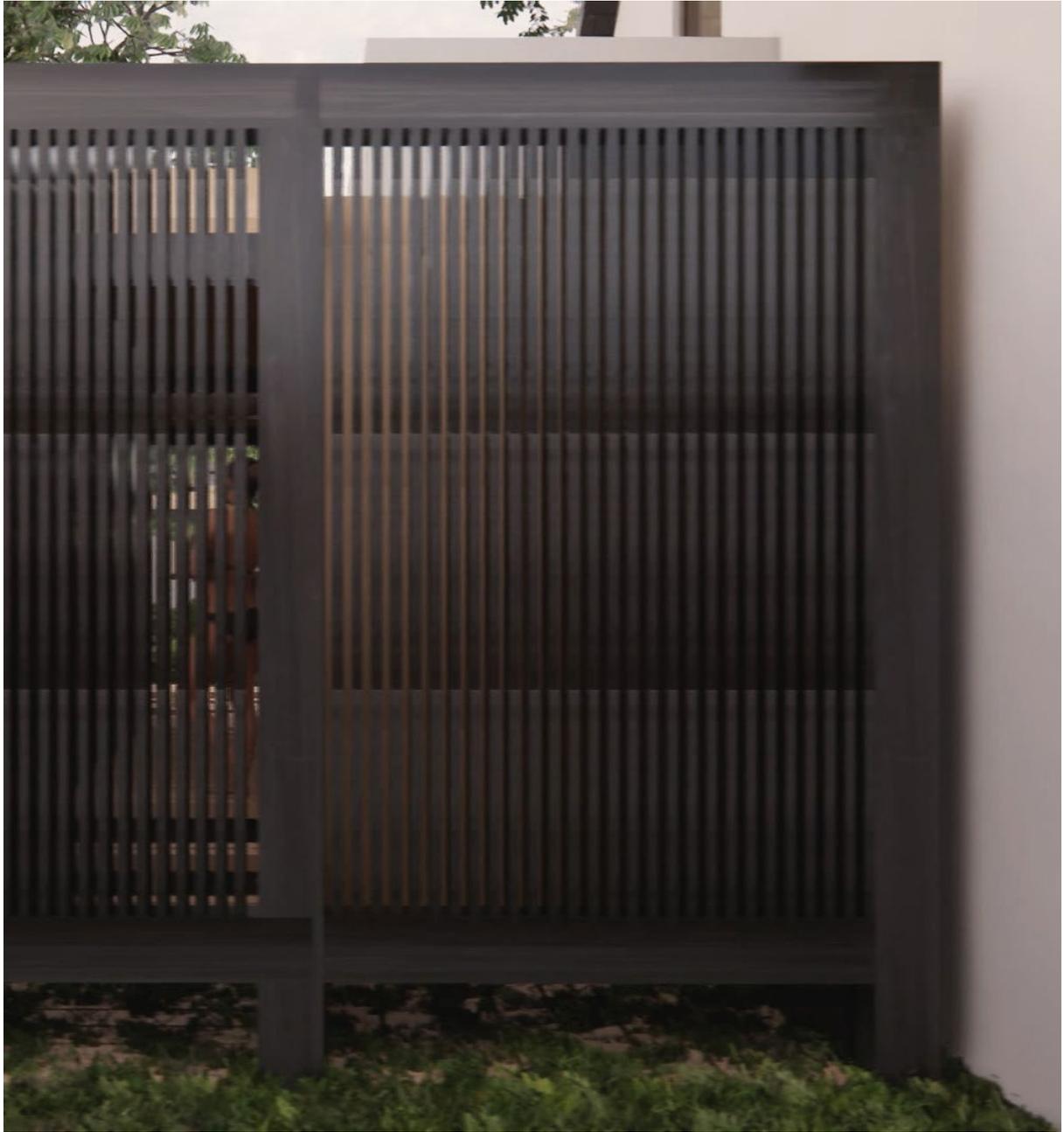
-60 m²

-used as a communal place
for preparing, cooking and gathering food





BALNEARY
-10 m²
-used as the sauna

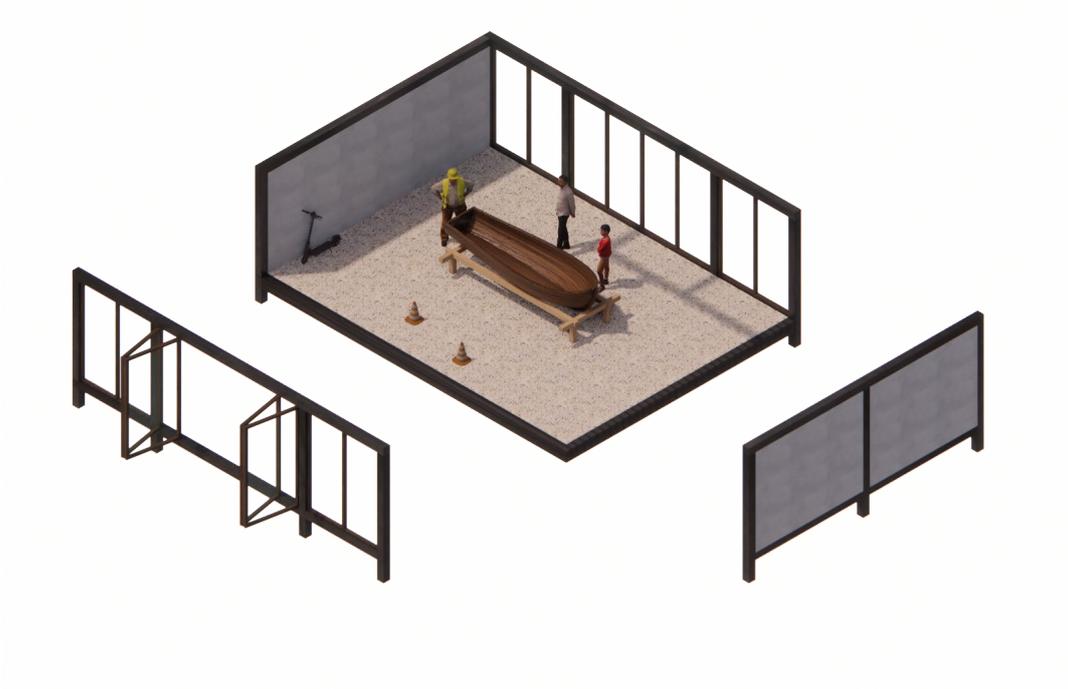




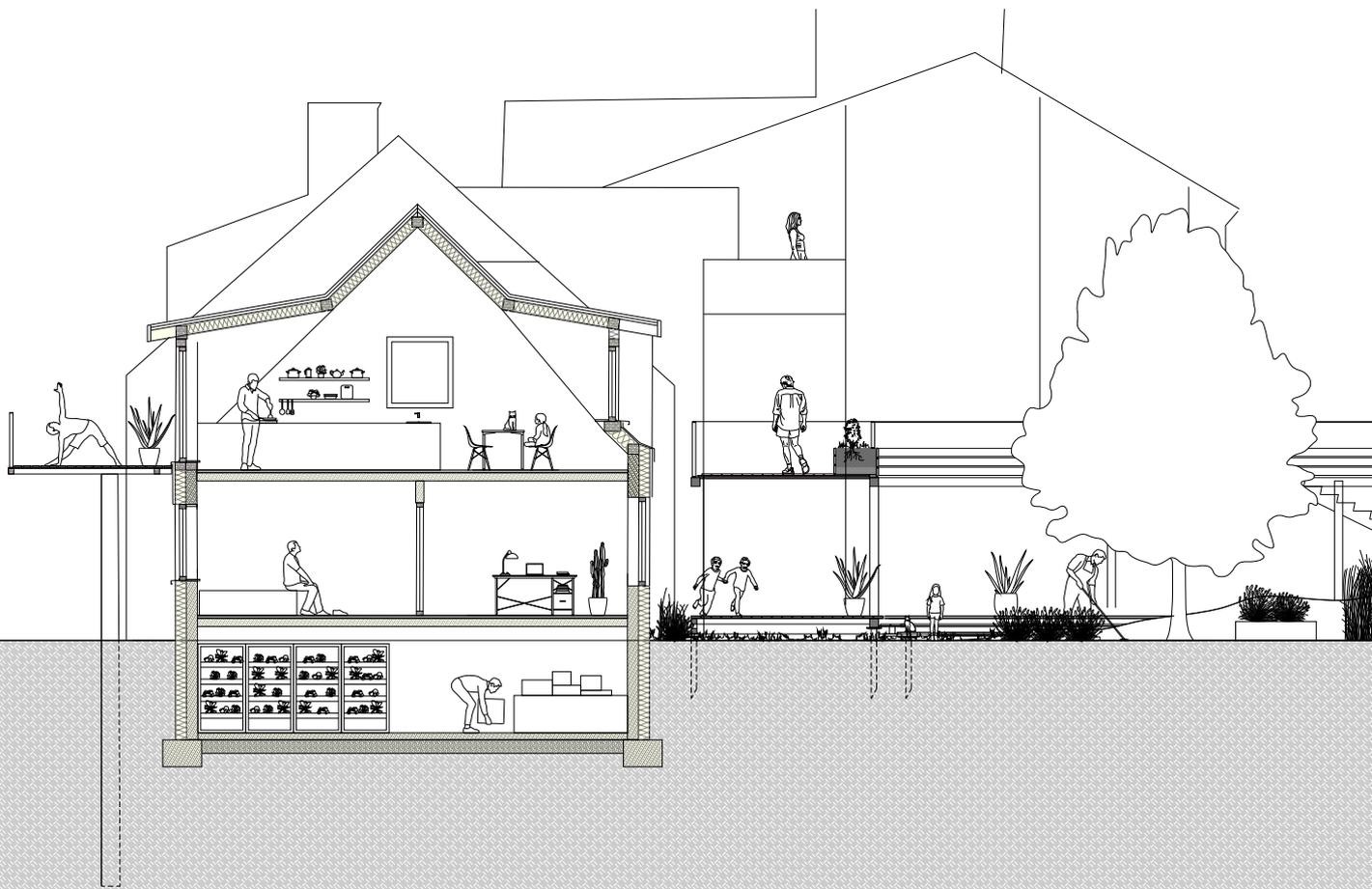
INFIRMARY

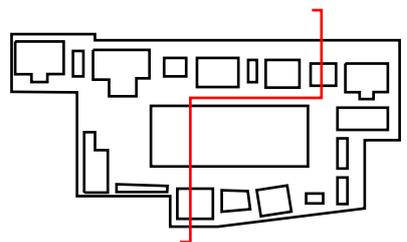
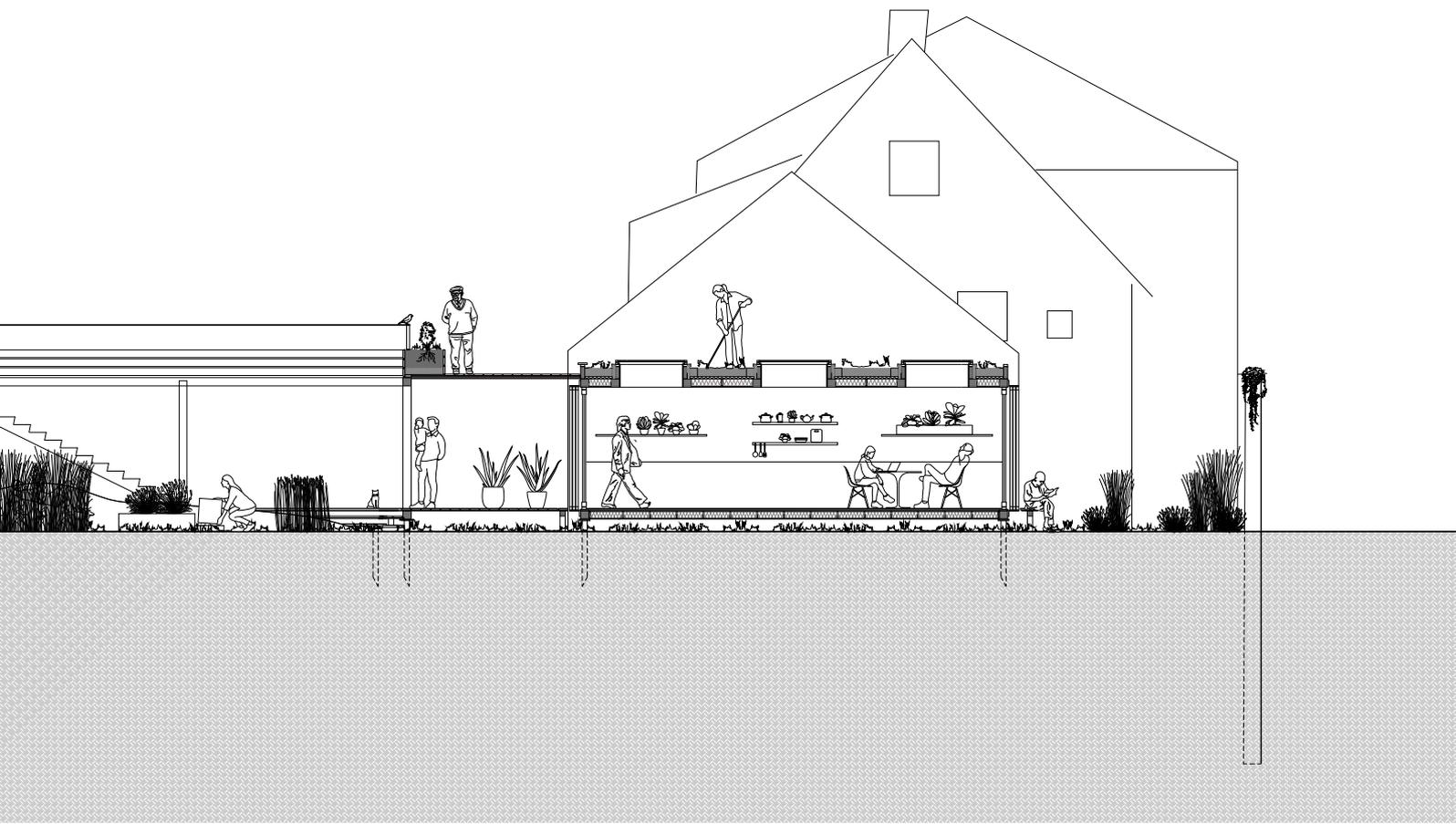
-55 m²

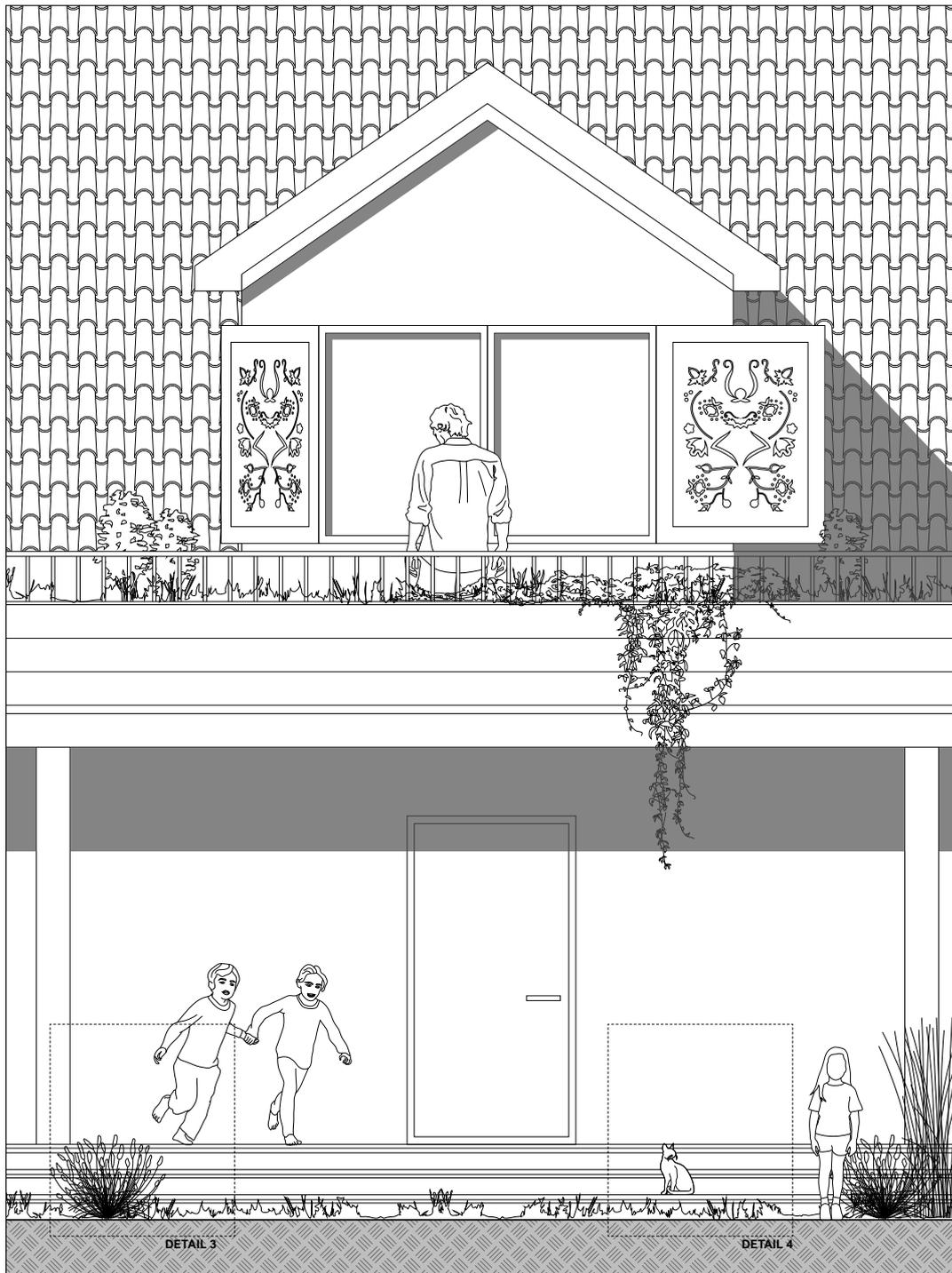
-used as a guesthouse or an office



ATELIER
-52 m²
-used as the workshop

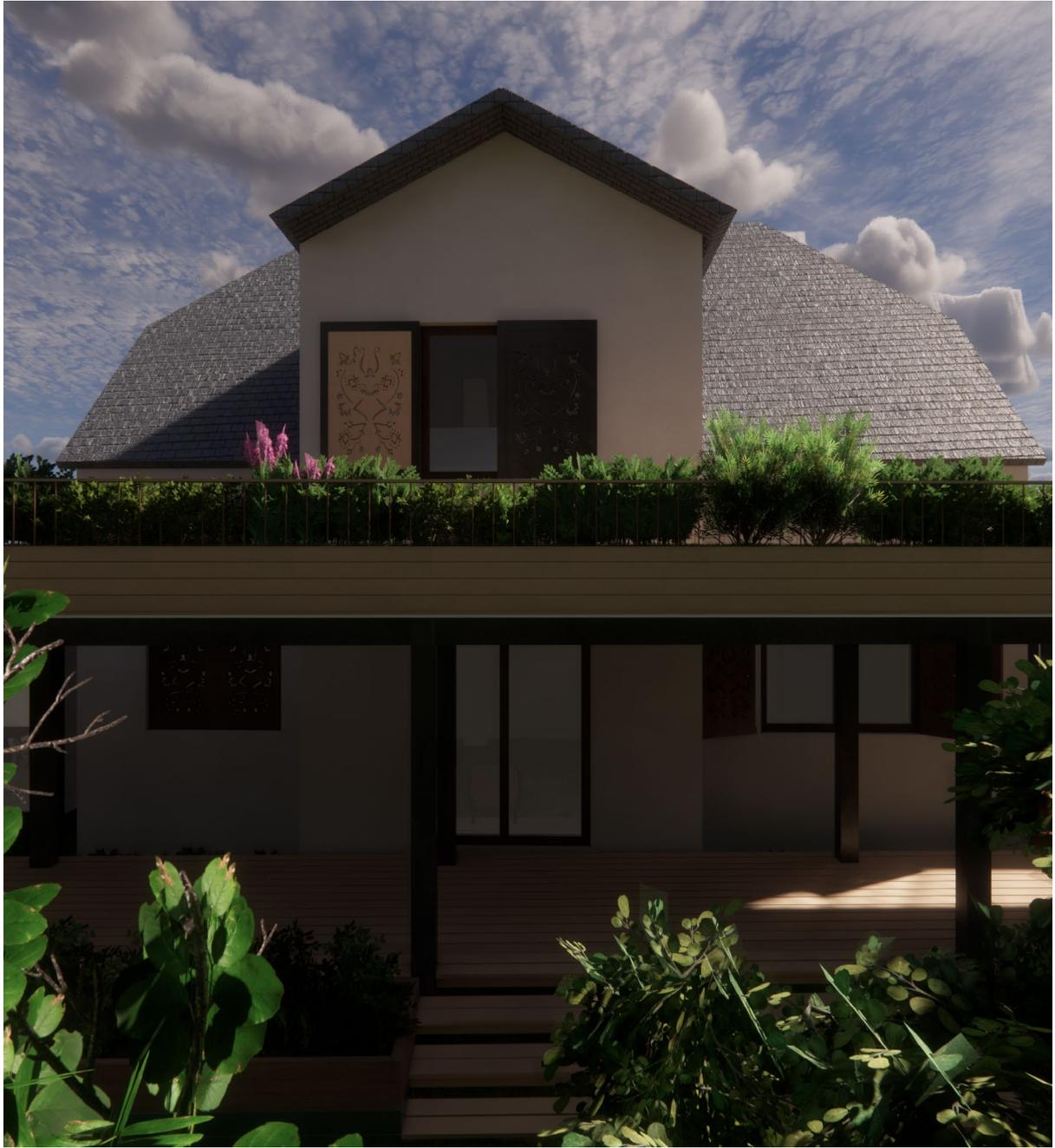


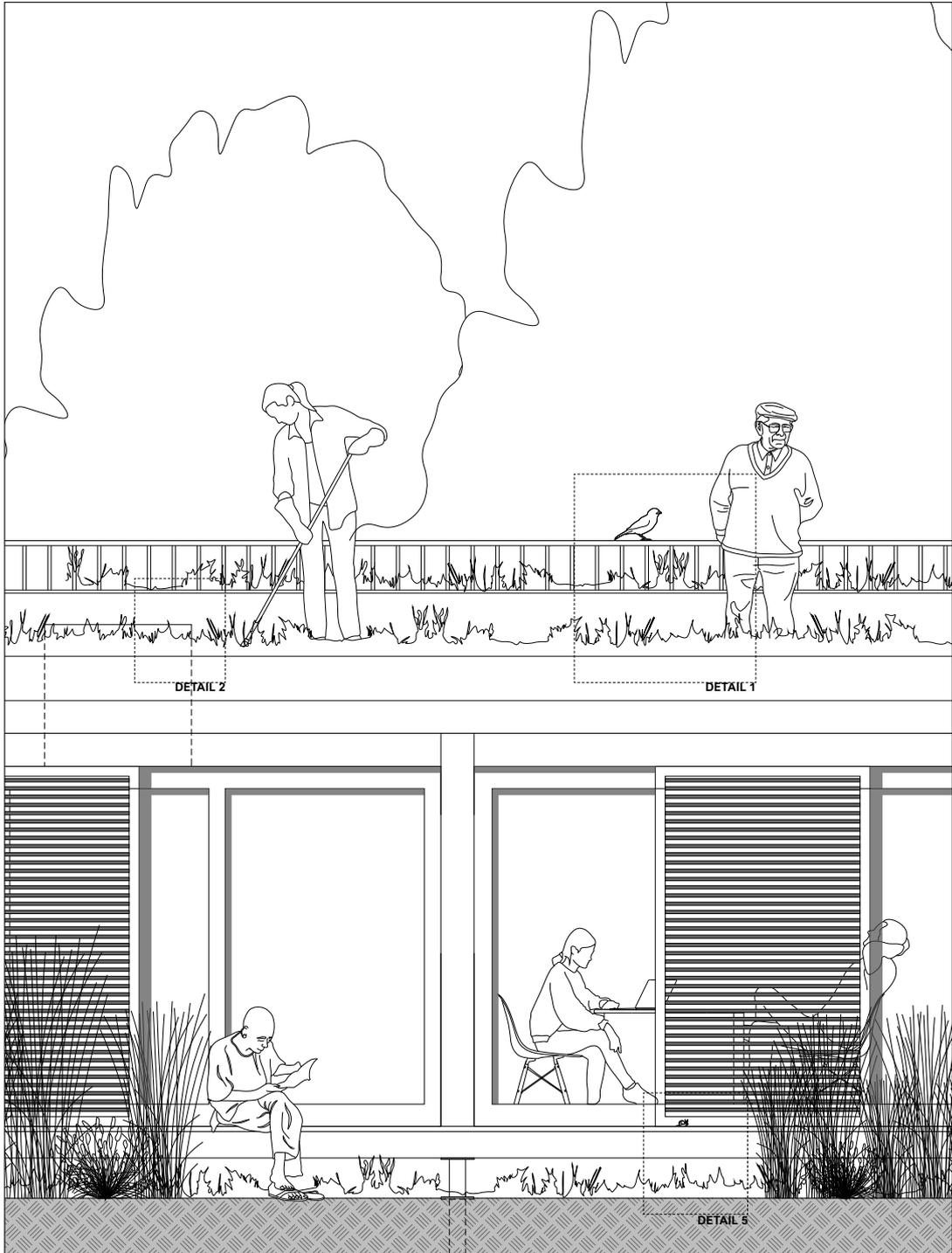




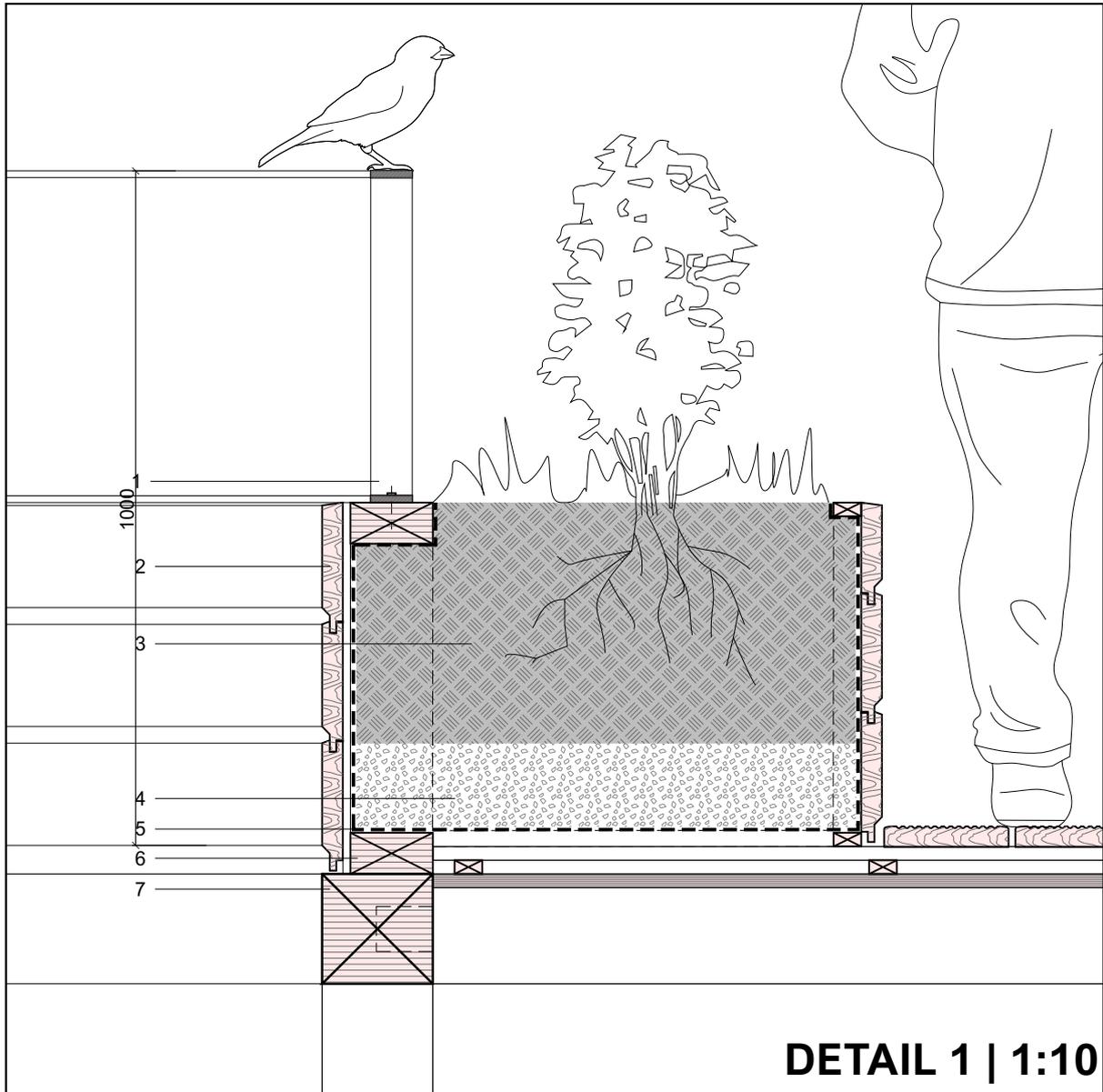
DETAIL 3

DETAIL 4









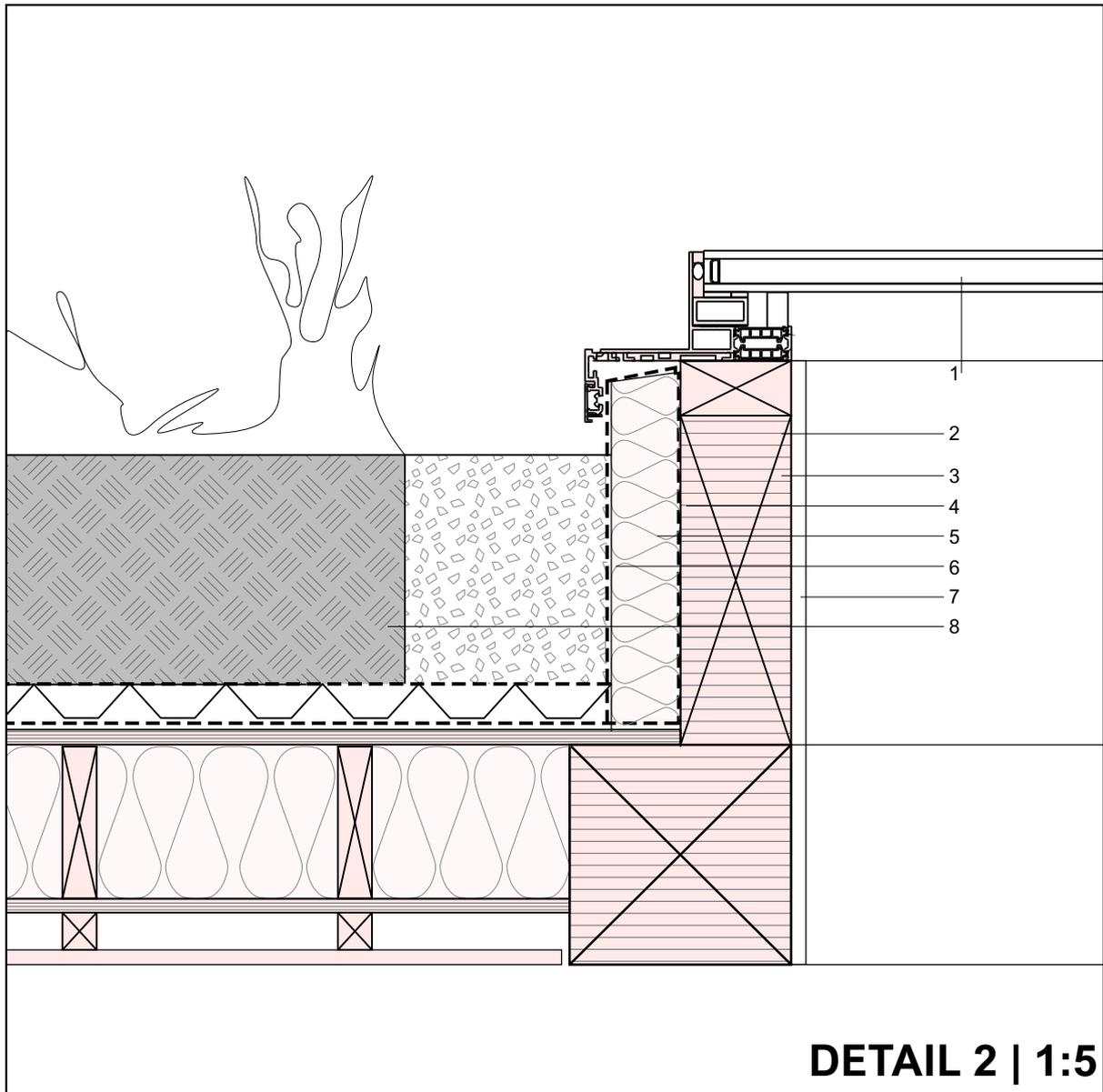
DETAIL 1

Balustrade - planter

- 1 - solid flat bar steel balustrade,
depth 60 mm, RAL 9003
- 2 - thermally treated weatherboards
- 3 - pottery soil for vegetable garden
- 4 - locally sourced gravel and shells
- 5 - root barrier and vapor-proof film
- 6 - glue laminated structural wood (balustrade and planter structural support)
- 7 - BSH glulam wooden structure of beams and columns
160x160 mm



Planter and balustrade of first floor raised walkway



**DETAIL 2
Rooflight**

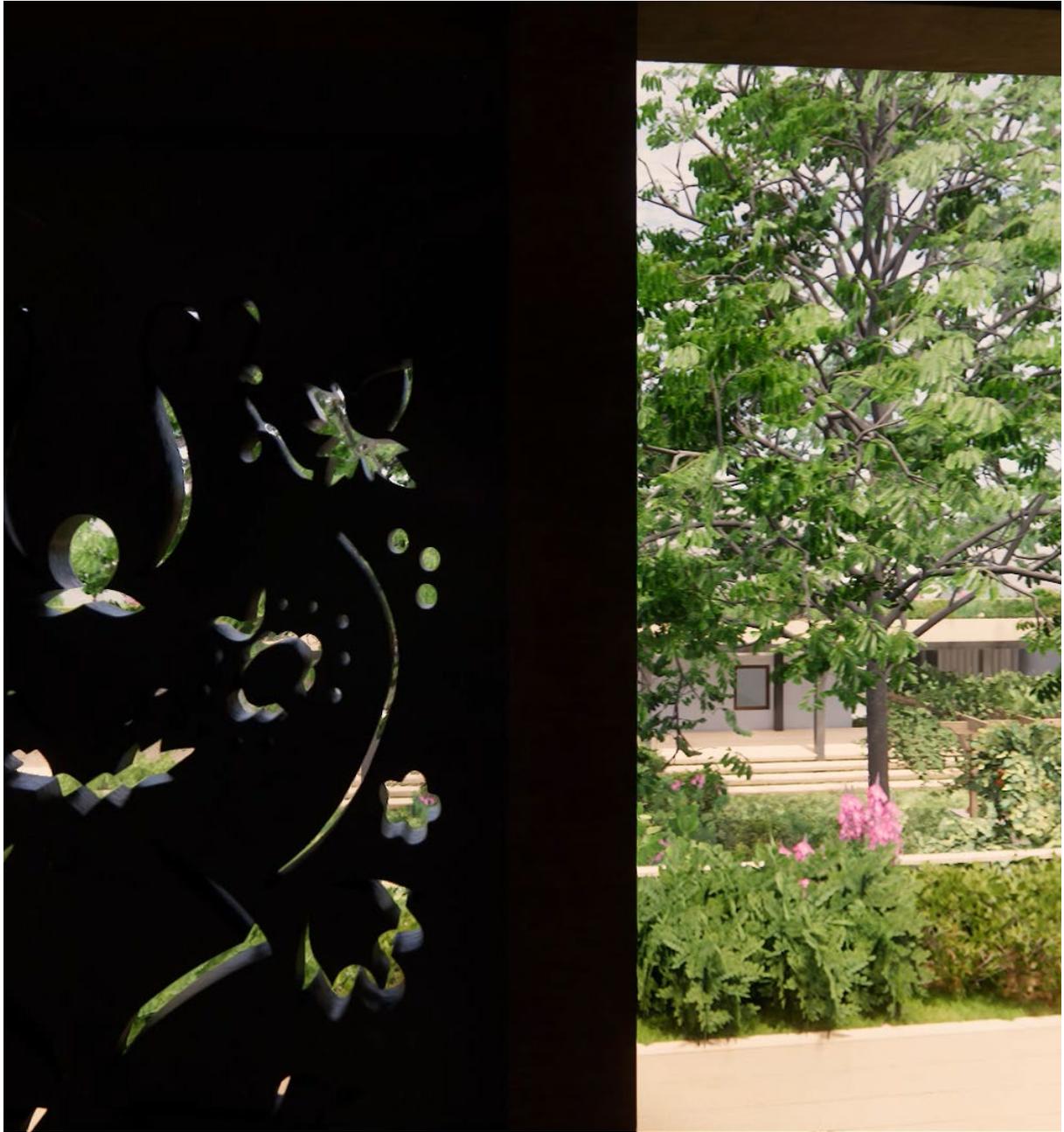
- 1 - fixed glazing rooflight
- 2 - wood-frame substructure rooflight
- 3 - glulam supporting beam 80x240 mm
- 4 - Vapor-proof film
- 5 - mineral wool insulation 60 mm
- 6 - root barrier
- 7 - corten stell claddin
- 8 - roof build up from the top: substrate layer 200 mm, filter fabric and root barrier, drainage system 40 mm, 160 mm mineral wool insulation between joists, 22 mm OSB sheathing above and below, white gypsum ceiling



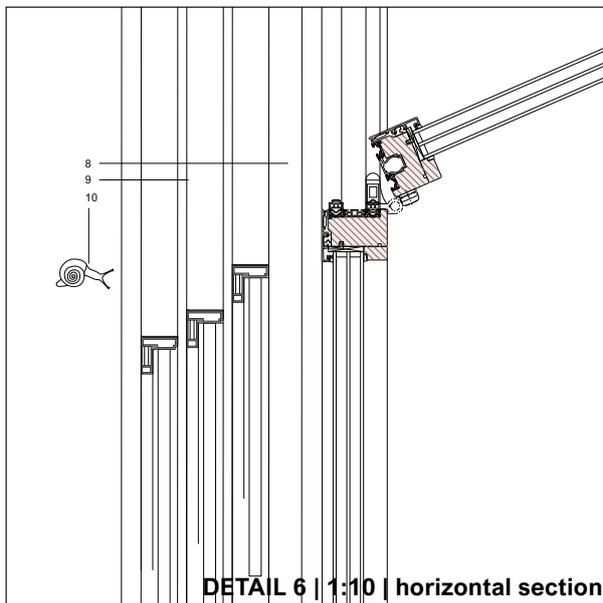
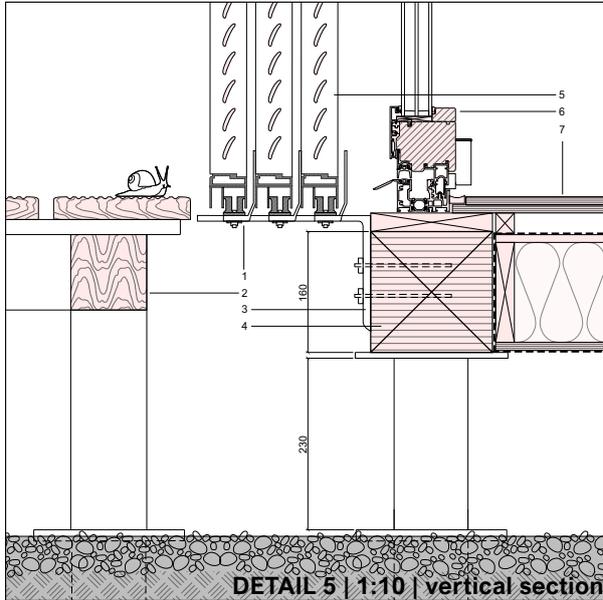
View from the roof of the communal kitchen



Charred wood cladding contrasting with plastered facade of existing buildings



Perforated wooden shutters



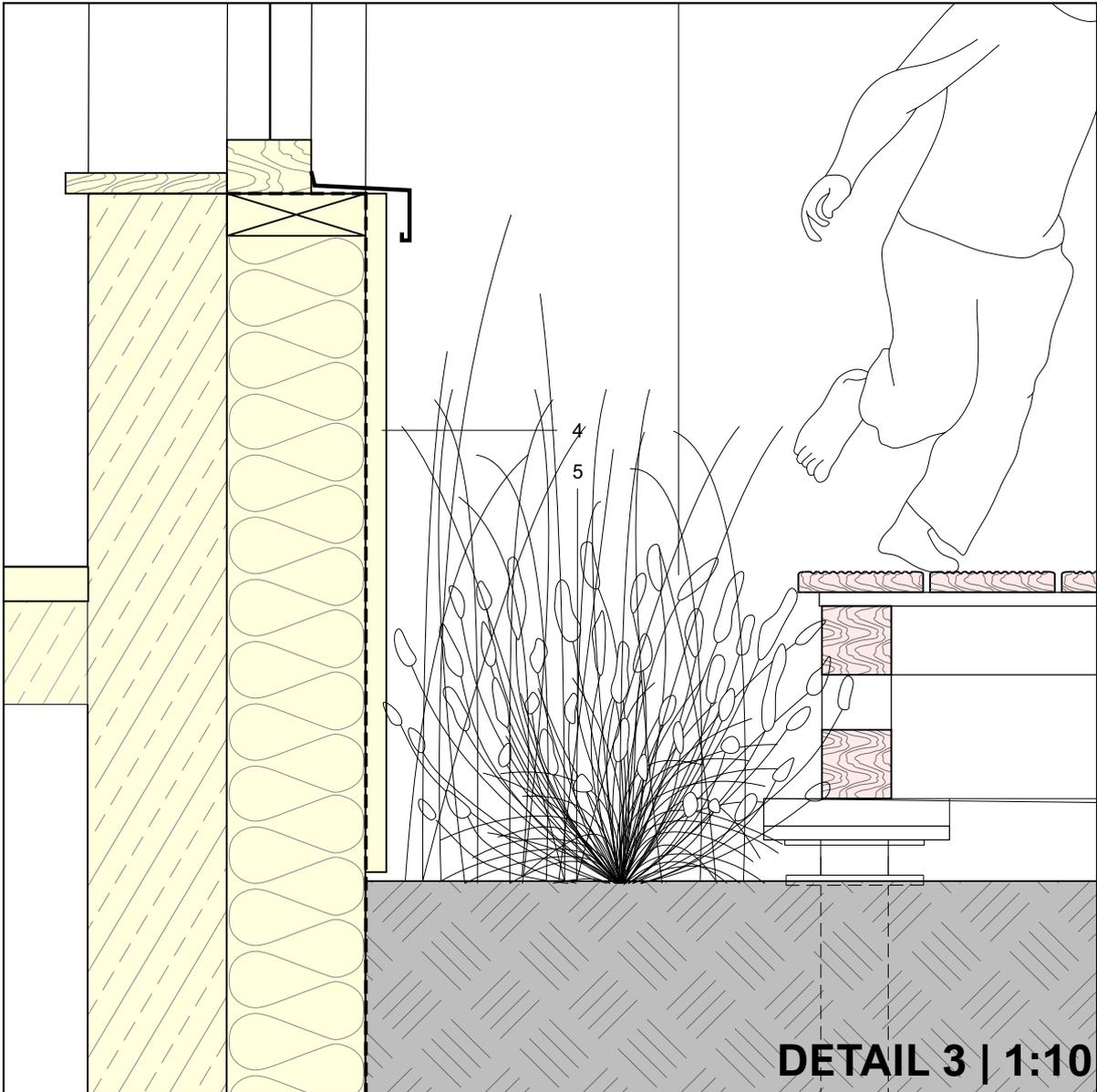
DETAIL 5

Raised porch

- 1 - Carrier profile shutter system
- 2 - thermally treated post 88x88 mm as load bearing structure for raised walkway
- 3 - L-profile 200x150x12 mm screwed to the glulam beam
- 4 - BSH glulam wooden beam 160x160 mm
- 5 - sliding shutter system
- 6 - Solarux, SL 97 Bi-Folding Glass Door, Wood/aluminium, heat-insulated, U-value=0.80 W/m²K, or similar
- 7 - floor build-up from the top: terrazzo finish 15-20 mm, 160 mm mineral wool insulation between joists, 22 mm OSB sheathing above and below, vapor-proof film
- 8 - cavity 40mm
- 9 - continuous guide sliding system for increased stability
- 10 - Helix pomatia, Burgundy snail



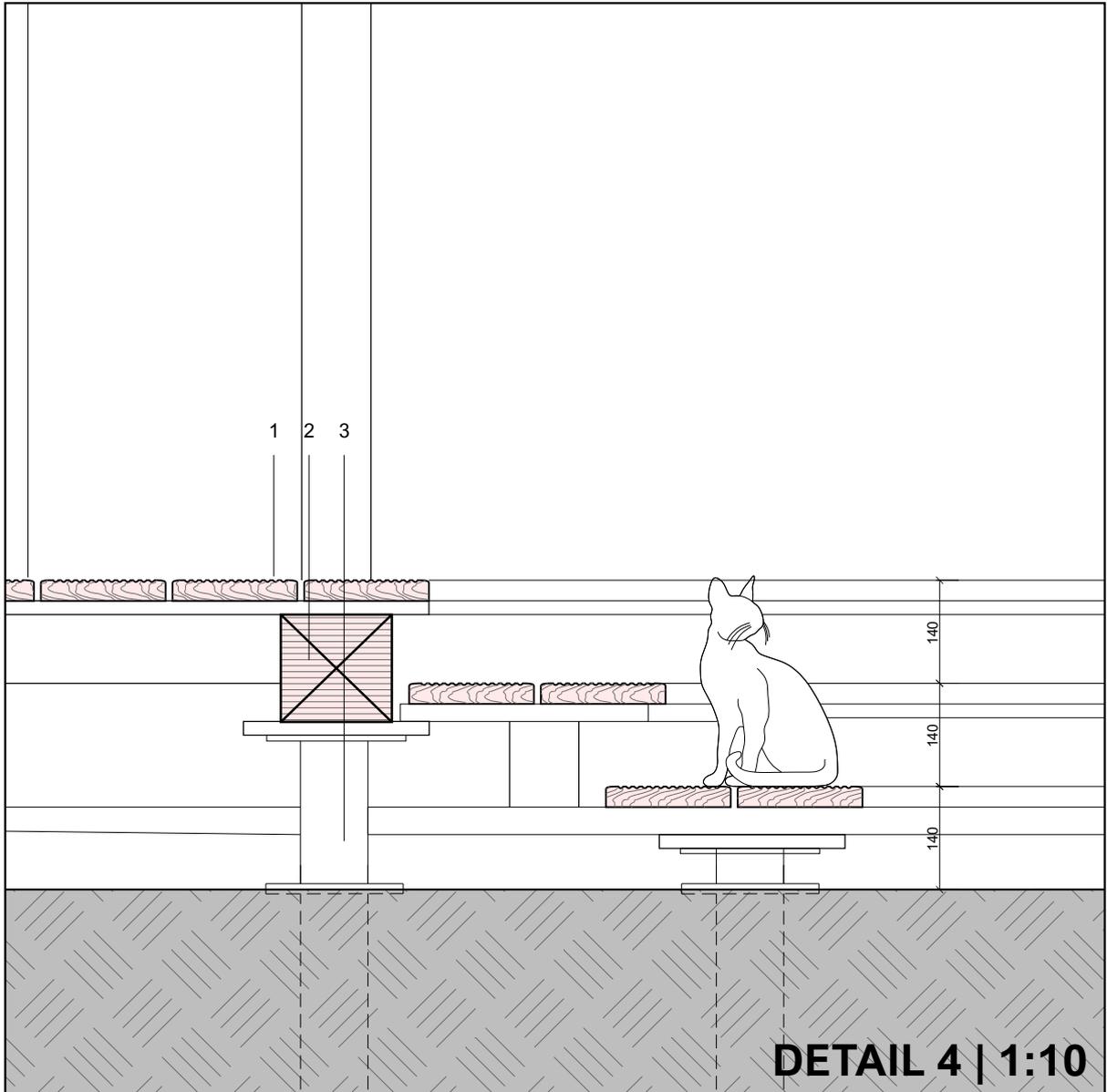
Shading elements of the refectory

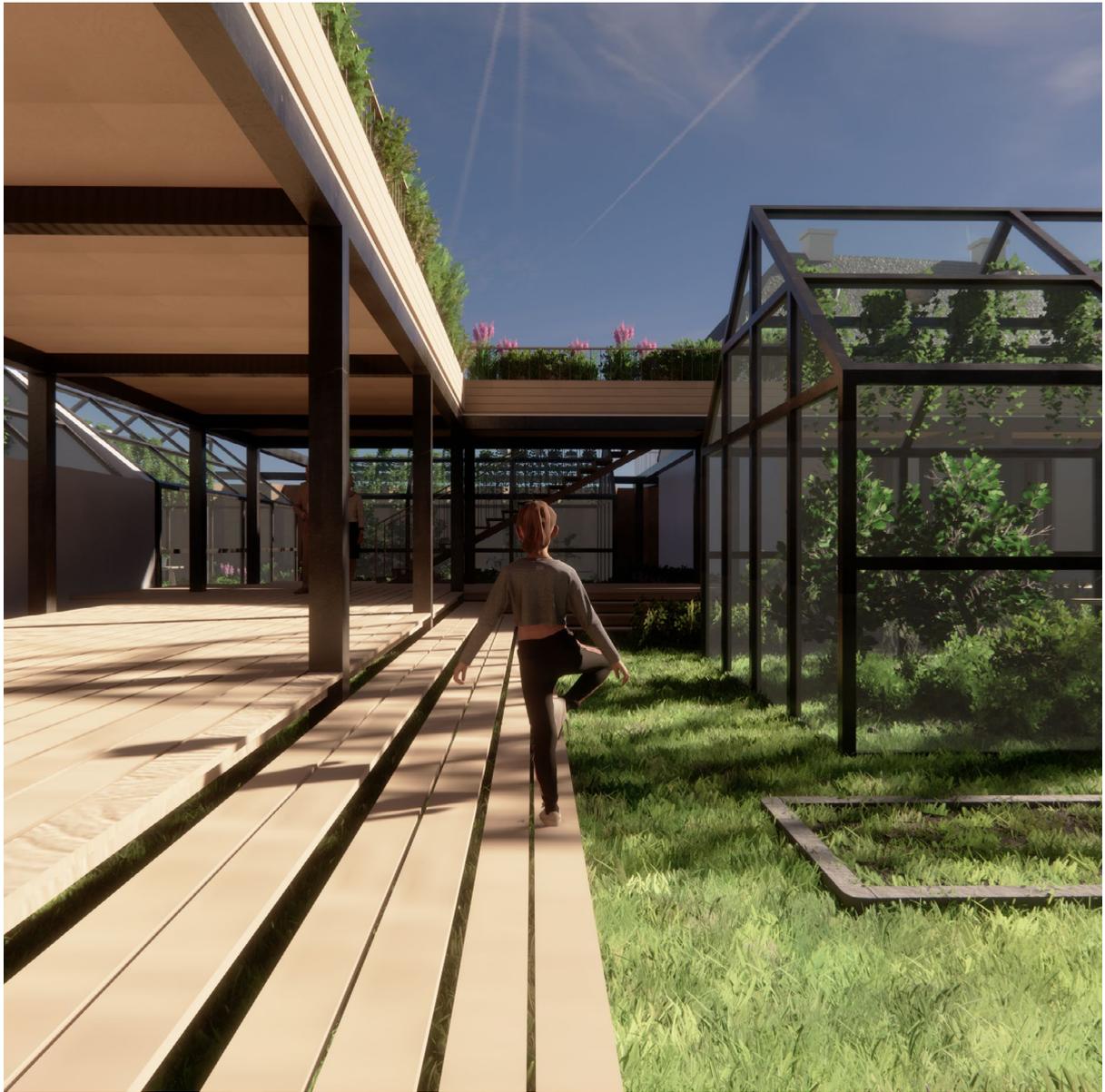


DETAIL 3 and 4

Green pockets and raised porch

- 1 - thermally treated decking, pine wood, 26x140 mm on a substructure of joists and battens
- 2 - thermally treated post 88x88 mm
- 3 - steel screw piles
- 4 - existing building
- 5 - green pocket creating privacy buffer between buildings and public porch walkway mostly prairie plants (grasses and flowers)







ENTREPRENEURSHIP

LIST OF CONSULTED EXPERTS

Anne Loes Nillesen, Defacto Architecture and Urbanism

Matthijs Bos, Consultant Flood risk Management and Coastal Engineering

Regarding spatial planning in areas prone to floodings, and how to approach the design both for the catastrophic scenario, as well as steadily sea level rising, regarding risks management, resiliency, future-proofing and policy-making

Ir. Pieter Ham

Regarding floating housing, vernacular architecture in flood-risked areas, regarding resources, possibilities, risks and chances, regarding mentality and first hand experience from flood experiences residenets of shore areas

Małgorzata Grechuta, Maritime Office, Gdynia

Anna Szczypińska-Woźnia, Maritime Office, Gdynia

Regarding spatial planning in the region of Hel Peninsula, spatial planning at the polish seaside in the context of European Union law, standards and current developments, about Kufeld in the wider context of Baltic seaside, about the potentials and threats of tourism in regard to Hel Peninsula, about the protective wall in Kufeld, about standards and regulations in spatial planning

Marcin Bulkowski, Structural Engineer at Arup

Regarding sheet piling, shell lace structures, steel framing in both marine and aircraft engineering, as well as latest developments in 3d printing and its use in the contemporary engineering

Iwona Czapp, municipality of Jastarnia (representative of Kuźnica)

Regarding the voice of Kufeld, how and what the local inhabitants imagine the future of their settlement, what is being discussed locally and what is being communicated on higher level (municipality, region, maritime department, nationally etc.)

Bogna Konkkel, resident of Kufeld, local activist

Leszek Kucira, local photographer in Kufeld, archivist and activist

What are the socio-economical flows of Kufeld, how did the environment change throughout the decades, how do local inhabitants imagine the future of Kufeld and how do the act accordingly

Peternel Felskens, Head of Hubert van Eyck Academie

Regarding cultural entrepreneurship, storytelling, potentials of architectural festival and tools to achieve such undertaking

Wojciech Radwanski, photographer

About context of Kufeld from the bird's eye perspective - drone footage

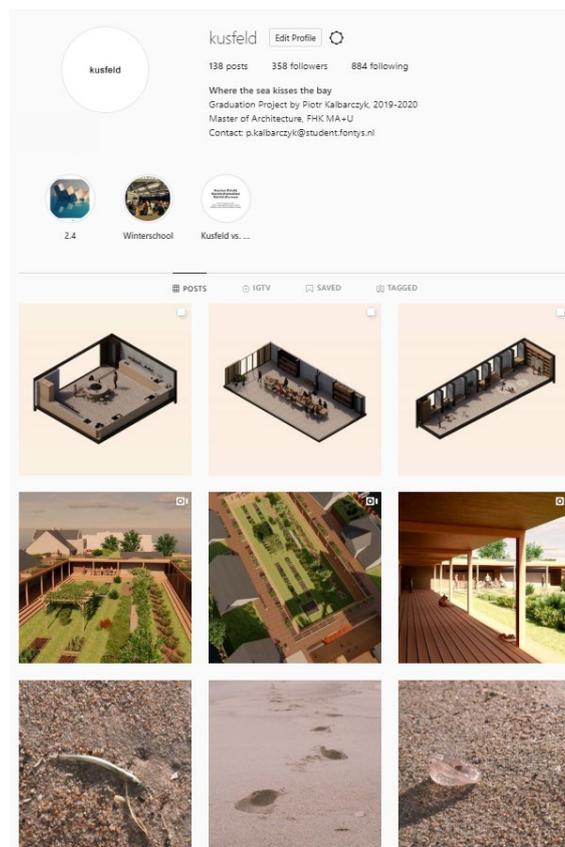
Alda Algaic, Docent at Fontys University of Applied Sciences

David Dooghe, Designer and researcher on urban development

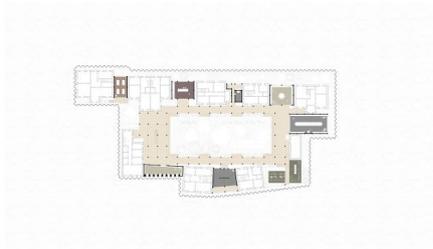
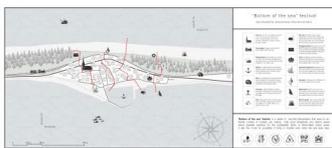
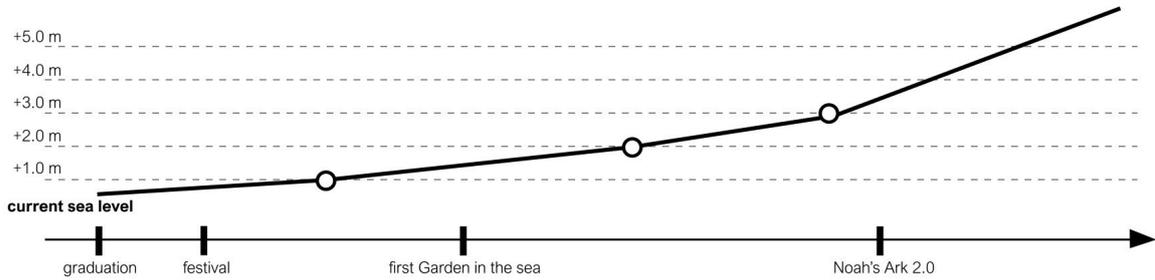
Regarding research approach, design, spatial, cultural, social, and economic context of the project proposed, regarding design process, risk assessment in research phase, archiving possibilities and

At the beginning of the project an Instagram profile was setup to publish progress on the project to the wider public - friends, professionals and those interested in the future of Kusfeld. Up until now (16th of June 2020) it gained ca. 350 followers, who got triggered by the topic of the graduation project and/or posted architectural production. As a consequence I was approached by a local architect with whom I had the opportunity to discuss the changes in the traditional and contemporary design of the area. I was also approached by an active member of Kusfeld's community who sent me a poem about Kusfeld.

The profile can be found under the following link: <https://www.instagram.com/kusfeld/>



Climate changes are an exponential process. Bigger the changes, faster the consequences. Following the idea of a timeline the graduation project is treated as a tail of expanded undertaking. Noah's Ark 2.0 is a toolbox of solutions for disaster prevention that the local inhabitants can form in their environment. The first Garden in the sea sets the mode for possibility of living in Kusfeld even when the sea level rises. But it could start already now with a "Bottom of the sea festival". With the topic of sustainability having its momentum, a cultural event, exhibitions and workshops organized around such infrastructure would allow to profoundly understand the context. It would make both local inhabitants and visitors aware about the future of flood-risked shore areas, and generate mental preparedness for possible relocation.







READING LIST

READING LIST

EXTREME CITIES The Peril and Promise of Urban Life in the Age of Climate Change || Author: Ashley Dawson

Ashley Dawson develops the thesis about smart planning causing architectural apartheid - very strong departure point for hypothesis and profound base for projects foundation.

Dutch Dikes || Authors: Eric-Jan Pleijster, Cees van der Veeken (LOLA Landscape Architects)

The Bible of Dutch know-how about defensive approach to flood risk management. Very well visually and content-wise resolved book about the basics of dikes planning.

Beyond the Dikes: How the Dutch Work with Water | Marinke Steenhuis and Paul Meurs

About spatial interventions that combine nature, human use, aquaculture and cultural history. Dutch philosophy of water management.

"Flood Resilience: a Co-Evolutionary Approach | Residents, Spatial Developments and Flood Risk Management in the Dender Basin" | Barbara Tempels

Thought-through, inspiring PhD work of young thinker and researcher in a similar scope of elaborations.

TOO BIG Rebuild by Design's Transformative Response to Climate Change || Author: Henk Ovink, Jelte Boeijenga

Rebuild by Design (RBD) was developed for the 'Presidential Hurricane Sandy Rebuilding Task Force' after hurricane Sandy hit the North-East Coast of the United States in 2012. This book aims to reflect 'RBD', assess all its aspects, and embed it in a broader context to offer a guide for politicians, designers, researchers, activists, and others.

Volume 20. Storytelling || Publisher: Archis

"Volume 20 is dedicated to the art of storytelling. It presents the storylines of current events and architecture to show that while the truth is important, so is the ability of fiction to elevate fact."

Truth in Fiction: Storytelling and Architecture | Kimber, Lee

"This research is about storytelling in architecture. Specifically, how we might better use narratives to play to the strengths of our medium. From examining current practices in publicly establishing narratives, to investigating the work of John Hejduk, this work examines how architectural narratives have been constructed in the past, and whether this has been successful."

New Netherlands: Towards transitional flood risk management anticipating to extreme future sea level rise scenarios | Geert van der Meulen (TU Delft Civil Engineering and Geosciences; TU Delft Water Management)

Interesting topic and approach to the project.

European Environmental Agency (EEA) (2013). **Adaptation in Europe**. Copenhagen, Denmark

European Environmental Agency (EEA) (2016). **Natura 2000 Network Viewer**. Copenhagen

Policy, procedures, administrative insight into plans, challenges and possible scenarios of latest developments within the EU.

National Aeronautics and Space Administration (NASA) (2017). **Sea level change, observations from space**. Consulted on sealevel.nasa.gov.

Source of data, analyses, images etc.

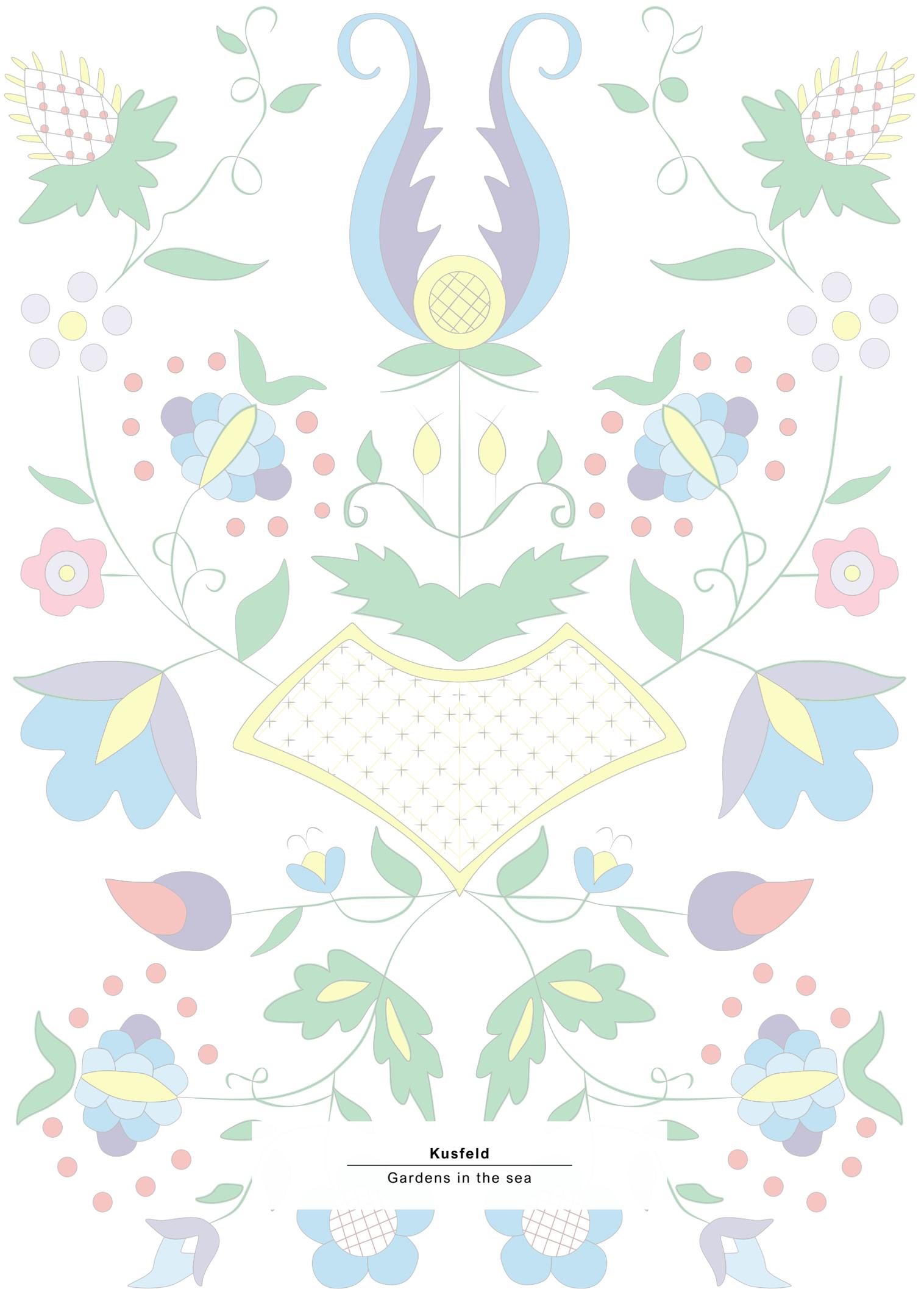
The Drowned World || Novel by J. G. Ballard

The Drowned World is a 1962 science fiction novel by British writer J. G. Ballard. The novel depicts a post-apocalyptic future in which global warming has caused the majority of the Earth to become uninhabitable.

Storytelling for Social Change! || edX online course

This course develops skills for using stories to deliver messages that affect audiences and drive change.





Kusfeld

Gardens in the sea