

ERIK LIDÉN • BOOKLET • AUTUMN 2021



ARK128 • ARCHITECTURE & URBAN SPACE DESIGN

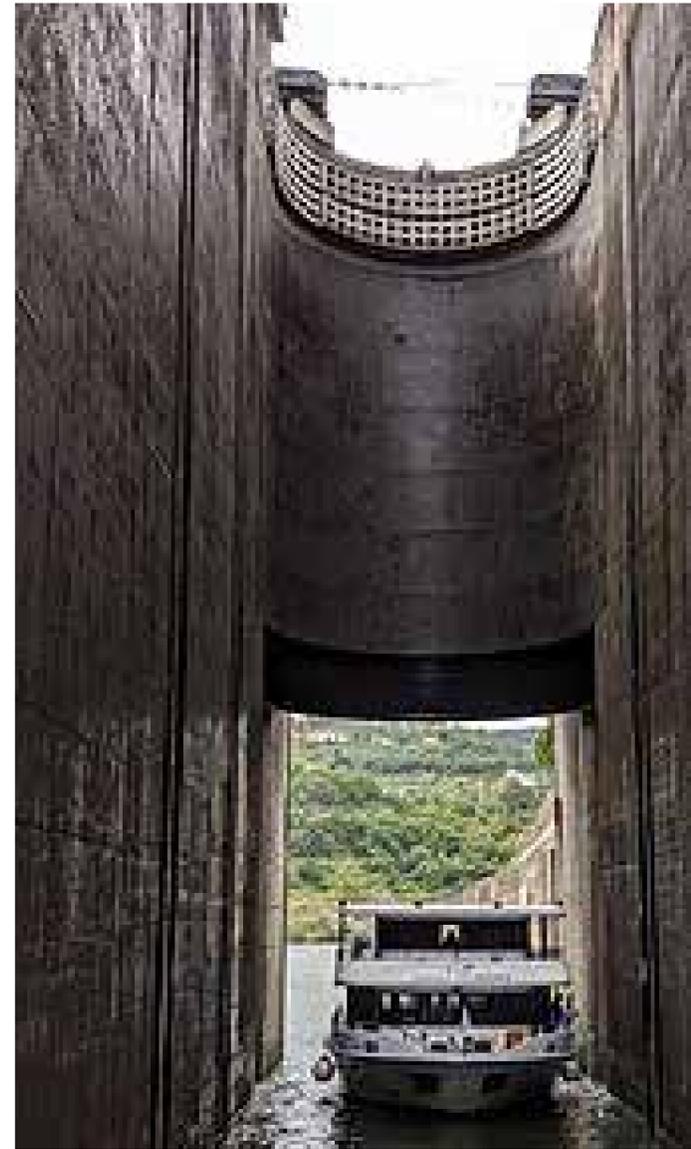
Infrastructure

SLUICES & WEIRS

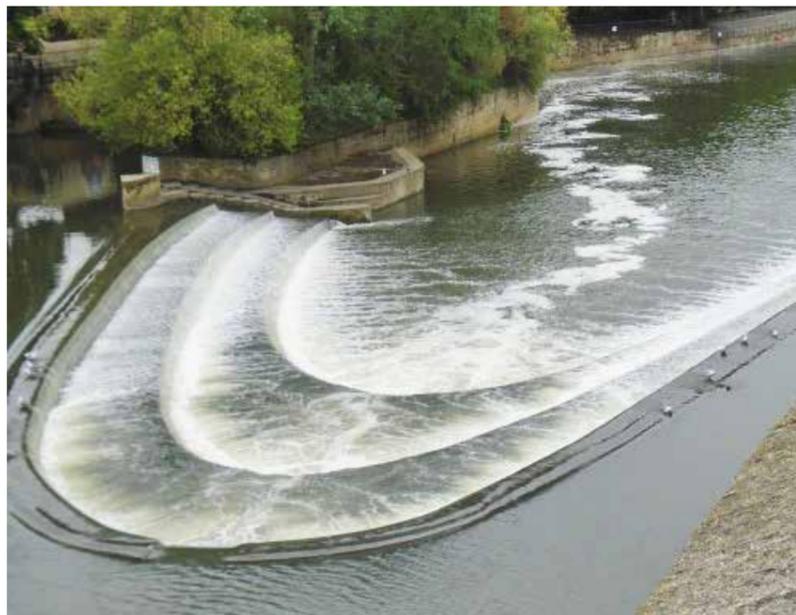
Sluices are water channels where the level of water and the intensity of its flow can be controlled. Using gates and water elevators they cut through the landscape, willing it to establish links between waterways on different elevations where previously there was none. The conflict within a waterflow literally going against its own stream is intriguing; a space where humans freely shape and invoke their own order on nature, to the point where the boundaries of landscape and structure become blurred.

key aspects

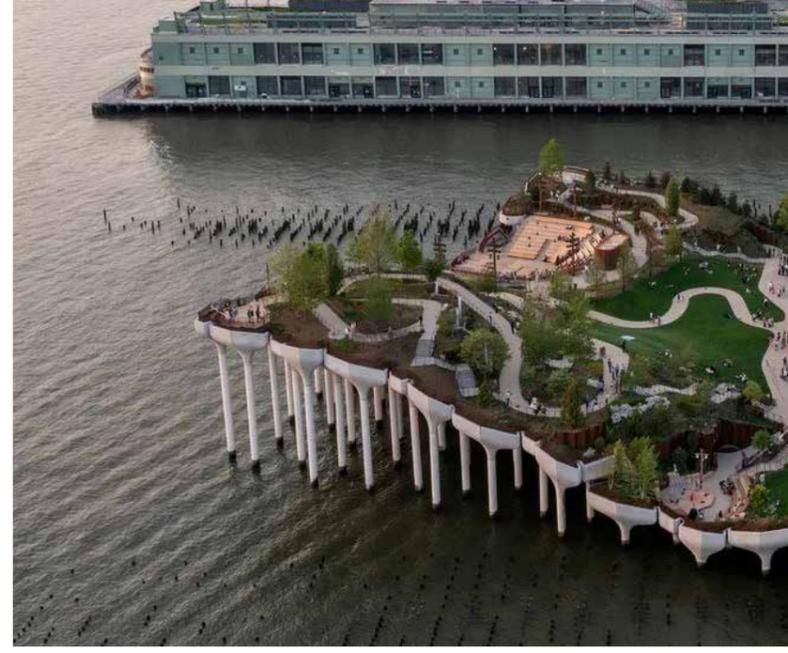
water elevators, connecting link, transformative, water reservoirs, hydraulics, controlling/slowing down water flow, cut into the ground, big impact on nature, different scales, floating perspective



Infrastructure



Human Space Type





Human Space Type

ACTIVE SPACES

Activity can mean a great many things and, depending on who you ask, all human spaces are in some sense active spaces, since we are never truly doing nothing at all. In the case of this studio, the focus of activities is intended to be more recreational and bring awareness and interactions between human and nature through experiences. As such, the Active Spaces are in essence multipurpose in their programming, sometimes fragmented within themselves, but always with the notion of creating spaces that by themselves become destinations to reach.

key aspects

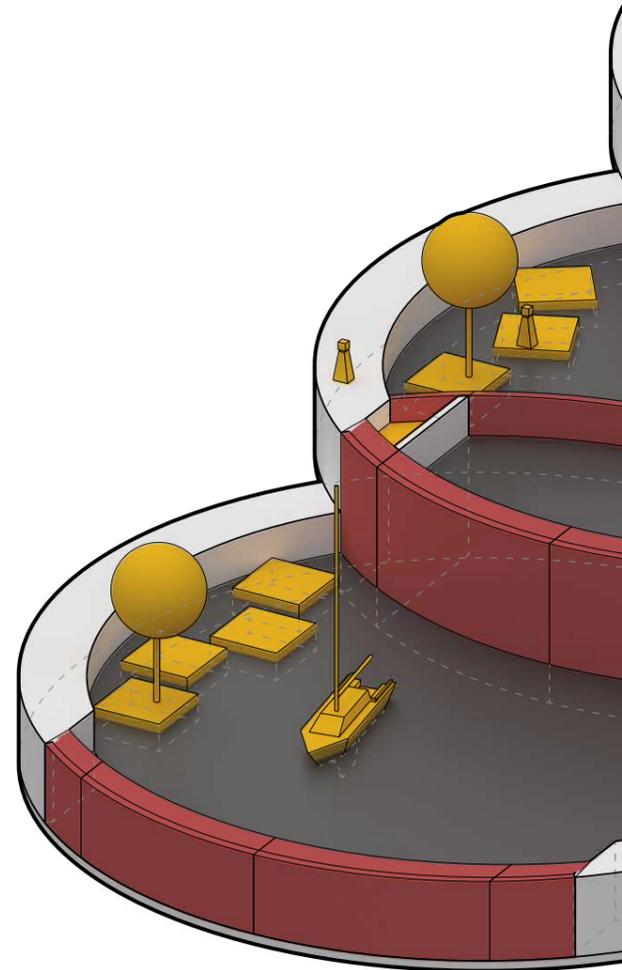
contact with nature, promotes movement, exploring space in 3 dimensions, multipurpose, activity+relaxation, multiple bits make up a whole, general and specific



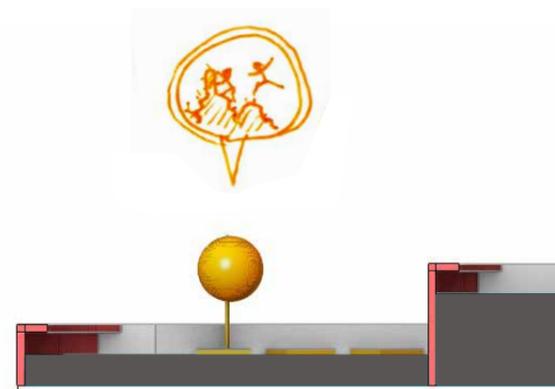
Hybrid Space Concept

ADVENTURE TRAILS

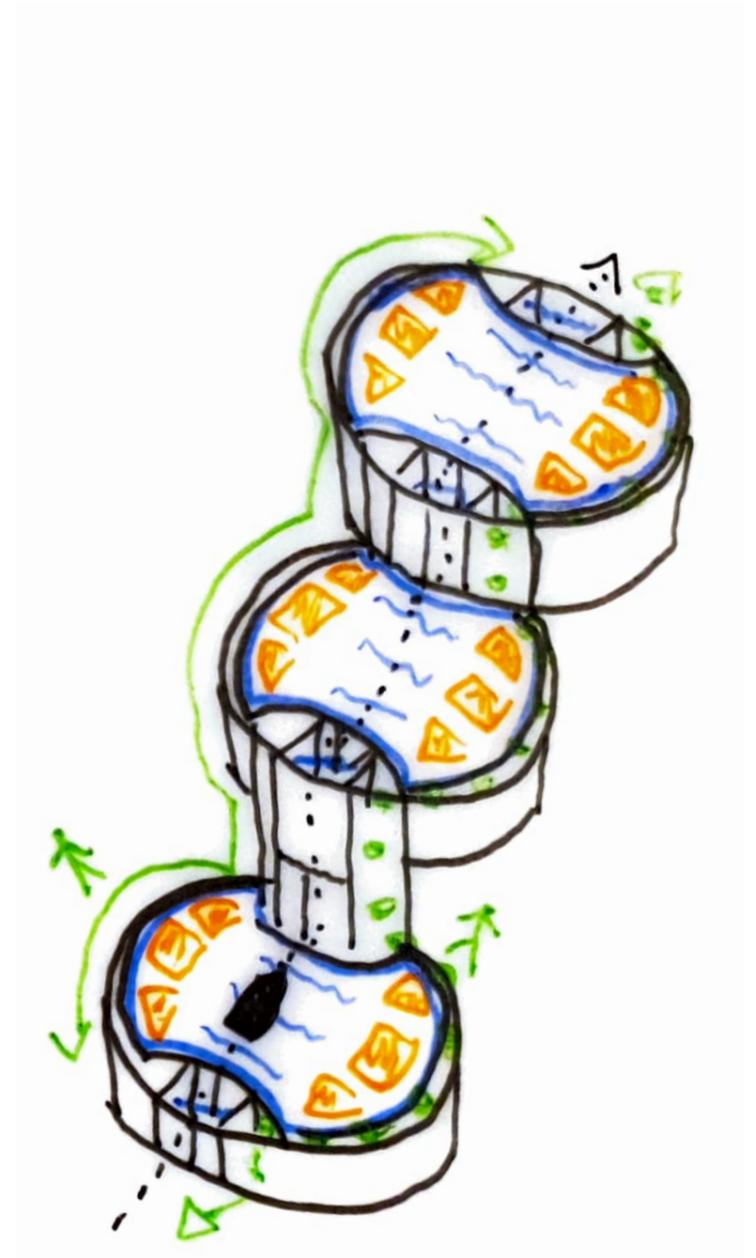
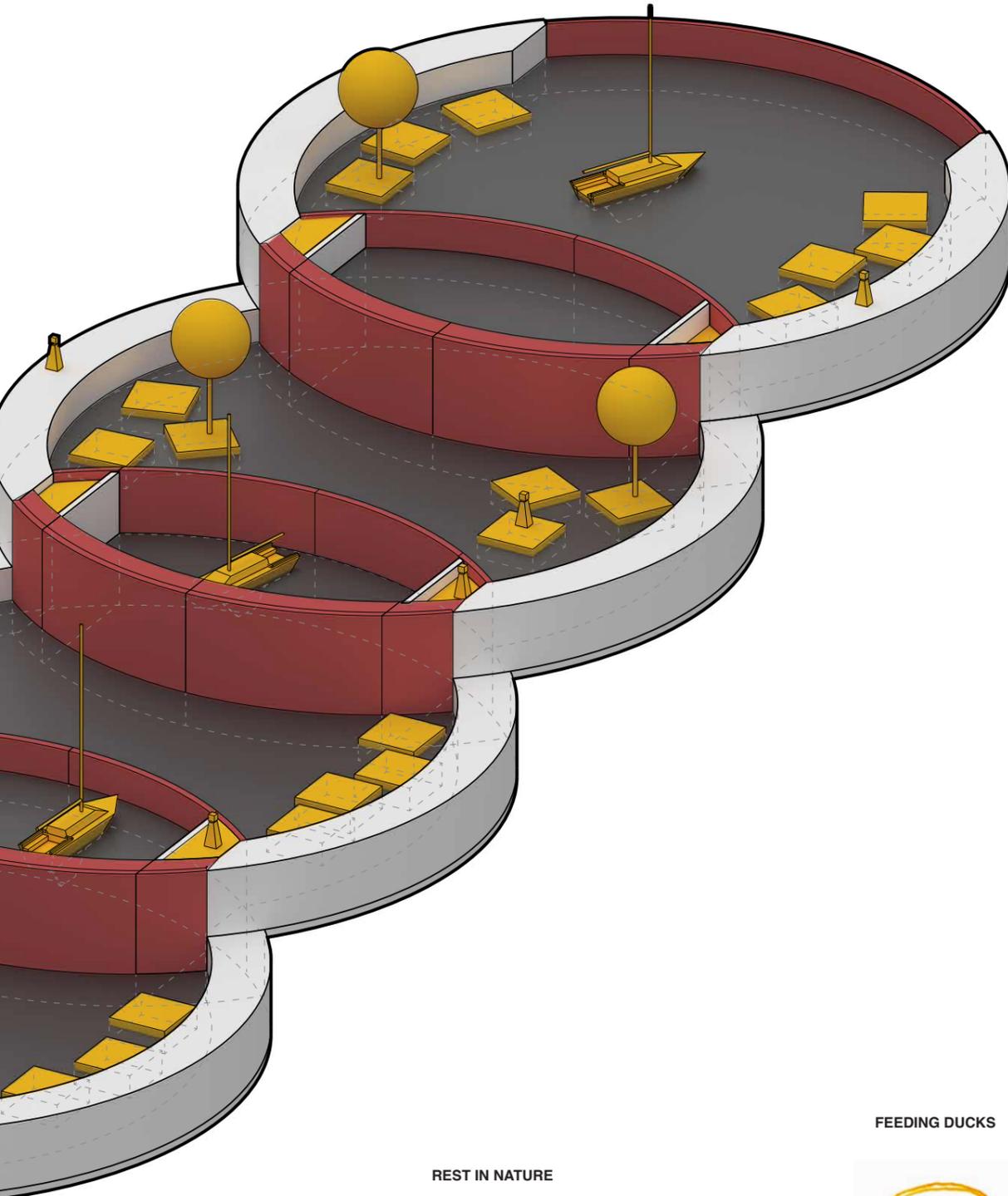
Through the combination of Sluices and Active Spaces we inject points of interest within paths oriented towards vertical movement. Places to stop and do different things along the trajectory, both for water bound vessels and pedestrians alike, making an otherwise empty corridor into a journey rich in experiences. These spaces are placed in the “landings” of the sluice channel, the basins between each regulated elevator, to allow continuous access while at the same time make the spaces for human activity fluctuate in relation to the everchanging water level.



EXHIBITION



Hybrid Space Concepts



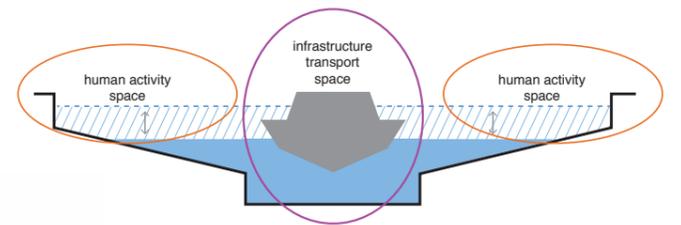
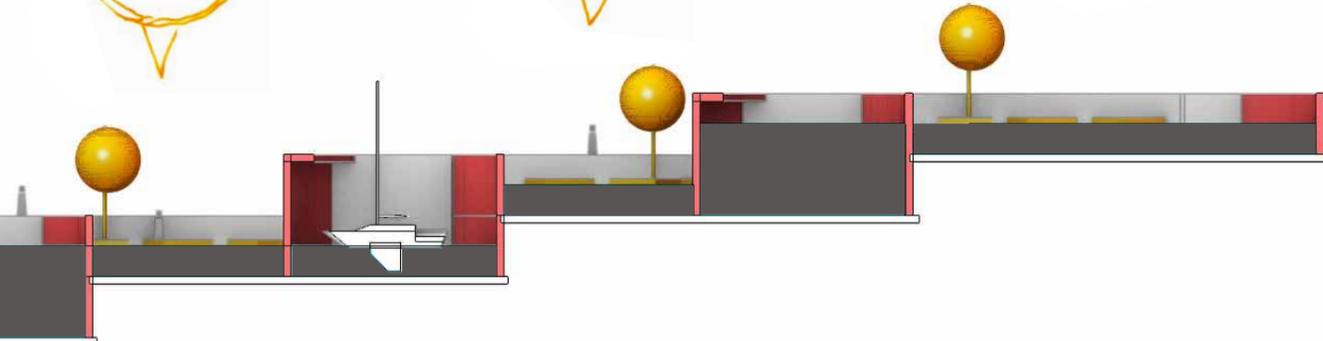
FEEDING DUCKS



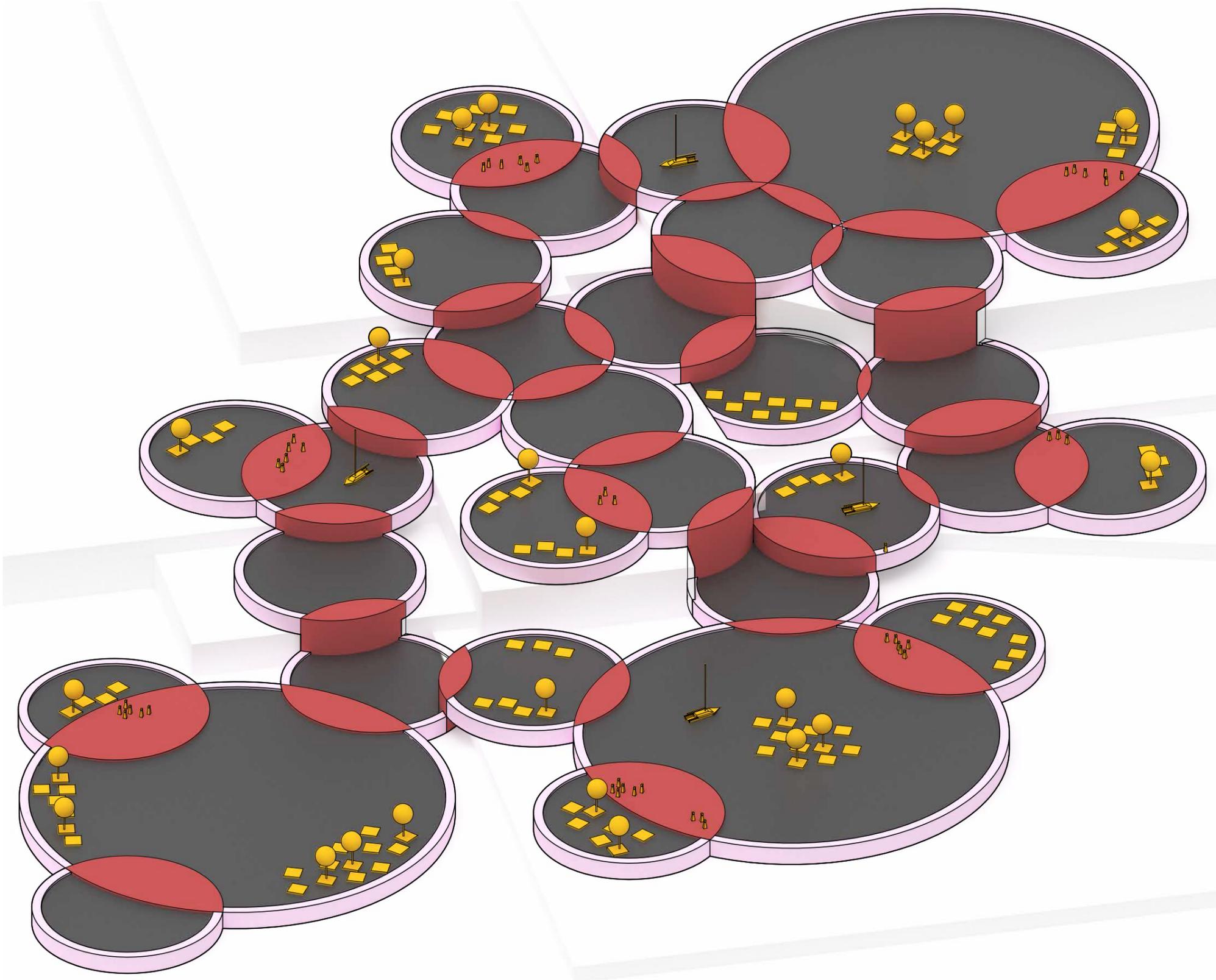
REST IN NATURE



OBSTACLE COURSE



Growth Network



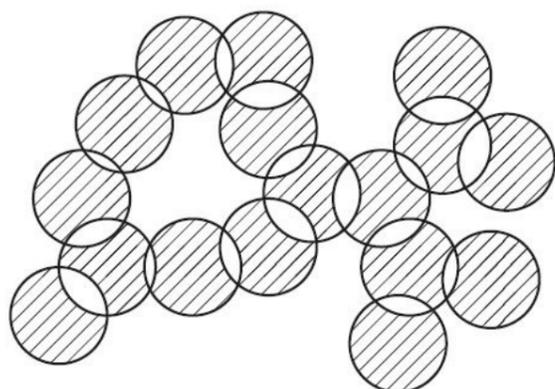


Growth Network

OVERLAPPING LINKS



Inspirations from nature, such as the branching out of river deltas and the monolithic and repetitive rock formations of the Giants causeway in Ireland, were taken to develop a growth network that relied on connected individual elements and a flow of water between them which adapted to the topography. Through playing with different actions that occur within the overlapping segments of the circular geometry of one hybrid space, a diversity in spaces and possible activities can be achieved that create its own maze-like topography with paths leading to various points of interest.

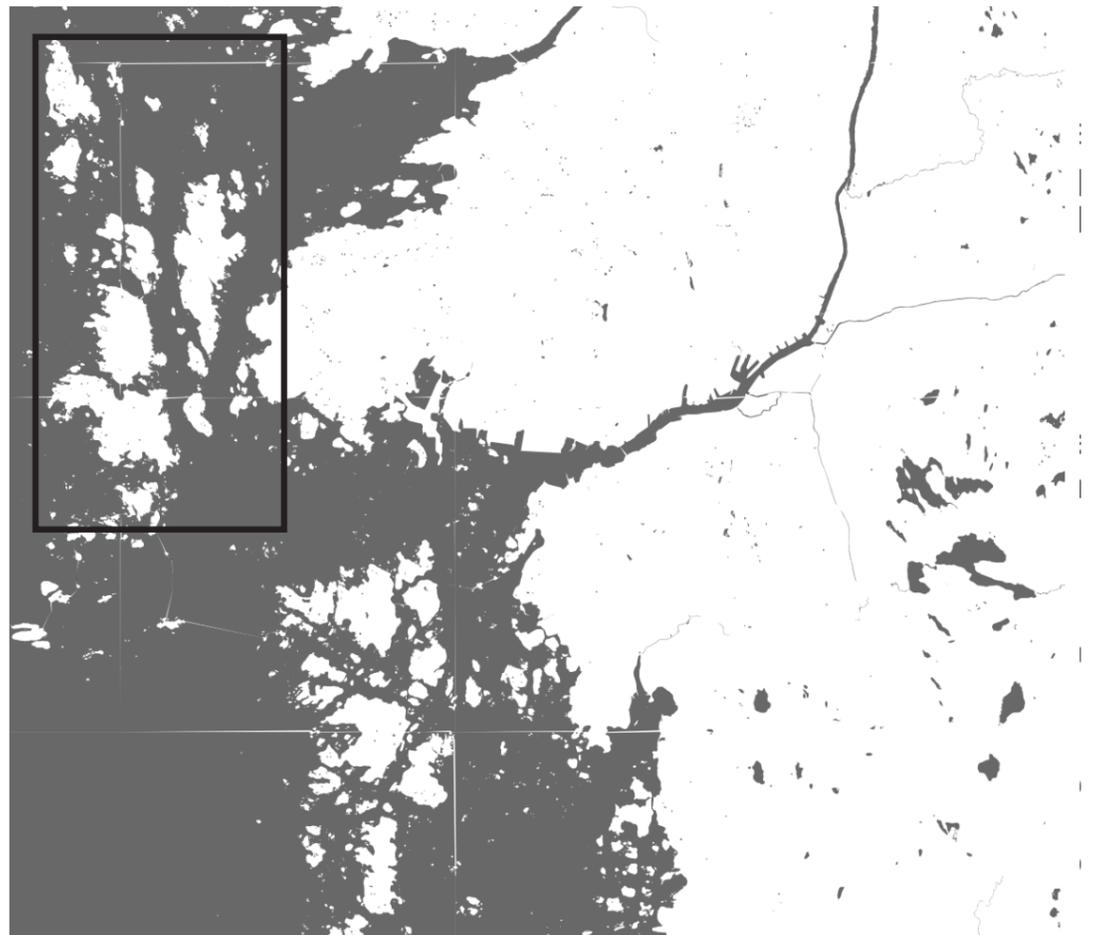


Problematized Waterfront

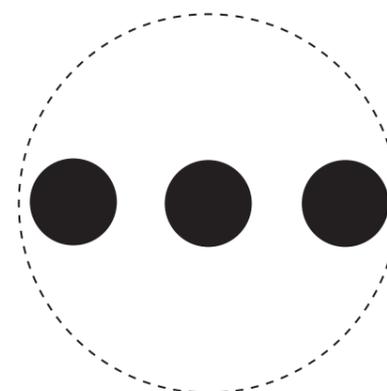
IRRESILIENT ARCHIPELAGO

The concept of resilience is commonly defined as the ability of an urban system to tackle shocks and stresses. Islands communities are in general irresilient in various ways. Businesses are season dependent. Ageing populations create fiscal pressure. The physical isolation make for various urban challenges. Rising sea levels change land use. In relation to the centralized urban core of Gothenburg, you could argue that this 'unland' is left behind.

Drawing upon previous concepts for hybrid space networks, an intervention for a more resilient archipelago was developed.



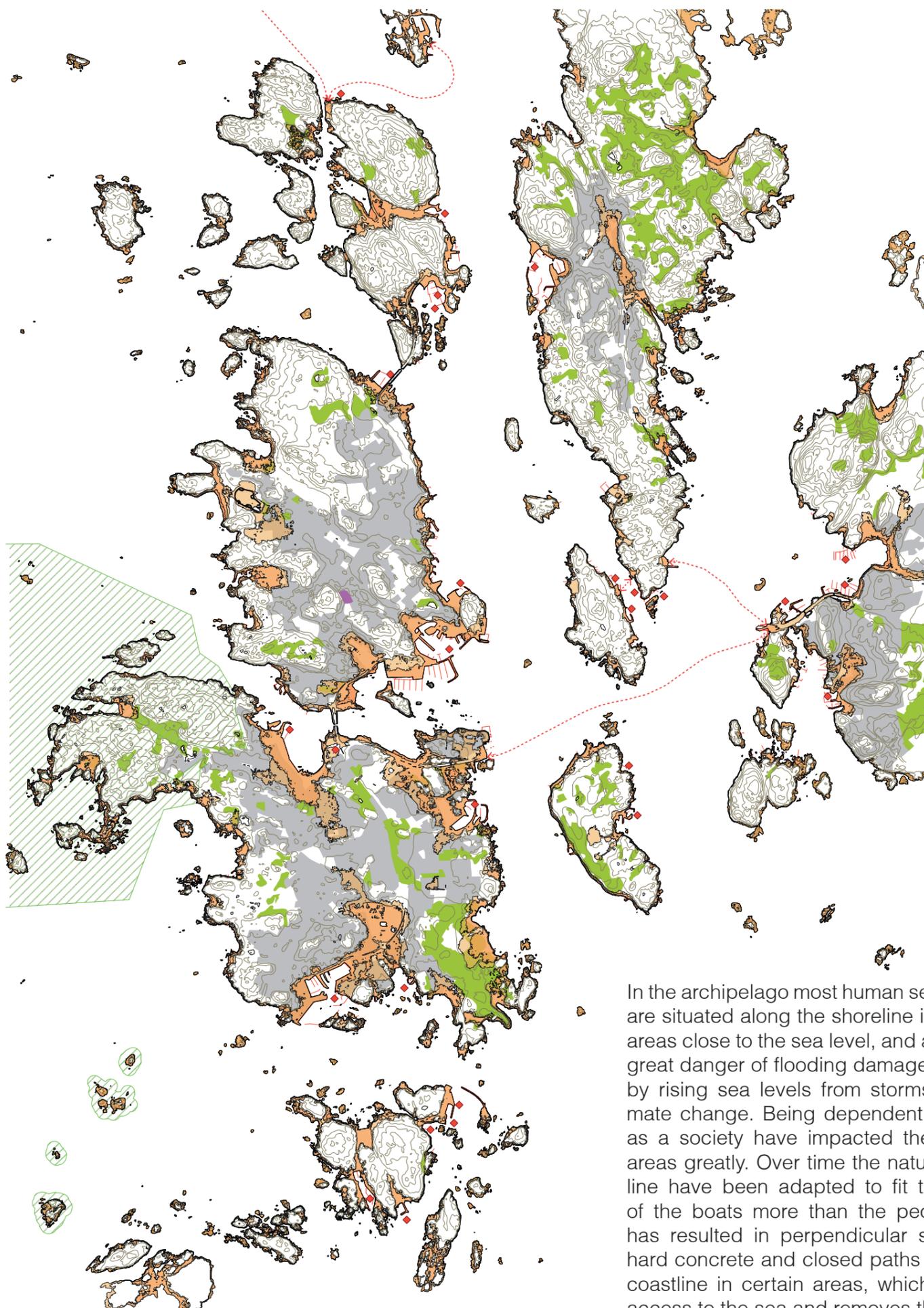
Workmethod & Concepts



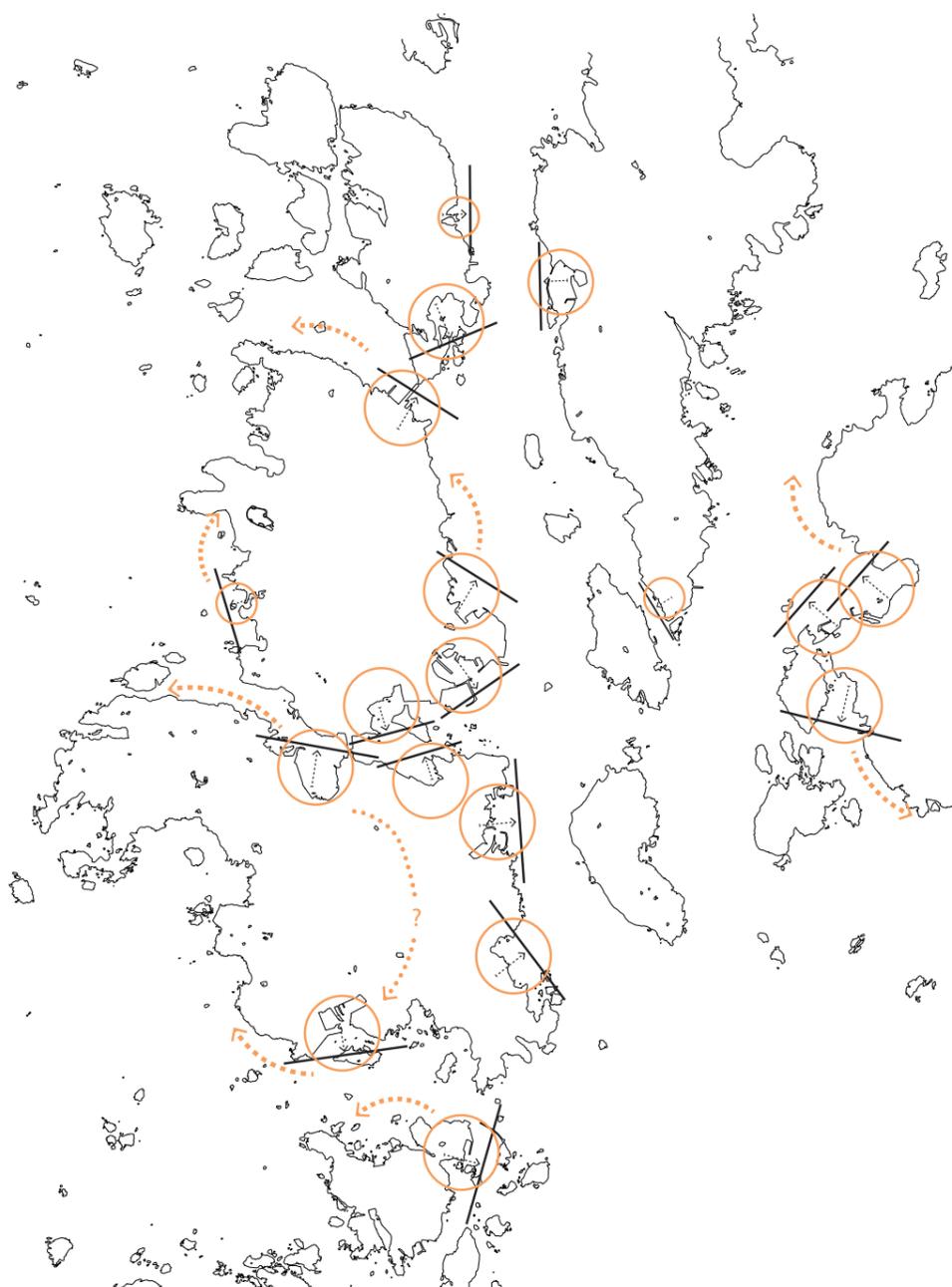
To handle to the complexity of the urban ecosocial system, a more holistic intervention would have a high degree of diversity in the challenges addressed. Three group members make for three approaches to resilience: crudely described as accept, protect and refuge.

A decentralized, somewhat beehive-like, organisation created high autonomy for group members in their work. The process made design a primary language. Intersections between networks, conceptually and spatially, are varied. Sometimes planned, sometimes coincidental, these intersections create a waterscape with complex spatial experiences.

Mapping the Archipelago

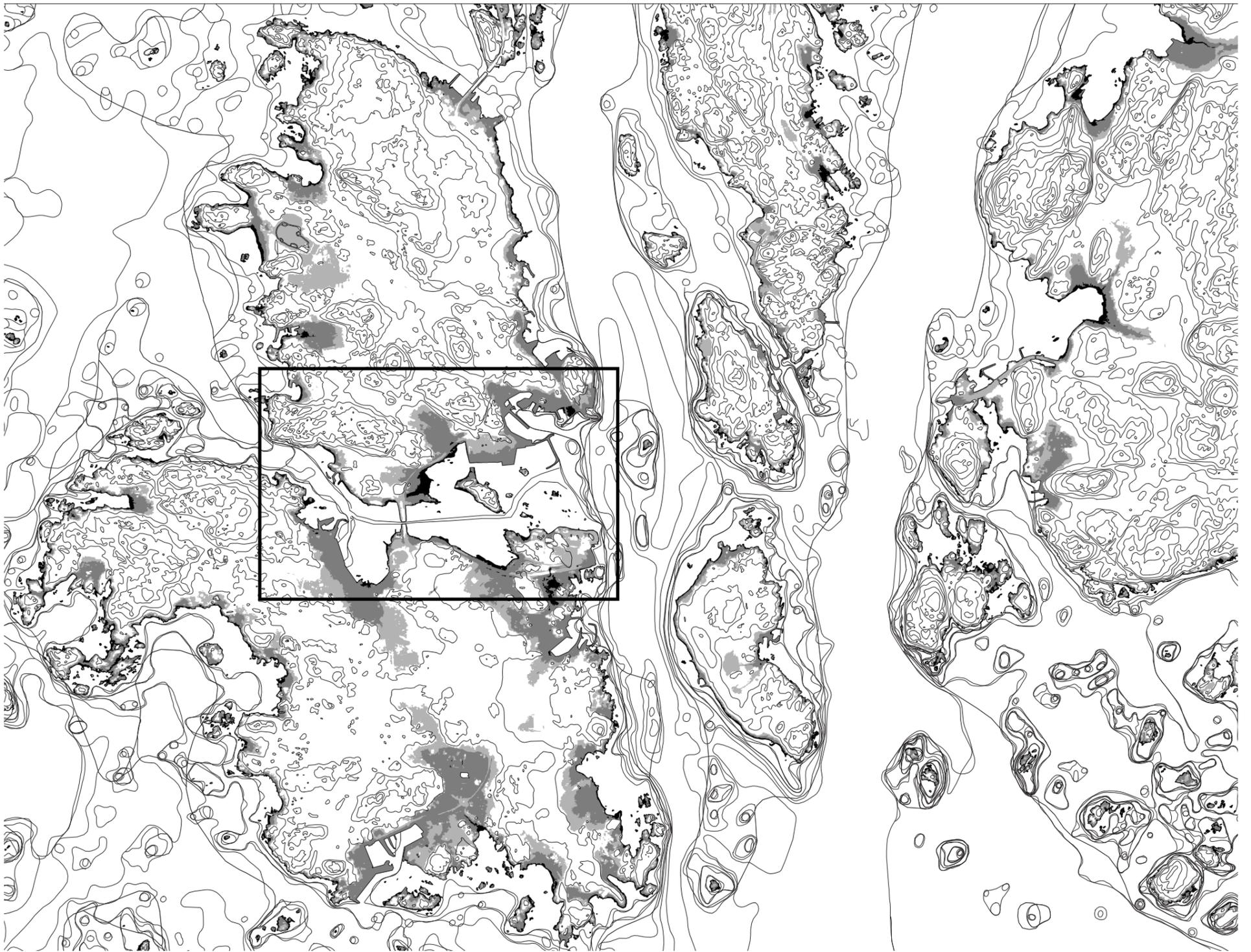


In the archipelago most human settlements are situated along the shoreline in harbour areas close to the sea level, and as such in great danger of flooding damages caused by rising sea levels from storms and climate change. Being dependent on boats as a society have impacted these coast areas greatly. Over time the natural coastline have been adapted to fit the needs of the boats more than the people. This has resulted in perpendicular spaces of hard concrete and closed paths along the coastline in certain areas, which limit the access to the sea and removes the natural beauty and wildlife that once was there.

Strategy Concept**PROTECTION FROM SEA LEVEL RISE**

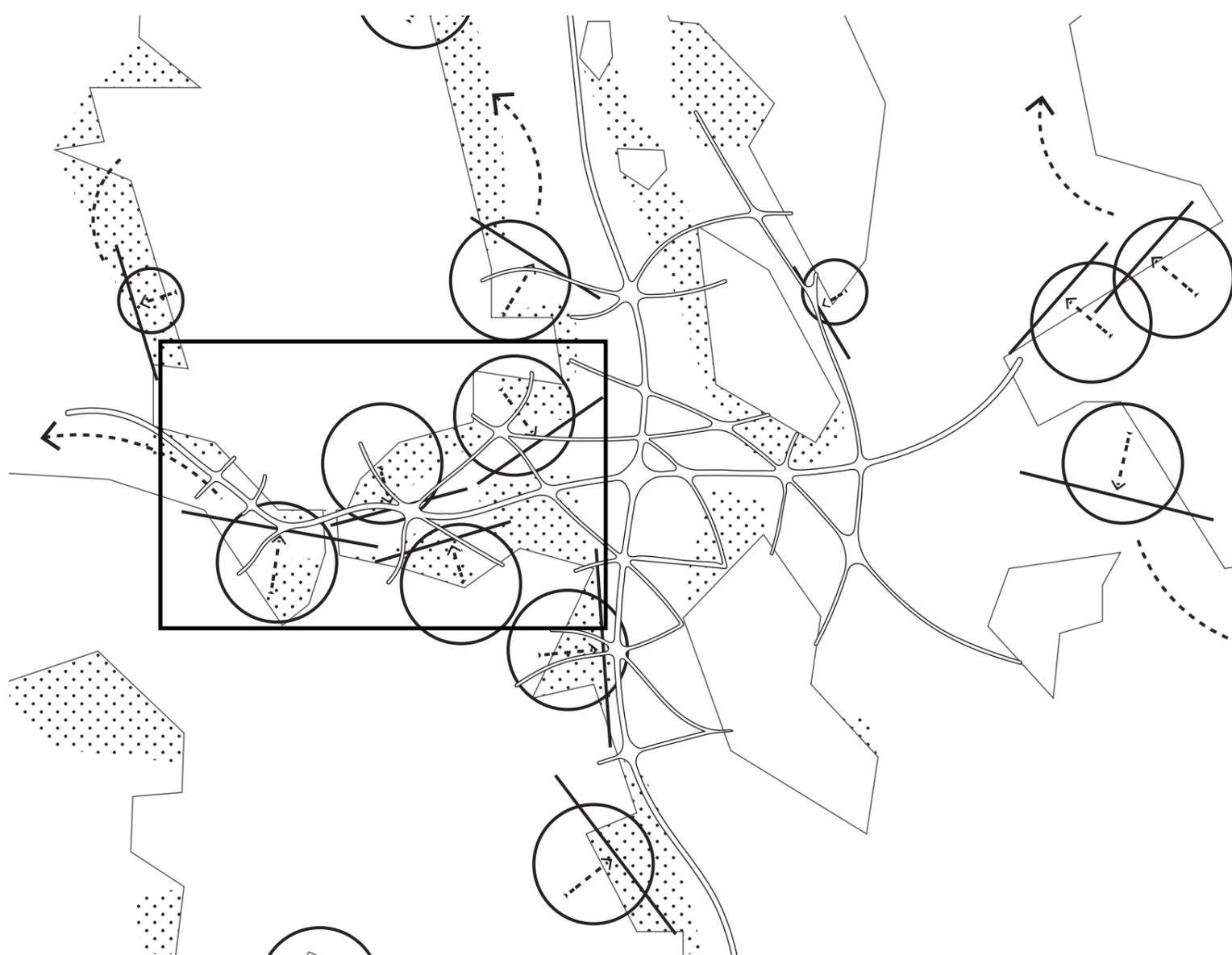
The goal is a resilient archipelago. To achieve that, my project focused on protecting these developed land areas in the harbours from rising sea levels through a barrier system traversable via sluices into the current harbours. These new structures in turn will aim to reshape the shoreline into a landscape where spaces for the marine functions can co-exist with humans and nature alike.

Focus Site



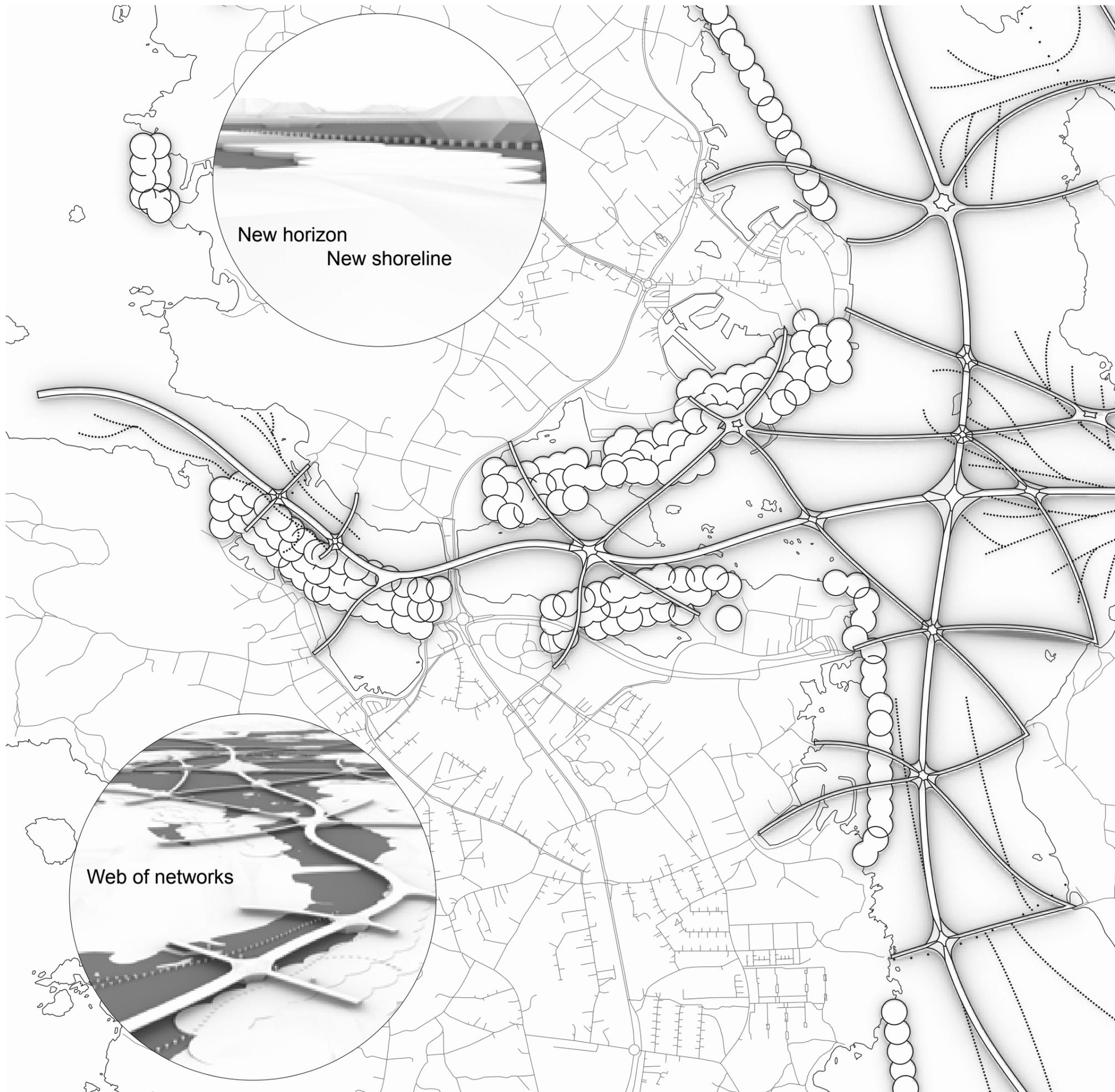
THE STRAIT BETWEEN ÖCKERÖ AND HÖNÖ

Team Strategy Concepts

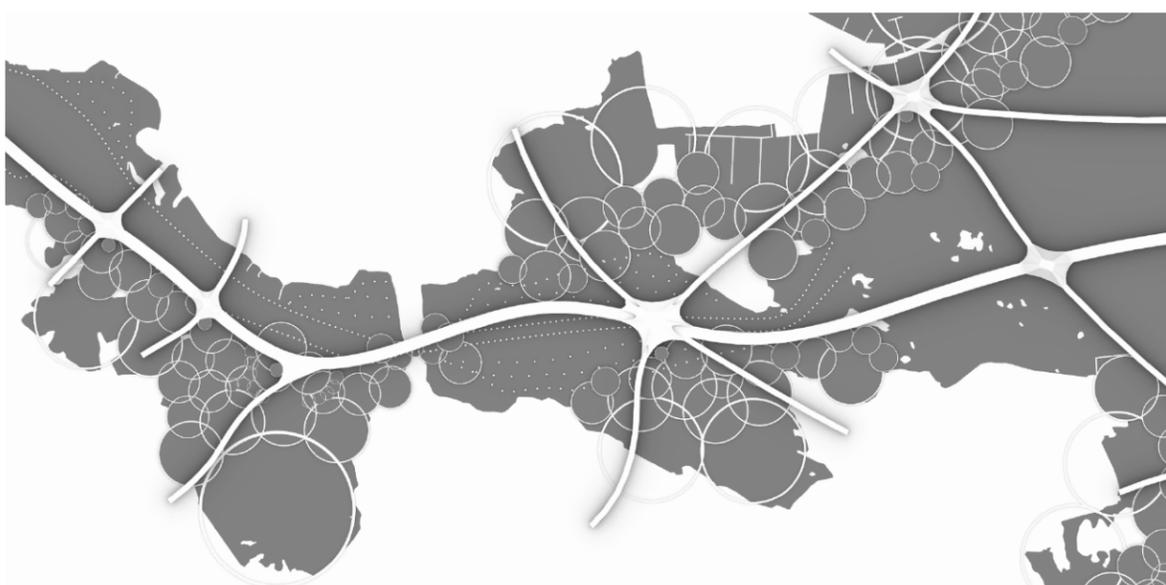


DIVERSE METHODS TO BUILD RESILIENCE

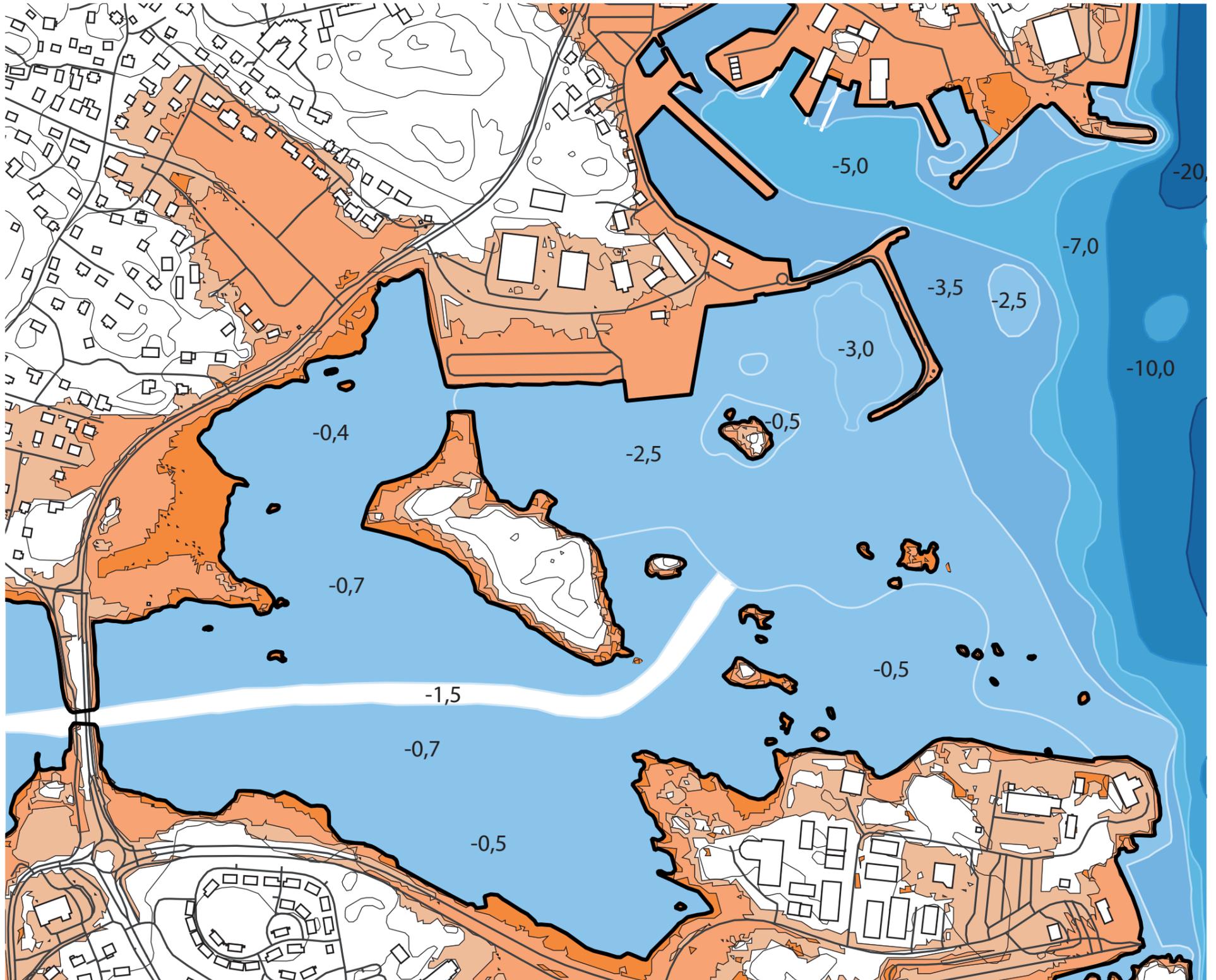
Suprastructure Prototype



Prototype Selected Views



Focus Site Mapping



Mapping water depths and SLR risk areas

Examining the harbour area more closely to define where the risk of flooding is the greatest.
Also taking into consideration the current water depth to avoid building really deep structures and place the vessel transportation routes in the appropriate locations where they can travel freely.

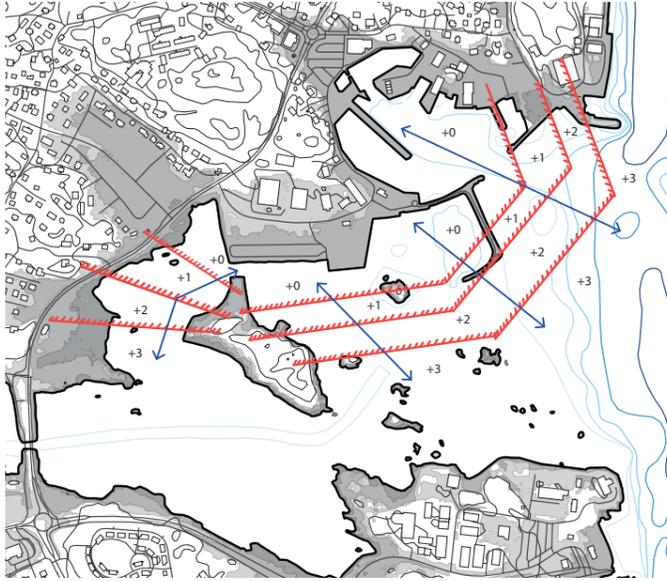
Focus Site Mapping



Mapping sea bed soil types and land usages

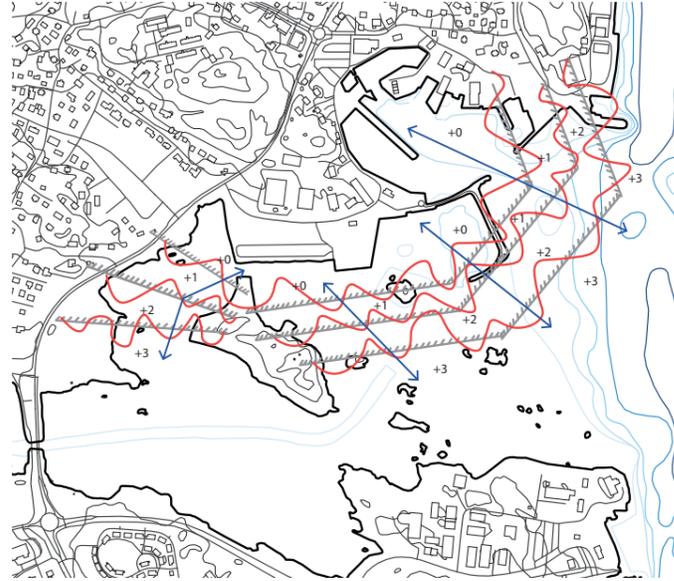
The focus area has a diverse soil types, with many important segments of eal grass and algae that are vital for a biologically healthy ocean and coastline. Adapting this diversity into the new structure and complementing it with new zones would be an ideal solution. The land usages is mainly residential and industry in the area, especially showing a lack of curated social and recreational spaces.

Network Design Strategy



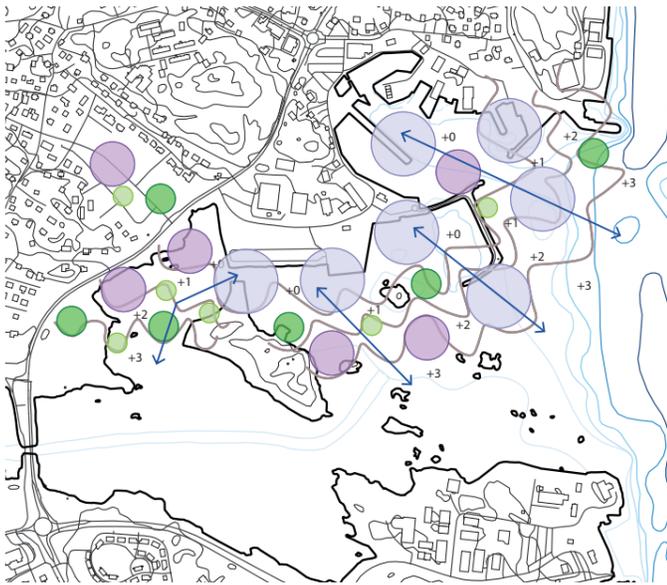
Protective barriers in three tiers along harbour

Building a stair up to the expected highest sea level rise (+3,5m) with paths via sluices through the structure.



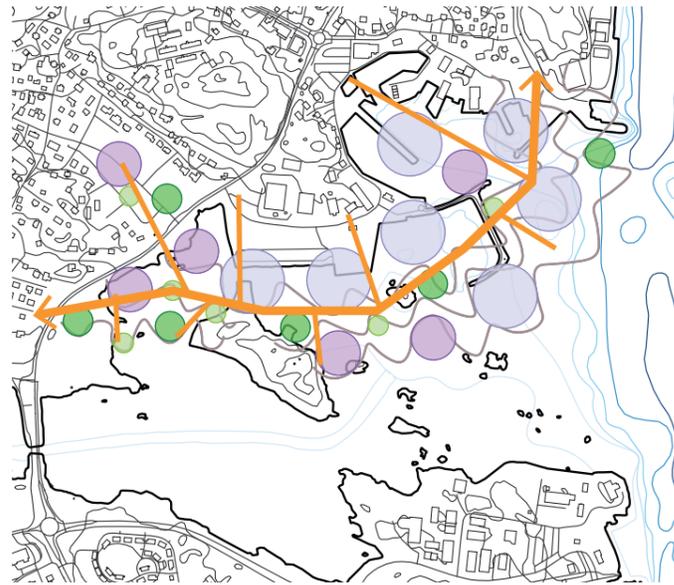
Weirs as barriers with longest edge possible

Weirs regulate water flow, and the longer the edge where the water pours over to the level below, the slower they can make it.



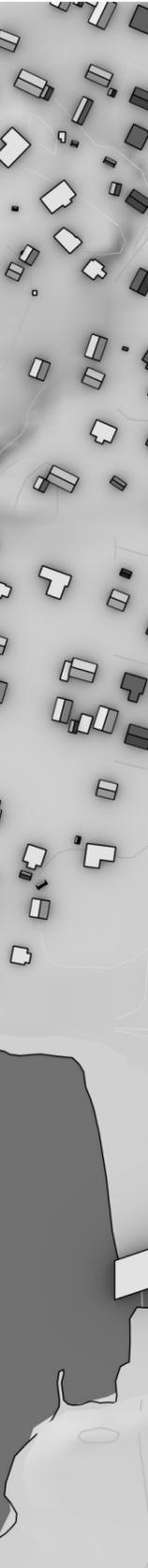
Highlighted basins with specific function programs

Size of the basins decide their programming and function, spread out into the area to serve different purposes and create permanent directional nodes for the entire network.

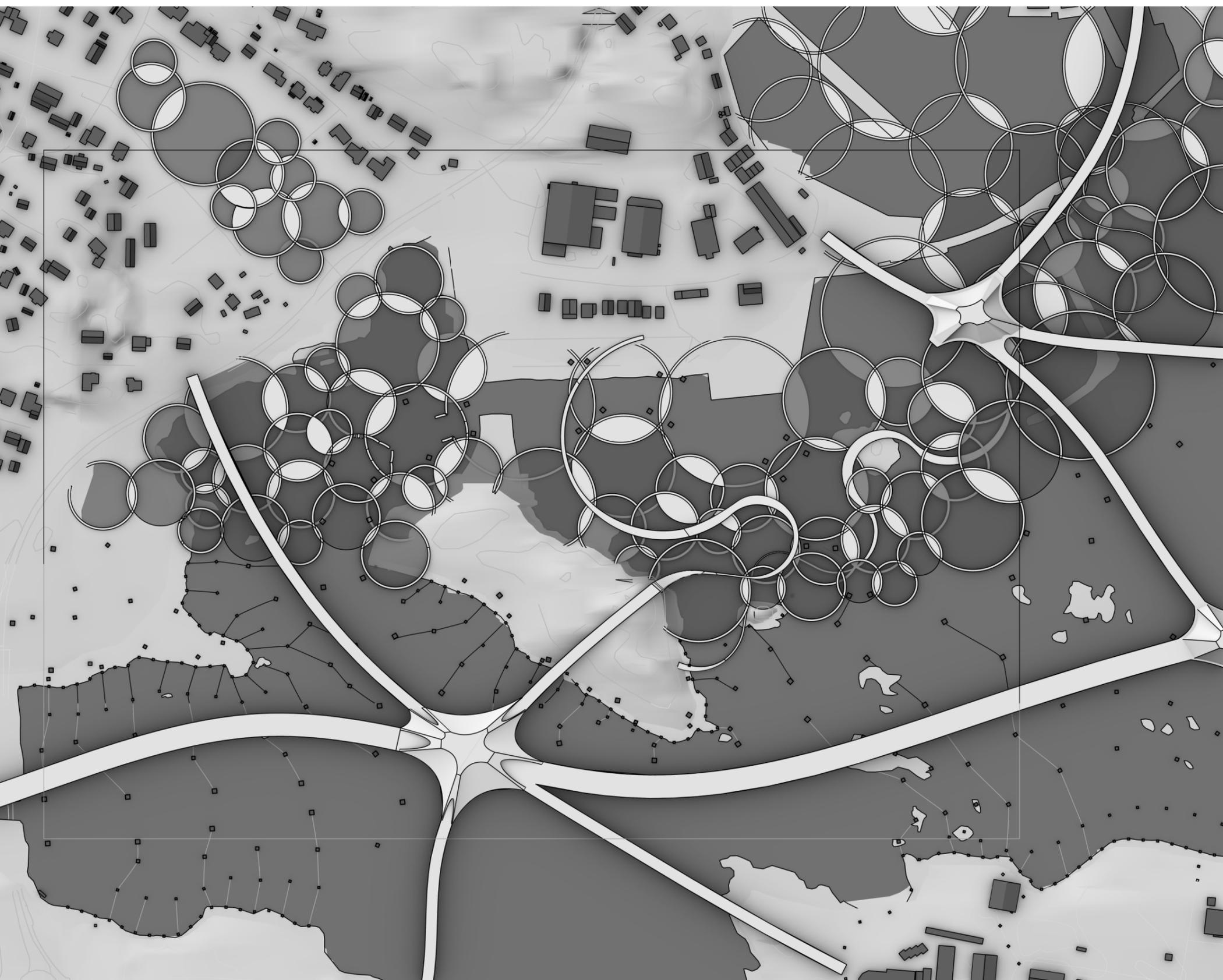


Pedestrian pathway through the entire structure

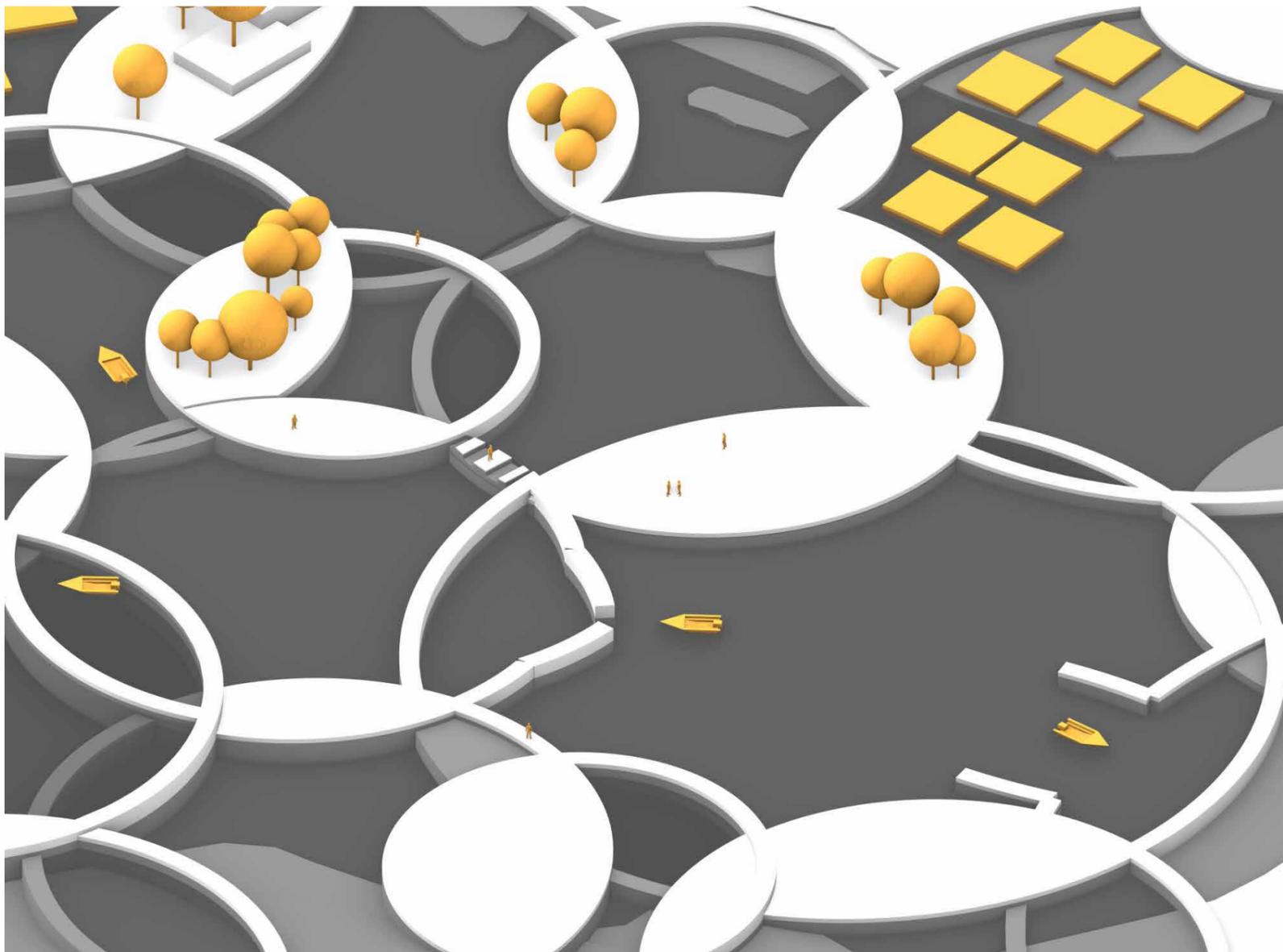
Using the edges of the basins to form the paths, jumping between levels and reaching out to different basins and important places on the island.



Midpoint Suprastructure Plan



Post-Midpoint Reflections

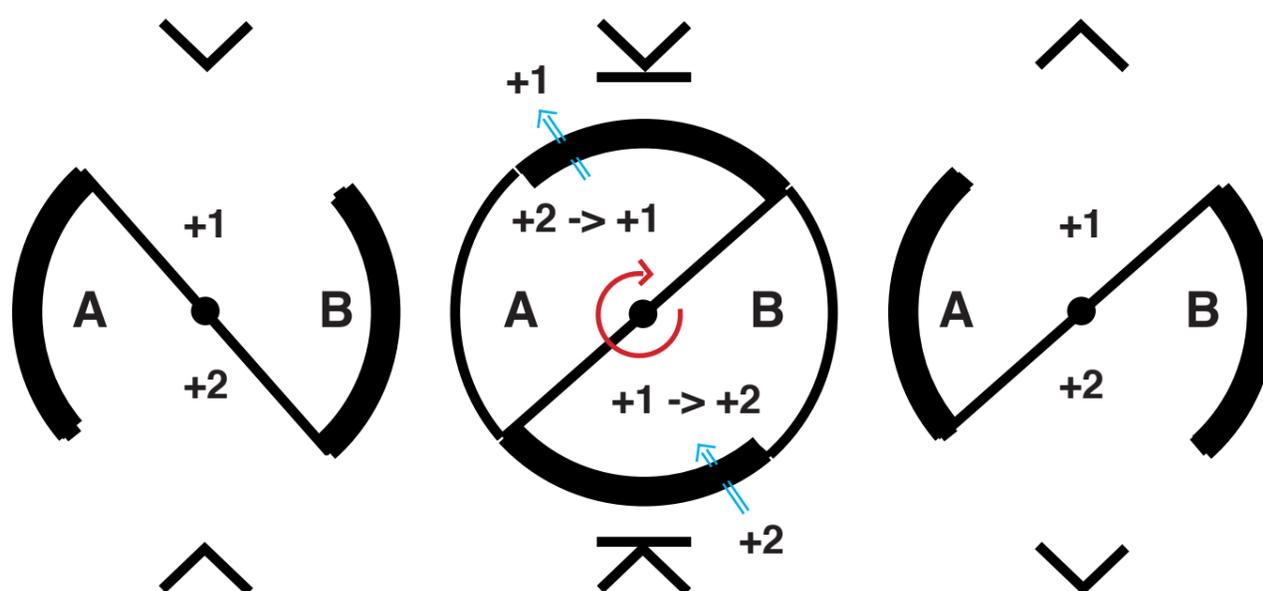
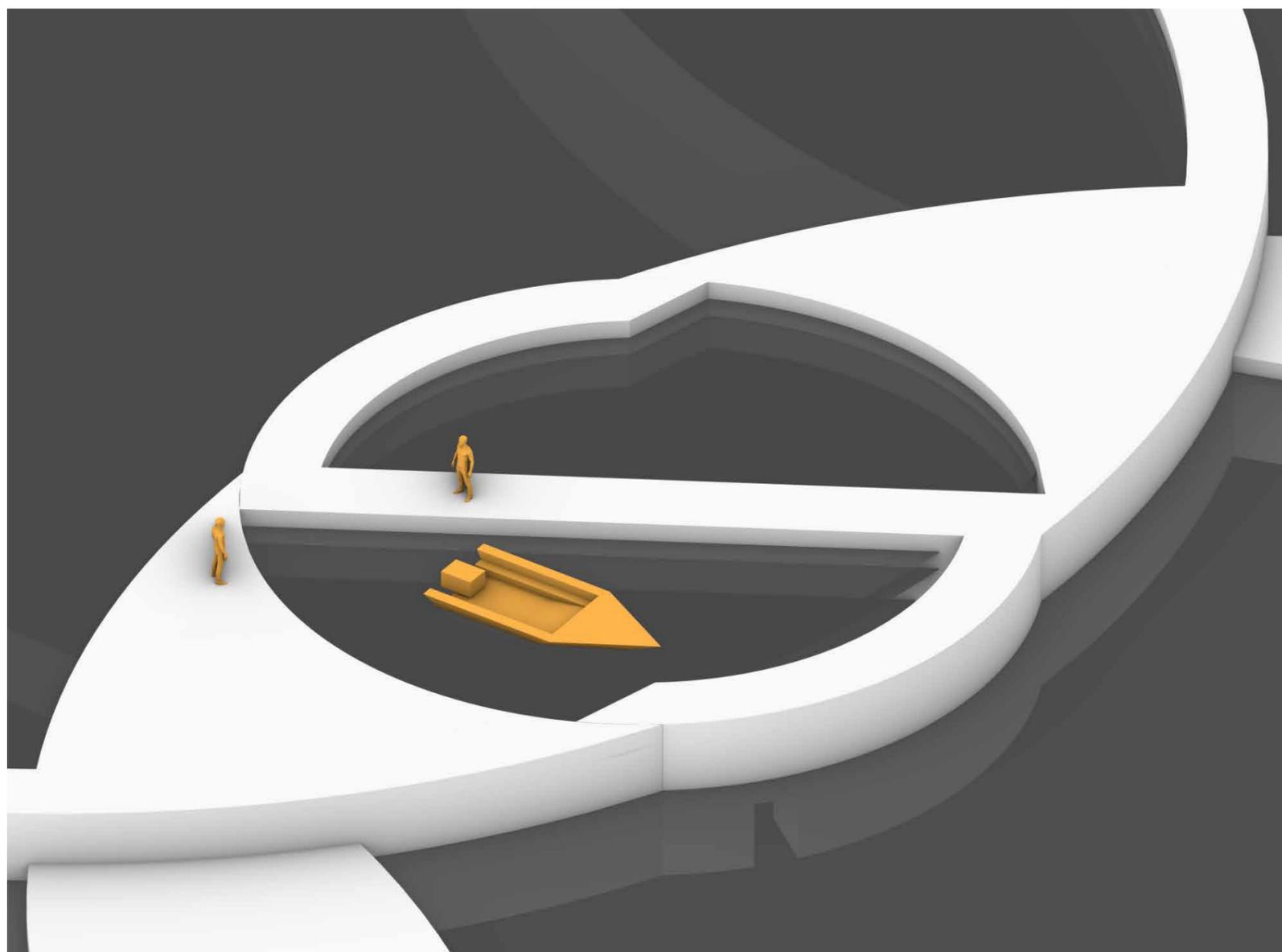


“A DIVERSITY OF SPACES, BUT LACK FLEXIBILITY AND COHERENT STRATEGY”

While the space itself felt interesting and received positive feedback, the larger networks design could have a more prominent strategy to bring it to a whole. Understanding how the spaces itself behaves on a human scale also felt necessary, zooming in and exploring with the placemaking to figure out what happened when the circular hybrid space-elements interacted with each other.

Furthermore, while the sluices works on a basic level, the fact that when they open they encroach on the basin area and thus sometimes limit the possible usages of those spaces into basically only a passage felt wrong to me personally. Thus a rework of the sluice system to be able to fit inside one overlapping segment, at least the one for the smaller vessels, was made to correct this aspect (see next page).

Updated Sluice System



Network Function Concepts



Marine

Maintaining the harbour for now, but adding more spaces to park your boat throughout the structure, as well as new toolsheds, boat club houses and other assisting facilities will aid the current marine culture and make it sustainable for a longer time.

Food production and Recreational tracks

The biodiversity can be boosted by using closed nutrition and waste system in food production within the structure. For instance ponds of fish farms connected to eel-grass beds and clam farms that filter out the excess waste is one such solution.

By mimicking certain qualities found in natural shorelines; steep rises, flooded sections, rest stops and scenery etc, recreational paths within the structure can be curated and function as hiking trails for the coastal society.



Coastal wildlife safari and sanctuaries

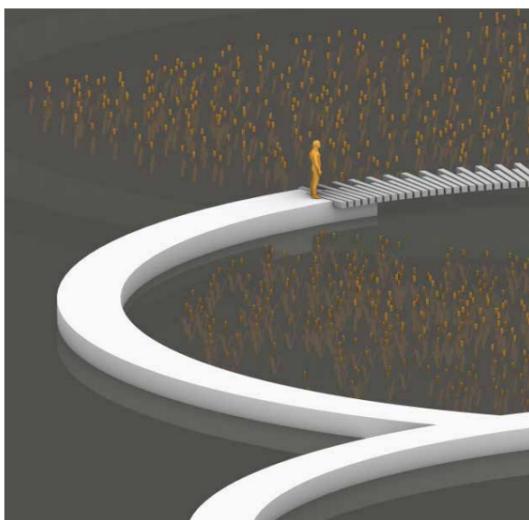
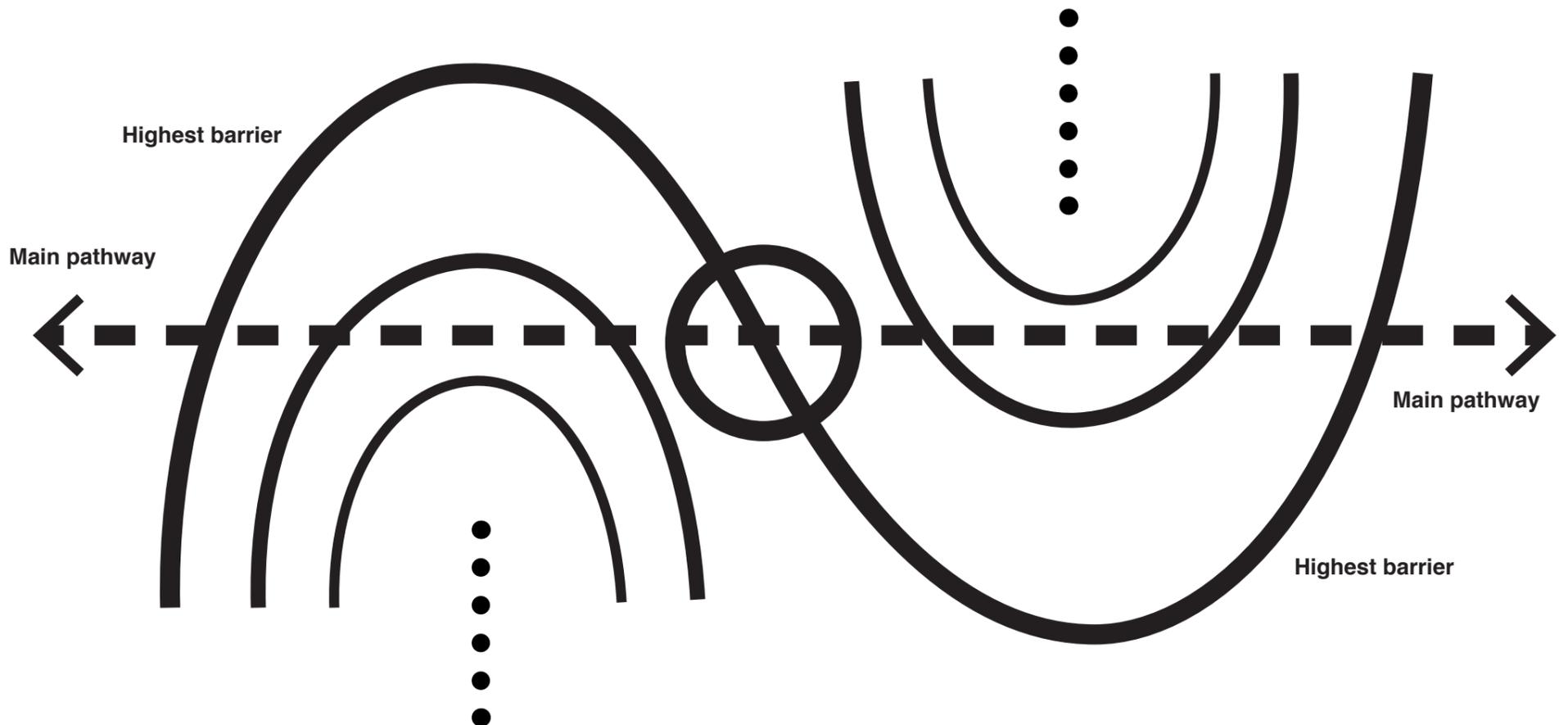
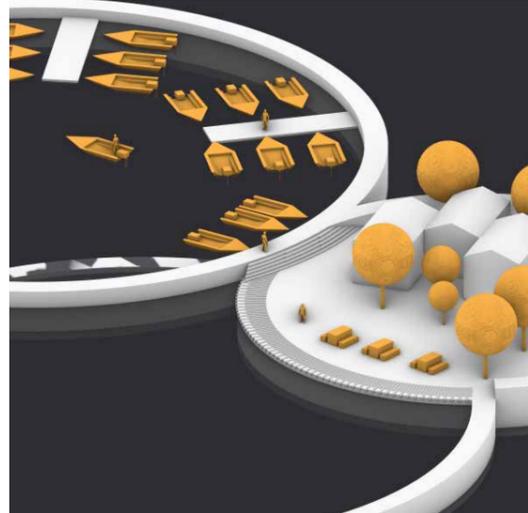
Finding a way to bring wildlife back to the shoreline and closer to human spaces can increase our understanding and acceptance of other lifeforms than ourselves. By establishing protected zones and shelters within the structure, the spaces could be populated during the mating seasons by seals, fish and birds in the area, which in turn could be a close-to-home safari opportunity for the residents and tourists alike, as long as the animals themselves are not disturbed by that.

Updated Network Concept

Protected zone

The hybrid spaces between the S-shaped barrier and the coastline are less prone to any flooding and thus can have a permanent function with constructed houses and important infrastructure nodes.

Marine and food production in particular could be dispersed in these areas.



Flooded zone

The spaces furthest from shore and outside the protective barrier are purposefully not as high up as the middle section of the structure, and are thus very likely to be flooded during heavy weather or sea level rises. When that happens the space changes and nature takes control of the space, although some parts are still traversable.

Wildlife sanctuaries and adventurous hiking excursions into hidden bath ponds frequent these areas in particular.

Finalization

Waterscape suprastructure

RESILIENT WATERSCAPES

Diversity of approaches:

- protect
- refuge
- accept

Conceptual kinship:

- common ground

Three approaches create a holistic result

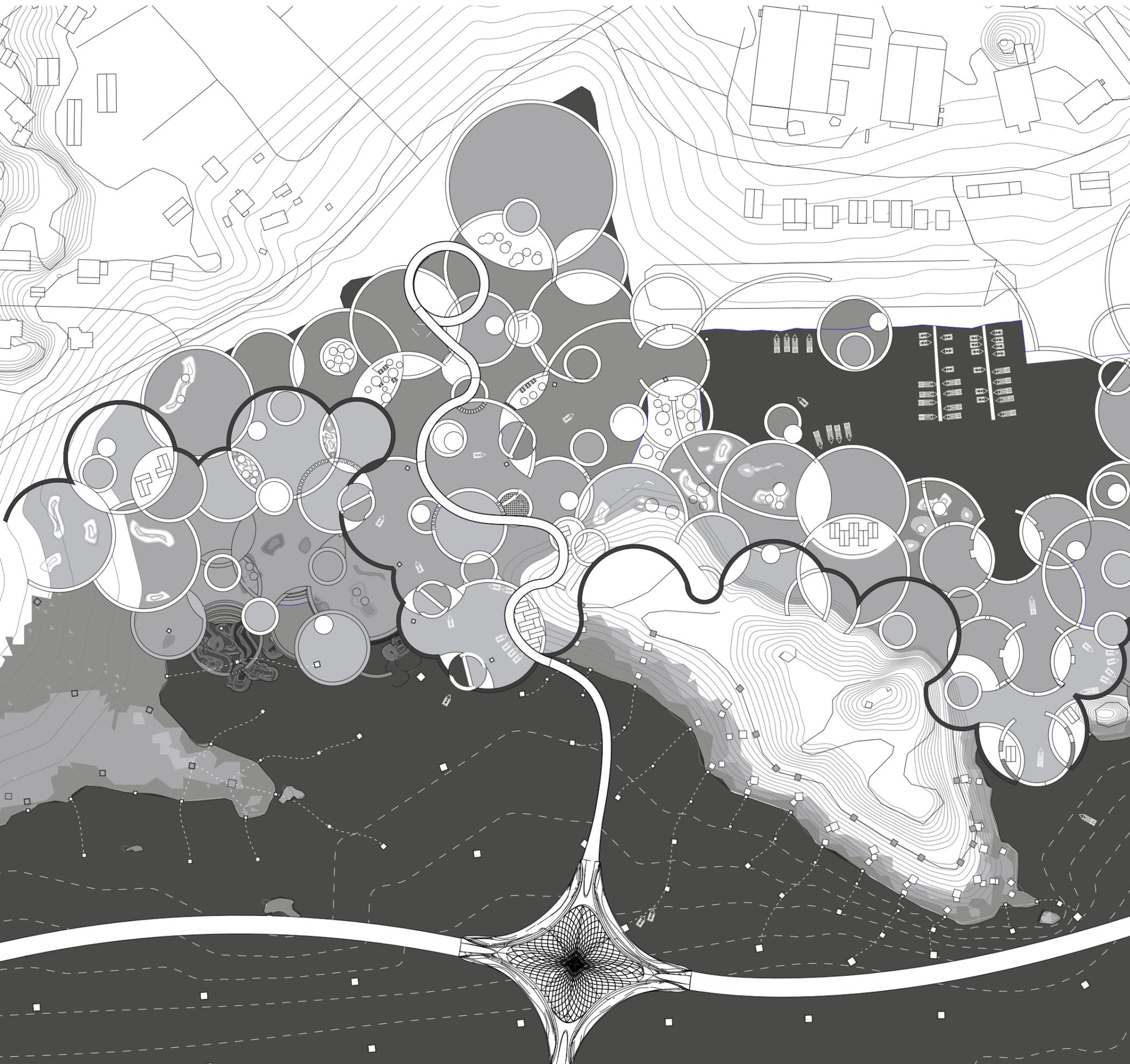


Bird, Fish, and All Inbetween



Bird, Fish, and All Inbetween

Suprastructure Plan



Collective Design Strategies



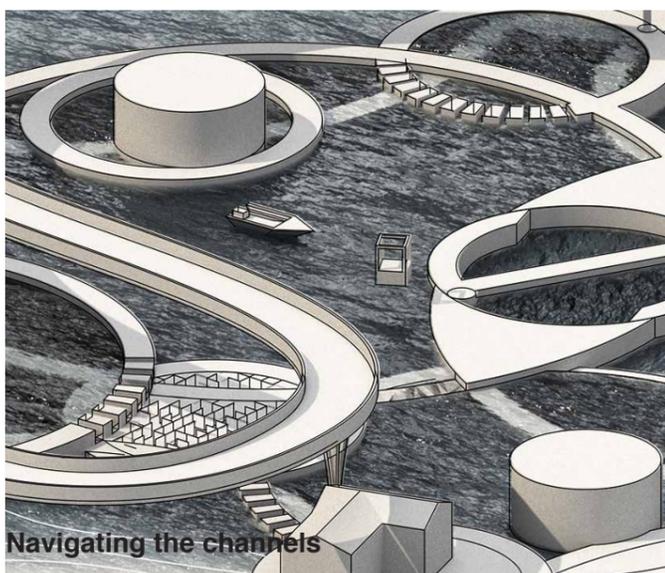
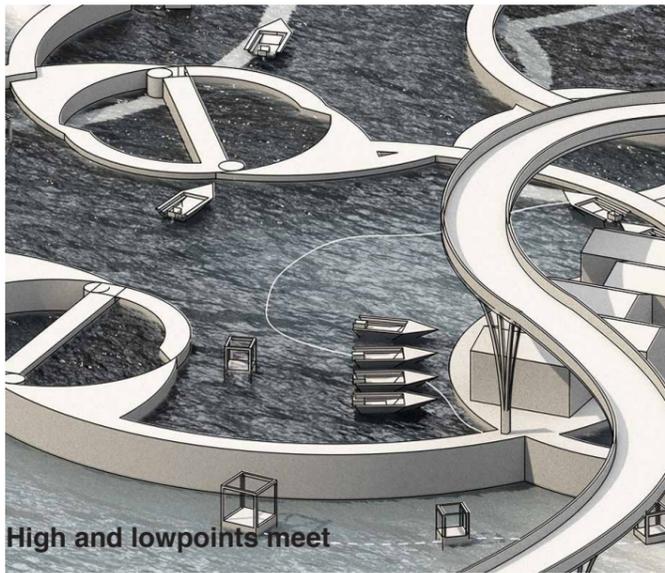
The three projects have all taken different paths to resolve the problematization of “Resilient Archipelago”, evident in the image to the left.

However, while the design and function differ, all have in some ways utilized Nodes, Fields and Lines to create their Hybrid Space Network, each project focused on a different strategy. This was not a planned result, but occurred naturally within the decentralized design approach of the group and when adapting each project to the boundaries presented by the team mates.

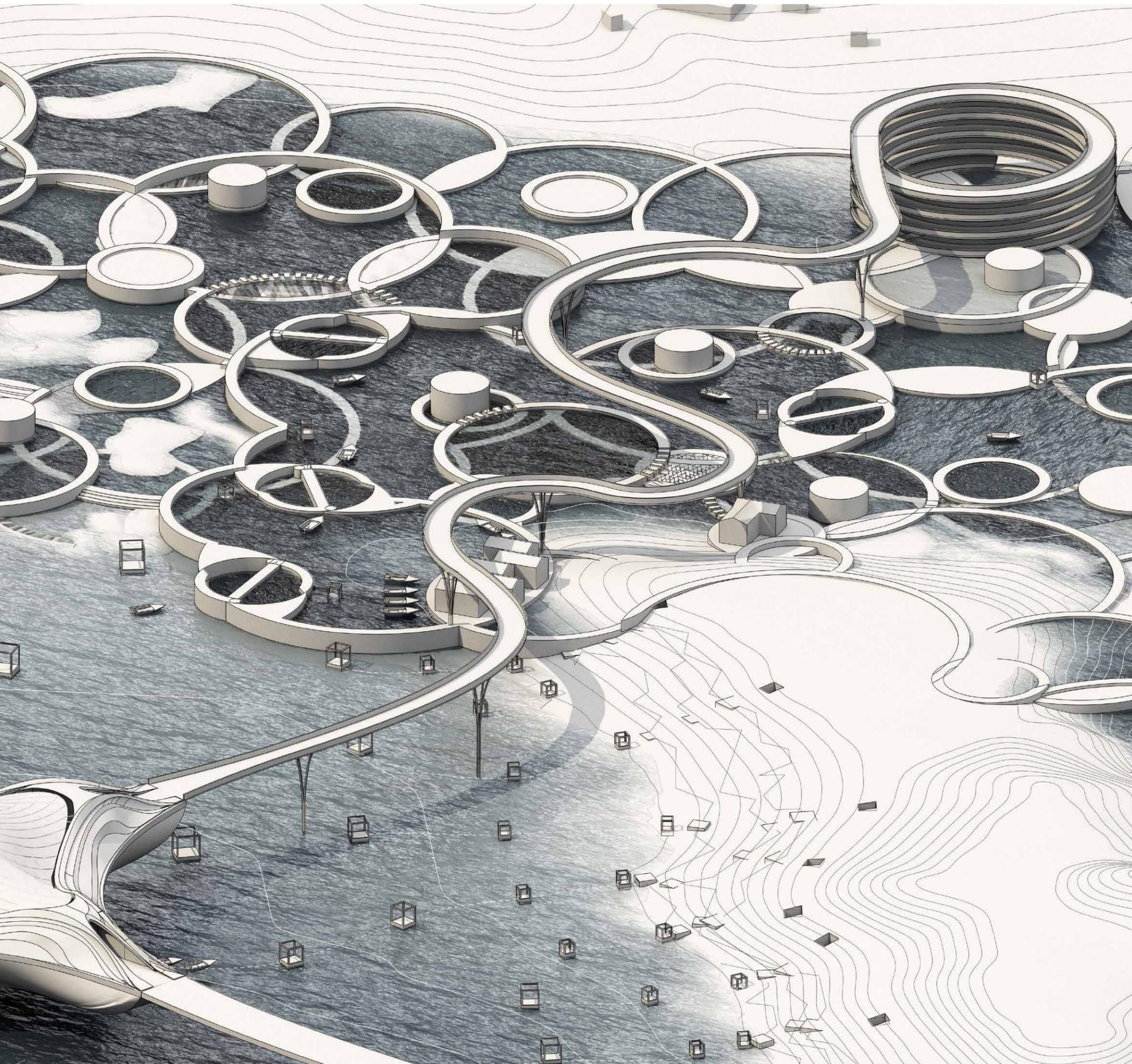
Together these strategies complement each other and create a diverse and resilient waterscape.



Interesting meetings



Suprastructure Axonometric



Waterscape Project Perspective





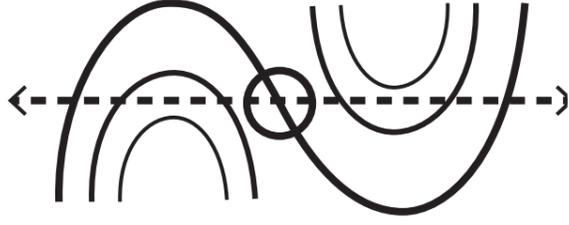
Waterscape project

(sur)ROUNDED BY WATER

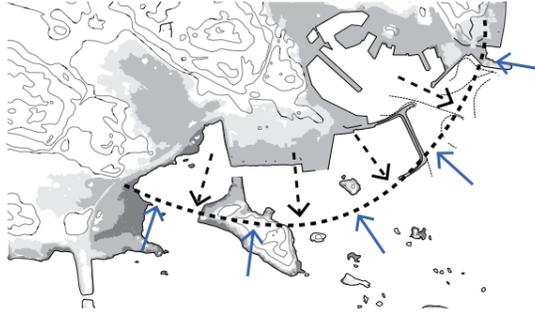
The threat of rising sea levels over time forms an inverted topography where the highest point will become the sea and the shoreline itself turns negative. To protect from flooding in key parts of the Öckerö harbour areas, a trapezoid barrier is proposed, that also aim to improve accessibility and strengthen the biodiversity along the coast. With a web of paths and spaces, traversable via sea through sluice gates, it redefines the context and establish itself as the new shoreline of the island.

The location within the suprastructure in relation to land, sea and elevation determines the longevity and functional qualities of a given space. The highest line, snaking through the middle of the network, divides the suprastructure into two areas; protected civilization and transformational nature, which at the top steps meet and blends together. While the protected side is more functional, its counterpart will over time inevitably be flooded and gradually return to nature's control.

Waterscape Network Concept



Mastering and relinquishing control of the sea
Barrier divides shoreline into controlled and uncontrolled zones, creating a changing multi-level landscape traversable by vessels and people alike



Protective barrier from the Sea Level Rise
Water and nature encroaching in, civilization expanding out



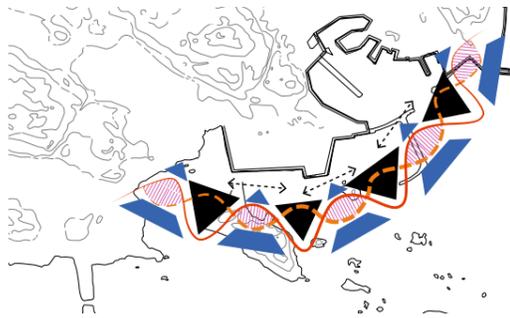
Fortified harbour area
Equal allocation of structure, flooded nature and protected civilization



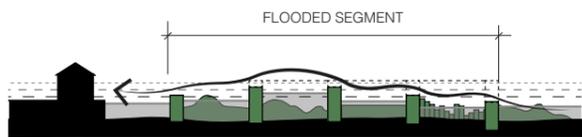
Opposing stairs
Harbour vessels going up to new sea level, ocean water step by step conquering more space



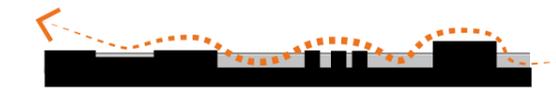
Highest ridge mirroring curated walkway
Harbour vessels going up to new sea level, ocean water step by step conquering more space



Different types functions in diverse spaces
Marine programming close to shore and along the paths, flooded nature towards the sea and over the ridge, & filled with activity between them all



One wide sponge
Multiple biological defense lines instead of one big wall



Traversing the new shoreline
Paths change in height, going over and under the water surface

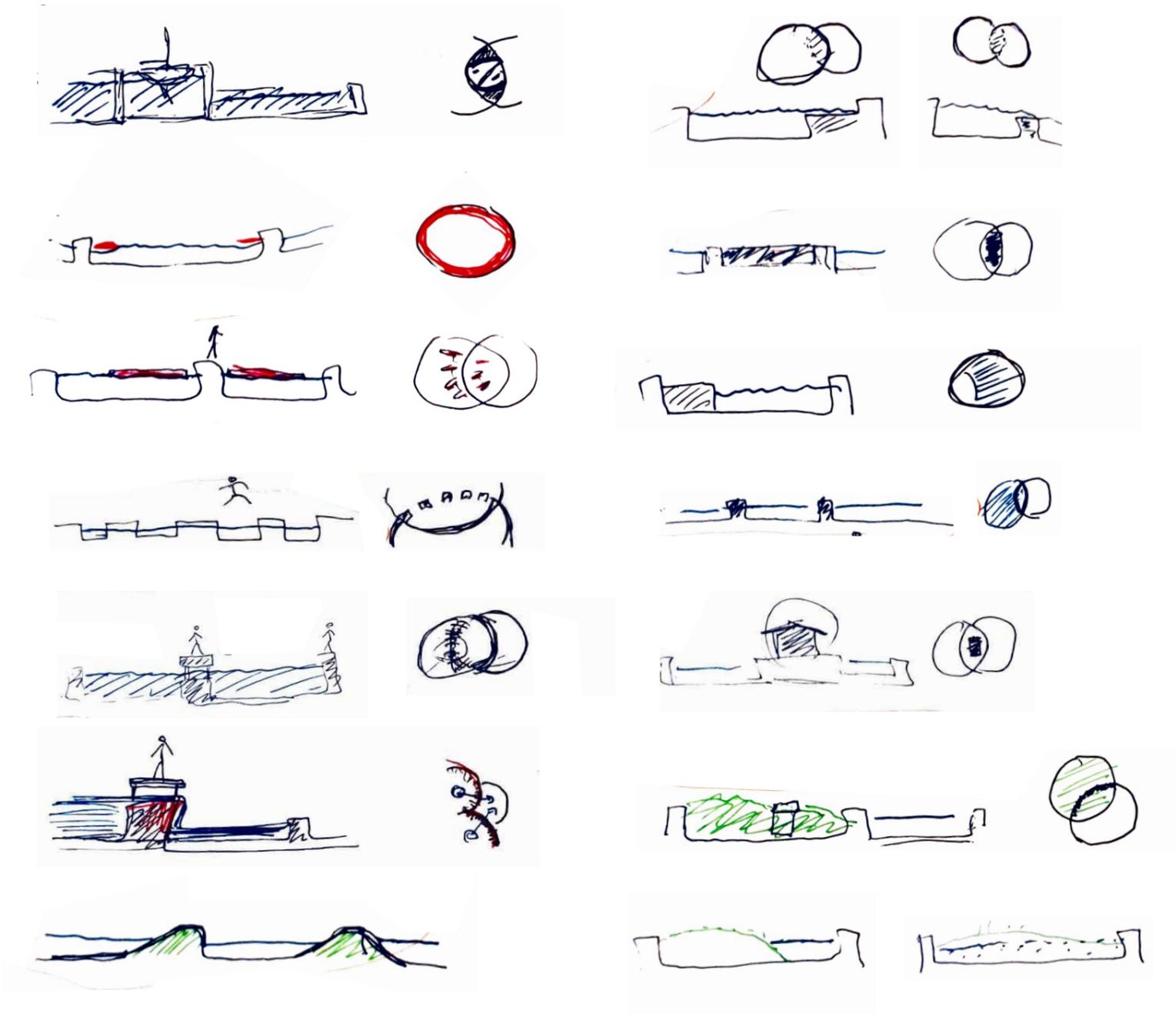
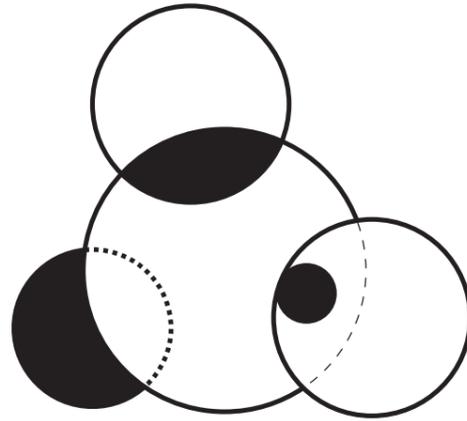


Waterscape Network Plan

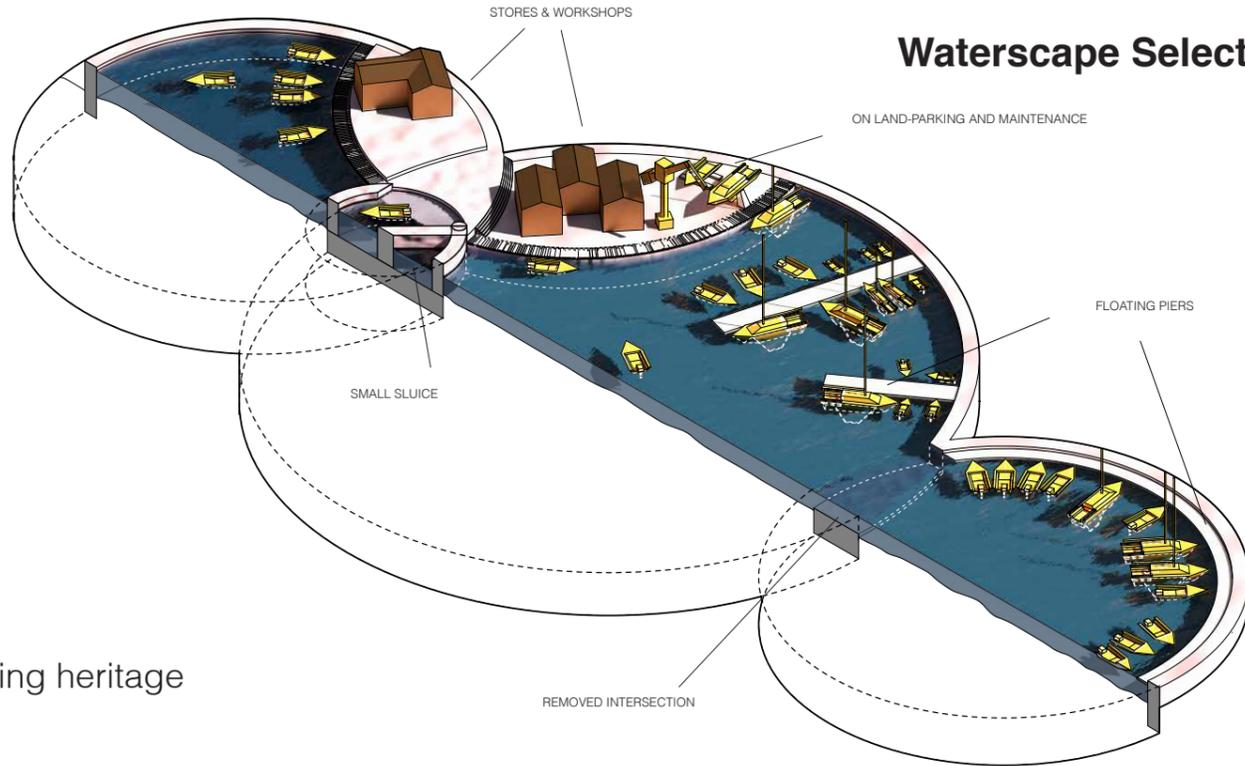


Waterscape Project Design Tools

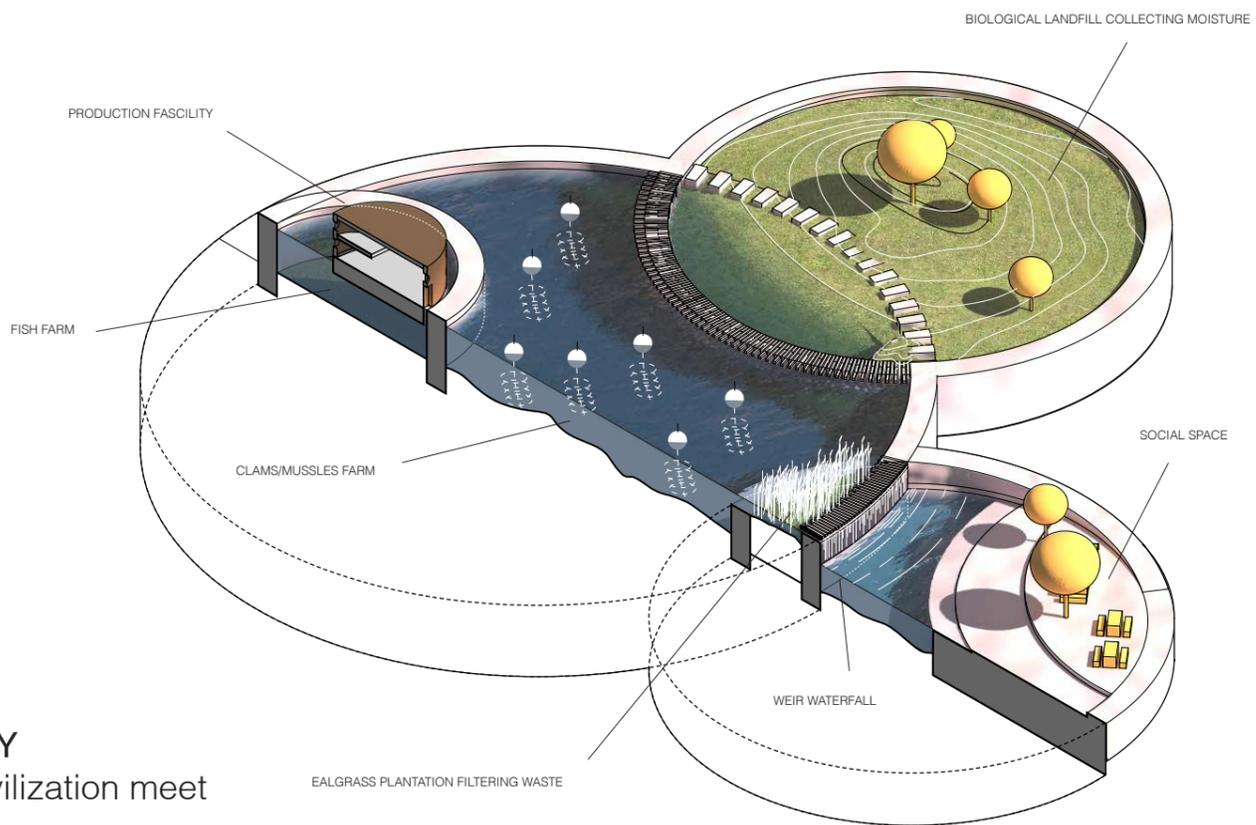
Using a simple cylindrical geometry as a basis for the design, through playing with different actions that occur when overlapping it with other cylinders a diversity in spaces can be achieved. Amplified in a network scale they together create its own maze-like topography with paths and spaces leading to various points of interest. This becomes the framework for diverse functions and activities that can benefit the coastal community take root in and develop into a resilient waterscape.



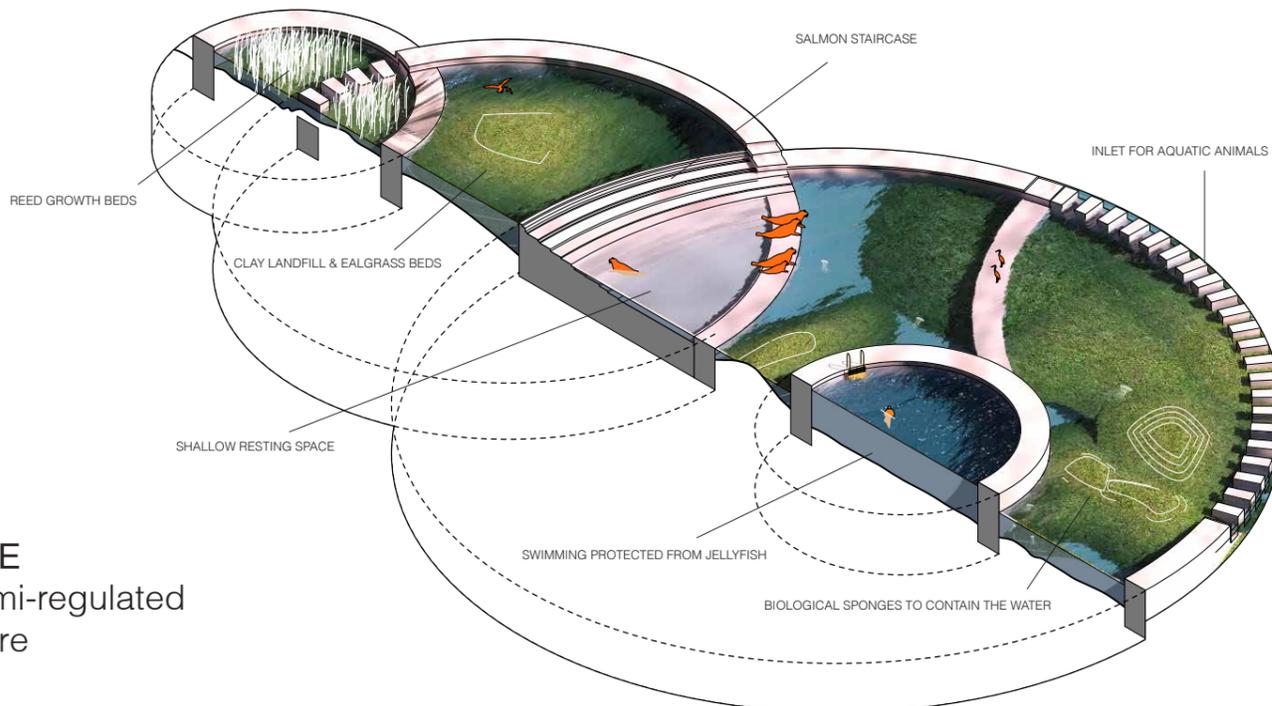
Waterscape Selected Functions



MARINE
 Supporting the seafaring heritage



ACTIVITY
 Where nature and civilization meet



NATURE
 Adventure in a semi-regulated biosphere

Waterscape Axonometric

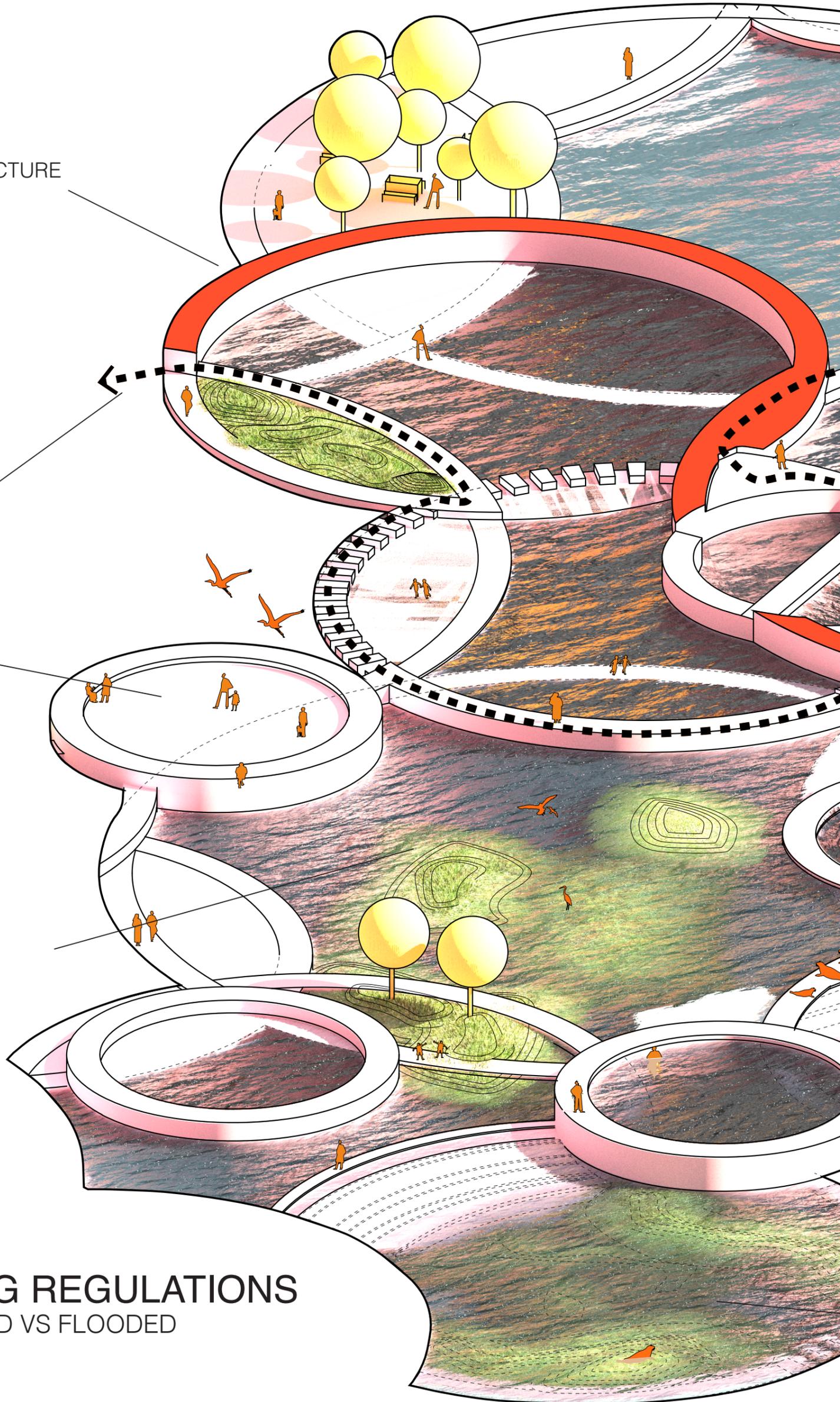
HIGHEST POINT IN STRUCTURE

MAIN ROAD

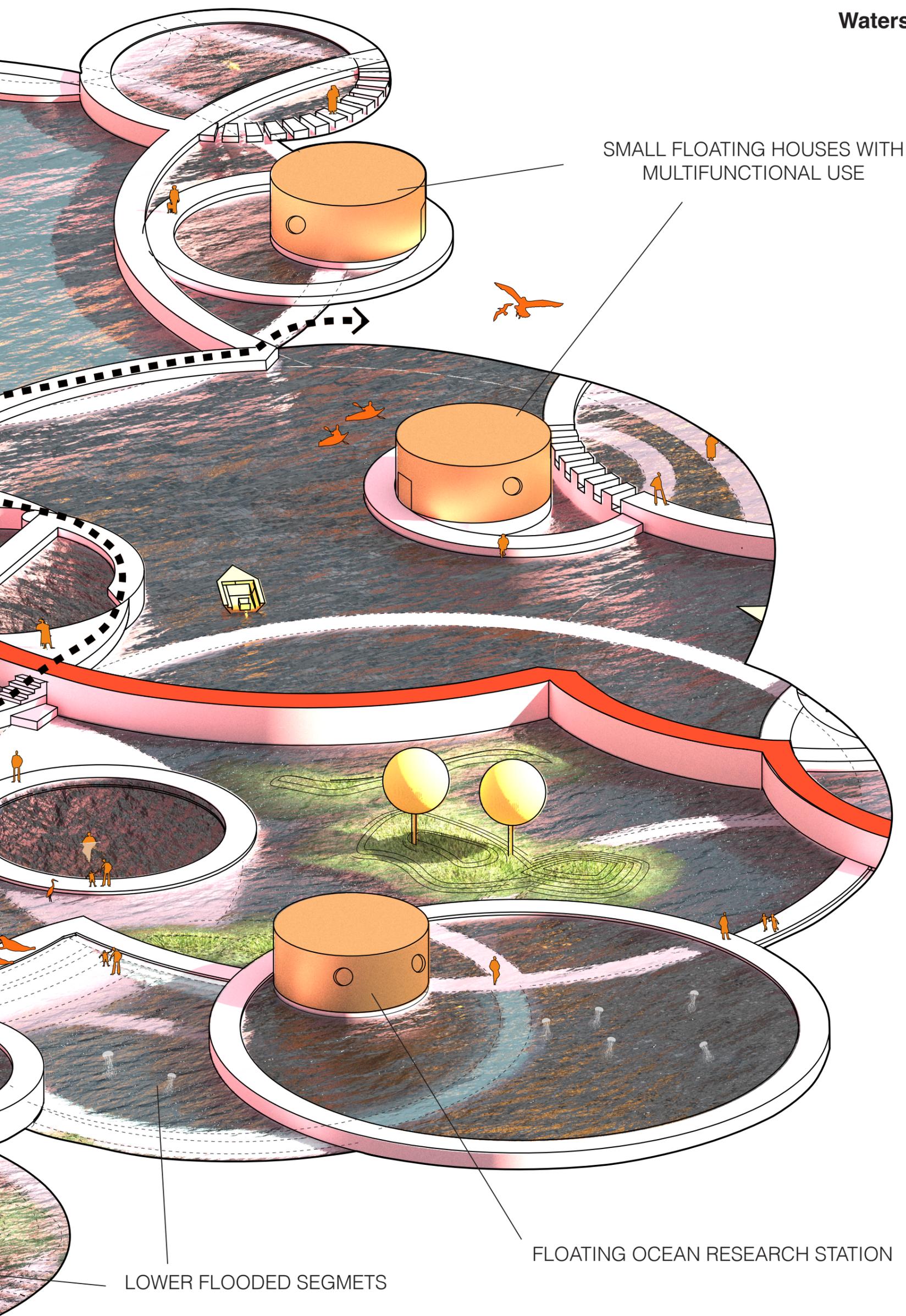
SOCIAL SPACE

BIRD BREEDING AREA

CONTRASTING REGULATIONS
PROTECTED VS FLOODED



Waterscape Axonometric

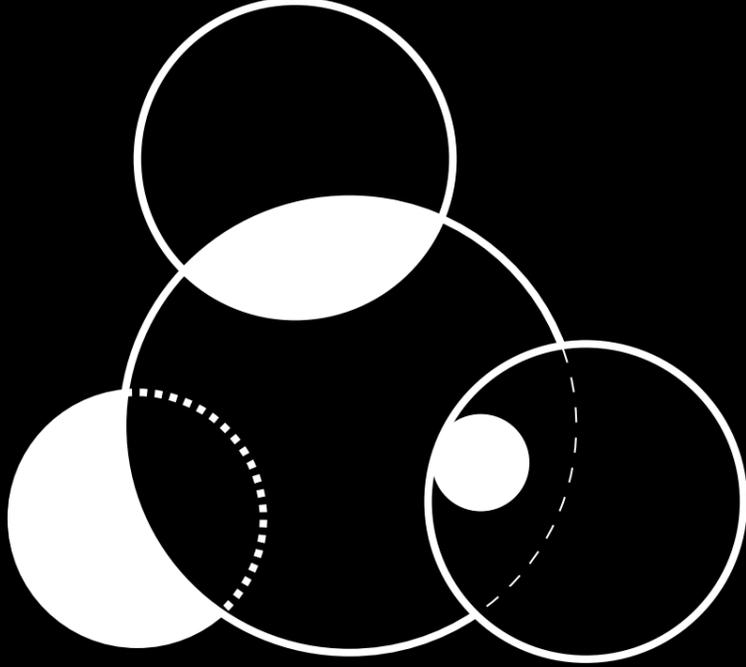


SMALL FLOATING HOUSES WITH
MULTIFUNCTIONAL USE

FLOATING OCEAN RESEARCH STATION

LOWER FLOODED SEGMENTS

ERIK LIDÉN • BOOKLET • AUTUMN 2021



ARK128 • ARCHITECTURE & URBAN SPACE DESIGN