THE PSITHURISM

n.the sound of the wind in the trees

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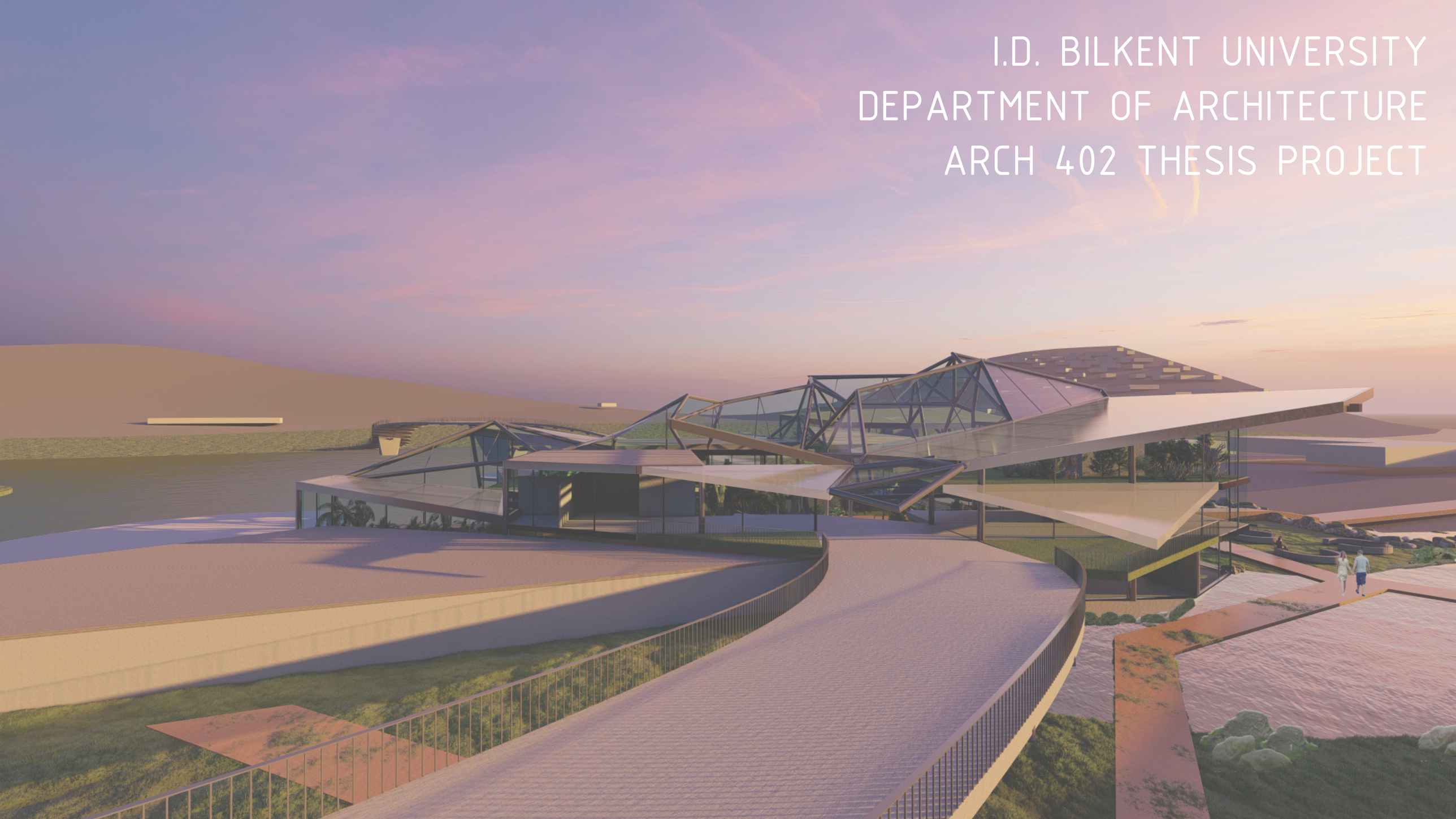
ARCH 402 THESIS PROJECT



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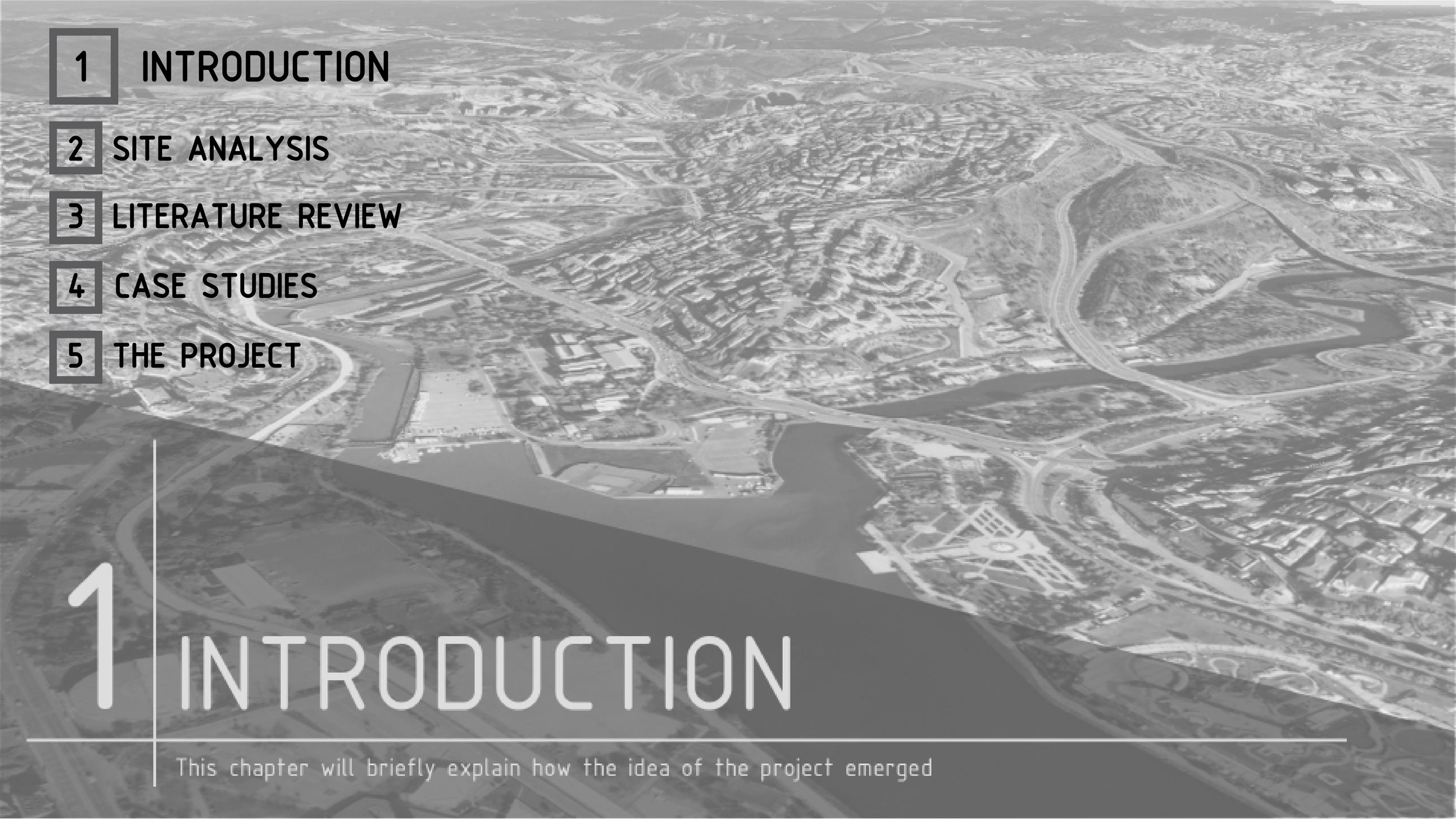


1 INTRODUCTION

This chapter will briefly explain how the idea of the project emerged

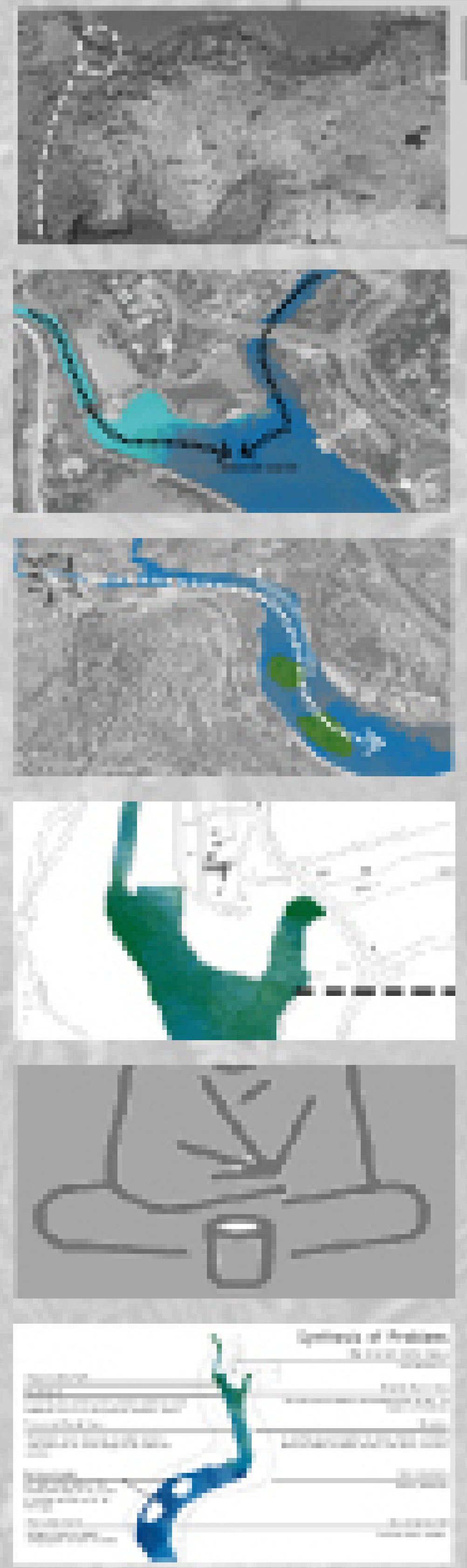
Introduction

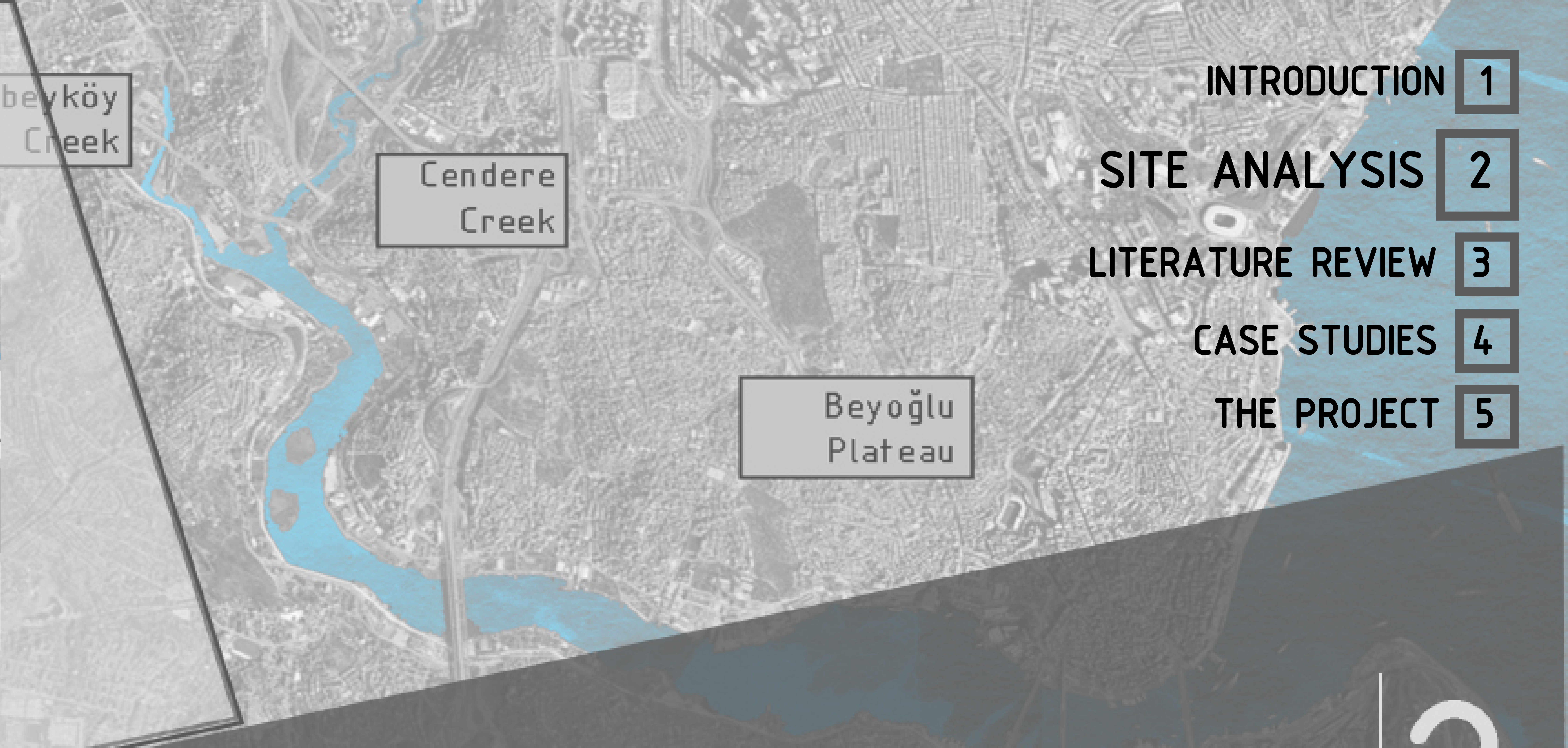
Being born and raised in Istanbul, I grew up observing some major problems surrounding my hometown. Two among these problems have always stuck out to my eye.

Firstly, I have always been seeing homeless people and beggars while walking around the city, and the extremely inhumain conditions they have to live in.

Secondly, even though Istanbul is an amazing city with wonderful views and landscape, the environment is being treated very poorly and some lands are not living up to their potential. The mistreartments effect the flora and fauna badly, therefore the ecosystem is endangered.

Regarding these major problems, I aimed to combine the solutions to both in my thesis project.



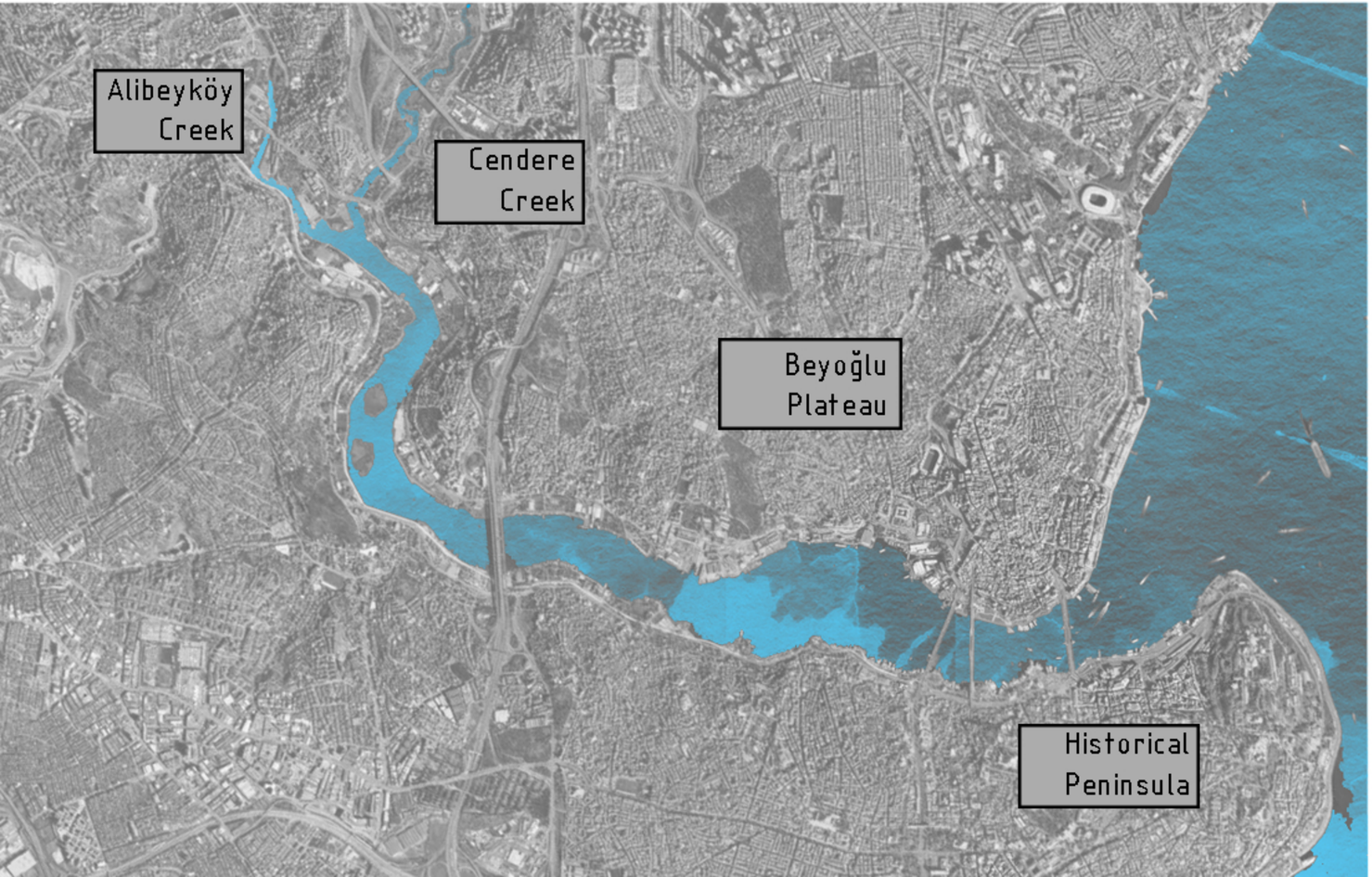


SITE ANALYSIS 2

This chapter will include general information and highlights of the site that lead to the concept of the project.

General Information of the Site

Haliç, gloablly known as Golden Horn, is the primary inlet of the Bosphorus in the European side of Istanbul. Being one of the most significant historical landscapes of Turkey, it preserves its popularity globally to this day. The name "Golden Horn" in the popular culture represents the view of the sun rising through the landscape as "golden" and the view of the landscape aerially as "horn".



The Golden Horn is fed by two creeks in the upper north side, Alibeyköy Creek and Cendere Creek. It separates the historical peninsula of Istanbul and the Beyoğlu plateau.

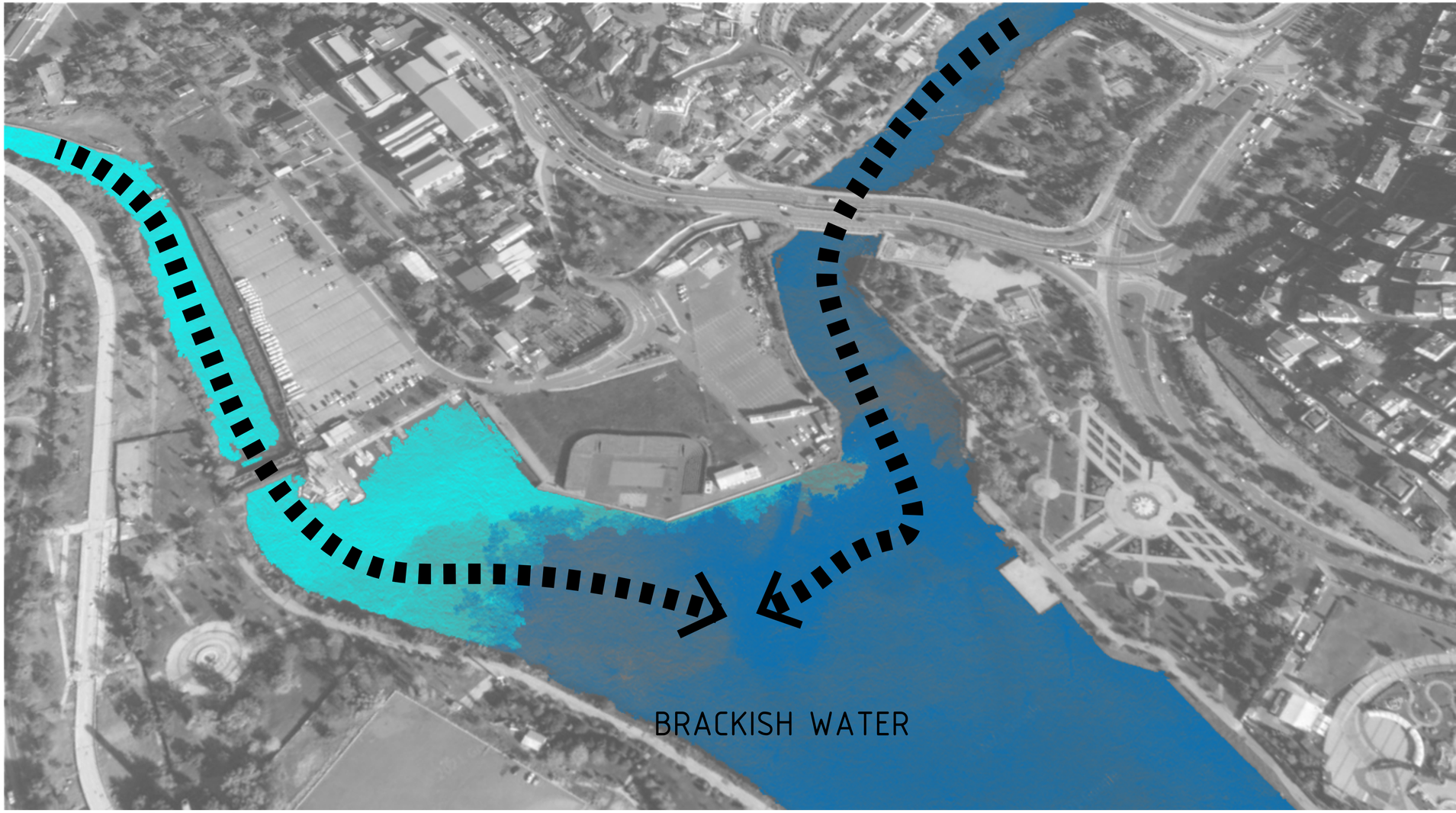
The significance of the Golden Horn can be analyzed through many subheadings. Both ecologically and socioculturally, the aspects and potential that the Golden Horn withholds are unneglectable.

CLICK TO GO BACK

The Ecological Factors: Brackish Water

When the salty water from Alibeyköy Creek and the fresh water from the Cendere Creek meet, brackish water occurs. Brackish water provides a great environment for a significant ecosystem, housing numerous kinds of flora & fauna.

However, this balance is interfered in the Golden Horn secause each year extra salty water is pumped to Golden Horn to accelerate the Stream in Kağıthane river.



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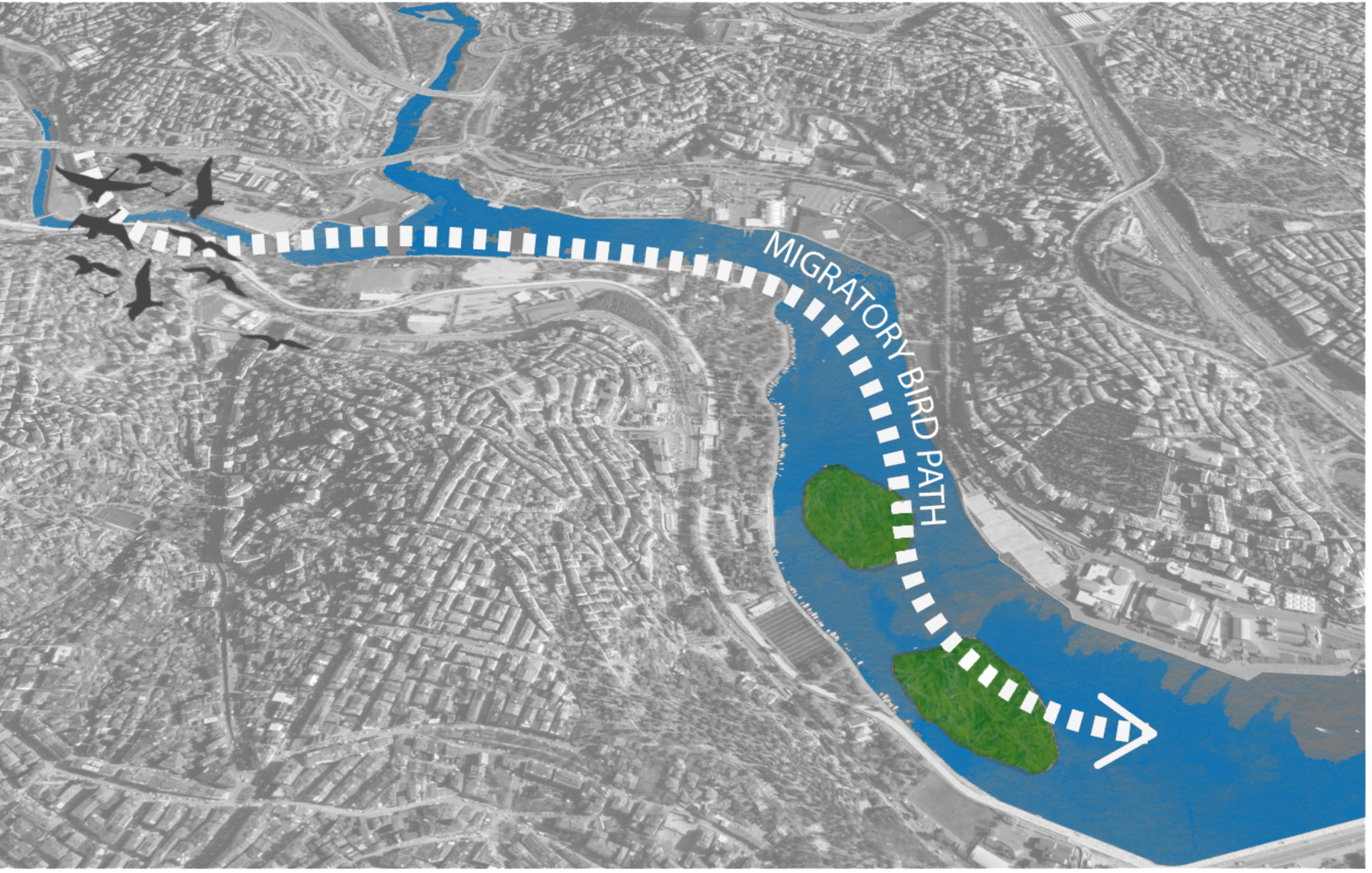
The Ecological Factors: Migratory Bird Path



The major migratory bird towards Africa goes through the Golden Horn. With the significant ecology it embeds, the Golden Horn becomes a place for resting of over 800.000 migratory birds.

The fitoplanktons, zooplanktons and
fish that grow in the brackish water provides nutrition to the birds.

The Bahariye Islands,located in the middle of the stream are ideal wetlands for the birds to feed and rest.

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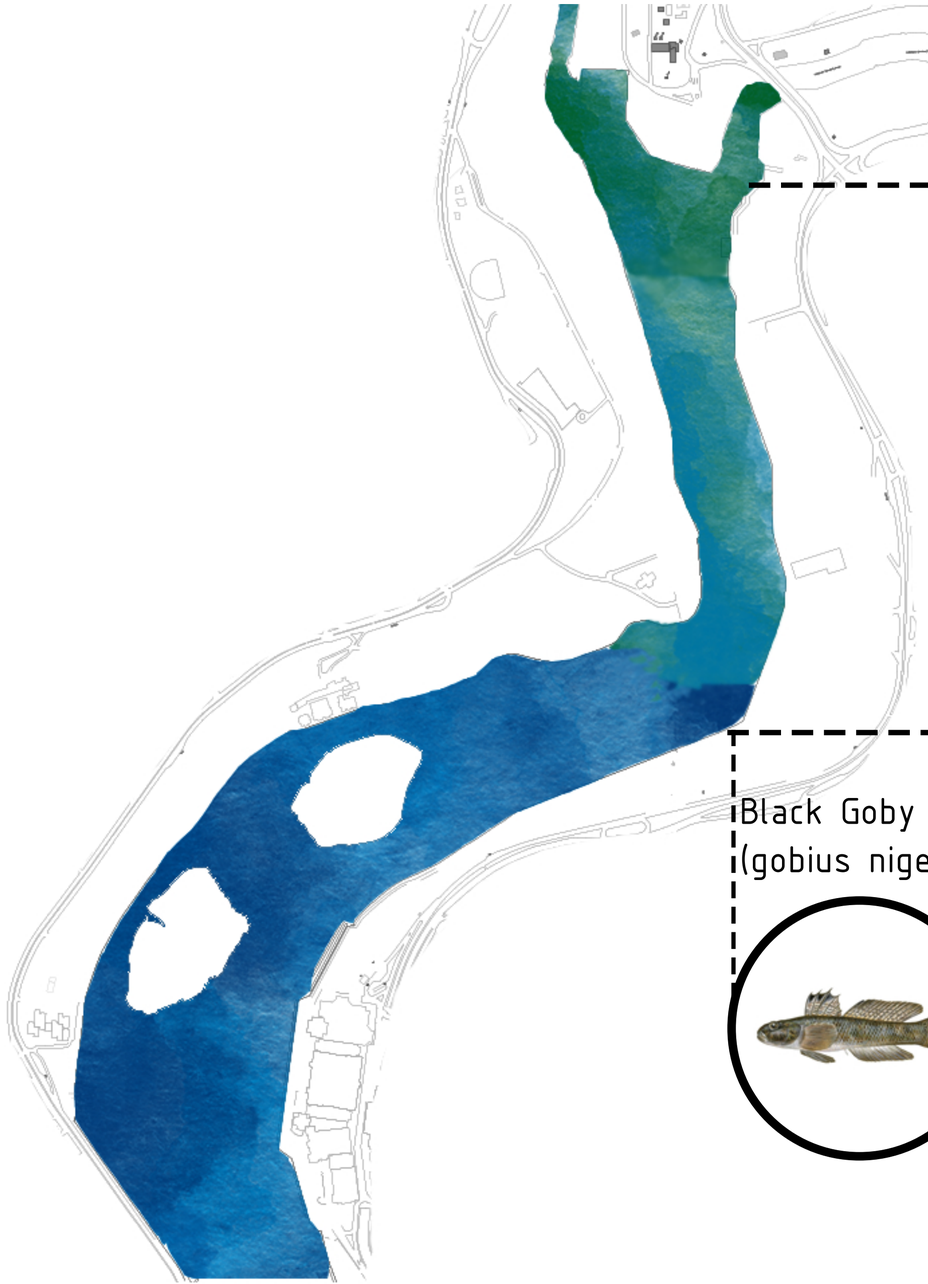
The Ecological Factors: Existing Fauna



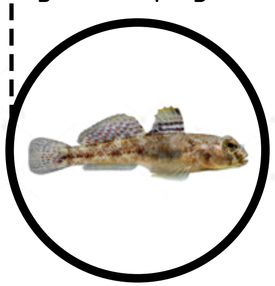
Tesselated Water Snake
(natrix tessellata)

Fire Bellied Toad
(bombina bombina)

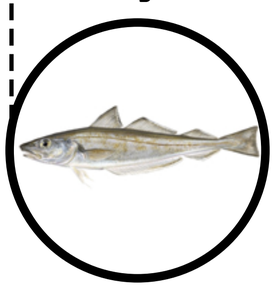
Muskrat
(ondatra zibethicus)

Black Goby
(gobius niger)

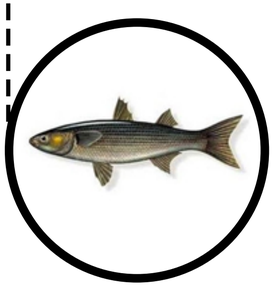
Rock Goby
(gobius paganellus)



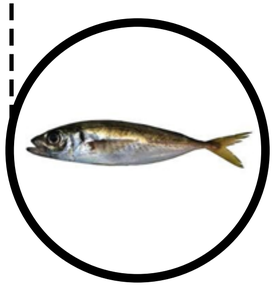
Whiting
(merlangius merlangus)



Golden Grey Mullet
(chelon aurata)



Mackerel
(Trachurus)



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The Ecological Factors: Existing Flora

The existing flora is mainly shrublands around the Golden Horn. The flora is insufficient and should be enrichened to benefit the ecosystem. The lack of beneficial greenery causes lack of oxygen dissolving in the water. If the water lacks oxygen, sulphur bacteria starts accumulating and the existing fauna is inevitably dangered.

INSUFFICIENT FLORA → LACK OF OXYGEN

↓

FAUNA IS ENDANGERED ← SULPHUR BACTERIA

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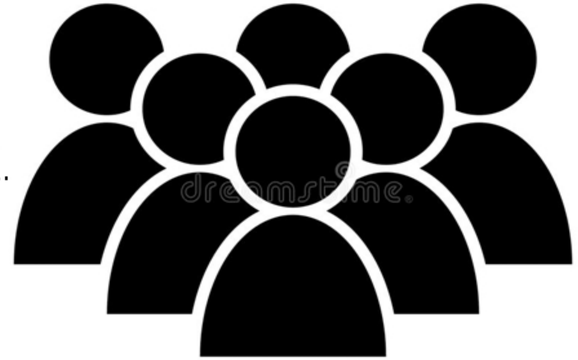
The Human Factor

Statistics show that most of the homeless and refugee population in Istanbul live in Beyoğlu & Fatih, the two edges of the Golden Horn.

The residents of the Golden Horn find their neighbourhoods:
-mediocrely aesthetical
-extremely polluted in terms of water pollution, garbage disposal, noise and smell.
-economically unbeneficial
-inefficient in terms of the transportation infrastructure



People living around the Golden Horn are mostly:
-Elementary school graduates
-Labor workers
-Family income of at most 1000 Turkish Liras.

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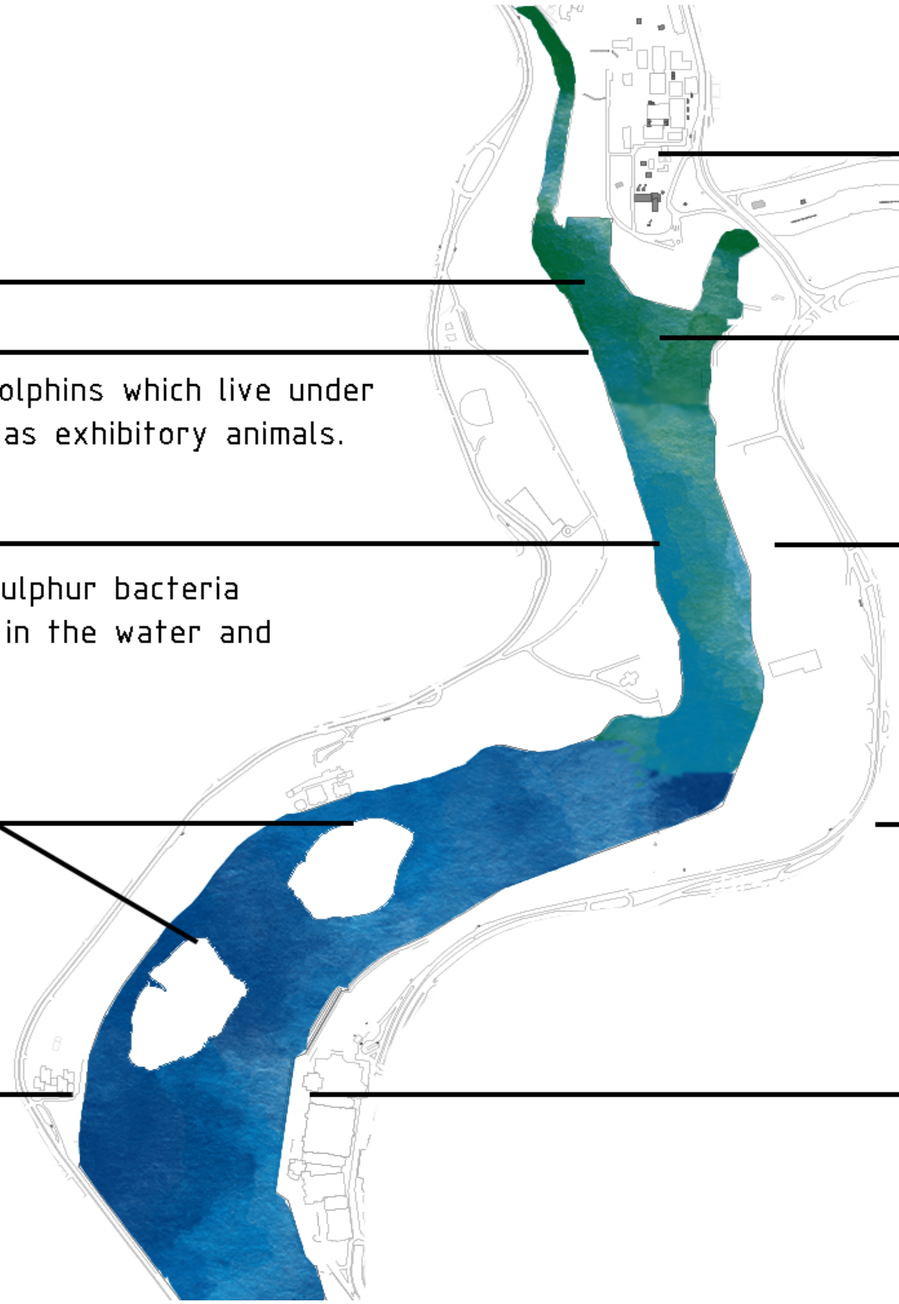
Synthesis



Bilgi University Santral Campus

Existing University

Migratory Bird Path

Brackish Water Area

Dolphinarium

An existing zoo, exhibiting mostly dolphins which live under inadequate conditions & being used as exhibitory animals.

The food cycle is bound to the brackish water of which the balance is threatened.

Threatened Flora& Fauna

Miniatürk

Threatened flora & fauna due to sulphur bacteria that occurs due to lack of oxygen in the water and pollution.

An existing museum targeted for mostly children , containing miniature models of famous artifacts from around the world.

Bahariye Islands

Haliç University

Wetlands in the middle of the stream that birds use as a place of resting, and fish use to lay their eggs.

Existing university.

The Human Factor

Haliç Congress Hall

Refugees, homeless people, unemployment and lack of income.

Existing cultural complex.

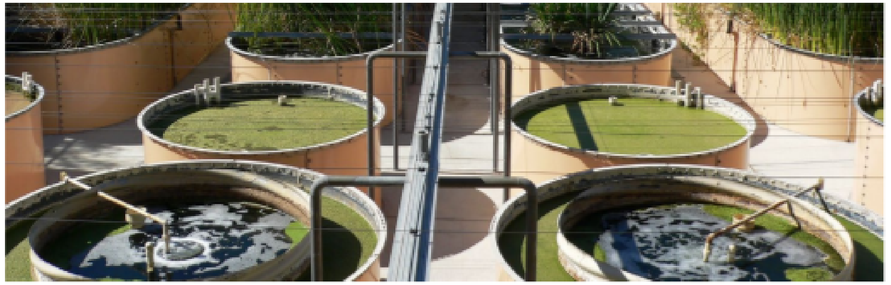
CLICK TO GO BACK

3 LITERATURE REVIEW

This chapter will include the literarure review of the ecological applications in my design.

What is the living machine system?

The Living Machine® System utilizes the latest technologies and engineering to mimic the ecology of natural coastal wetlands. The system provides lasting water solutions by effectively treating and reusing wastewater through a series of wetland cells filled with optimized gravel, which promote growth of micro-ecosystems, and a process of tidal cycles, like in a coastal wetland, resulting in a high quality of reusable water.



How it works

THE PROCESS:

- water is pumped into a tank where debris settles and degrades
- then water flows into an equalization tank which determines the release of high and low "tides" into specially engineered gravel, sand, and plant boxes (wetland cells)
- following this, different tidal wave cells with different organisms eat and purify the black water
- in order to remove an microscopic sediment, the water is screened and treated with ultraviolet light
- for some municipal building, the water is lightly chlorinated to meet city standards

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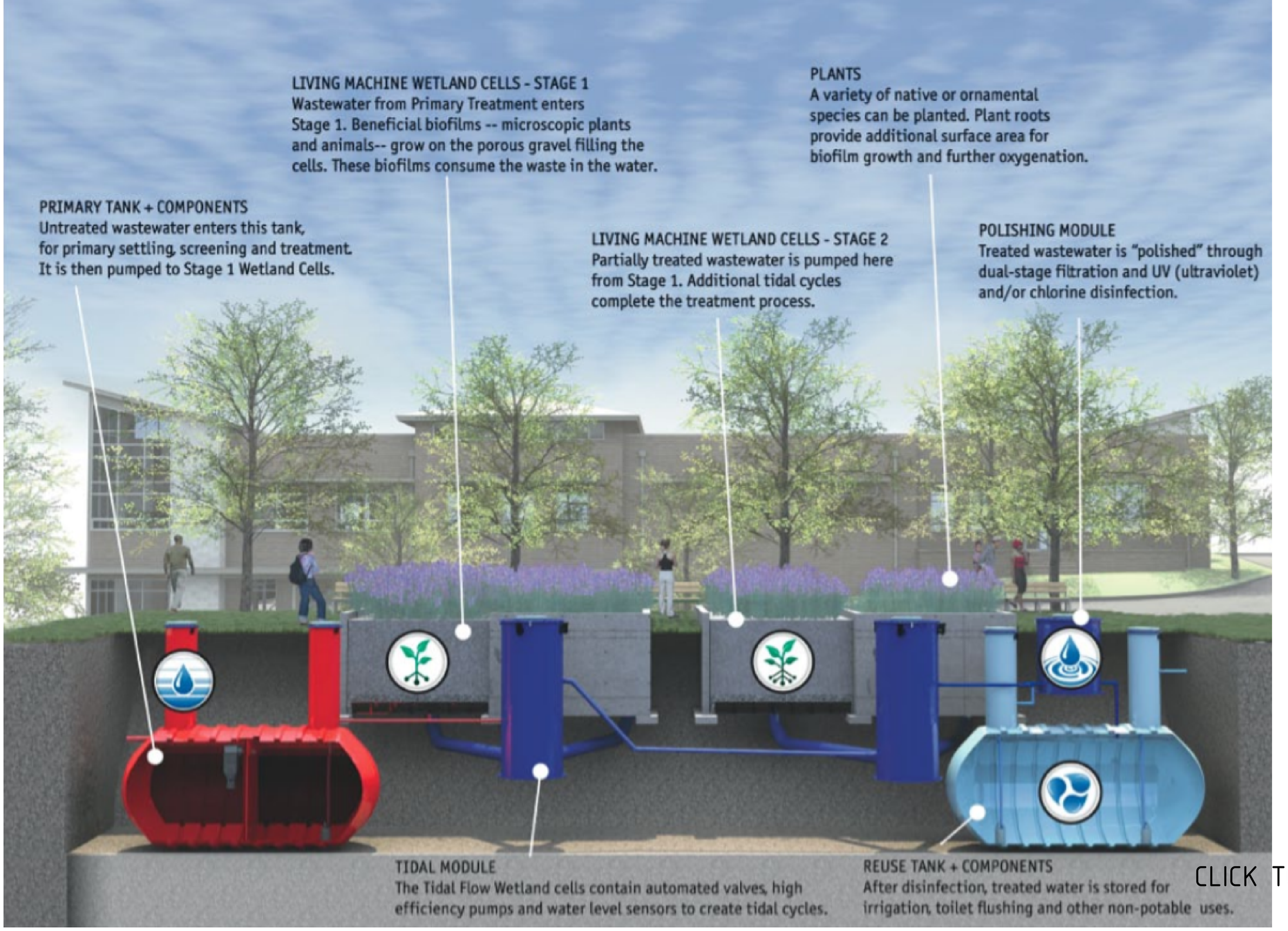

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WETLANDS

Wetlands are defined as "areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs and similar areas." (Clean Water Act, EPA)

Why are wetlands valuable?

Economics

- A wide range of natural products are derived from wetlands such as fish and shellfish, blueberries and cranberries, timber, wild rice, and medicine and herbs from the soils and plants.

Fish & Wildlife

- Many animals and plants rely on the wetlands for survival, including about 1/3 of the threatened and endangered species in the U.S.

Recreation & Aesthetics

- Wetlands have recreational, historical, scientific, and cultural values.
- A total of $59.5 billion is spent annually in the U.S. towards hunting, fishing, bird watching and wildlife photography.
- People enjoy the fascination of being close to water, which results in hiking, boating, and other recreational activities.

Flood Protection

- Wetlands are a vital component in slowing down the speed of flood water in addition to the runoff from pavement and buildings.
- The sponge-like nature of the wetlands allows it to trap and slowly release surface water, rain, snow melt, groundwater and flood waters. Additionally, the roots of trees and other wetland vegetation absorb the water.

Shoreline Erosion

- The plants in wetlands hold the soil in place with their roots and help to slow down the flow of water from the currents.
- In coastal areas, wetlands are utilized to buffer the storm surges from hurricanes and tropical storms.

Water Quality & Hydrology

- The filtering capabilities of wetlands enable the surface runoff to be cleaned and removed of contaminates before the water reaches open water
- The wetlands retain excess nutrients and some pollutants, as well as reducing the sediment buildup that would clog the downstream waterways and harm the fish and amphibian egg development.

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CASE STUDIES 4

This chapter will include the case studies that influenced my design.

Kew Gardens Princess of Wales Conservatory

Located in the UK, Kew Gardens Princess of Wales Conservatory is a botanical house containing 10 various climatic zones that vary from tropical to rainforest ecosystems. Each of these biomes are controlled by computer in terms of temperature and humidity. It was designed by architect Gordon Wilson.

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National Ecology Center Botanical Greenhouses

National Ecology Center Botanical Greenhouses was designed by Grimshaw Architects and located in South Korea. It is created by 5 distinct biomes, following the form idea that was derived to mimic a river. The biomes are sub-tropical, mediterranean, temperate, tropical and polar.

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Suncheon International Wetlands Center

Suncheon International Wetlands Center was designed by Gansam Architects & Associates and located in South Korea. The buildings and circulatory areas are designed in a way that minimally affects the ecosystem.

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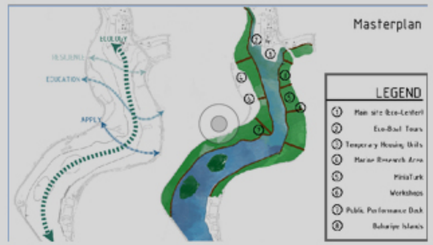
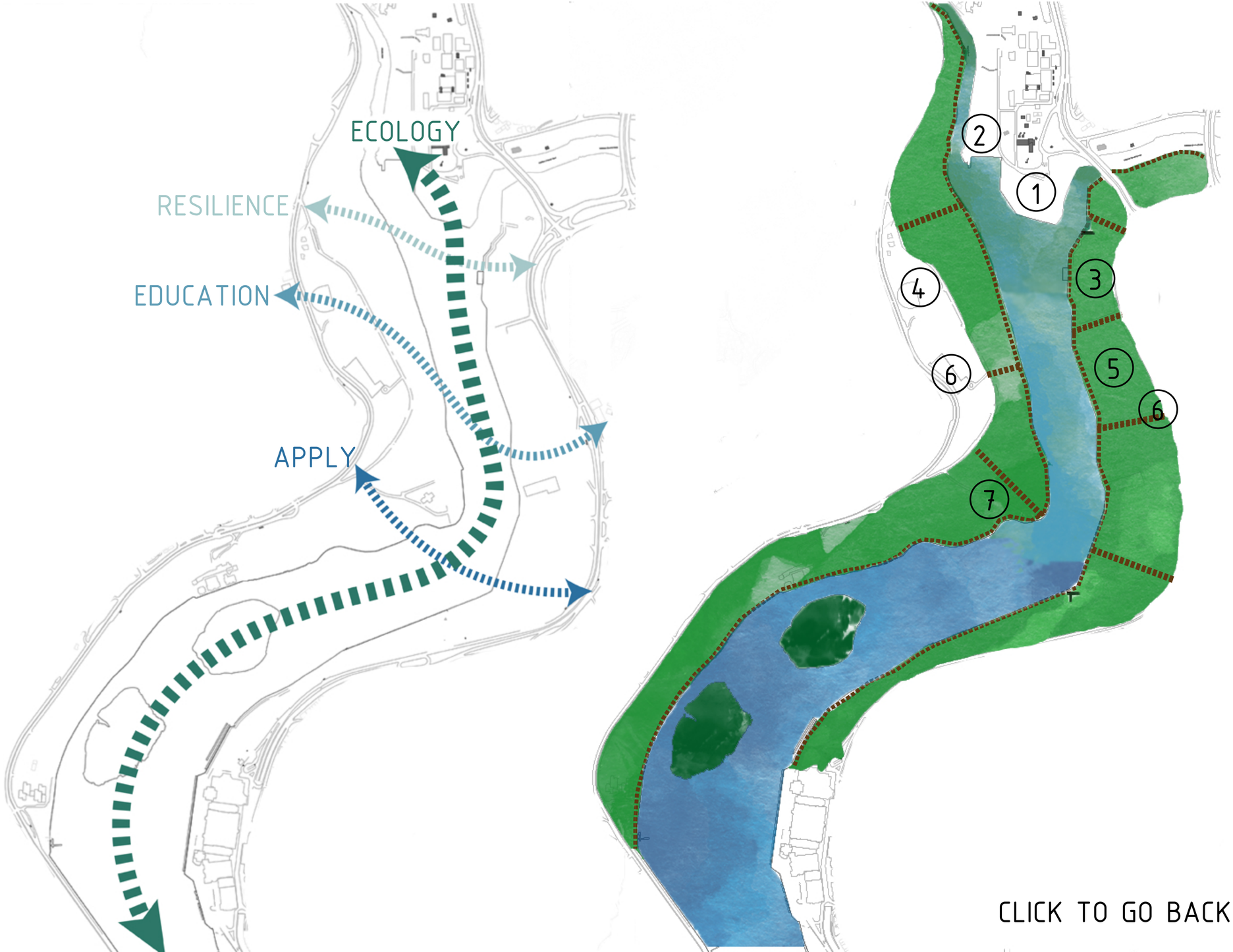


5 THE PROJECT

Masterplan



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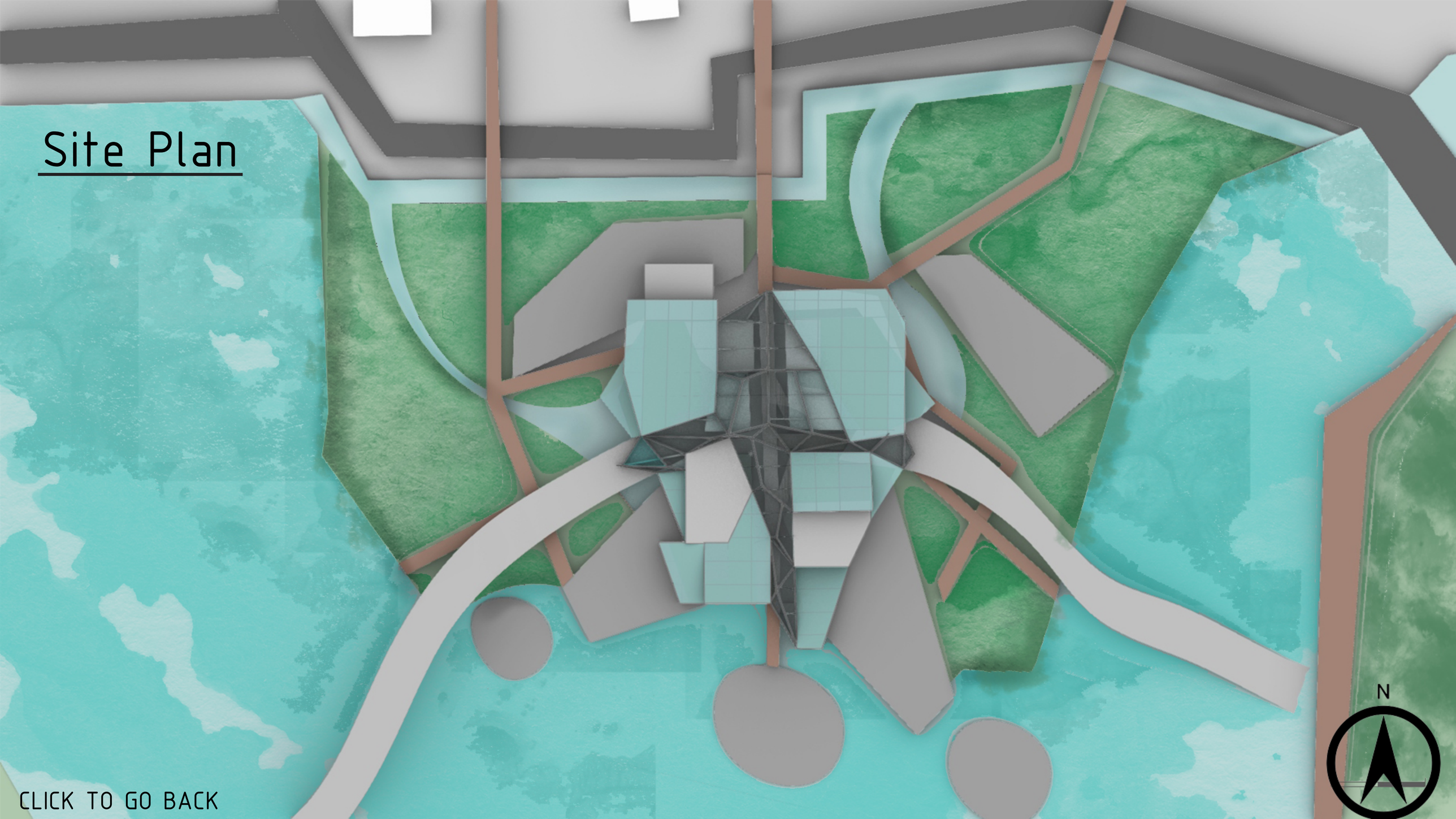
LEGEND

1. Main site (Eco-Center)
2. Eco-Boat Tours
3. Temporary Housing Units
4. Marine Research Area
5. MiniaTurk
6. Workshops
7. Public Performance Deck
8. Bahariye Islands

Site Plan



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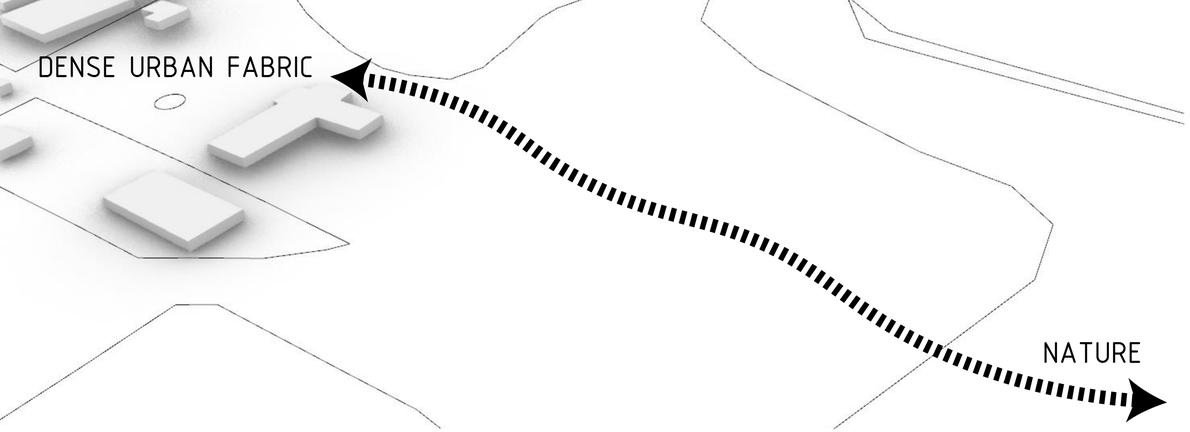
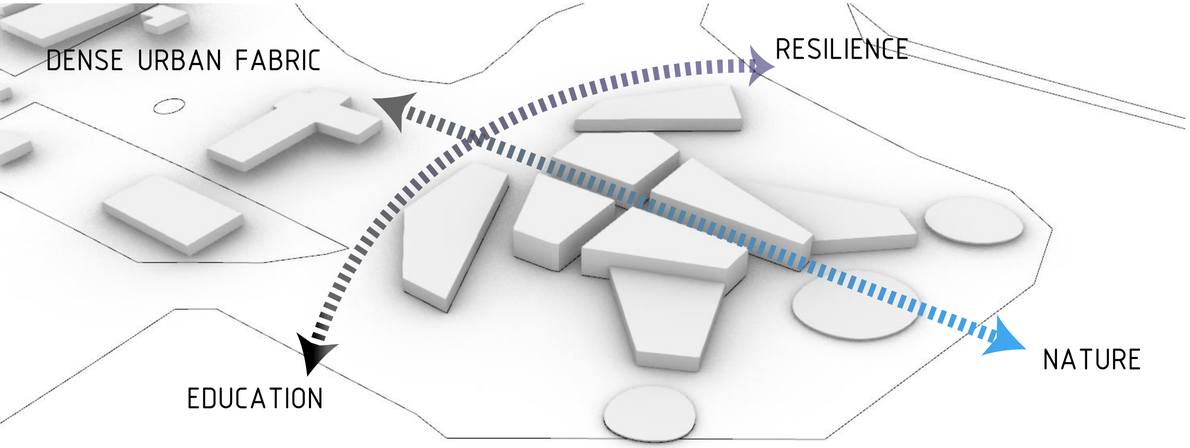
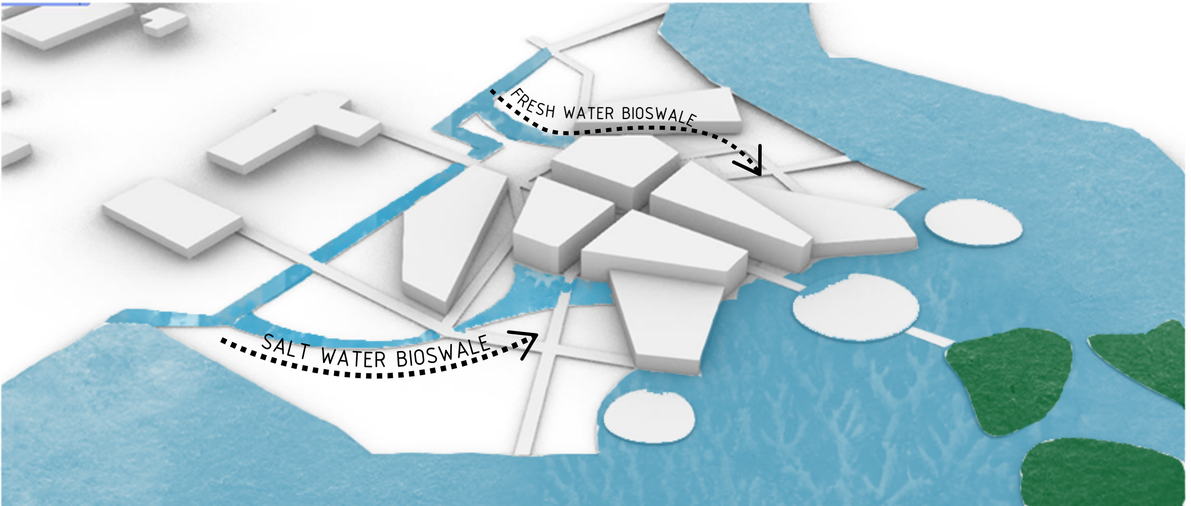
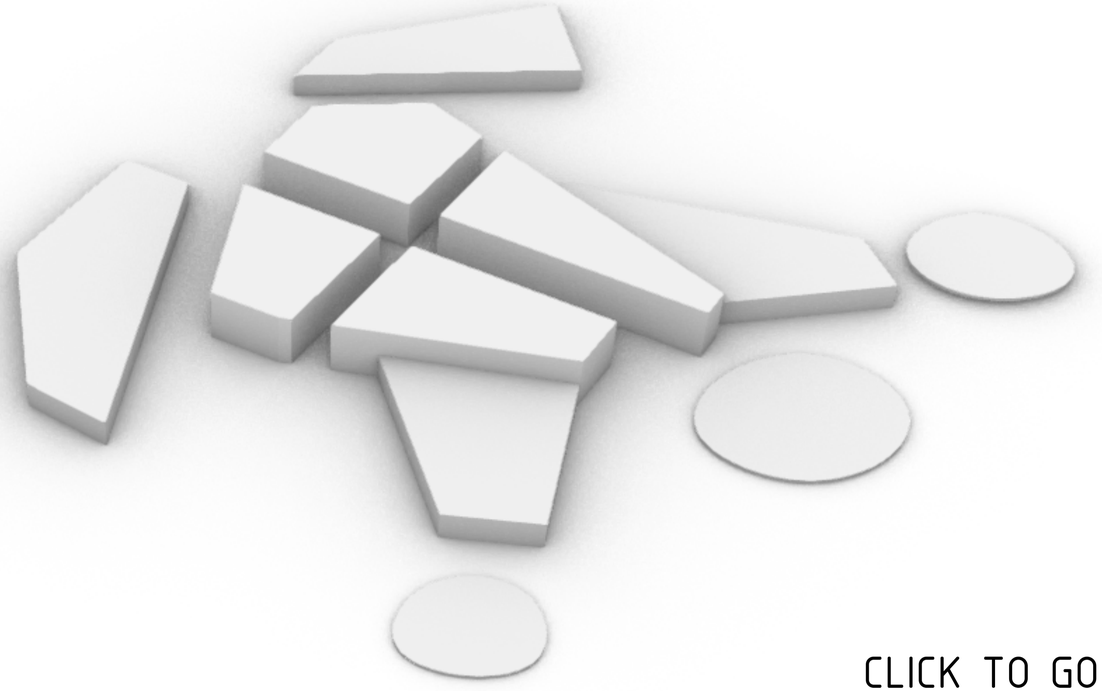






Building Development & Concept

The idea is to heal both nature and human. While creating a smooth transition from man to nature with appropriate functions, the people who are less fortunate have a chance to earn a brand new life. First they learn using the functions of the existing Bilgi University, then they get a job in the ecological research center and botanical gardens, then they are given temporary housing for a year.



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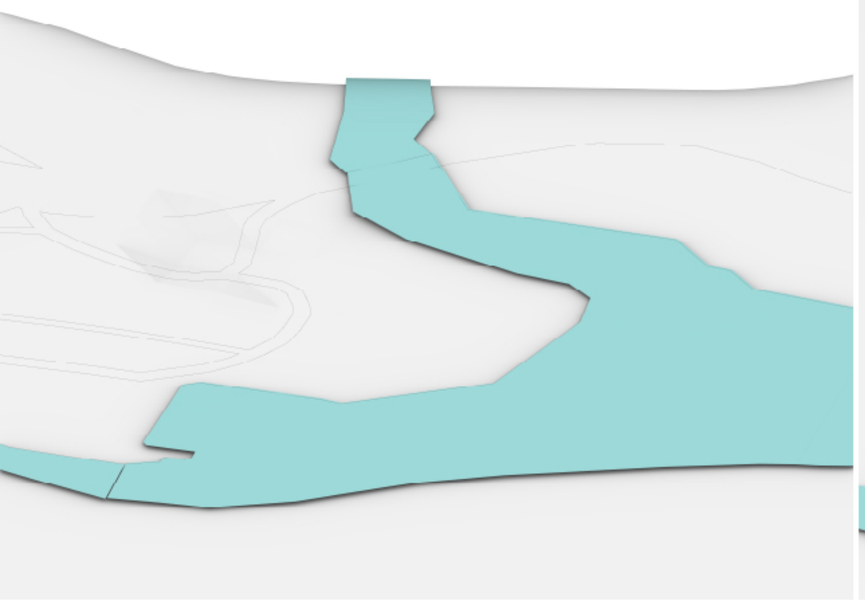
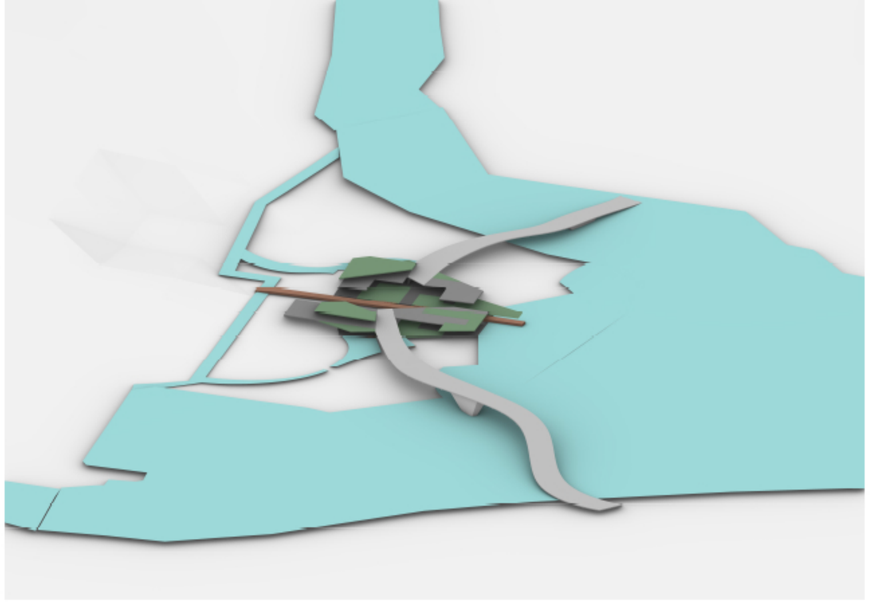
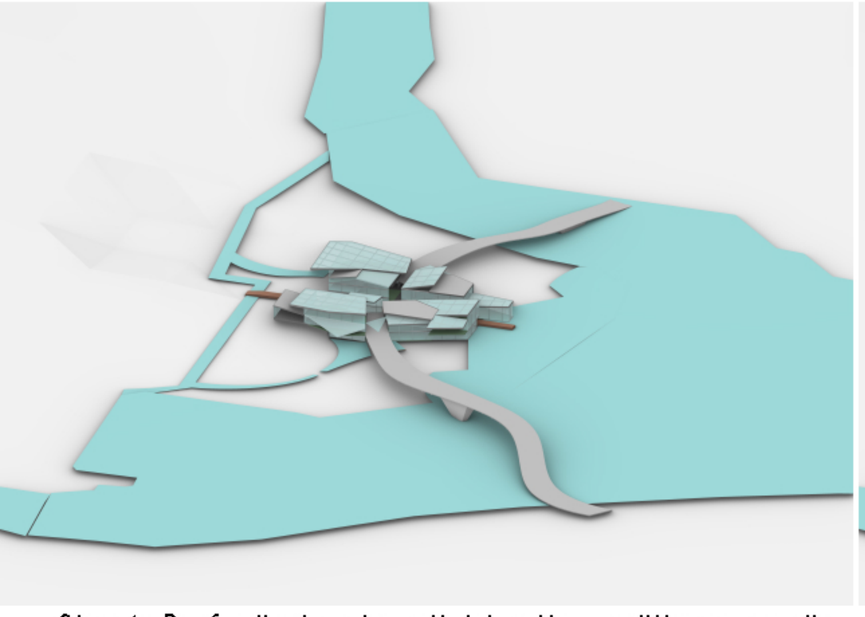


Step 1: Existing conditions

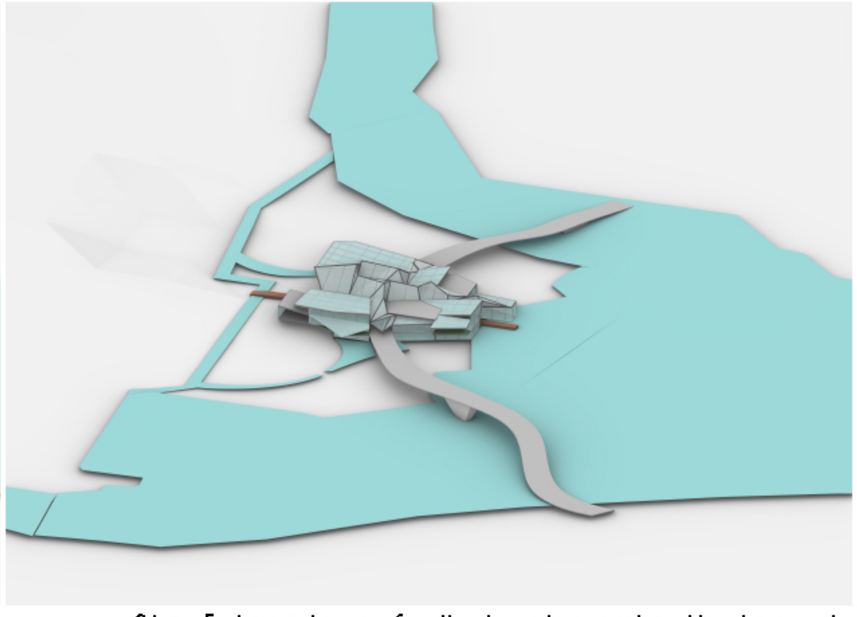
Step 2: Creation of "Man to Nature" axis and connecting the two edges to the site with bridges



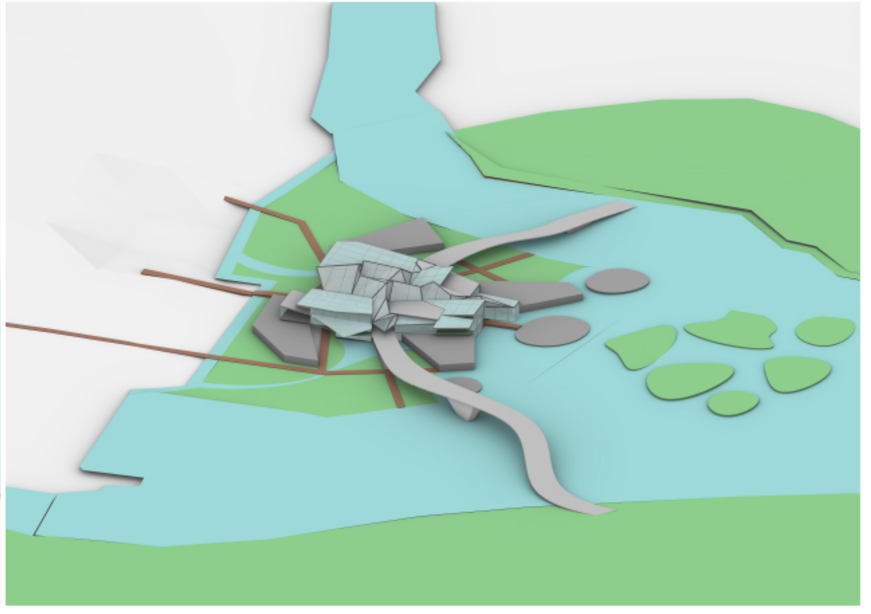
Step 3: Botanical garden development and biome differentiation



Step 4: Roof adjustments optimizing the conditions regarding each distinct biome

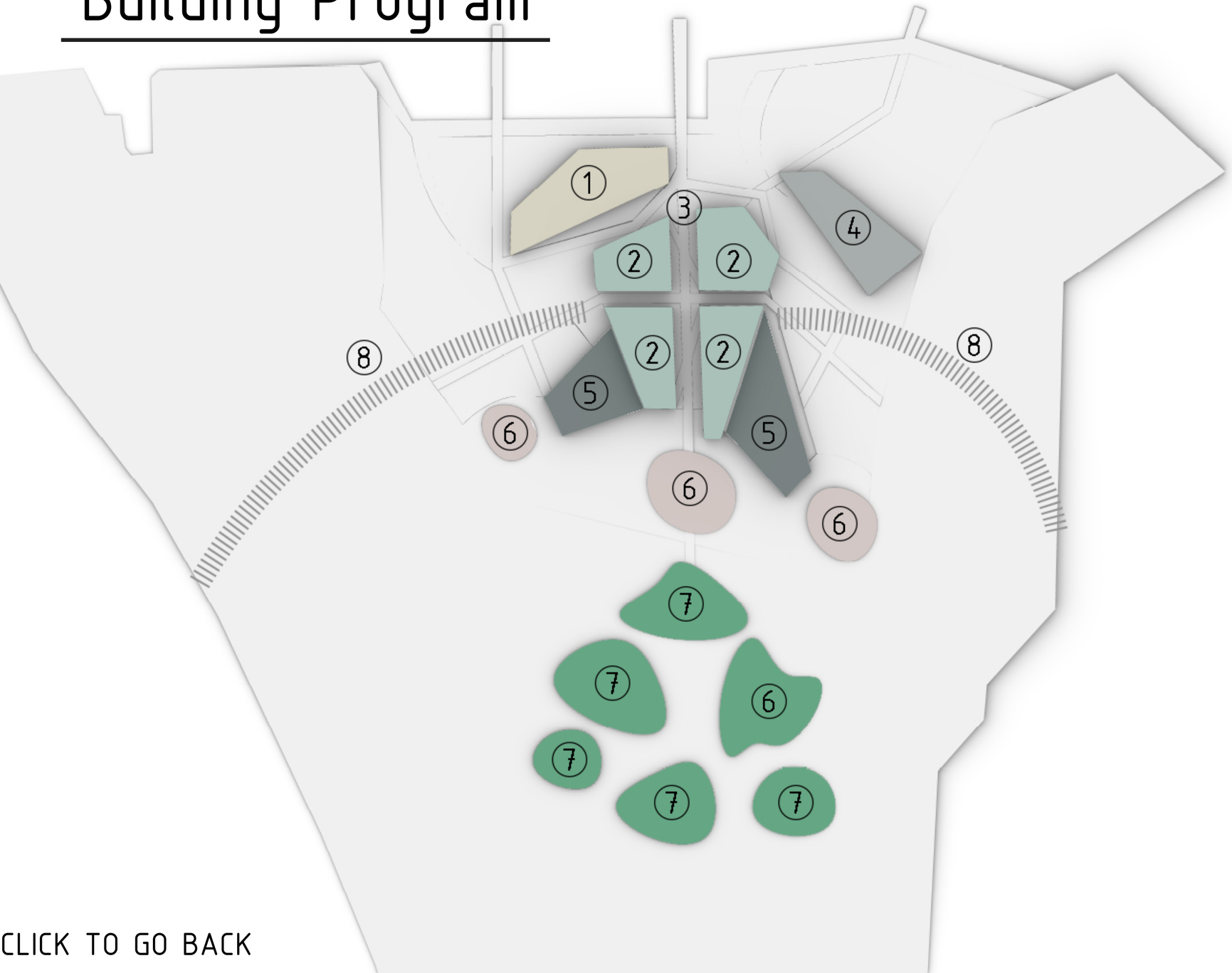


Step 5: Ice cube roof adjustment covering the two main circulatory axis



Step 6: Creation of wetlands to finish the "Man to Nature" axis and greenery on the edges

Building Program



① Vocational Training Center

- -Lecture Rooms
- -Seminar Rooms
- -Library&Study Hall
- -Training Labs

② Botanical Gardens & Research Center

- -Tree exhibit areas
- -Research Labs
- -Co-Working Zones
- -Observation Zones
- -Offices
- -Meeting Rooms

③ Living Machine Technology (basement floor)

④ Temporary Housing Units

- -Single Homes
- -Family Homes

⑤ Public Facilities

- -Restaurant
- -Organic Bazaar
- -Amenities

⑥ Animal Research Labs

⑦ Wetlands

⑧ Bird Observation Bridges

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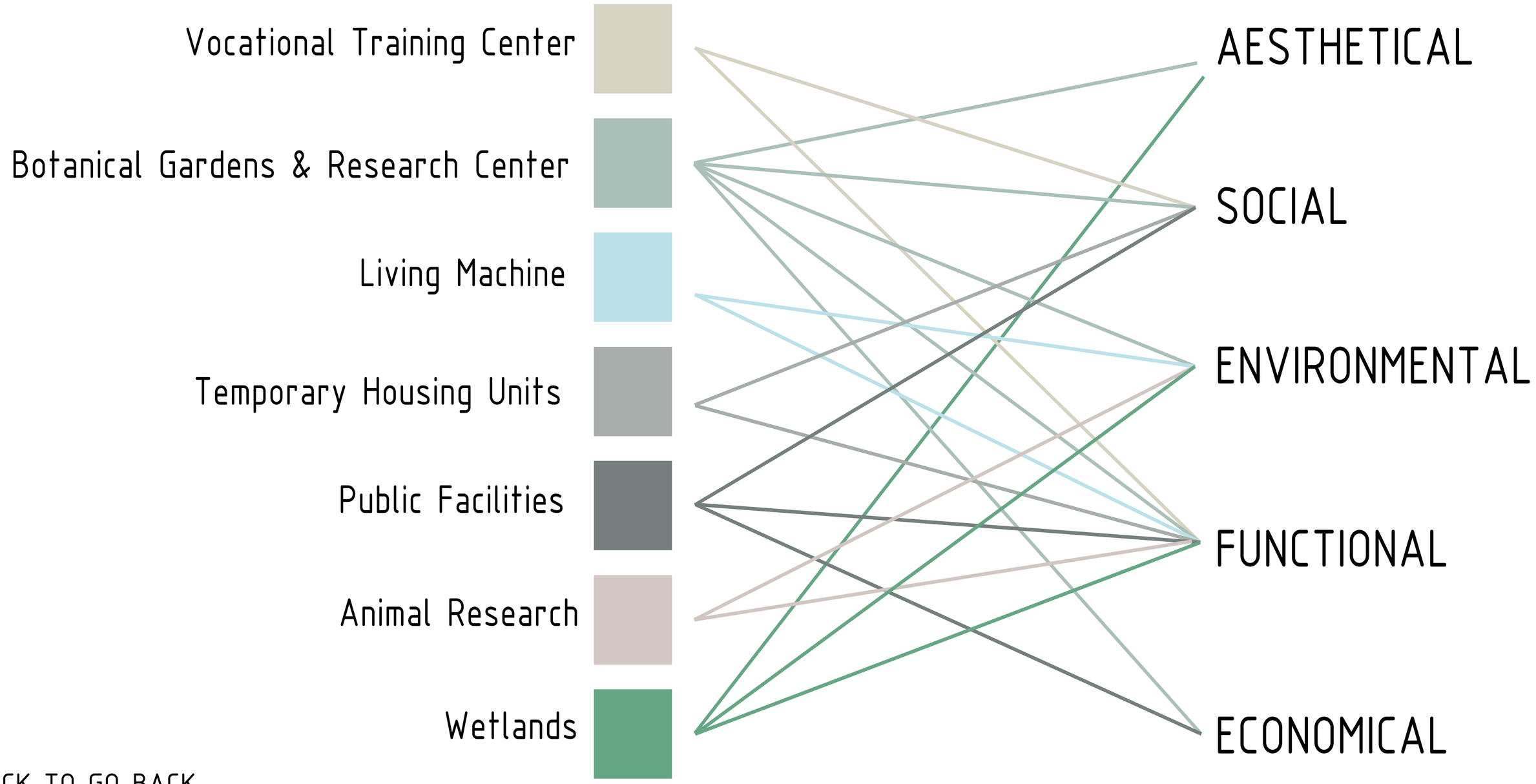
Ordering Systems



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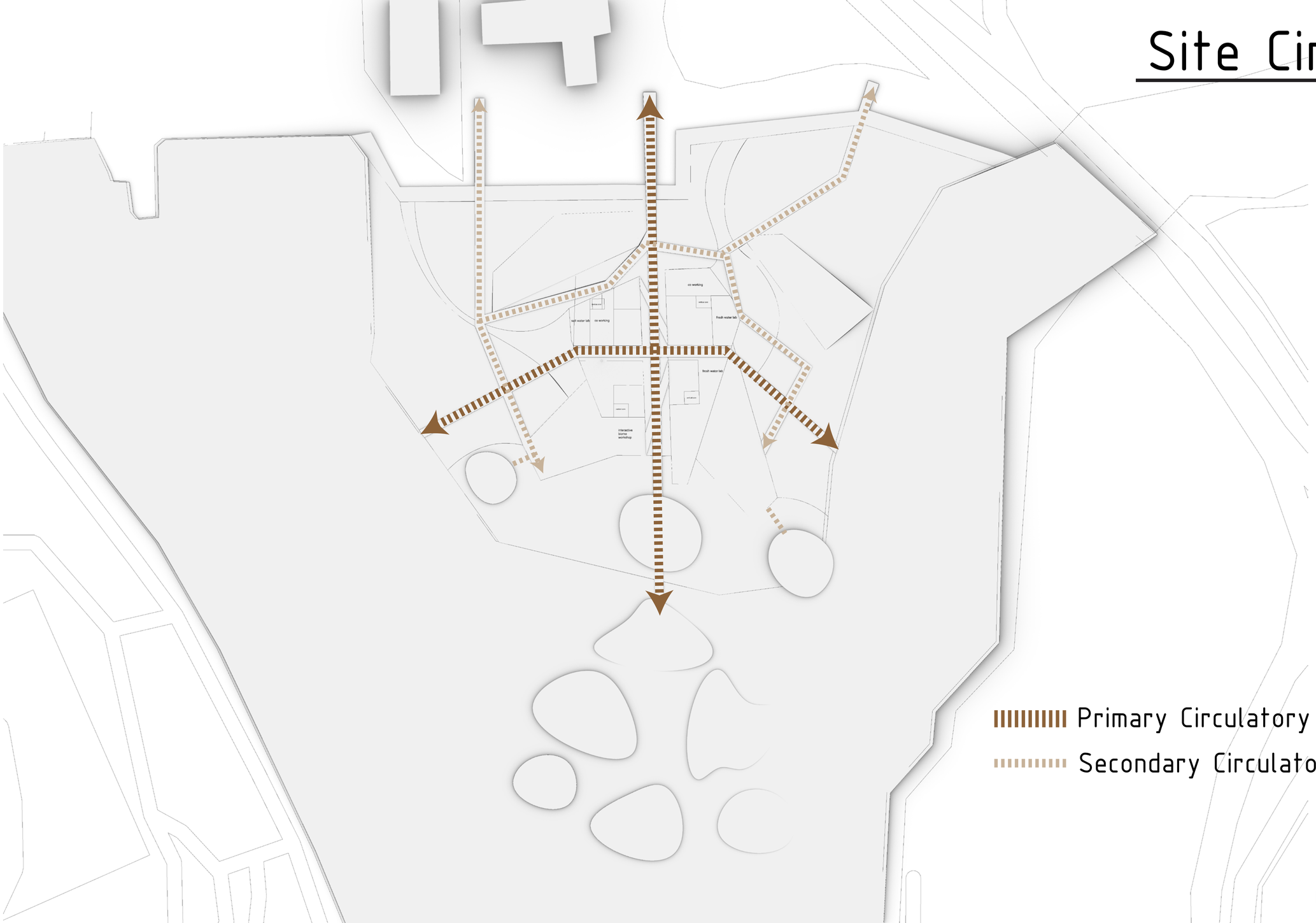
Site Circulation



Primary Circulatory Axis

Secondary Circulatory Axis

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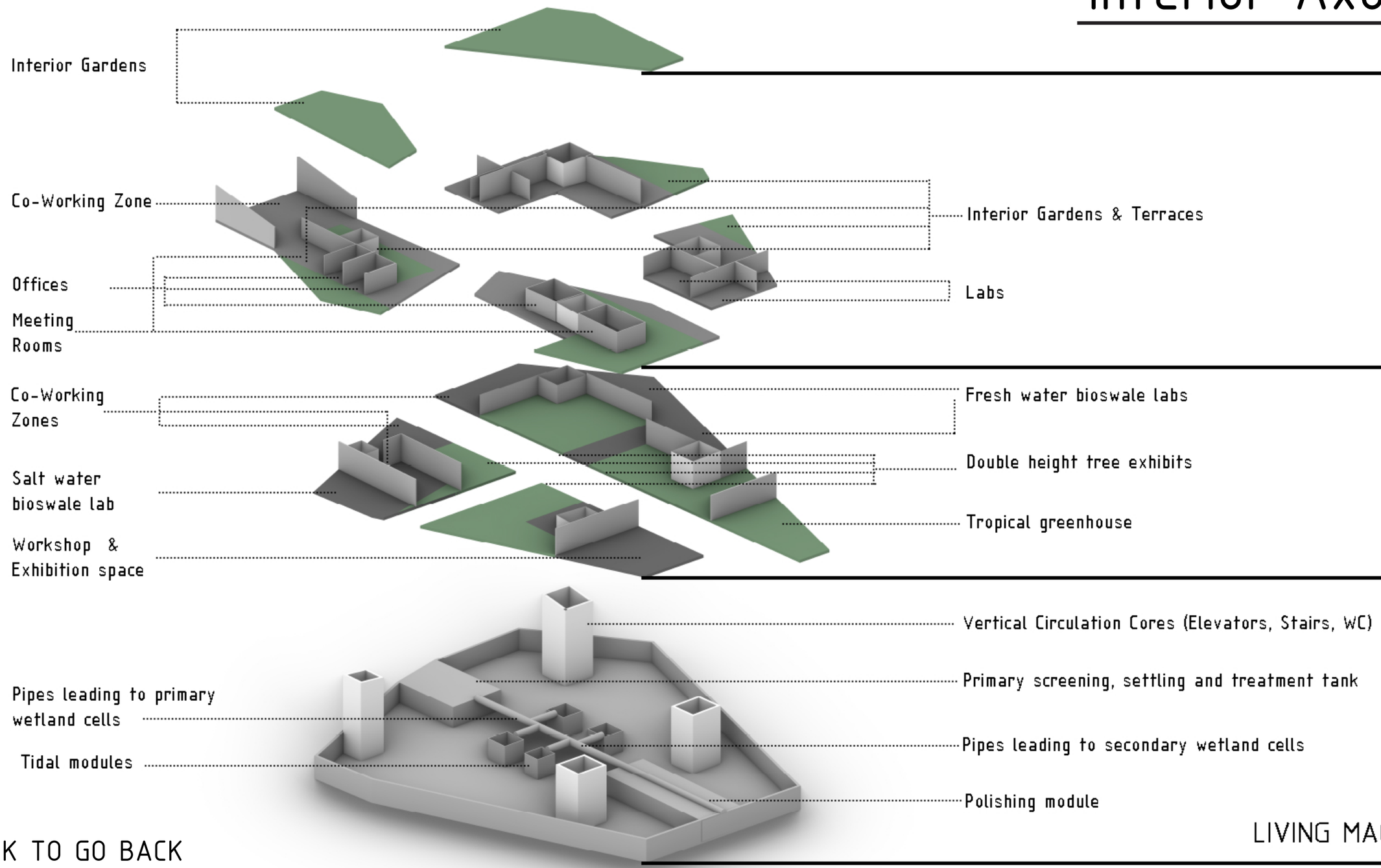
Interior Axonometric



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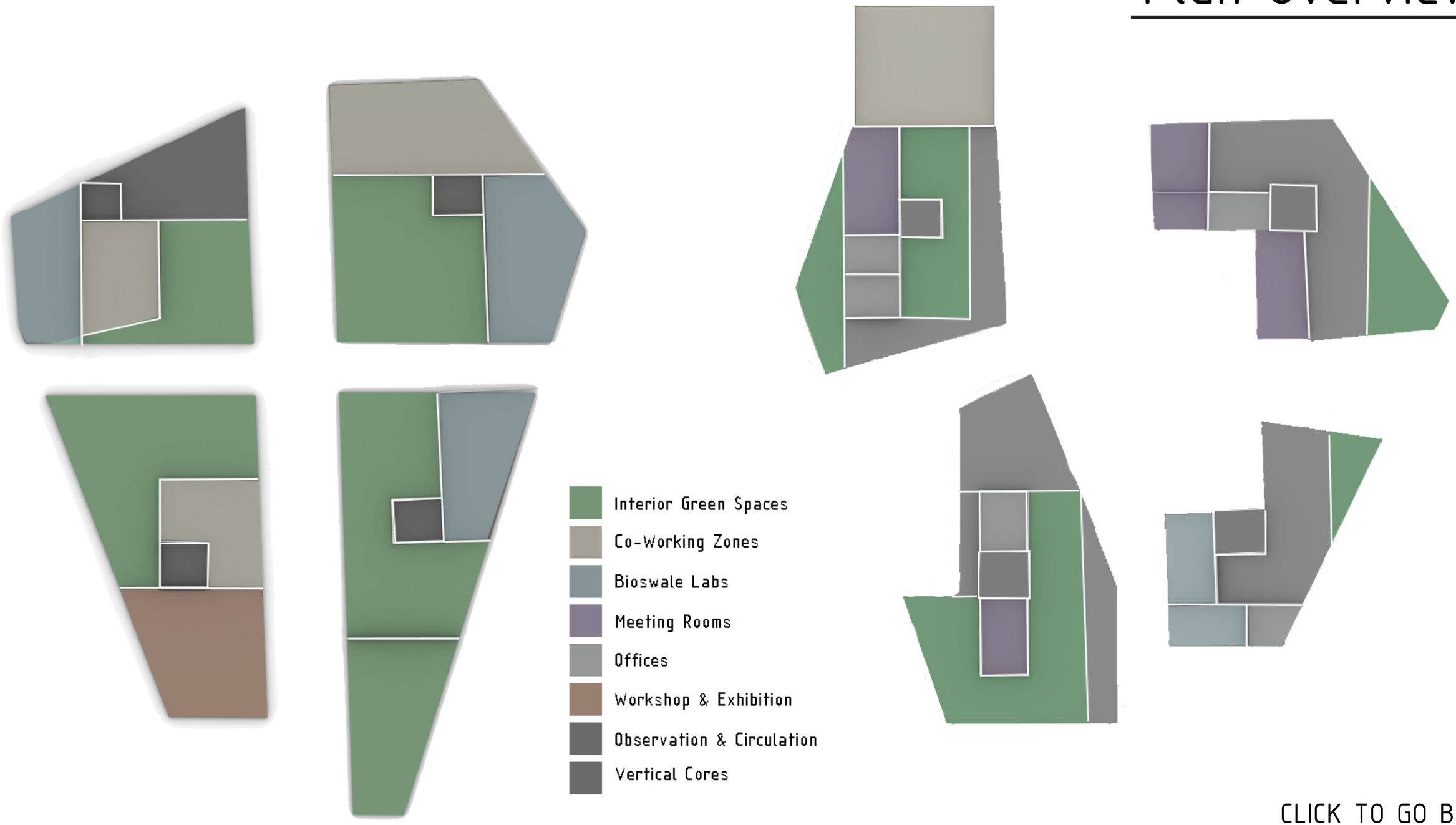
Plan Overview



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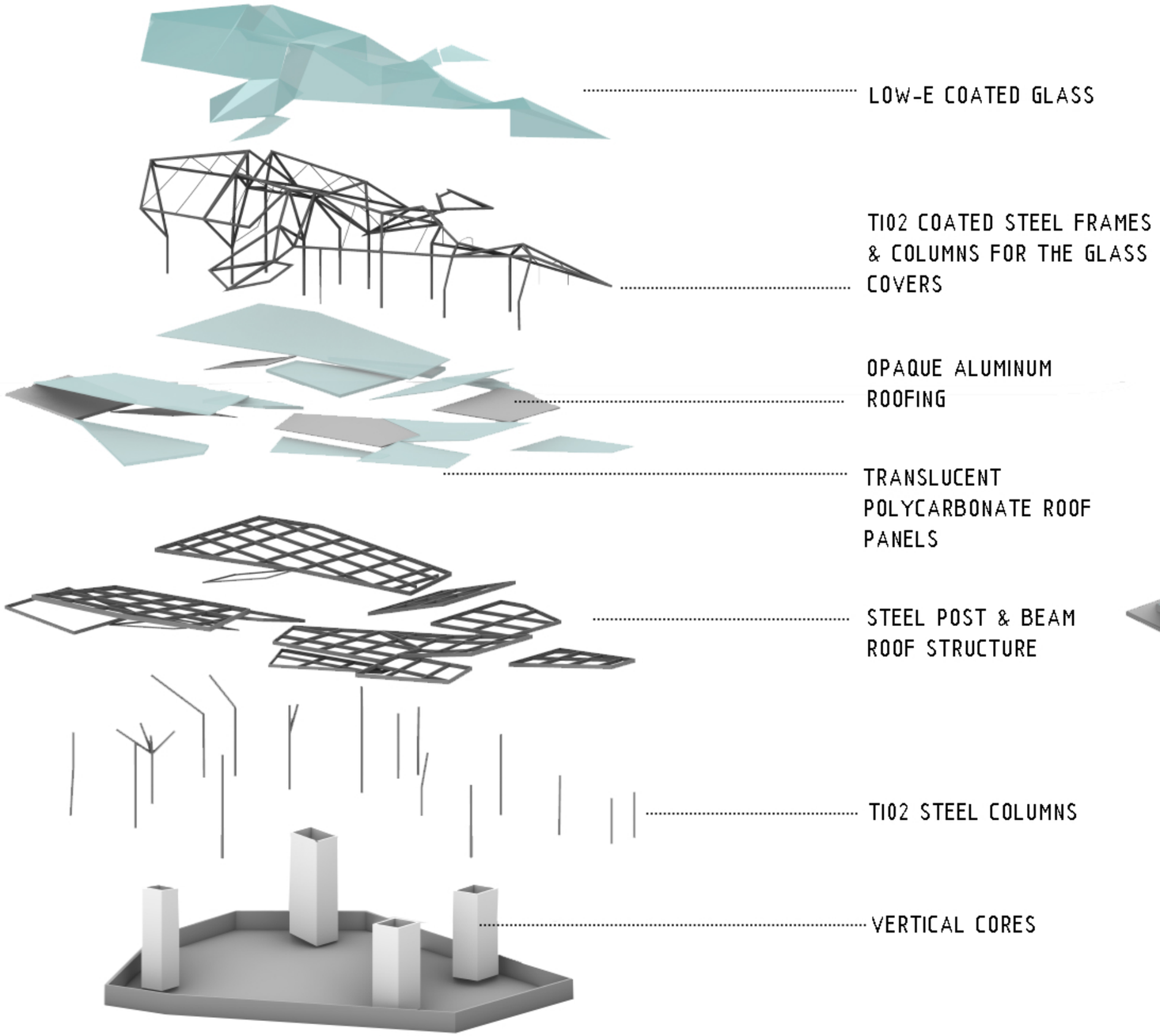
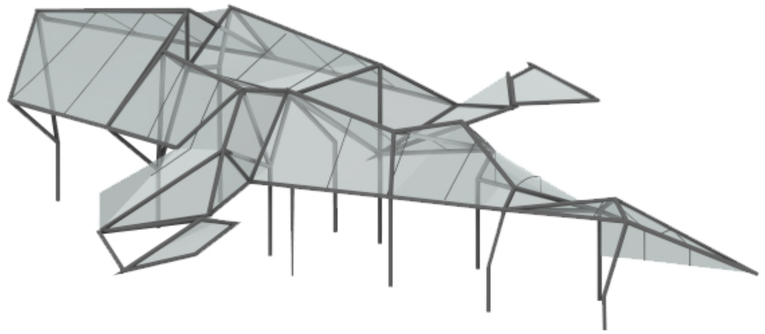
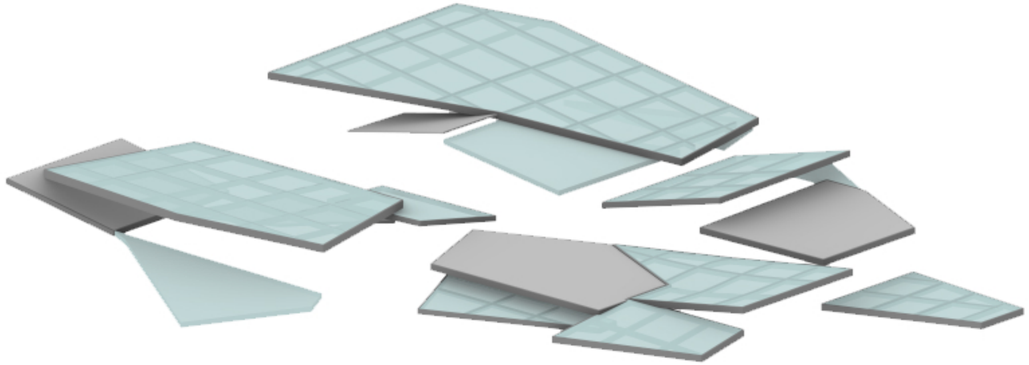
Structure Diagram





GLASS CUBICAL ROOFS TO EMPHASIZE THE PEDESTRIAN CIRCULATION



TRANSLUCENT POLYCARBONATE PANELS OVER INTERIOR GARDENS

OPAQUE ROOFING OVER RESEARCH & STUDY FUNCTIONS

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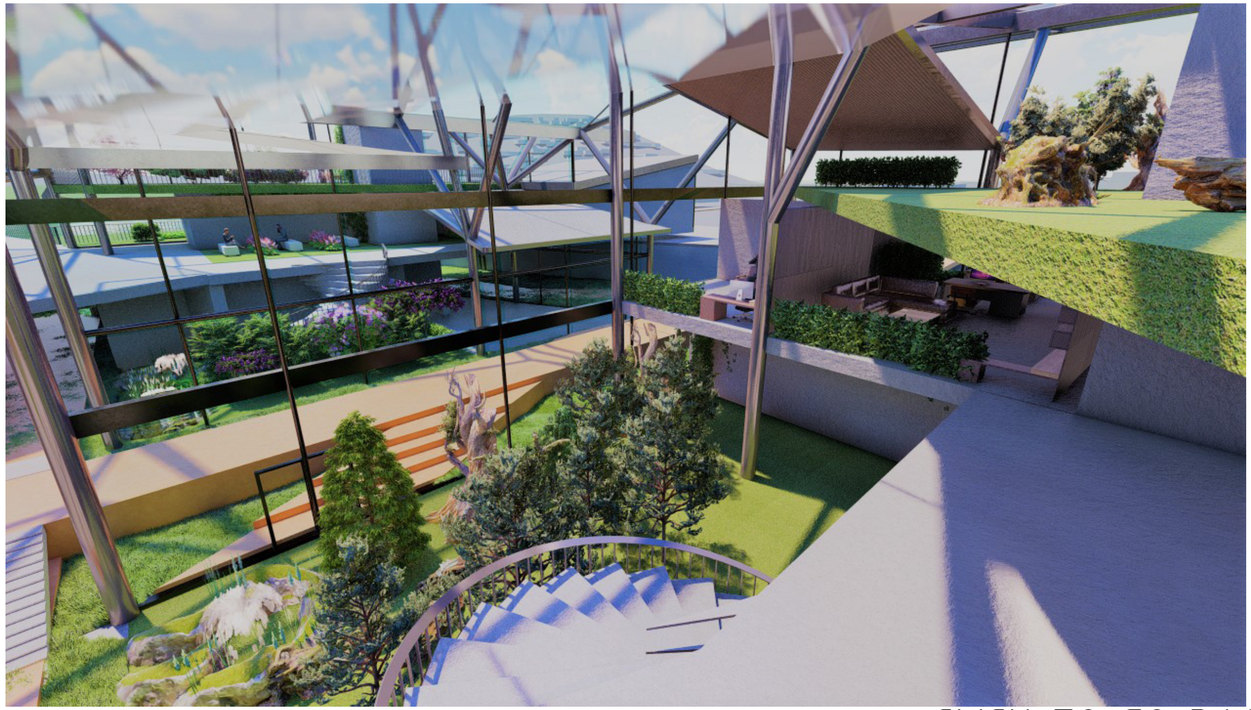
Biome Differentiation

2. BLACK SEA BIOME
-Oak tree
-Birch tree
-Coniferous
-Spruce
-Pine trees

1. SALT WATER BIOME
-Mangrove trees
-Shrubs
-Birch trees
-Lilac flowers



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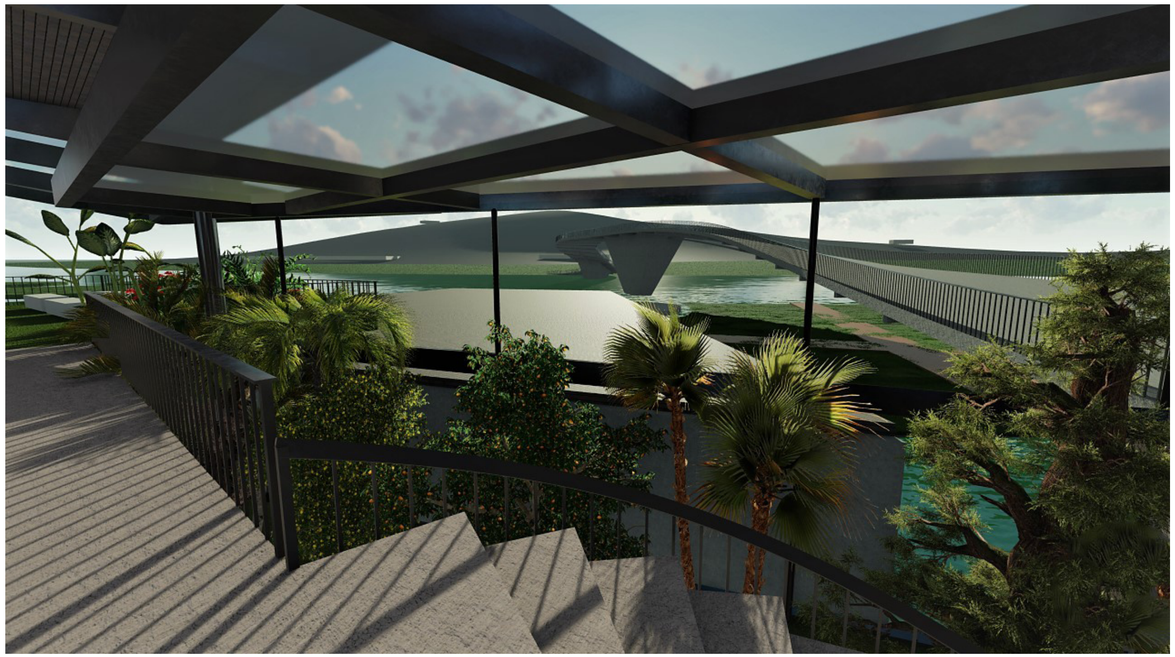
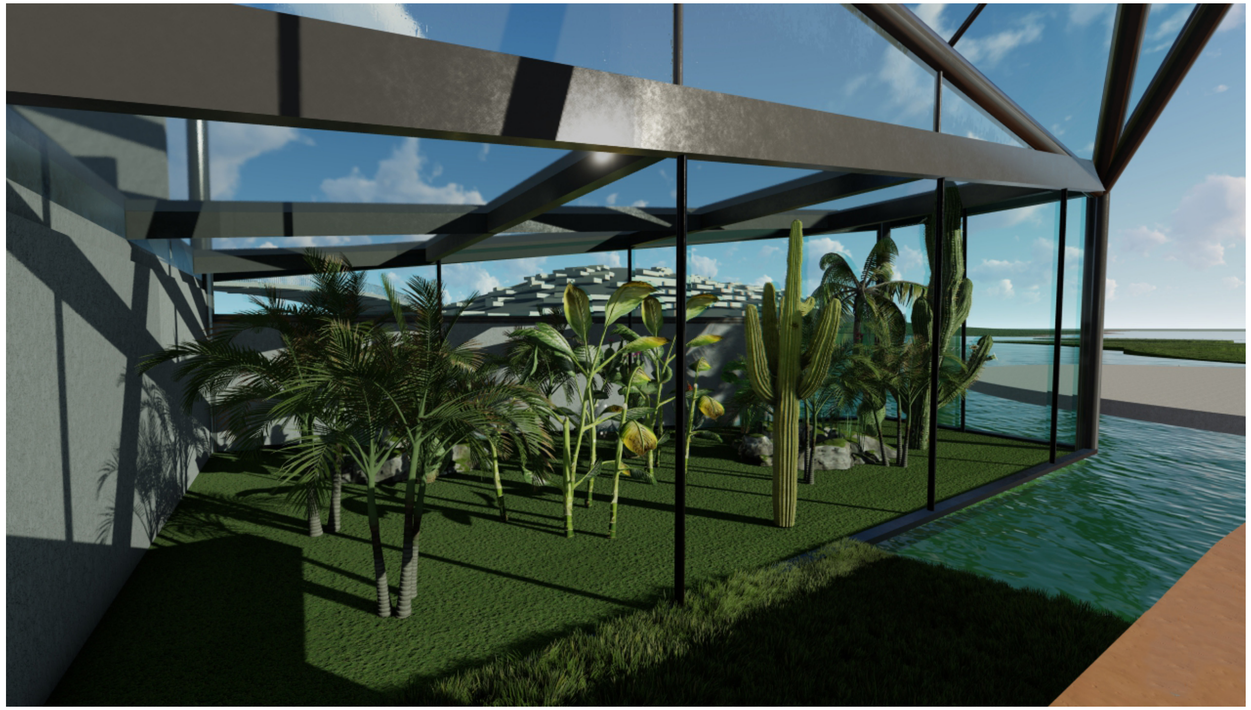


3. MEDITERRANEAN BIOME
-Olive tree
-Juniper tree
-Mastic tree
-Palms
-Oleander
-Citrus tree
-Scoth pine

4. TROPICAL BIOME
-Elephant's ear
-Cactus
-Ficus benjamina
-Fishtail palm
-African candelabra



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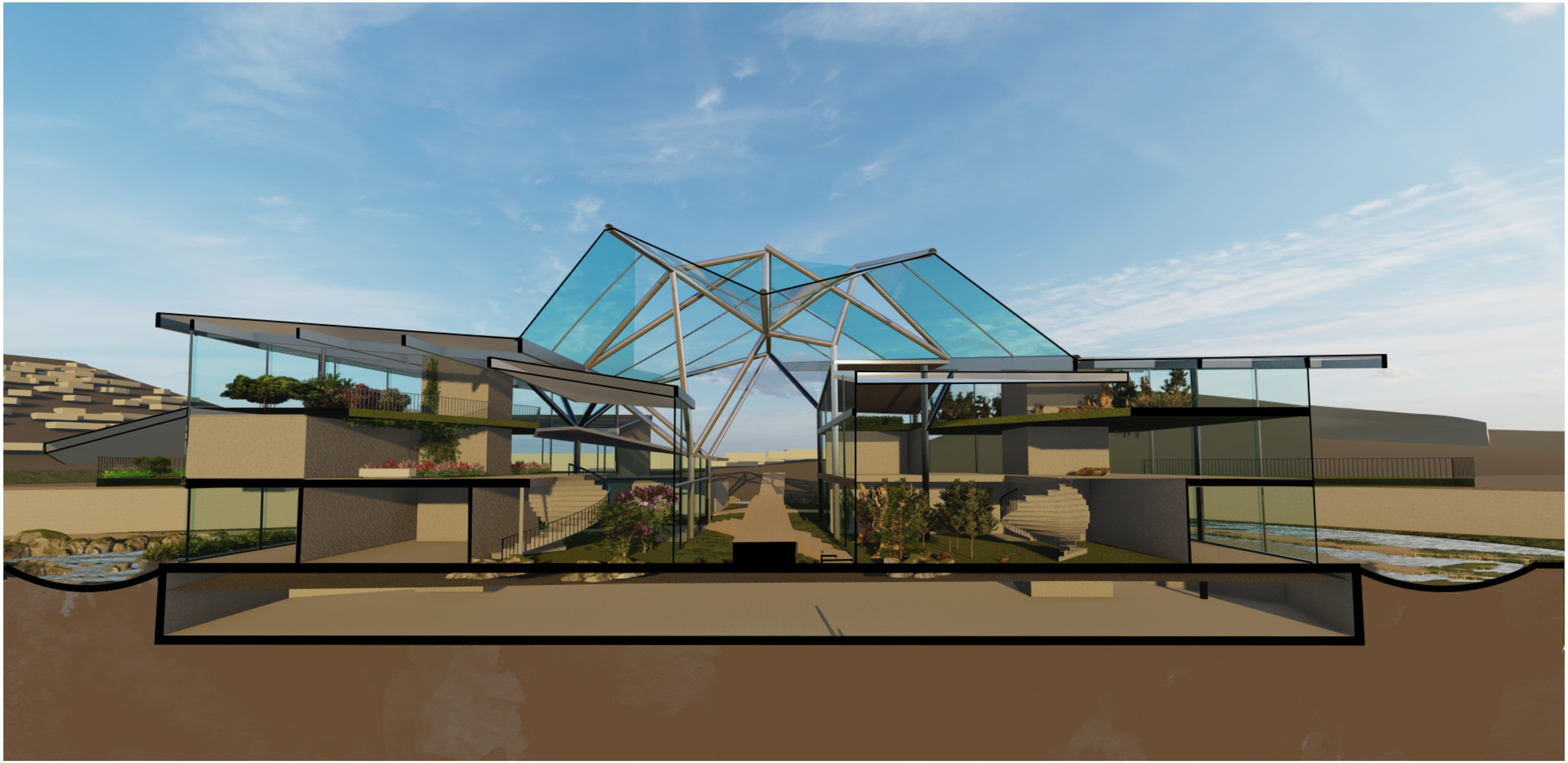
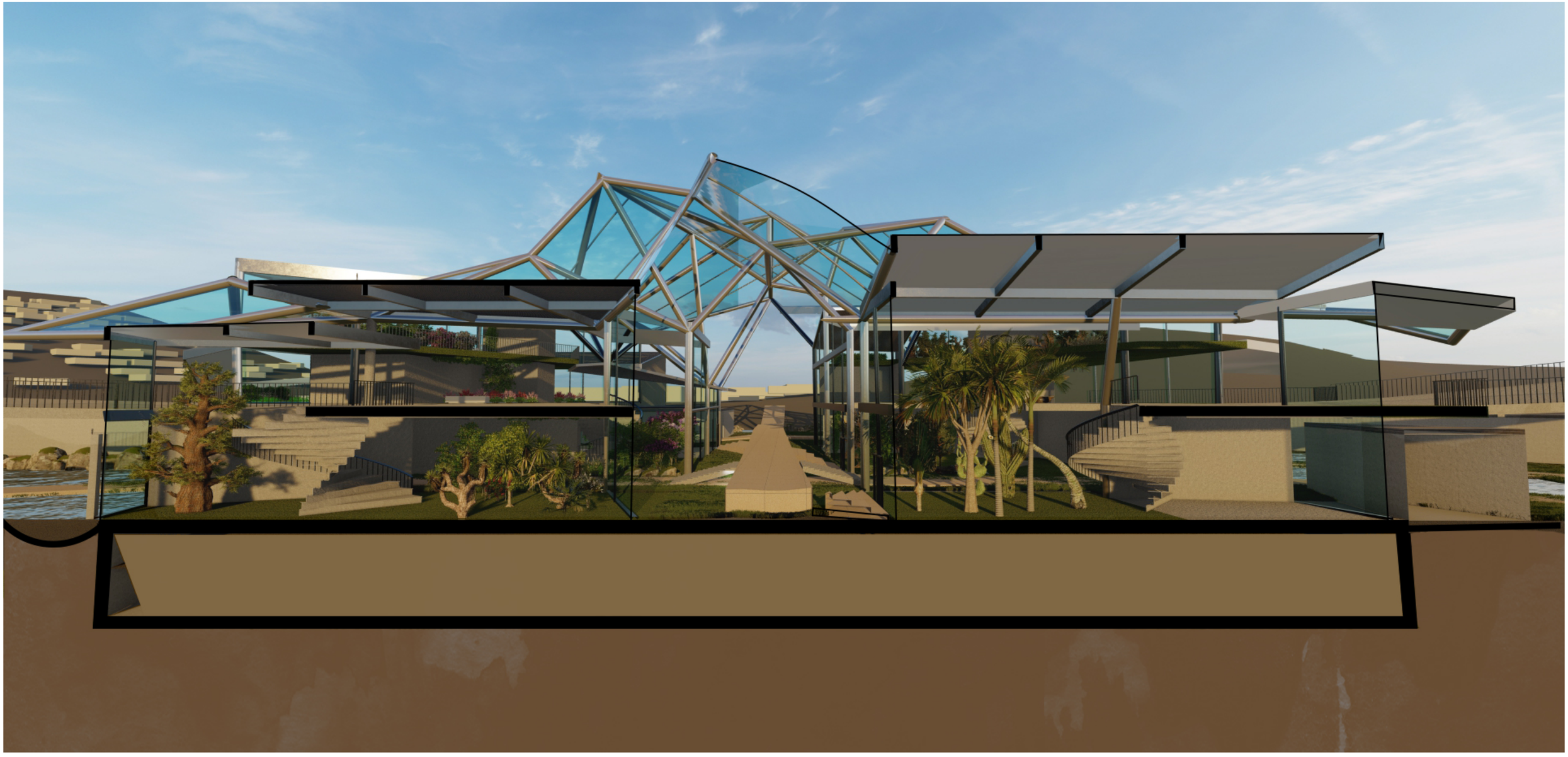
Sections



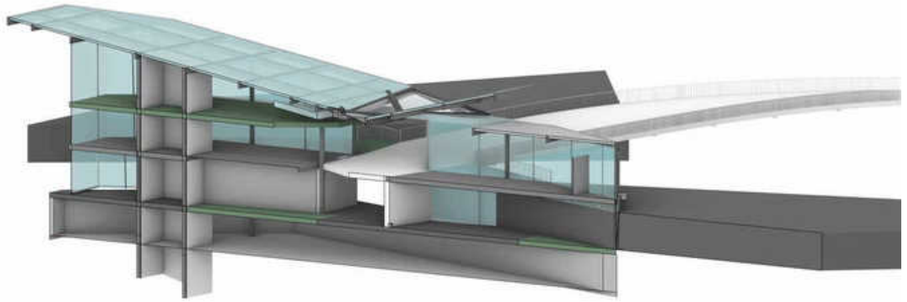
CLICK TO GO BACK



CLICK TO GO BACK

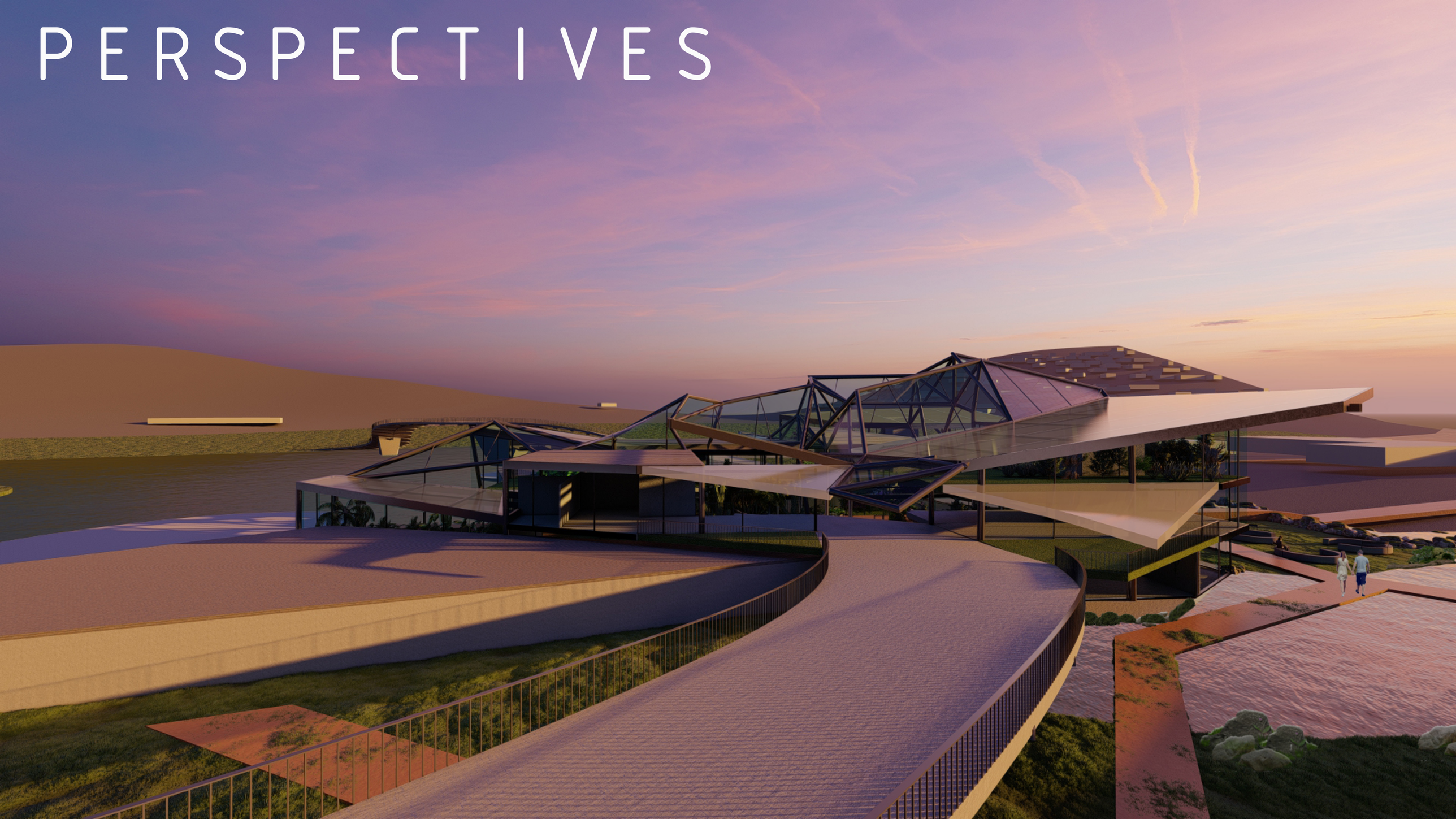
SECTION ANIMATION

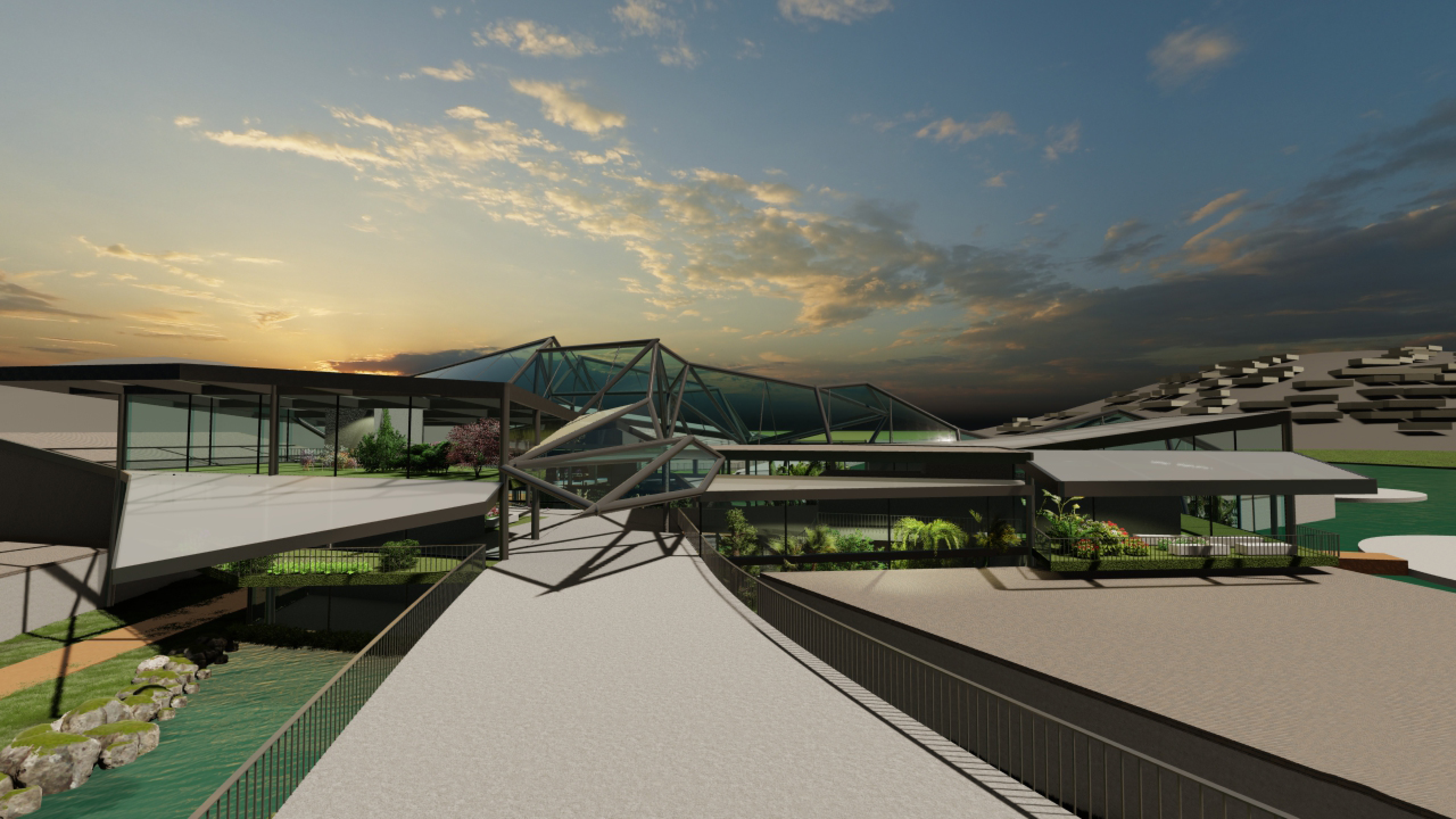
CLICK IMAGE TO VIEW ANIMATION

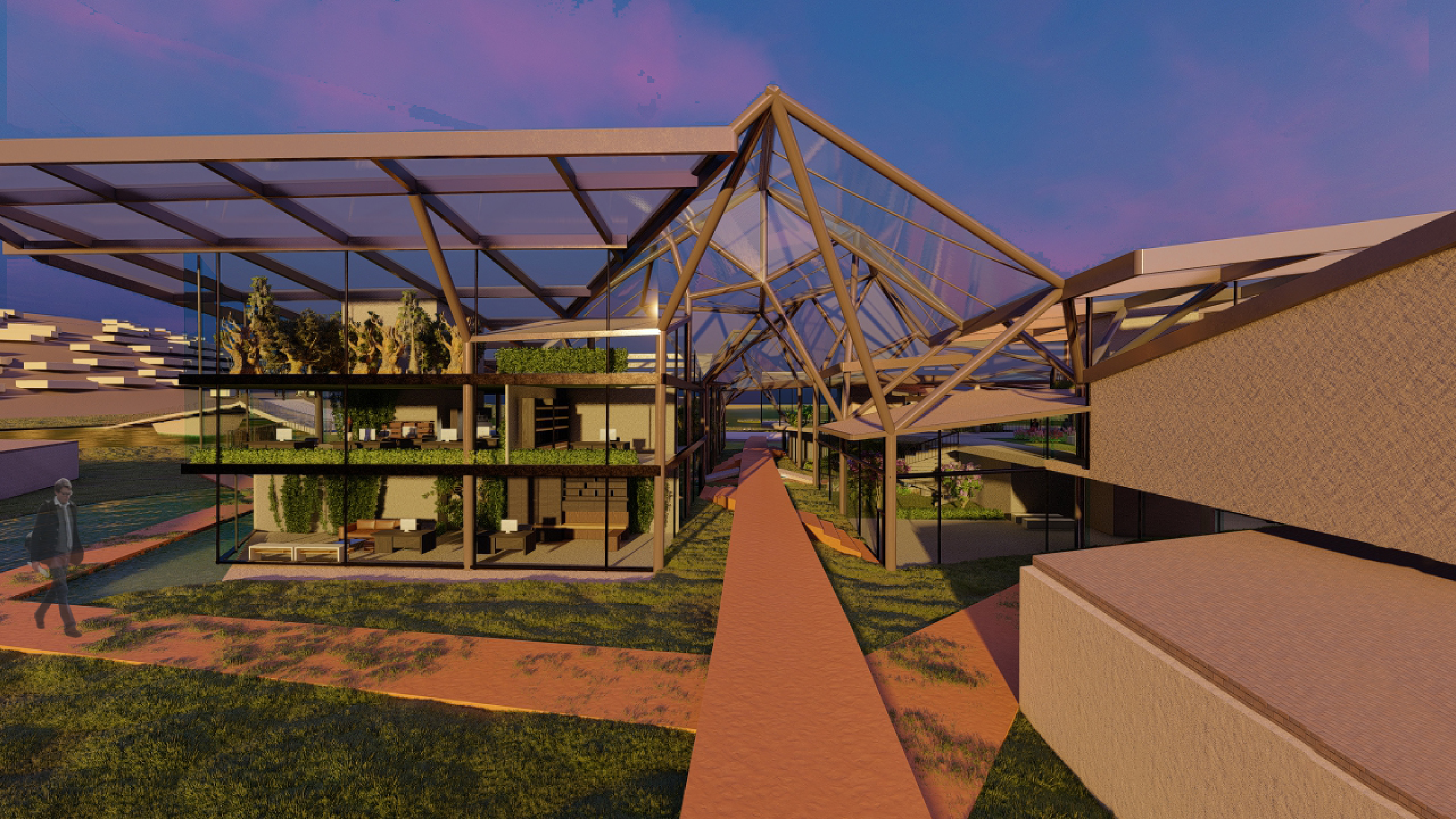


CLICK TO GO BACK

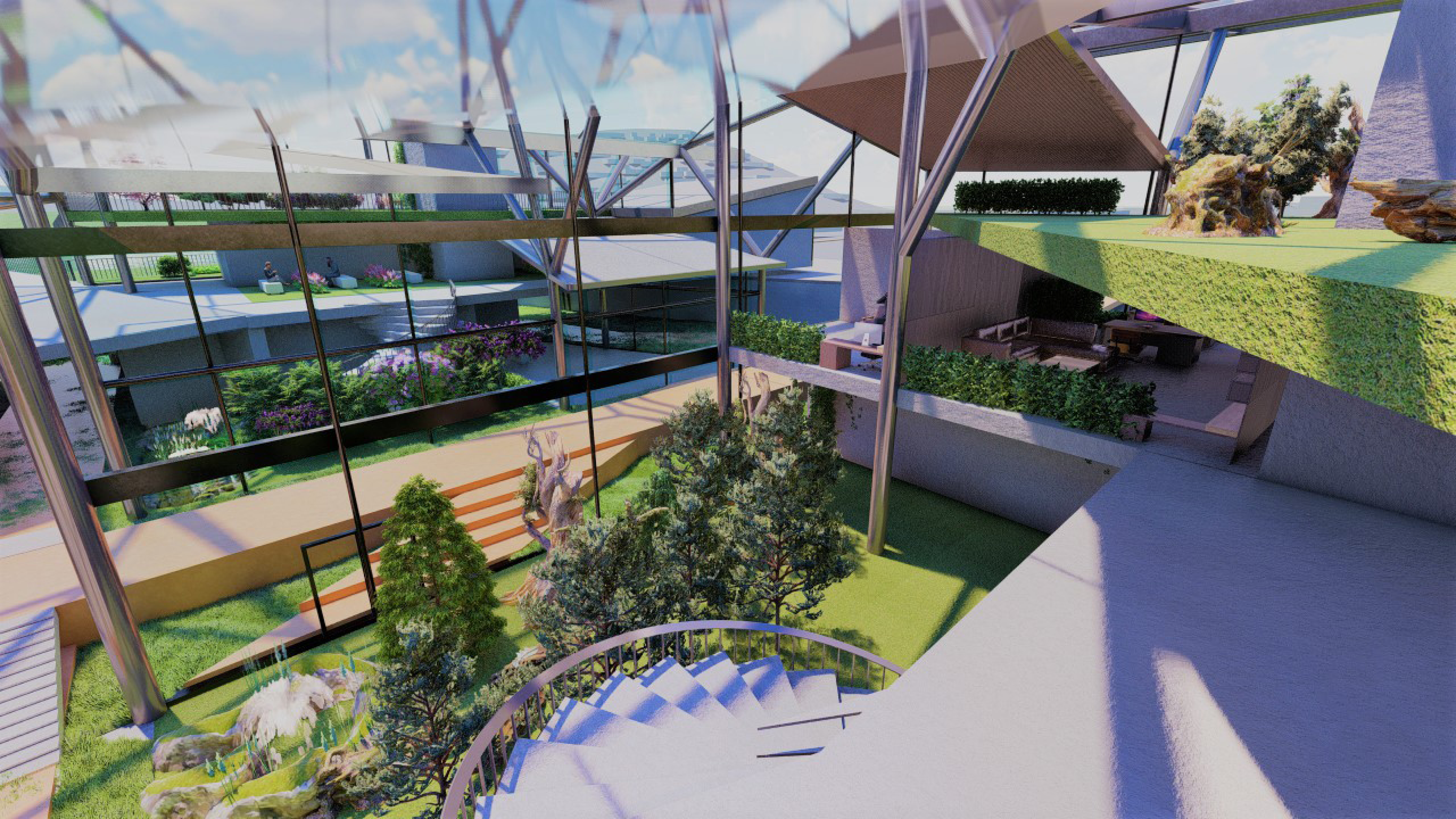
PERSPECTIVES

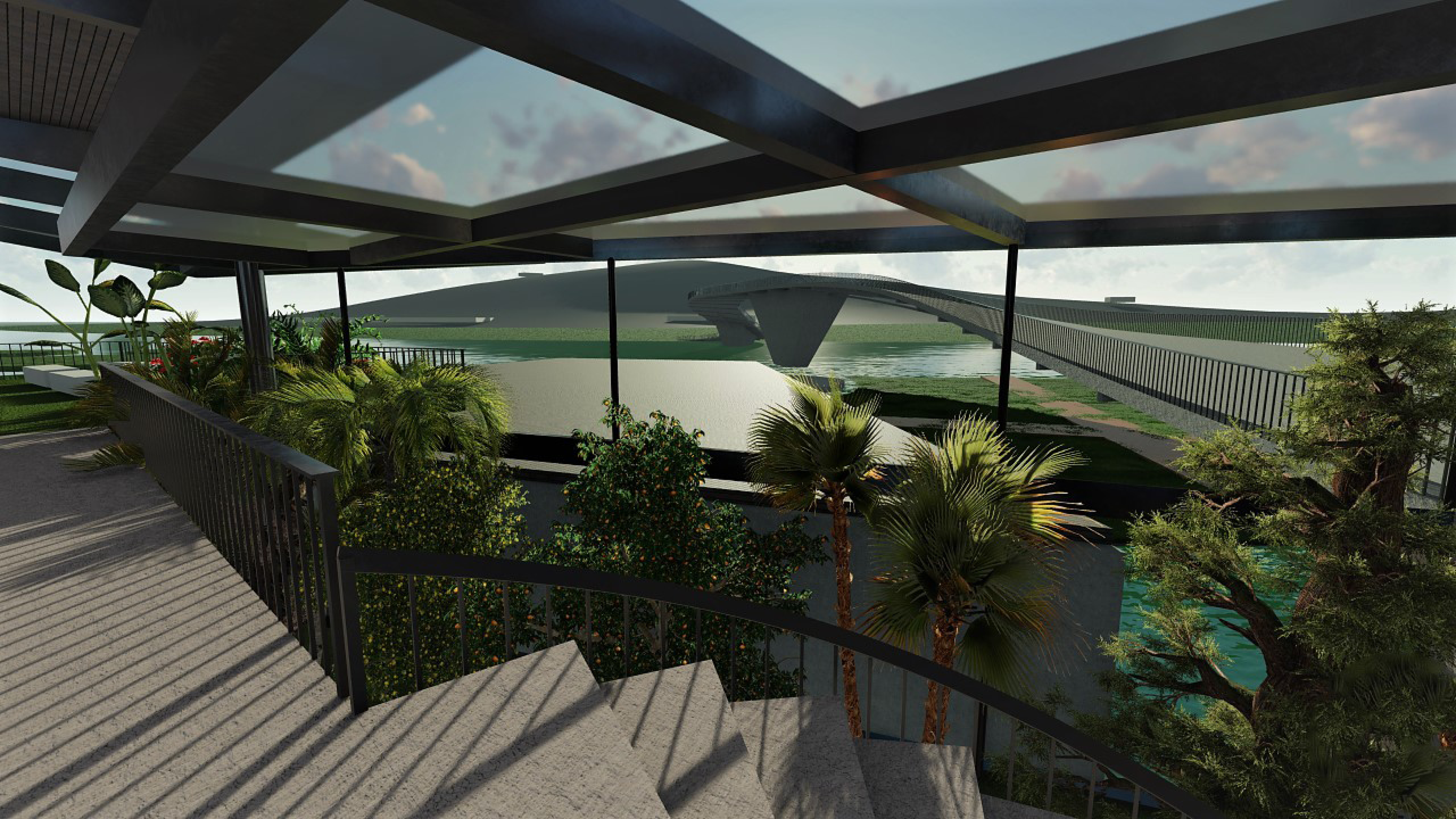


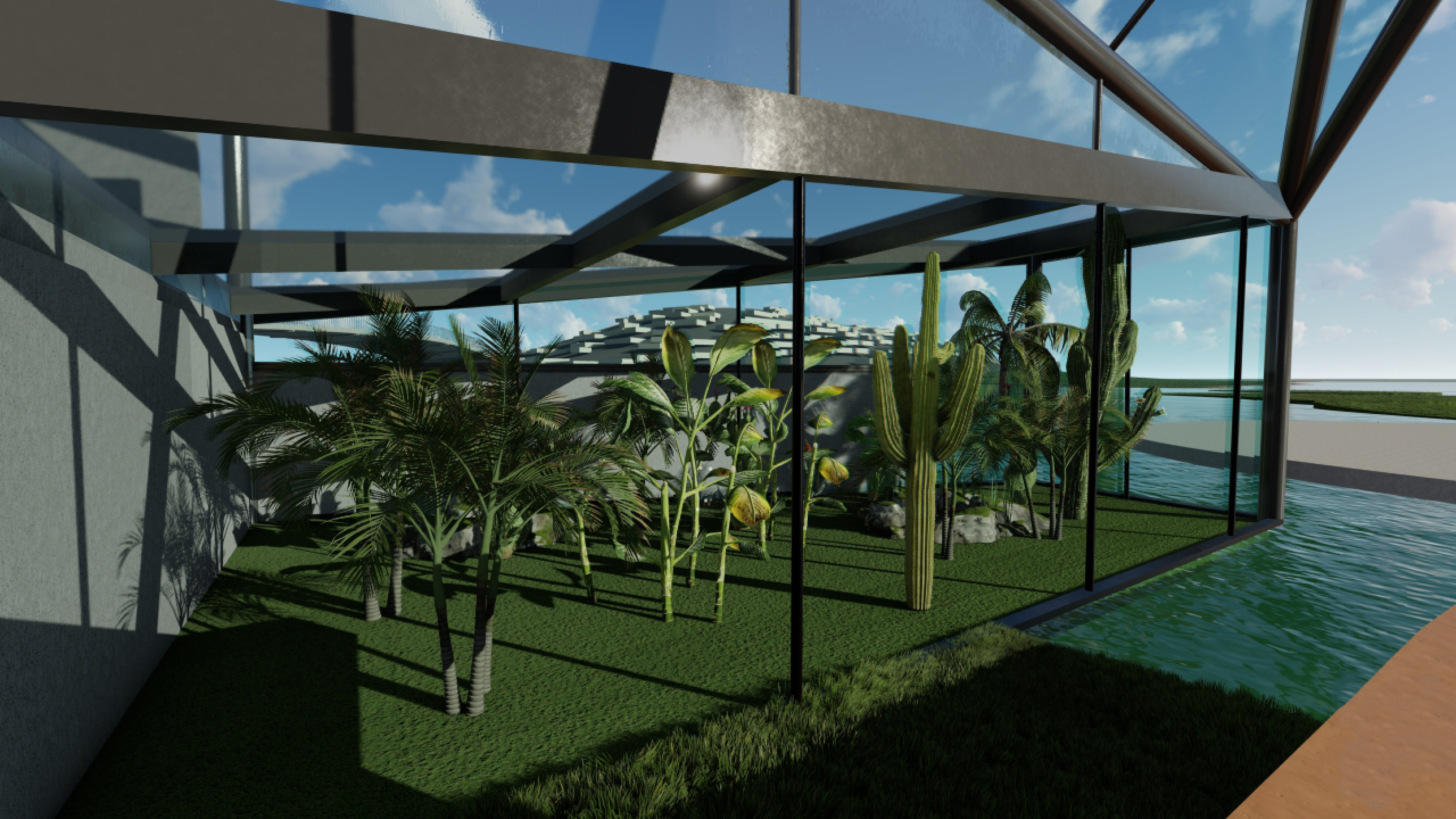





LUMION
PRO STUDENT







TAKE A CLOSER LOOK..

(click image to view the video)