An aerial photograph of a river delta, showing a central river channel that branches out into numerous smaller channels and oxbow lakes. The terrain is light-colored, likely sandy or silty, with darker patches of vegetation. A road or path runs parallel to the main river channel. The overall scene is a complex network of waterways.

"We have forgotten how to be good guests, how to walk lightly on the earth as its other creatures do."

Barbara Ward

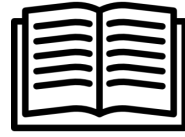
Content



INTRODUCTION



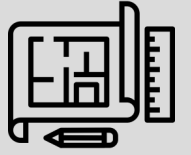
SITE ANALYSIS



LIT REVIEW



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The Salt Lake

Sereflikochisar, Ankara, Turkey



Salt Lake is a salt lake located at the intersection of Ankara, Konya and Aksaray provinces in the Central Anatolia Region of Turkey. 40% of Turkey's salt need is met from this lake. Salt in Tuz Gölü is formed when meteorological waters infiltrate underground, melting the salt domes that were formed before and transporting them to the surface along tectonic lines.



The Salt Lake

Sereflikochisar, Ankara, Turkey

Salt Lake, located on southeast of Ankara, is a bird paradise within the borders of Aksaray, and its surroundings; While it hosts hundreds of bird species with its sheltering opportunities, it also draws attention with its endemic plants. Salt Lake is one of the richest basins in Turkey, with the presence of birds living in the small lakes and marshes around it. While this region is located on the migration route of wild birds, the absence of an important wetland other than Tuz Gölü and its surroundings in the middle of the steppe directs migratory birds to Tuz Gölü. The lake, which does not freeze in winter due to its high salt content, is also a good shelter for migratory birds.





INTRODUCTION



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Biological Features

The vast water area covered in winter constitutes an important wintering area for waterfowl. Due to the relatively uninhabited nature of the lake environment, the birds feed easily in the surrounding puddles, pastures and cultivated areas, and can swim in the lake waters that do not freeze even in the coldest days of winter. There are ecologically sensitive plant communities in the region consisting of salty steppes and endemic species. Salt Lake is the most important incubation area of flamingos in our country, and there are giant incubation colonies consisting of 5-6 thousand nests each in the middle parts of the lake.



Biological Features

Why Salt Lake is convenient for Flamingo Breeding?

1- Landscape characteristics of the lake

Flamingos are birds from «open landscapes». They breed in open lakes, lagoons, artificial salt pans, seashores and even freshwater marshes and avoid closed habitats that prevent them from seeing predators and from taking off easily.

2- Substrate quality of the nesting site

Flamingos nest on low islands of mud or sand, surrounded by water, and construct a nest-mound of the material surrounding the nest. If the surface of the island is hard or dry, there will be no mound, or either no nest at all.

3- Water levels around the nesting site

The water level must be sufficient to prevent any terrestrial predator intrusion but also not so high nests flooding.

4- Foraging Resources

Brine shrimps, one of the main food of flamingos live in salty waters.

5- Predation & Disturbance

Flamingos are very sensitive to disturbance and predation when breeding.



Salt Lake & Flamingos

ANKARA HABERLERİ

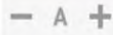
Flamingolar Tuz Gölü'ne gelmeye başladı

AA

Flamingolar, kendileri için dünyadaki en büyük doğal üreme kolonisi olan Tuz Gölü'ne gelmeye başladı.



AA



Havaların ısınmasının ardından, önemli göç yolları üzerinde bulunan Tuz Gölü'ne her yıl on binlerce flamingo gelir. Göl flamingolar için essiz beslenme kuluçka ve kres

Türkiye'nin en büyük 2. gölü olan Tuz Gölü, 21 bin flamingoya ev sahipliği yapıyor

Türkiye'nin en büyük 2. gölü olan Tuz Gölü'nde, 21 bine yakın flamingo bulunuyor. Aksaray Üniversitesi Veteriner Fakültesi Dekanı Prof. Dr. Mustafa Cemal Darılmaz, Tuz Gölü'nün dünyanın en büyük flamingo kuluçka merkezlerinden biri olduğunu belirterek, "Flamingolar için Tuz Gölü önemli bir alan. Hem de barındırdığı endemik bitkilerle oldukça korunması gereken önemli bir alan olarak biliyoruz. En son geçen yıl yapılan sayımlarda 21 bin flamingo rakamına ulaştık. Bu yıl bu sayının daha da artmasını bekliyoruz" dedi.

Abone ol [Google News](#)

Paylaş [Twitter](#) [Facebook](#) [WhatsApp](#) [Print](#)



HABERLER / Foto Galeri / Seyahat HABERLERİ / Flamingoların yaşam cenneti: Tuz Gölü

Flamingoların yaşam cenneti: Tuz Gölü

Kuş varlığı yönünden Türkiye'nin en zengin gölleri arasında yer alan Tuz Gölü, her yıl binlerce flamingoya ev sahipliği yapıyor.

Abone ol [Google News](#)

Paylaş [Twitter](#) [Facebook](#) [WhatsApp](#) [Print](#)



Akdeniz Havzası'nda birçok ülkede görülen flamingolar, dünyadaki en önemli yaşam ve kuluçka sahalarından biri olan Tuz Gölü'nde, görsel şölen sunuyor.

What's happening in the Salt Lake?

AA | Son Güncelleme: 14.07.2014 - 14:39

Rekor çekilmenin olduğu Tuz Gölü'nde flamingo ölümleri artıyor



refid:26803490 ilişkili resim dosyası

Dünyada flamingolar için en önemli kuluçka sahalarından biri olan Tuz Gölü'nde sular 12 gün içinde 270 metre çekilirken, flamingo cenneti olan göldeki ölü kuş sayısı 50'ye ulaştı.

Haberler / Yaşam

ABONE OL

Tuz Gölü ile ilgili korkutan uyarı!

02.06.2019 - 15:01
Güncelleme: 02.06.2019 - 15:01

Türkiye'nin ikinci büyük gölü ve flamingo cenneti olan Tuz Gölü, giderek küçülüyor. Selçuk Üniversitesi Fen Fakültesi Biyoloji Bölümü Hidrobiyoloji Anabilim Dalı Öğretim Üyesi Prof. Dr. Cengiz Akköz, önlem alınmadığı takdirde gölün yok olabileceğini ifade ederek, "Yağışlar bol olduğu zaman göl şişiyor ve etrafı genişliyor. Biraz büyüyor ama gerçek olan göl sürekli kuruyor. Bunun sebebi besleyici kanalların kuruması, suyun gelmemesi, yer altı suyu tarımsal sulama ve kuraklık nedeniyle sürekli azalıyor olması" dedi.



Tuz Gölü'nde korkutan manzara! Yüzlerce flamingo ölü halde bulundu

Anaokulu - Kocaeli - Tuz Gölü'nde korkutan manzara! Yüzlerce flamingo ölü halde bulundu
17 Haziran 2020, 19:59 tarihinde eklendi

Her yıl Tuz Gölü'ne gelen flamingoların (altı turna) ölü olarak bulunması dikkat çekti. Flamingo cenneti olarak bilinen doğa harikasında karşılaşılan manzara araştırmacıları endişelendirdi. Türkiye'nin tuz ihtiyacının yüzde 40'ını karşılayan Tuz Gölü, on binlerce flamingo tarafından ziyaret edilerek kuluçka bölgesi olarak kullanılıyor.



Yardım | A | Artır - Azalt | Yorum

Çok kötü haber... Artık flamingolar gelmiyor



Çonya, Ankara ve Aksaray illerinin sınırları içerisinde yer alan Türkiye'nin ikinci büyük gölü olan Tuz Gölü son yıllarda hızla küçülüyor. Havadan görüntülenen göl kenarlarının içlerine çekildiği ve gölün küçüldüğü gözlenirken, gölün Çihanbeyli ilçesine bağlı Gölyazı Mahallesi'ndeki sulak alanlarına gelen flamingolar da gelmiyor.



Habere ilgili daha fazla fotoğraf için galeriyi ziyaret edin.

What's happening in the Salt Lake?

Haberler > Doğa > Tuz Gölü hızla küçülüyor

Tuz Gölü hızla küçülüyor

DOĞA



Konya, Ankara ve Aksaray illerinin sınırları içerisinde yer alan Türkiye'nin ikinci büyük gölü olan Tuz Gölü son yıllarda hızla küçülüyor

05 Temmuz 2018, Perşembe 19:52 San GünüZaman 05/07/2018 19:52

YAZI BOYUTU

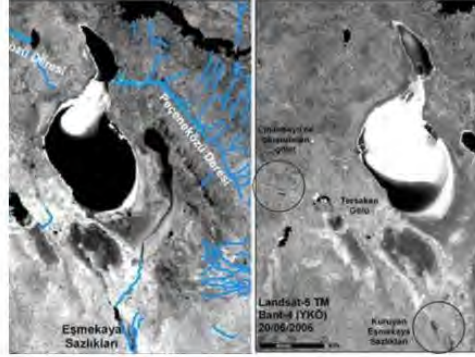
Abone Ol Google News



Kuş varlığı açısından Türkiye'deki önemli sulak alanlardan olan Tuz Gölü ve yakınındaki birbirleriyle ilişkili küçük göller olan Akgöl, Bolluk Gölü, Düden Gölü ve Tersakan Gölü'nün yer aldığı bu bölge, uluslararası kriterlere göre uluslararası öneme sahip 81 sulak alandan A Sınıfı Sulak Alan kategorisindeki 18 sulak alan içerisinde yer alıyor.

Tuz gölü 90 yılda yüzde 85 tükendi

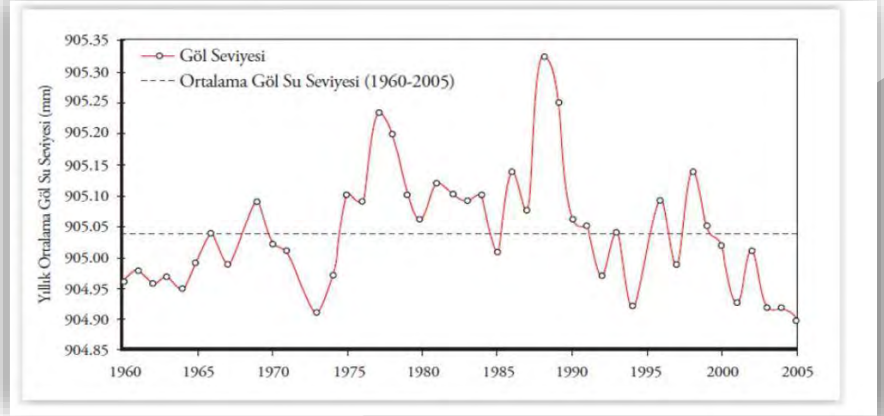
Tuz Gölü'nün 90 yıllık haritalar ve günümüz uydu fotoğraflarıyla nasıl bir durumda olduğu ortaya çıktı.



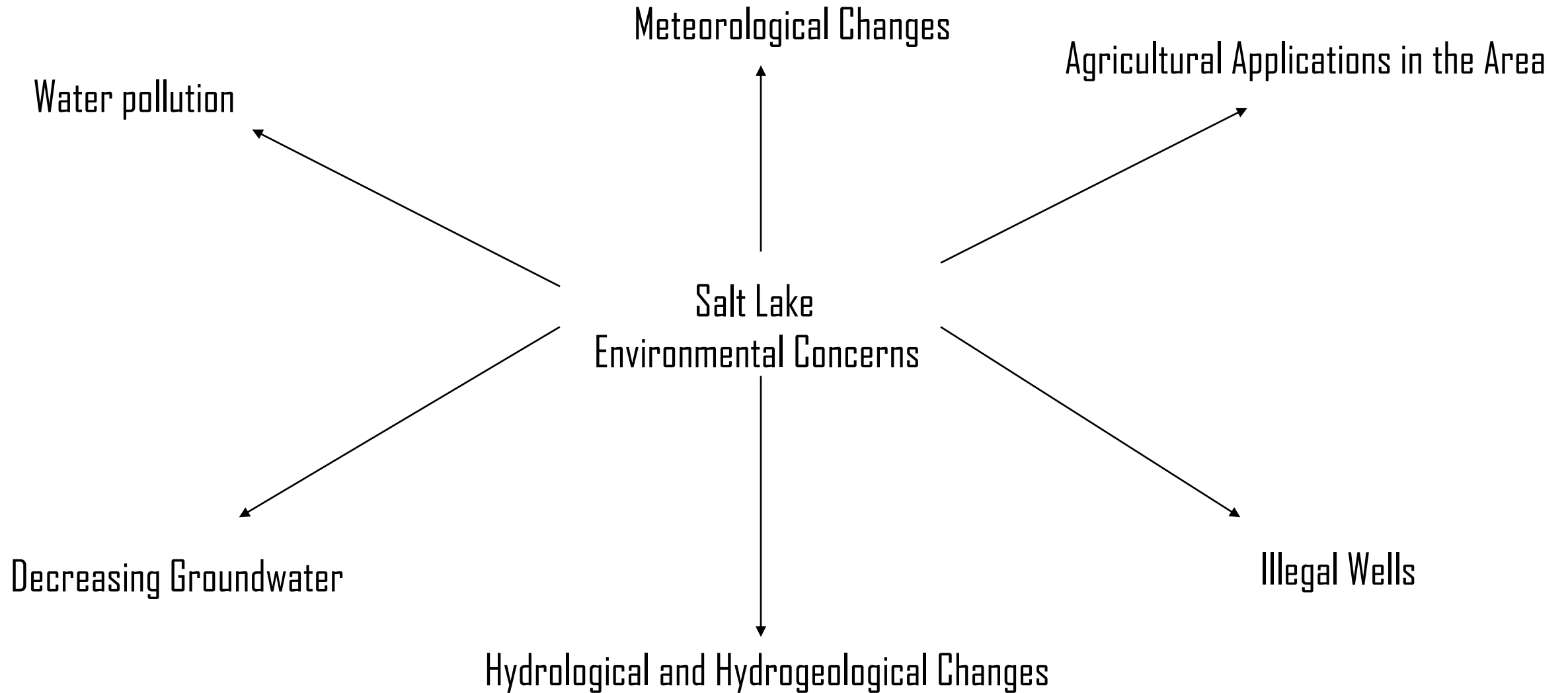
Tuz gölü'nün 90 yıllık haritalar ve günümüz uydu fotoğraflarıyla yapılan çalışmalar sonucunda, 90 yılda yaklaşık yüzde 85 küçüldüğü tespit edildi.

Aksaray Üniversitesi Mühendislik Fakültesi Jeodezi ve Fotogrametri Mühendisliği Bölümü Öğretim Üyesi Yrd. Doç. Dr. Semih Ekercin, AA muhabirine yaptığı açıklamada, Tuz Gölü'nde kuraklık üzerine yaptığı bir araştırmada, son yüzyıl içindeki kıyı çizgisi değişimini incelediğini söyledi.

Ekercin, harita ve güncel uydu görüntülerinin karşılaştırılması ile elde edilen "Tuz Gölü Kıyı Çizgisi Değişim Belirleme Çalışması"nda 1915 yılına ait tarihi askerî harita ve NASA tarafından ücretsiz olarak sağlanan uydu görüntülerini kullandığını belirtti. Ekercin, bu çalışmasını arazi üzerinde yaptığı çalışmayla da desteklediğini kaydetti.

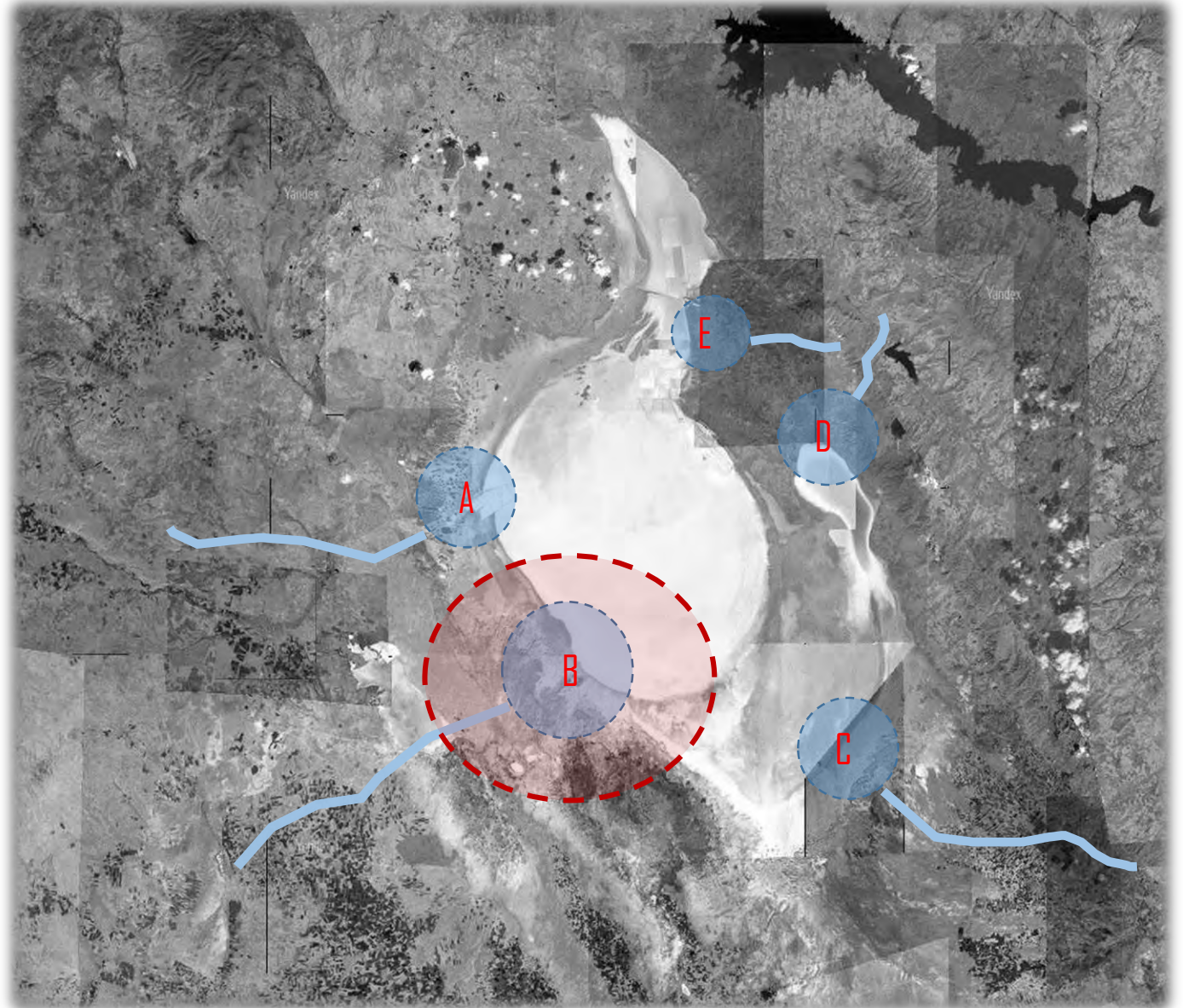


Salt Lake Environmental Concerns



Revitalization & Purification

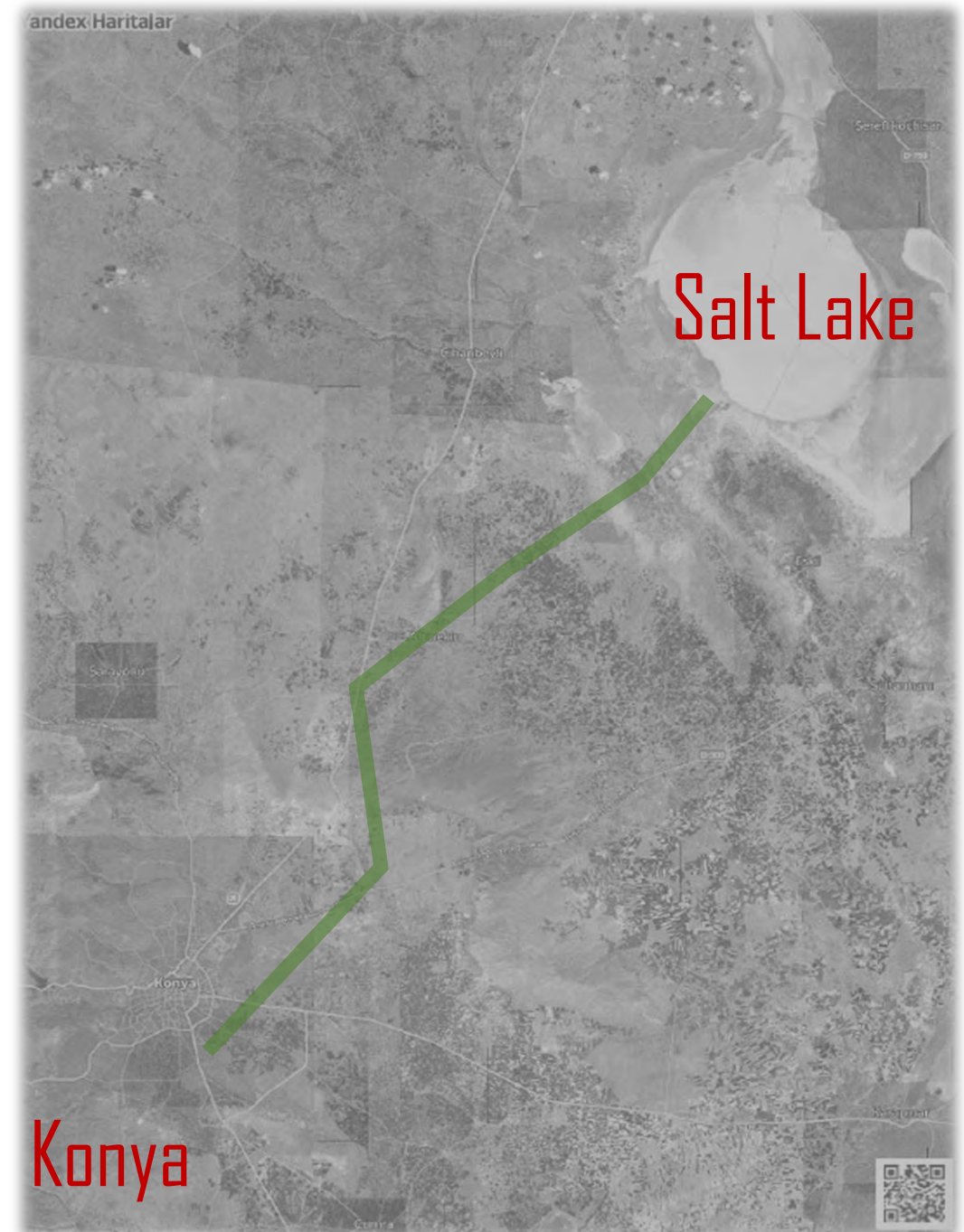
- A** Revitalization & Purification of Insuyu Stream that comes from Cihanbeyli
- B** Water treatment of Konya Drainage Channel.
- C** Revitalization of Melendiz Stream, establishing a controlled water flow between Mamasin Dam and the Salt Lake.
- D** Revitalization of Peçenek Stream. Establishing controlled water through Salt Lake.
- E** Treatment and purification of the waste water channel that comes from Koçhisar.



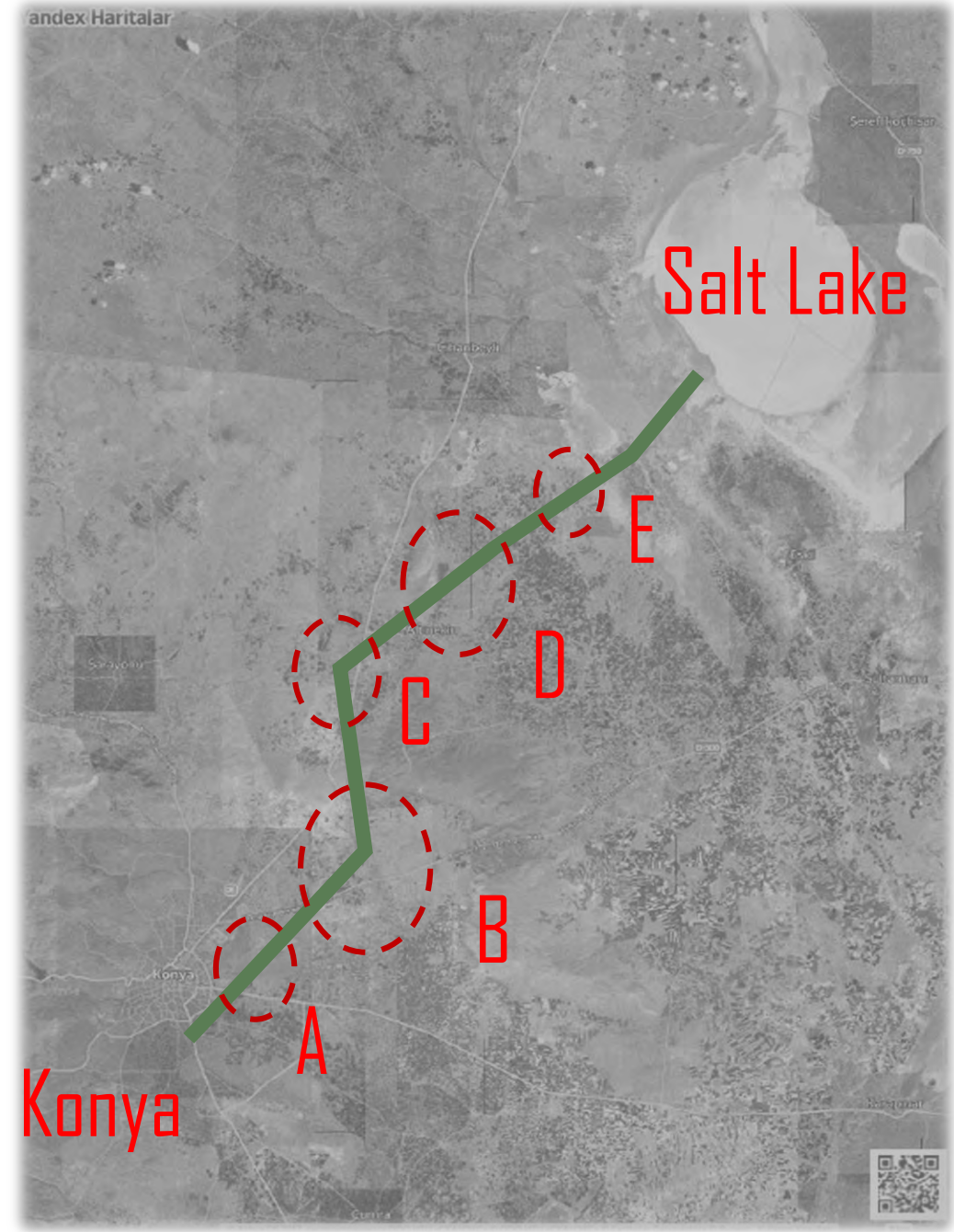
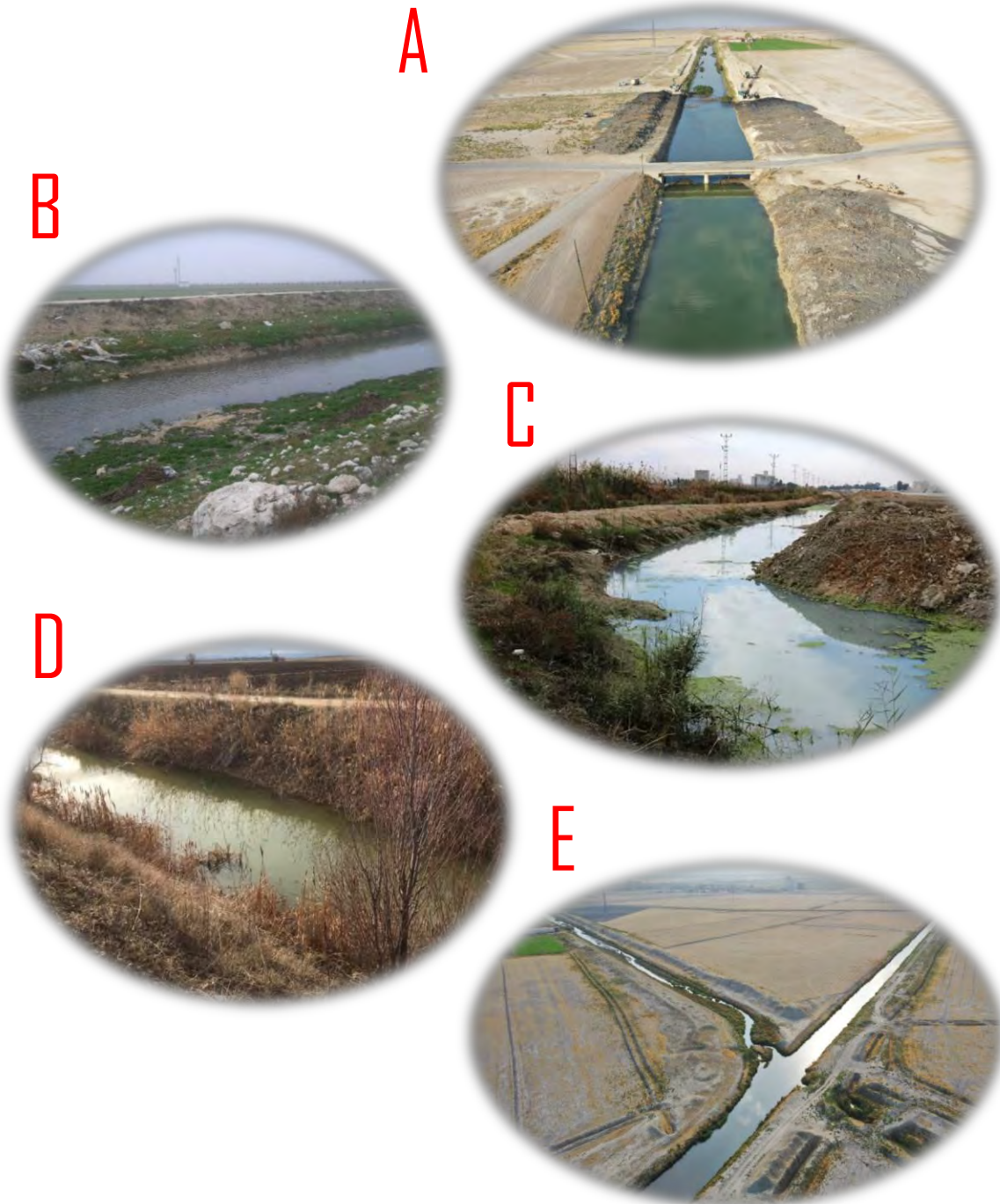
Water Pollution in the Salt Lake

Konya Waste Water Channel

- Constructed in 1974
- Man-made
- It was built for irrigation and flood control of surrounding agricultural areas, but it became a wastewater drainage channel.
- 185 km long
- Carries wastewater from surrounding cities and industrial areas to the salt lake



Konya Waste Water Channel



Konya Waste Water Channel



Google Earth

Water Pollution in the Salt Lake

Konya ilinin kanalizasyon suları halihazırda herhangi bir arıtıma tabi tutulmamaktadır. DSİ Ana Tahliye Kanalı vasıtası ile Konya Ovası'nı da geçerek Tuz Gölü'ne kadar ulaşmaktadır. Mevsimin kurak olduğu dönemlerde kanal suyu, Konya Ovası'ndaki çiftçiler tarafından pompalarla çekilerek sulama amaçlı kullanılmaktadır.

10

Ancak bu işlem zamanla bölgede bir takım olumsuz sonuçların doğmasına sebep olacaktır. Zira bir takım ağır metaller, fazlaca organik madde, azot, klorür ve yağ-gres gibi maddeler içeren kanal suyu, sulama neticesinde bölgede birikim yaparak toprağın normal bileşenlerini bozacaktır.

KONYA İL ÇEVRE DURUM RAPORU, 2013

TUZ GÖLÜ:

Dünyanın nadir doğal kaynaklarından olan ve ülkemiz tuz ihtiyacının % 64'ünü karşılayan Tuz Gölü, aynı zamanda flamingo kuşları için de kuluçka alanı olarak kullanılan önemli bir sulak alanımızdır.

Tuz gölündeki sorunlar, Konya Ovası sulama sularını drene etmek amacıyla Devlet Su İşleri Genel Müdürlüğüne 1974 yılında 185 km. uzunluğundaki ana tahliye kanalının devreye girmesiyle birlikte başlamıştır. Kanala, yapılış amacının dışında, başta Konya ili olmak üzere çevresindeki diğer yerleşim merkezlerinden kaynaklanan evsel ve endüstriyel nitelikli atıksuların artılmadan deşarj edilmesi nedeniyle, Göldeki kirlenme başlamış ve su miktarındaki artma nedeniyle tuz üretimi giderek düşmeye başlamıştır.

Göldeki kirlenmenin yanı sıra, ana tahliye kanalı boyunca, kanaldan kontrolsüz şekilde yapılan sulamalar, tarlaların ileride ıslahı mümkün olmayacak şekilde verimsiz ve çorak arazi haline getiren etimlerde

mühendislik dergisi

Dicle Üniversitesi Mühendislik Fakültesi

Cilt: 8, Sayı: 3, 649-658

Temmuz 2017

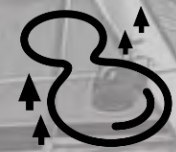
Konya ana tahliye kanalında ağır metal kirliliğinin izlenmesi

Erkan KALIPCI¹, Zehra CEYLAN¹,

¹ Nevşehir Hacı Bektaş Veli Üniversitesi, Çevre Mühendisliği Bölümü, Nevşehir

Makale Gönderme Tarihi: 04.02.2016

Makale Kabul Tarihi: 09.01.2017



INTRODUCTION



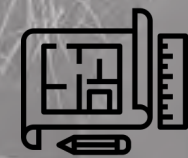
SITE ANALYSIS



LIT REVIEW



CASE STUDIES



THE PROJECT

Lit Review

The Living Machine System utilizes the latest technologies, and is engineered to mimic the ecology of natural wetlands.

The system provides a lasting water solution by effectively treating and reusing wastewater through a series of wetland cells. These cells are filled with optimized gravel, which promotes the growth of a micro ecosystem, resulting in a high quality reusable water.

How it works? Water is pumped into a tank where debris settles and degrades, then water flows into an equalization tank which determines the release into specially engineered gravel, sand, and plant boxes (wetland cells).

Following this, different cells with different organisms eat and purify the black or grey water in order to remove the microscopic sediment. The water is then treated with ultraviolet light and is lightly chlorinated to meet suitable standards.





A living machine provides an opportunity for on-site water reuse and provides a living laboratory with on-site educational opportunities. It also utilizes all wastewater and produces high quality water that can be used to flush toilets, supply cooling towers, irrigation, and other non-drinkable situations. In addition, the living machine may save water in remote and drought prone areas.

Attractive and effective foliage can be integrated in the interior and exterior of public spaces and the energy efficient design enables lower operation and maintenance costs. Overall, the technology has a smaller physical footprint and a lighter carbon footprint.



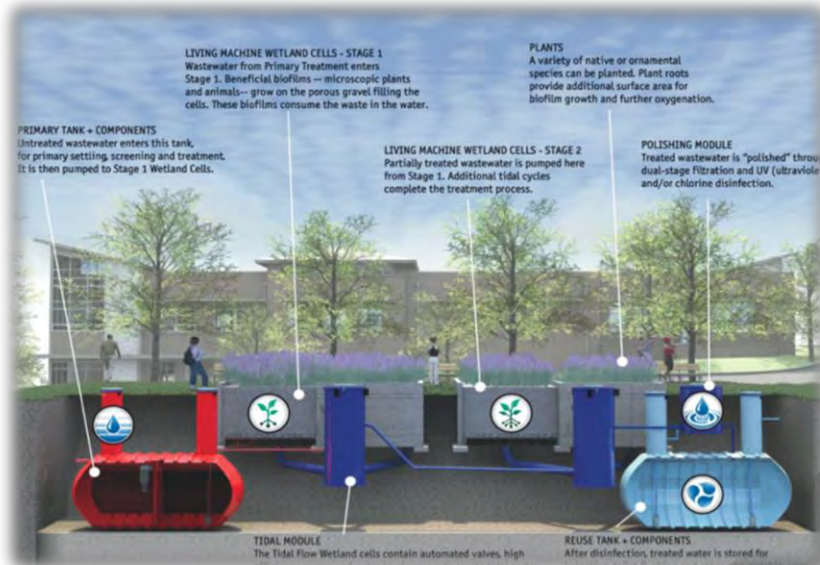
HOW IT WORKS?

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

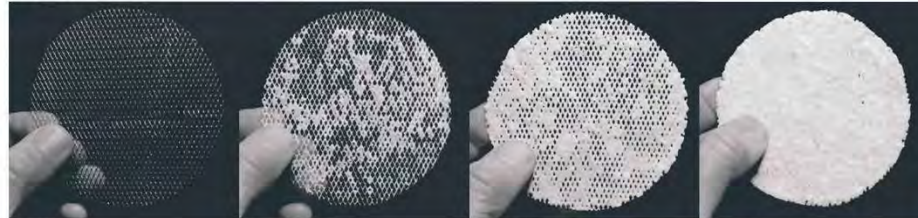
In order to remove a microscopic sediment, the water is screened and treated with ultraviolet light.



- **Third strategy :**
The natural crystallization of salt strategies

➔ Experiment vol.1

Testing experiment for crystallization of salt on a structure **submerged in a saturated salt solution.**



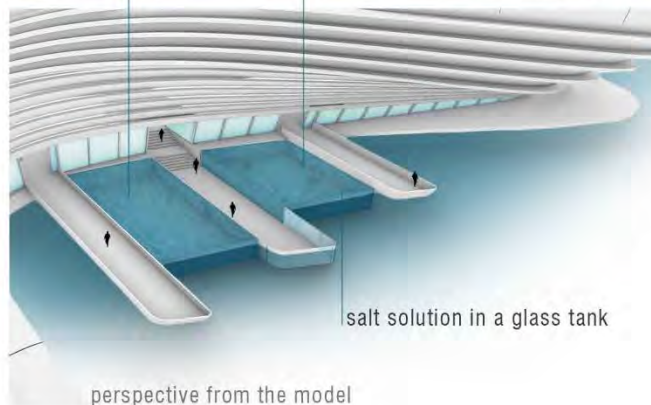
Day 0

Day 2

Day 4

Day 7

by **adding "methanol"** to the solution which acts as a **catalyst** that **doubles** the speed of crystallization, So The number of days will be reduced .



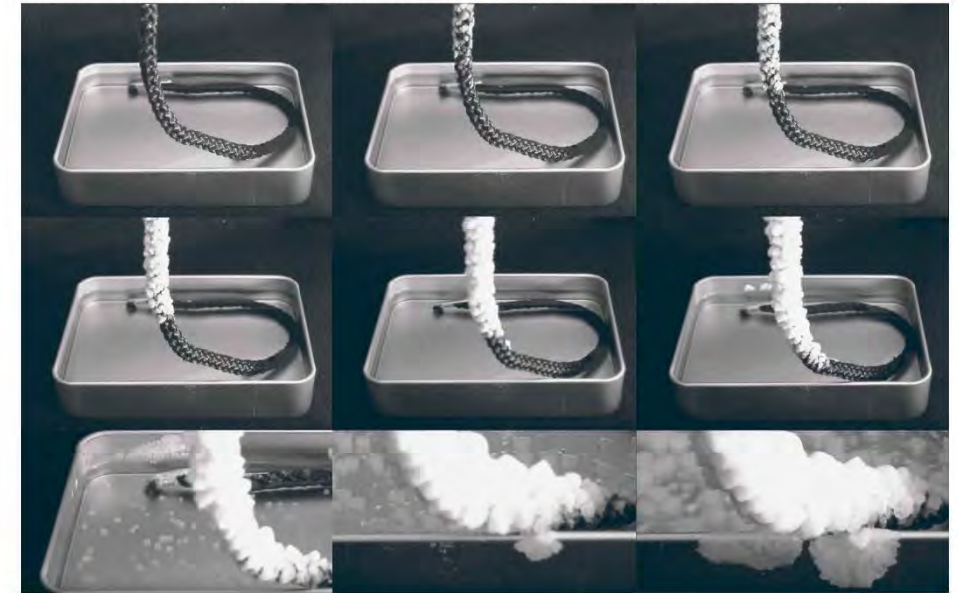
Underwater Gallery based on experiment vol.1

Enhances visitors' relation with the place where they can leave one of their belongings in the water and get it after a month or more as a piece of salt

➔ Experiment vol.2

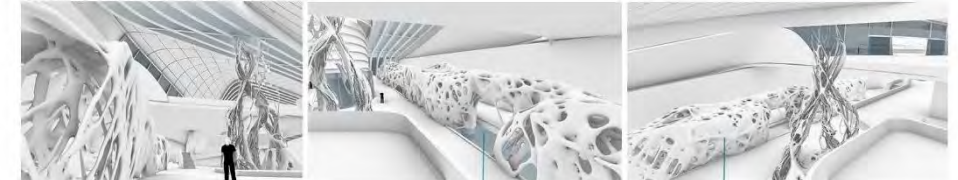
Testing experiment for crystallization of salt on a structure a **part of which is submerged in a salt solution.** and the rest of the structure out of the solution .

"Methanol" and **"Sunlight"** acts as a **catalyst** that **doubles** the speed of crystallization, So The number of days will be reduced .



Slat growth time-lapse sequence in a month adding methanol as a catalyst .

interior shots from the model



Salt solution

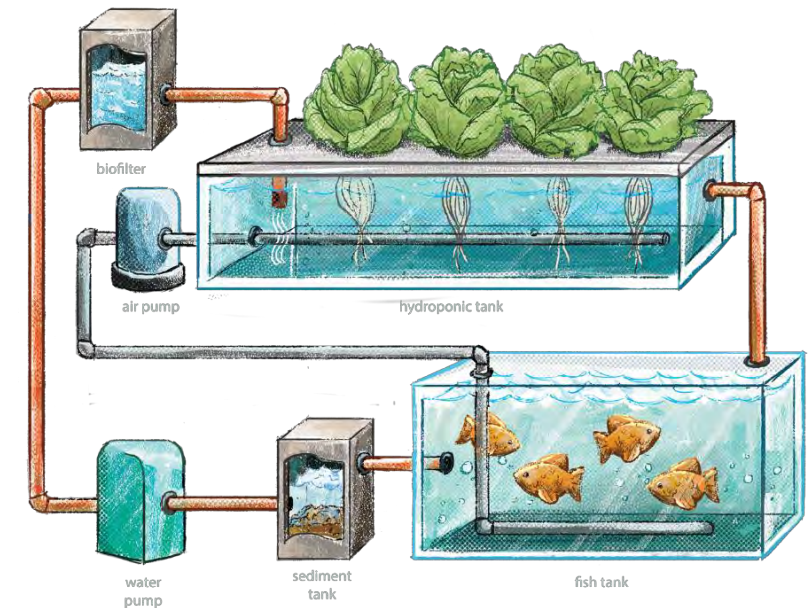
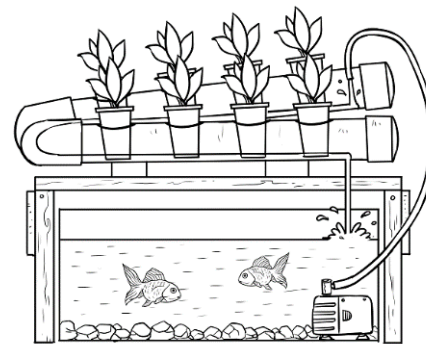
Salt pavilions
based on
Experiment vol.2

Lit Review: Aquaponics

What is Aquaponics and How Does it Work?


Aquaponics is a combination of aquaculture, which is growing fish and other aquatic animals, and hydroponics which is growing plants without soil. Aquaponics uses these two in a symbiotic combination in which plants are fed the aquatic animals' discharge or waste. In return, the vegetables clean the water that goes back to the fish. Along with the fish and their waste, microbes play an important role to the nutrition of the plants. These beneficial bacteria gather in the spaces between the roots of the plant and converts the fish waste and the solids into substances the plants can use to grow. The result is a perfect collaboration between aquaculture and gardening.

Aquaponics is a big hope for sustainable organic crop production, aquaculture and water consumption. The fish waste is recycled and used for plant growth instead of throwing it in the ocean. The water is recirculated in a closed system lowering the consumption of this resource.



Lit Review: BlueEnergy

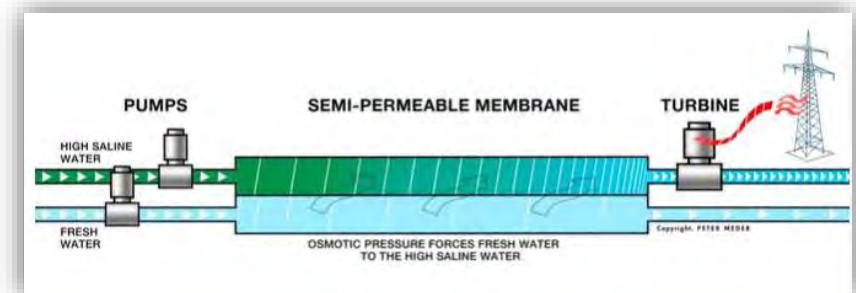
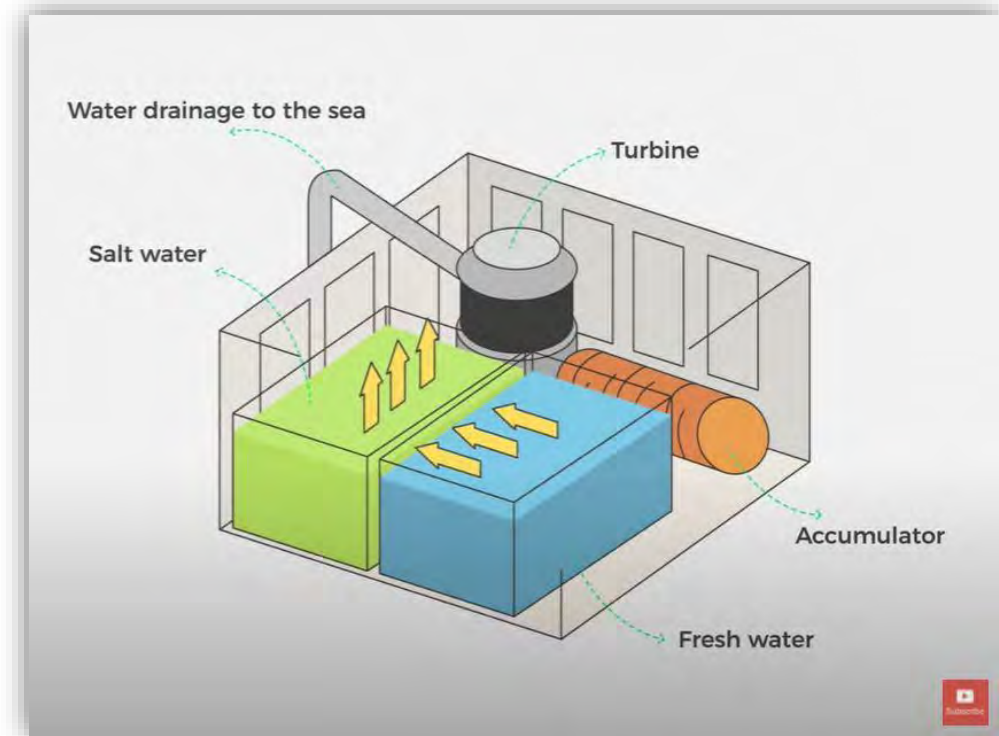
Blue Energy: can we get all our future energy from salt water?

 Tim Smedley Jan 29, 2019 · 6 min read ★



Forget Nuclear Fusion. There's a future energy source that has been proven, piloted, and is accessible to any coastal nation. Salinity gradient power — more simply known as 'blue energy' — is an idea that has been kicking around since the 1950s. When the mouth of a river meets the sea, huge volumes of freshwater meet salty seawater. As the salinity of the seawater mixes into the freshwater, the two waters diffuse quickly to reach an equilibrium. This mixing process releases energy: as much, in fact, as the same volume of water falling from a 250 meter high hydroelectric dam.

The potential power available was estimated in the 1970s (based on average ocean salinity and global river discharges) to be between 1.4 and 2.6TW a year: enough to meet almost all the entire global electricity demand.



Lit Review: Why Flamingos are Pink?

Flamingos are long-legged wading birds that are usually covered in bright pink feathers. With a name that derives from the Spanish or Portuguese word meaning “flame-colored,” the birds are known for their vibrant appearance. Though it is their most-famous quality, the pink of the flamingo’s feathers is not a hereditary trait. The birds are in fact born a dull gray. So, if it’s not a part of their DNA, why do these birds take on shades of pink and red?

For flamingos, the phrase “You are what you eat” holds more truth than it might for humans. **The bright pink color of flamingos comes from beta carotene, a red-orange pigment that’s found in high numbers within the algae, larvae, and brine shrimp that flamingos eat in their wetland environment.** In the digestive system, enzymes break down carotenoids into pigments that are absorbed by fats in the liver and deposited, for flamingos, in the feathers and skin. To actually color the physical attributes, carotenoids must be ingested in very large amounts. Because the flamingo diet is nearly exclusively carotenoid-filled delicacies, the birds have no problem coloring themselves. A human, on the other hand, would need to eat quite a lot of carrots (a food heavy in carotenoids, which also gives the substance its name) to turn a shade of orange.

Jonathan Hogeback





INTRODUCTION



SITE ANALYSIS



LIT REVIEW



CASE STUDIES



THE PROJECT

Case Study

Port of Portland Headquarters

by ZGF Architects portland, oregon



- the tidal flow wetland cells are incorporated into the lobby of the building.
- the objective of the new 200,000 sq ft building was to be sustainable, costeffective, attractive, and a teaching tool.
- the system handles all the wastewater from the 500 employee which occupy the building and produces high quality water to be reused to flush toilets.
- foliage is fused into both the interior and exterior public spaces
- the building has shown a 75% reduction in water use

Case Study

Omega Center for Sustainable Living

Designed by John Todd Ecological Design, New York, USA



The Omega Center for Sustainable Living may be the most beautiful waste water treatment plant in the world. Invented by Dr. John Todd, the building is powered by solar and geothermal power, so it requires no additional power to operate. It is not using any chemicals to treat the water, with the plants the grey water is getting cleaned in each step.



INTRODUCTION



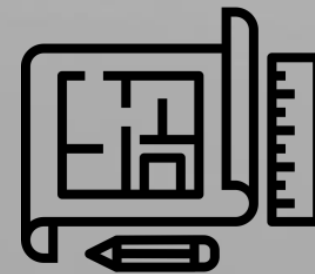
SITE ANALYSIS



LIT REVIEW



CASE STUDIES

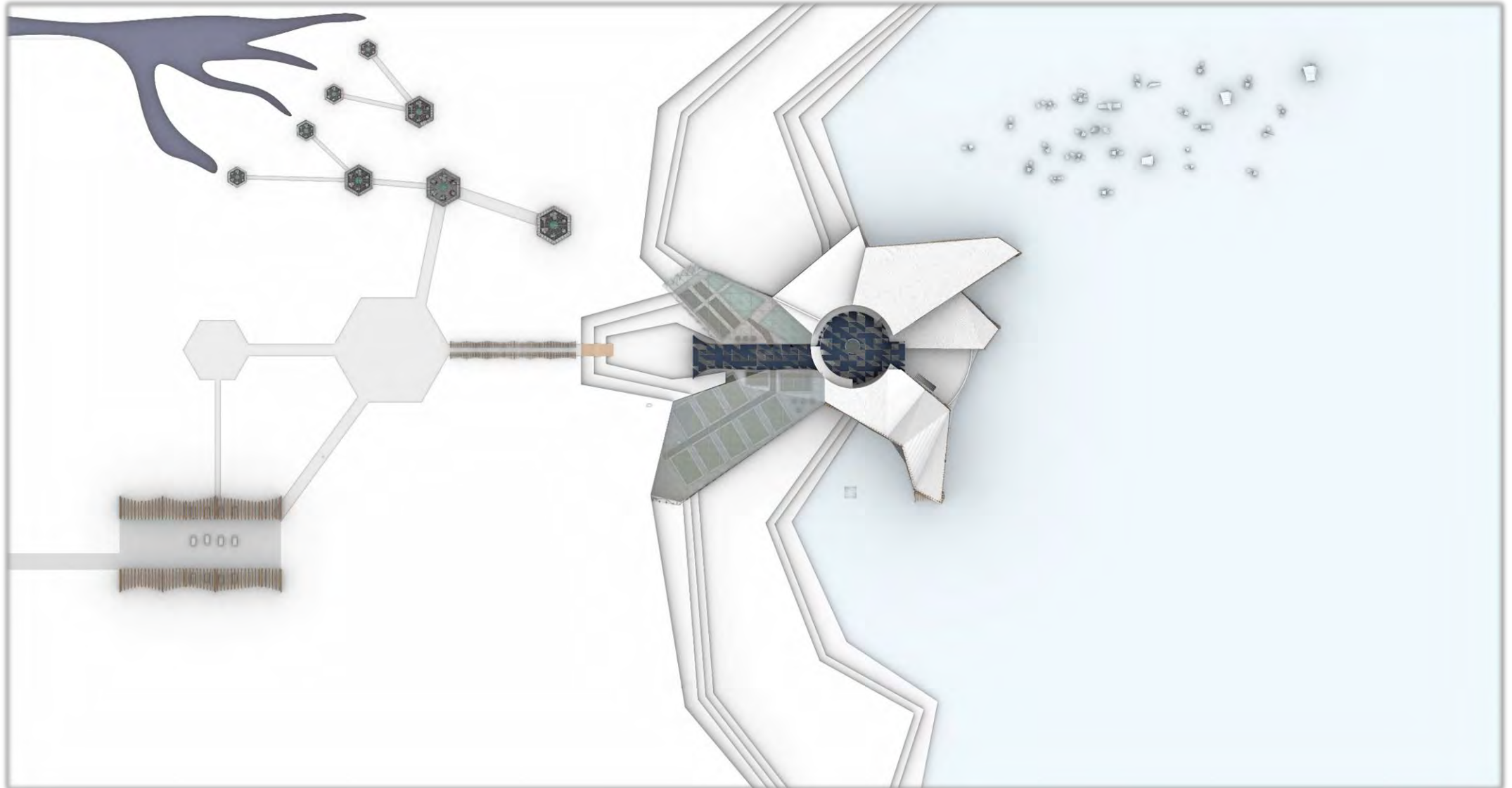


THE PROJECT

The Project

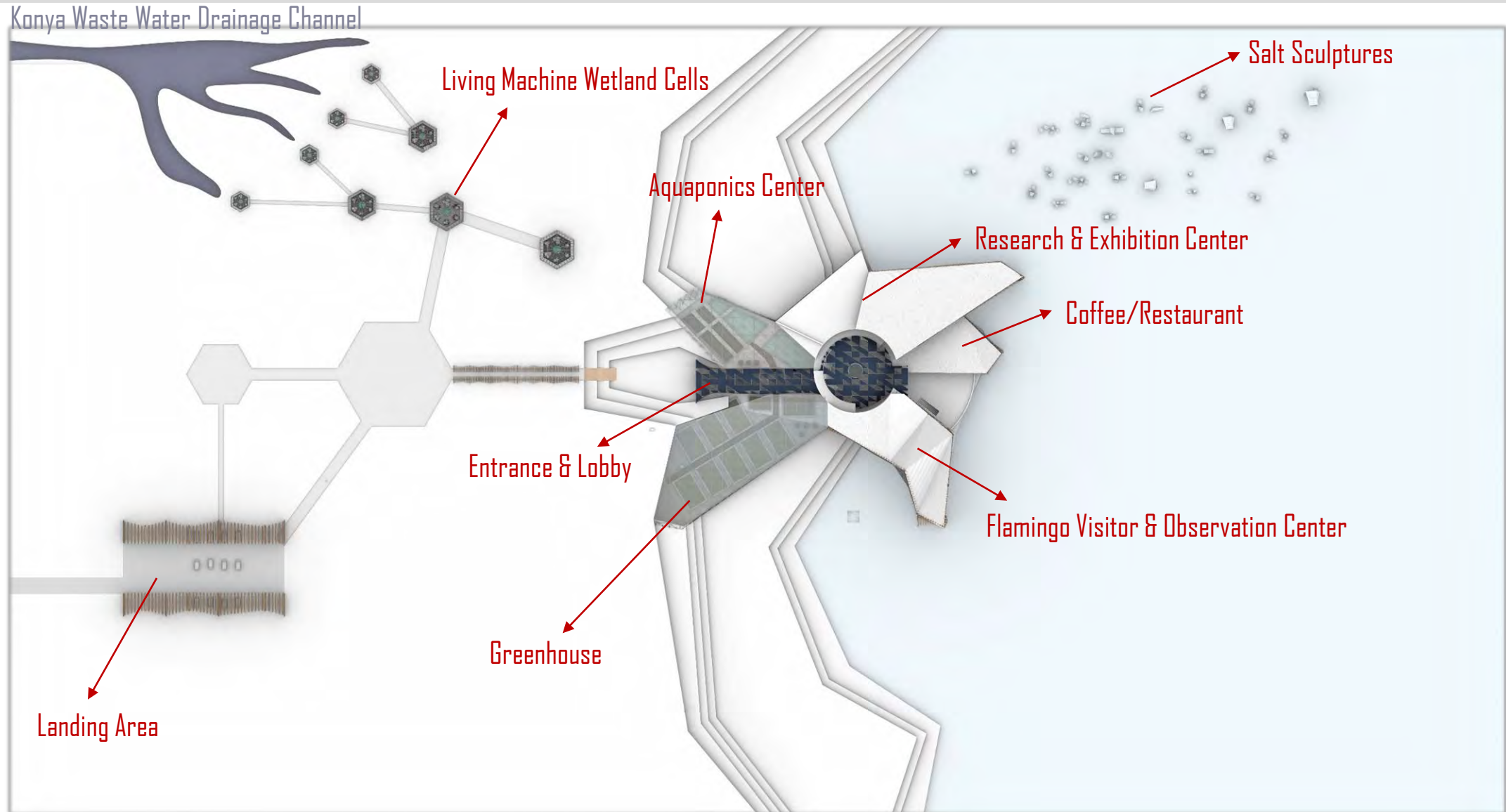


Master Plan

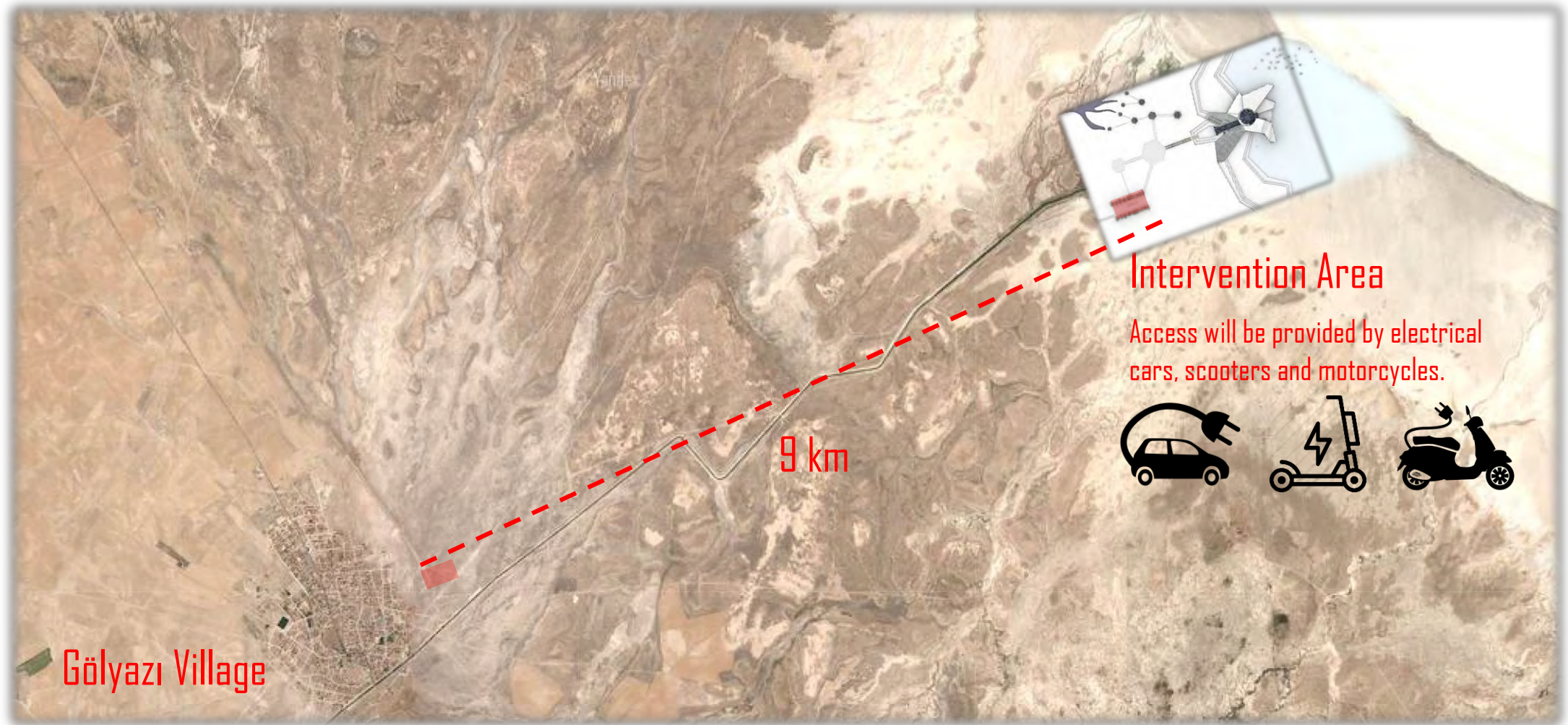


Master Plan

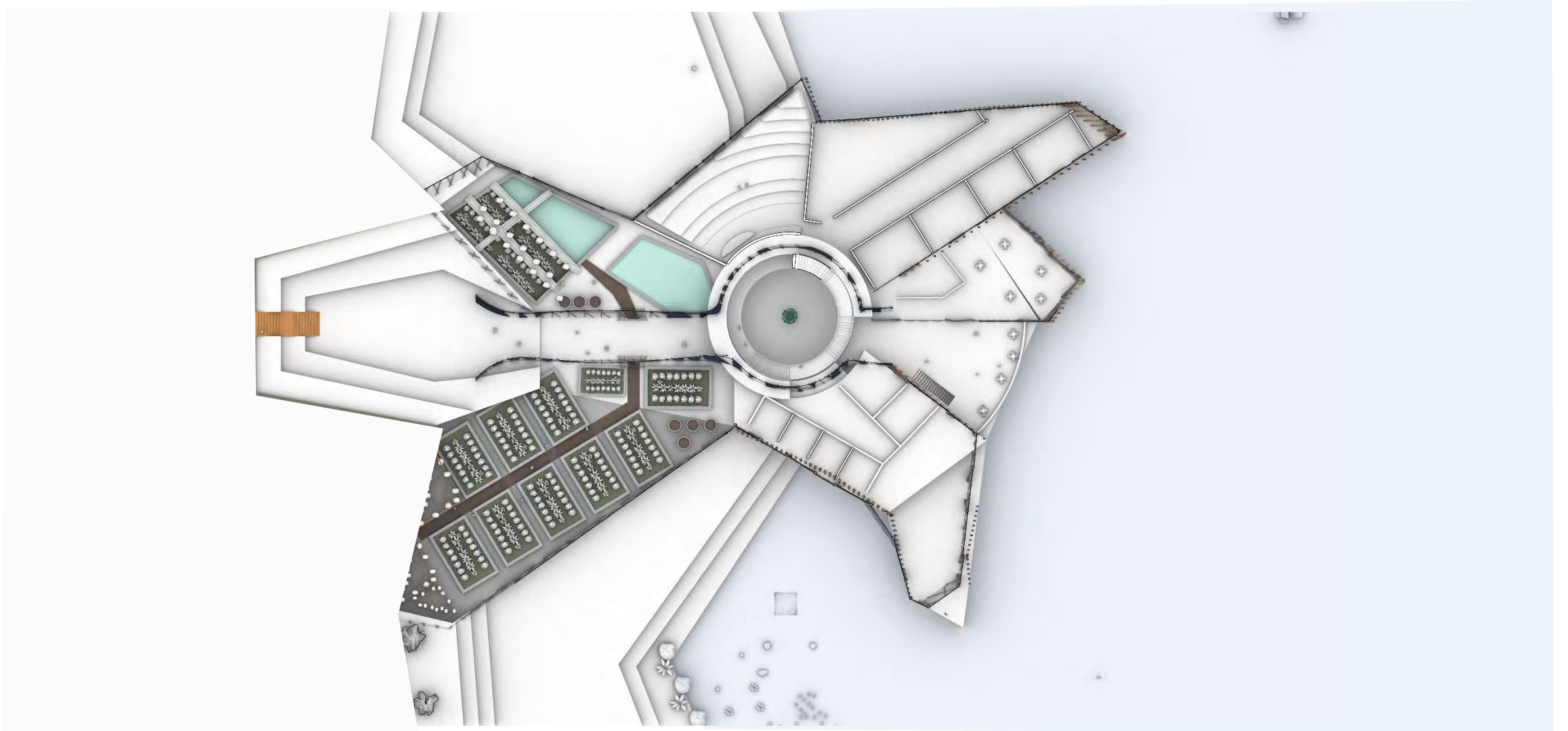
Programmatic Functions



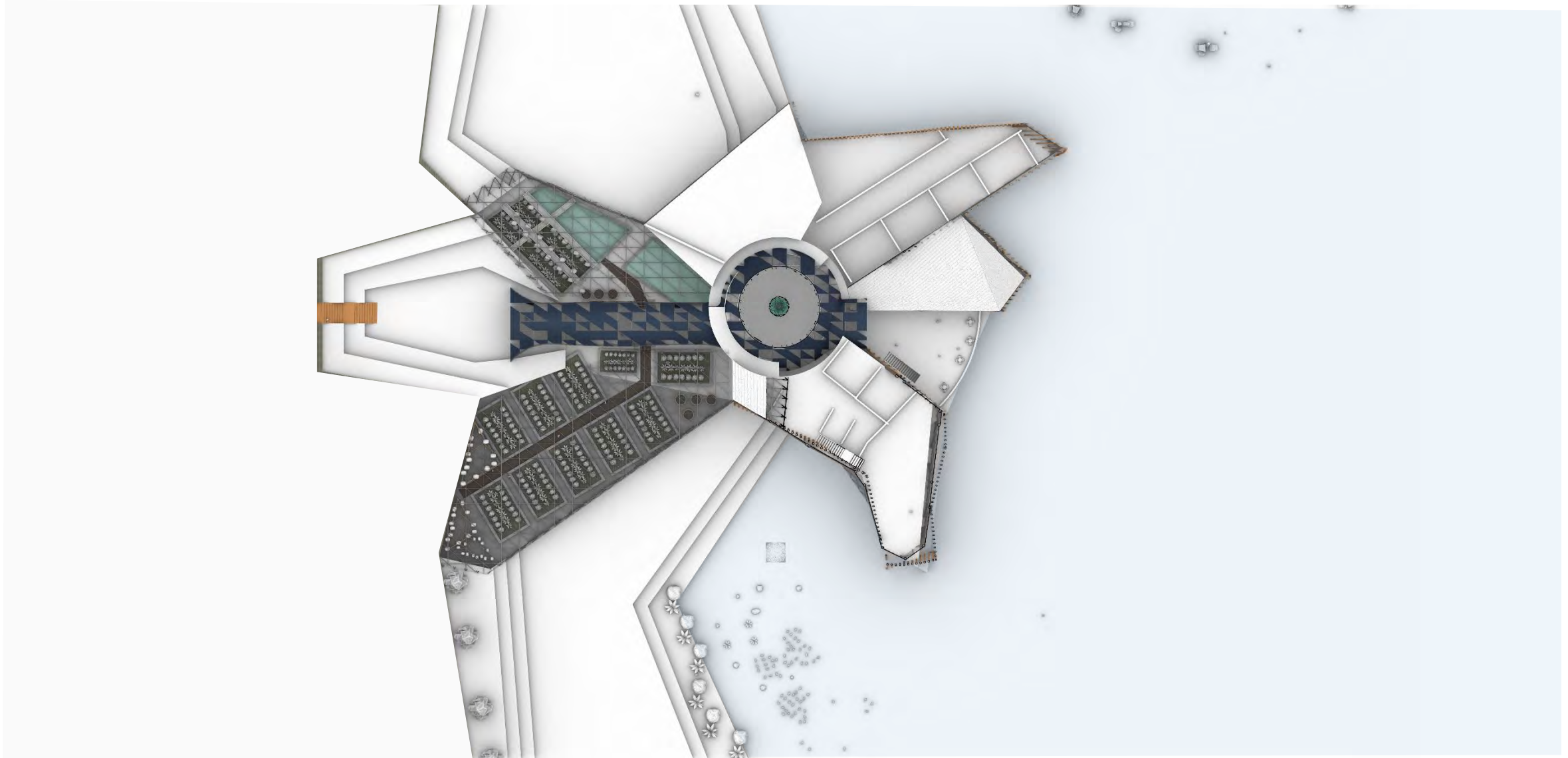
Accessibility Diagram



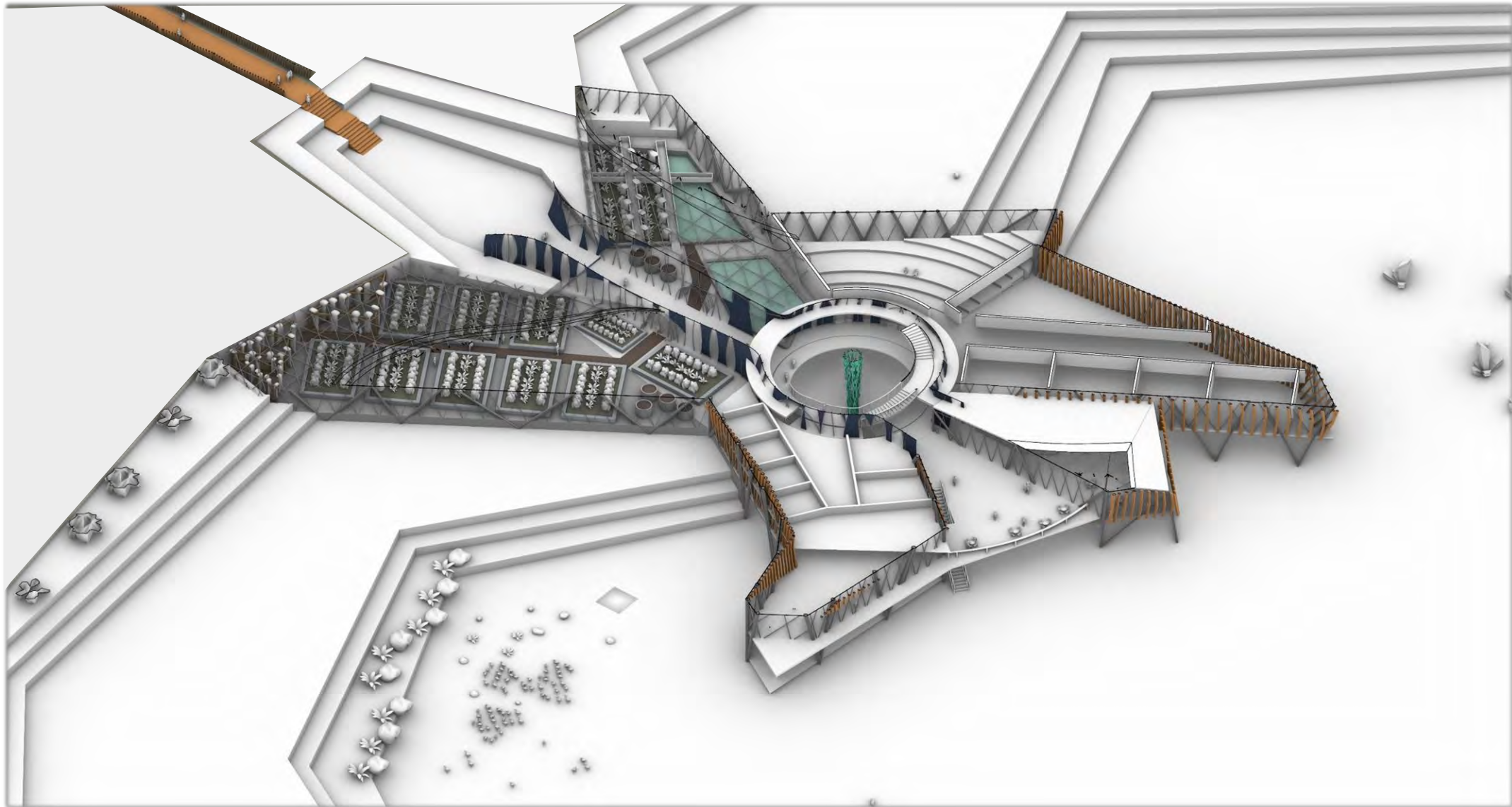
Ground Floor Plan



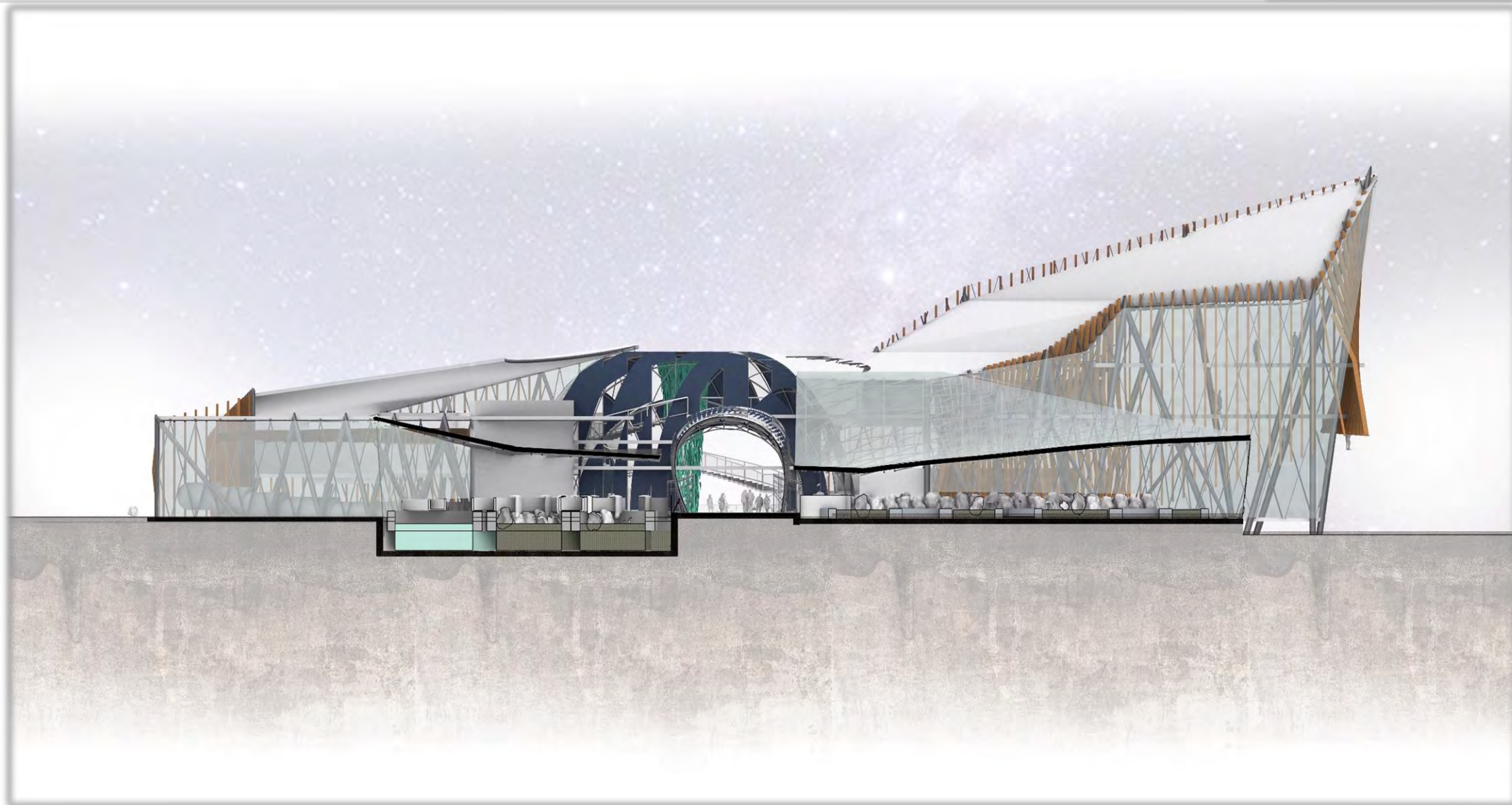
Second Floor Plan



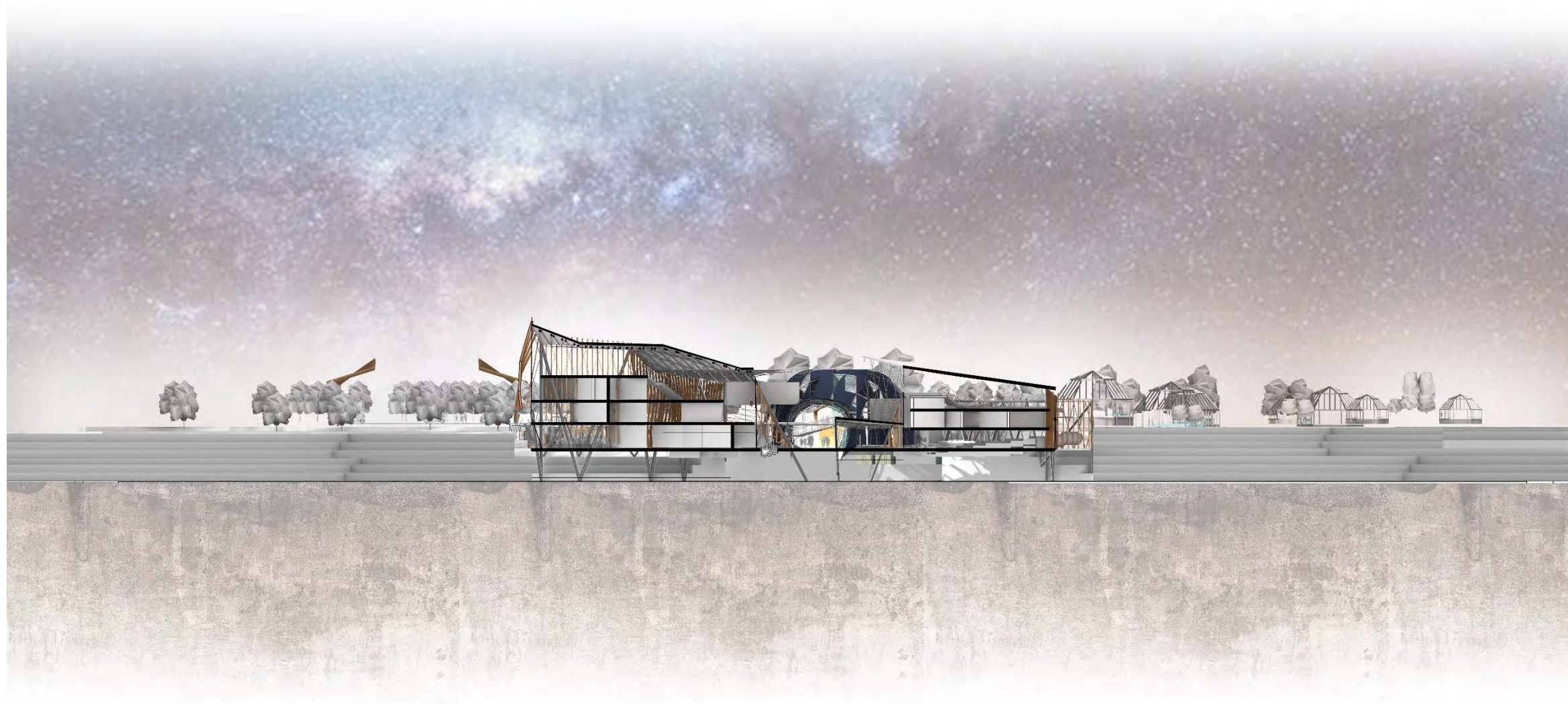
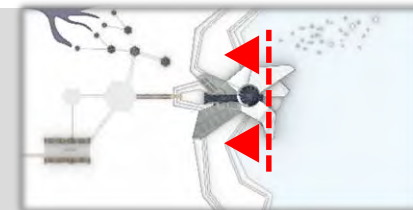
Axonometric View



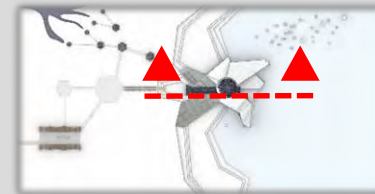
Section



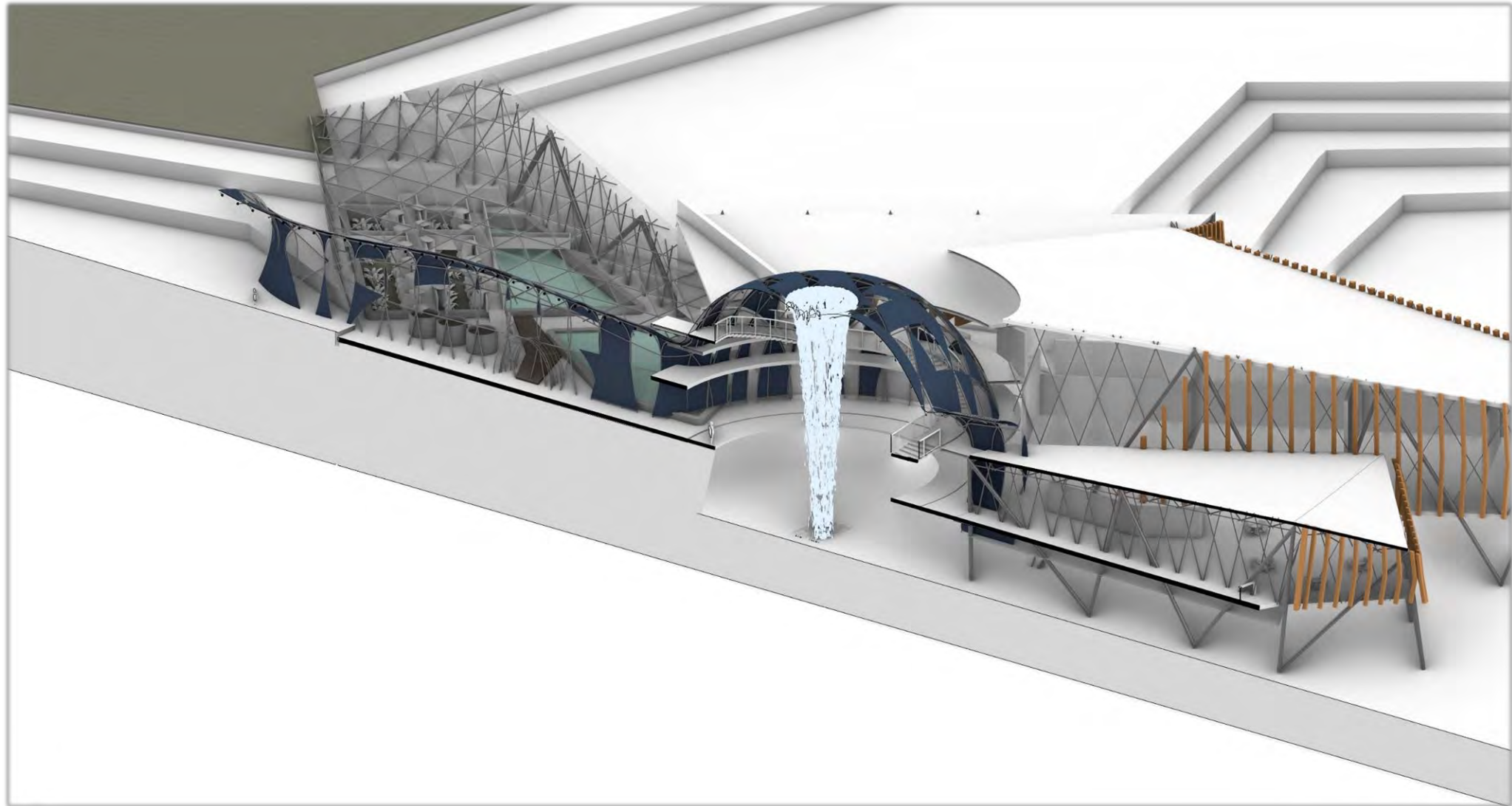
Section



Section



Section Perspective



North Elevation



East Elevation



South Elevation



West Elevation



Structural Detail

Opaque Photovoltaic Panels

Semi Transparent Glass

GFRP Roof Panels

Vertical Plywood Louvres

Slanted Steel Columns

Reinforced Concrete Slab

Steel Mullions

Steel Diagrid Structure

Structural Glass

Diagrid Mullions

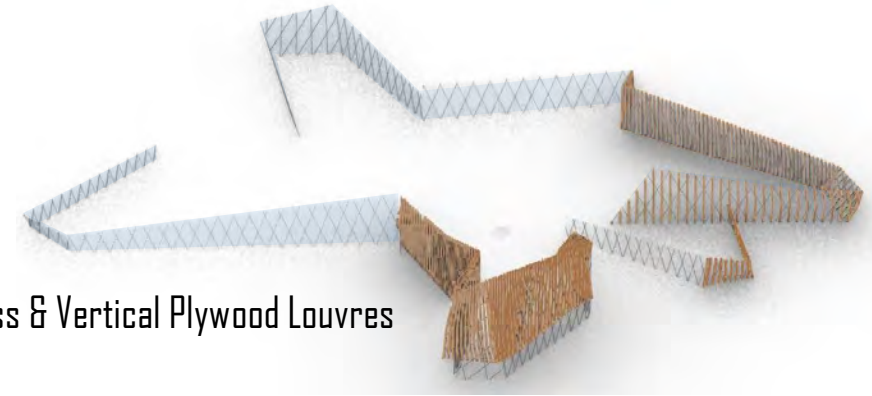
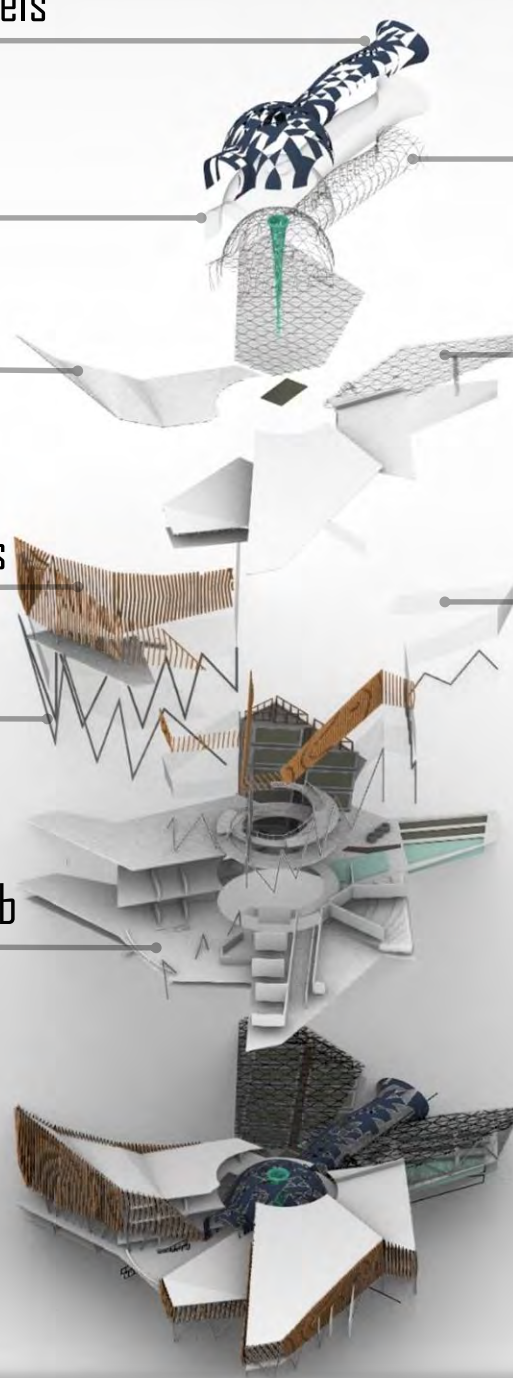
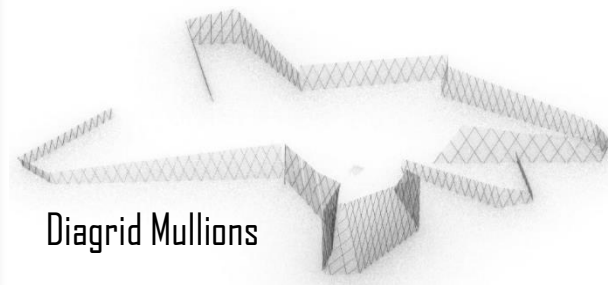
Structural Glass & Vertical Plywood Louvres



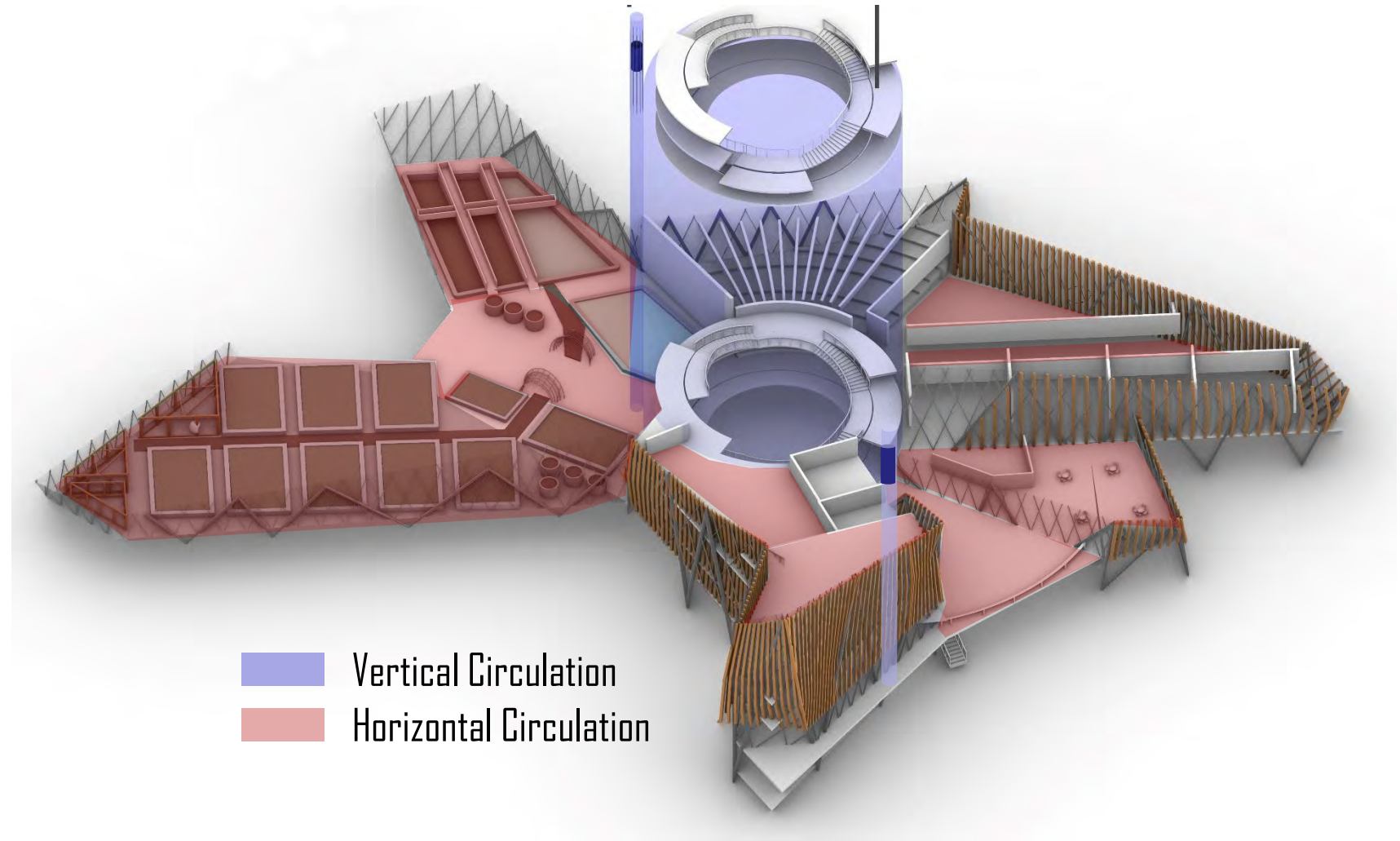
Lobby Structure



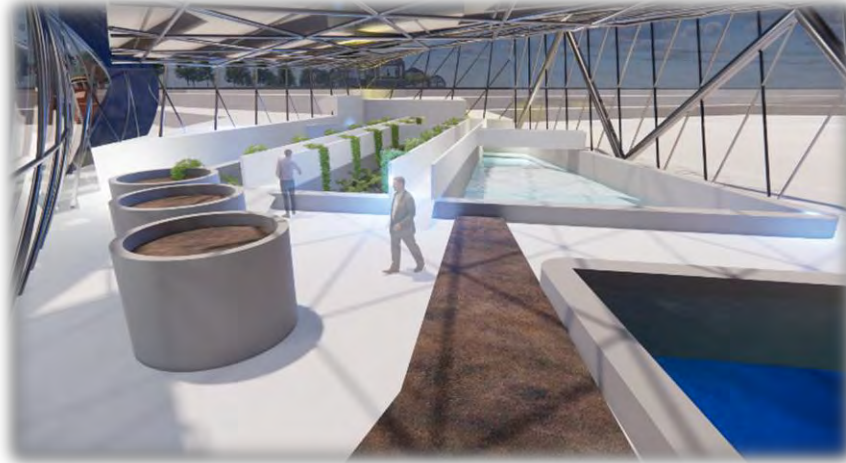
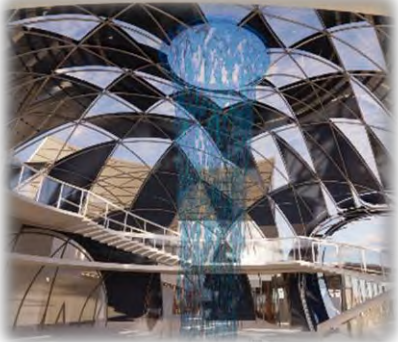
Main Staircase Detail



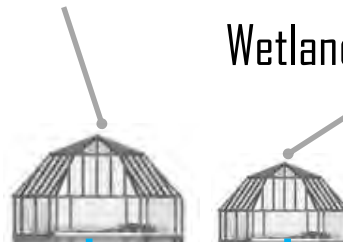
Circulation



Living Machine

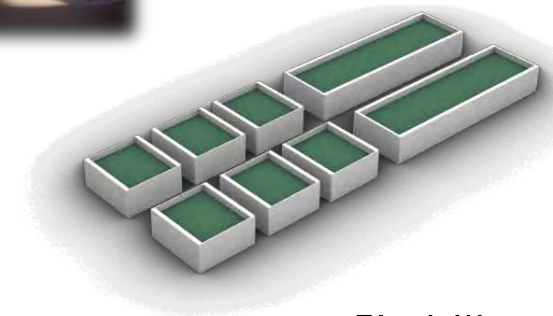


Wetland Cells Stage 2: Living Machine Infiltration



Wetland Cells Stage 1: Gravel Infiltration

Primary Tank + Components



Black Water

Clean Water Utilized in Aquaponics

Polishing Modules

Tidal Modules

Secondary Black Water Collecting Tanks

Black Water Collected in Concrete Wall

Clean Water meets with Salt Lake











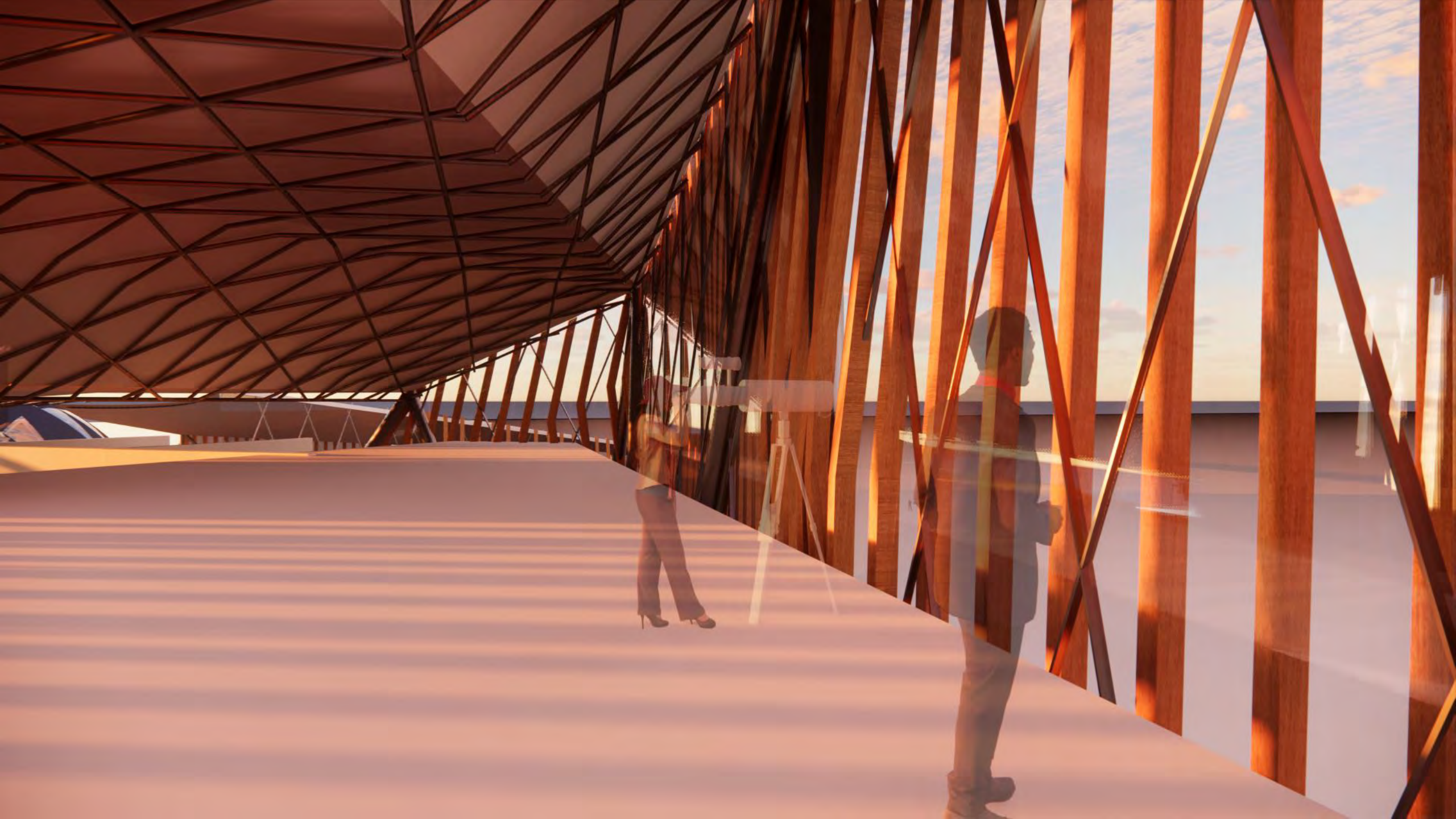












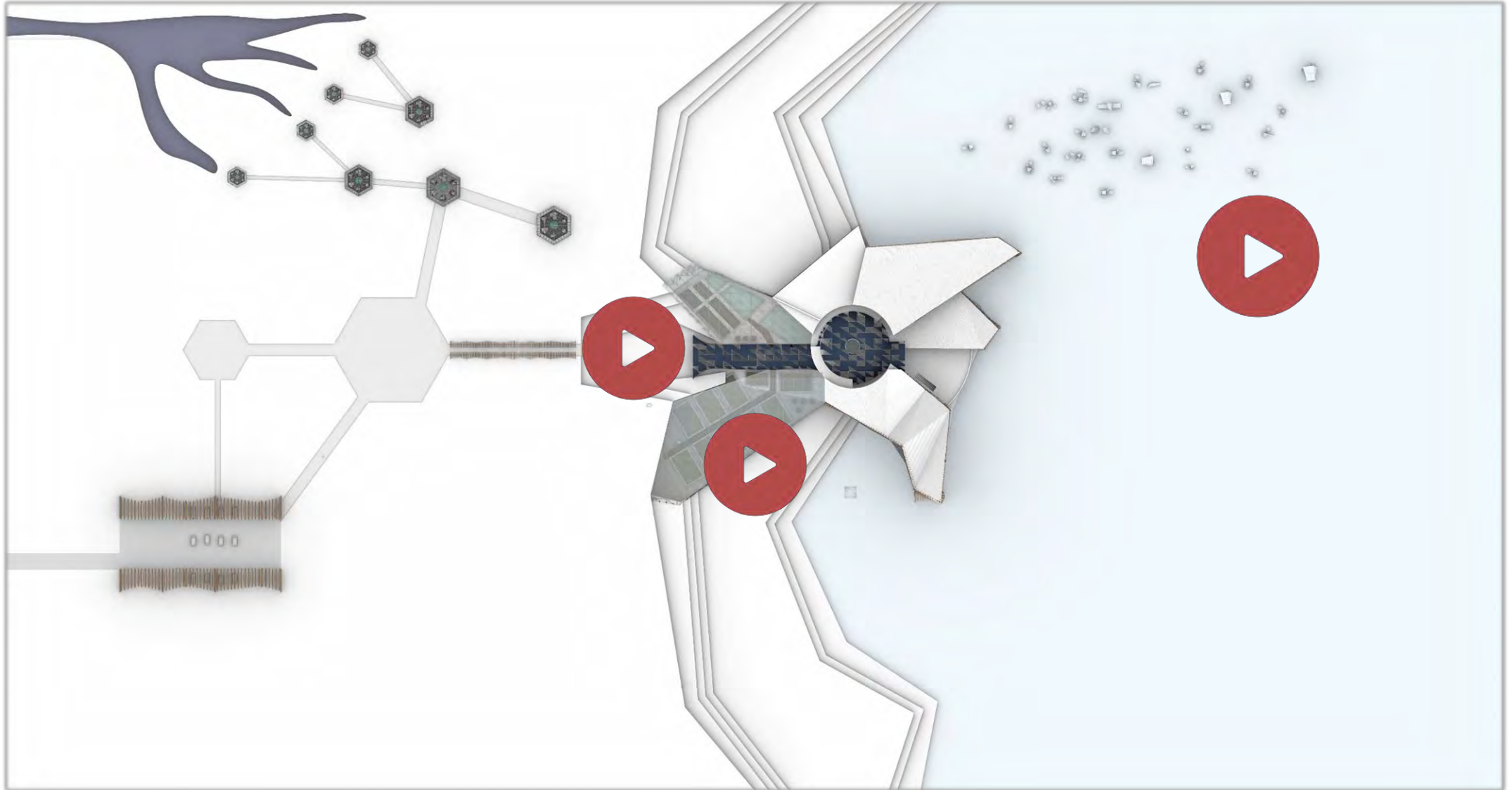








Fly-Through











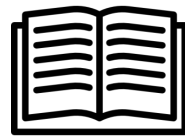
Thank You!



INTRODUCTION



SITE ANALYSIS



LIT REVIEW



CASE STUDIES



THE PROJECT
