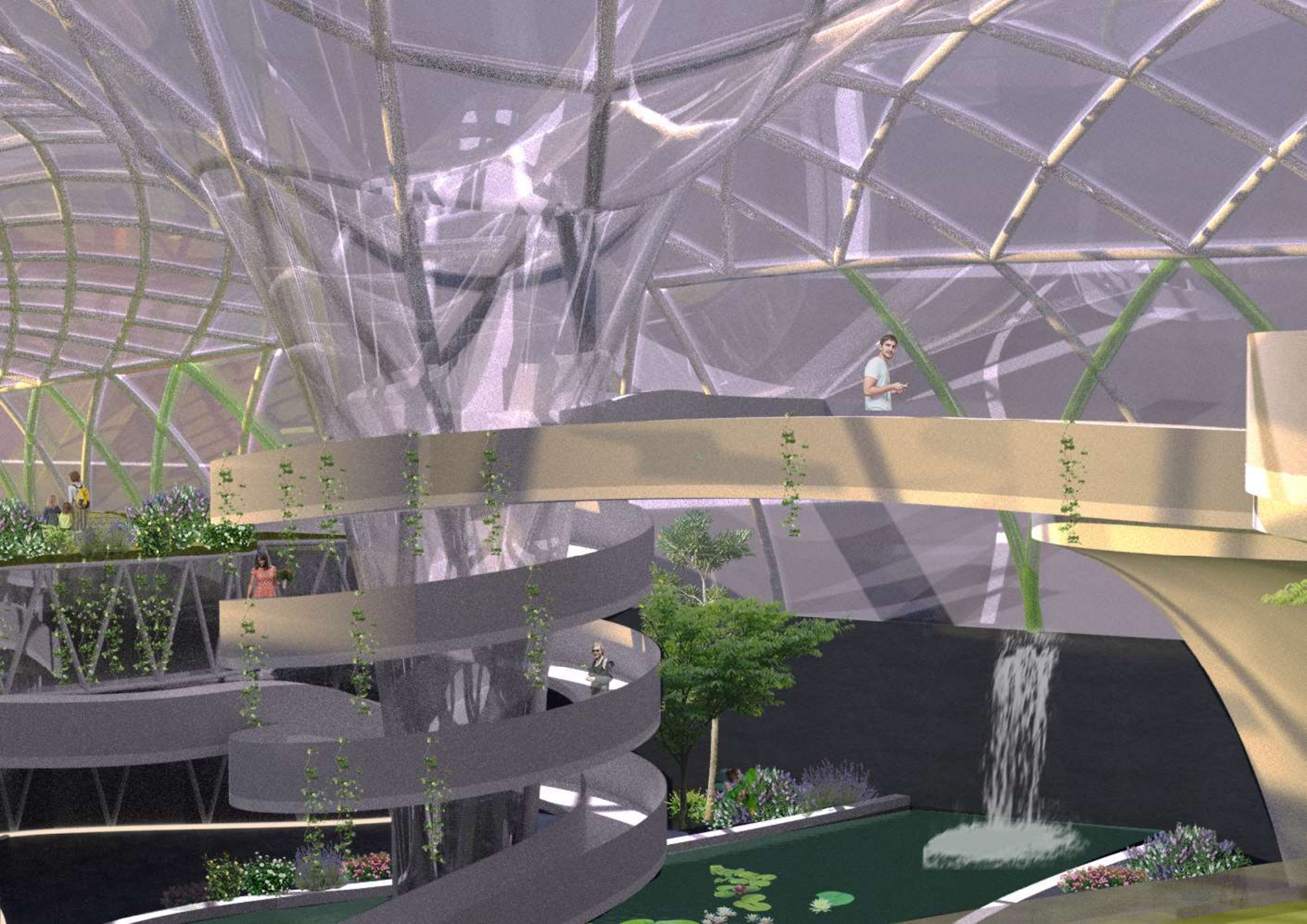


TABLE OF CONTENT

1. SITE ANALYSIS

2. LITERATURE REVIEW

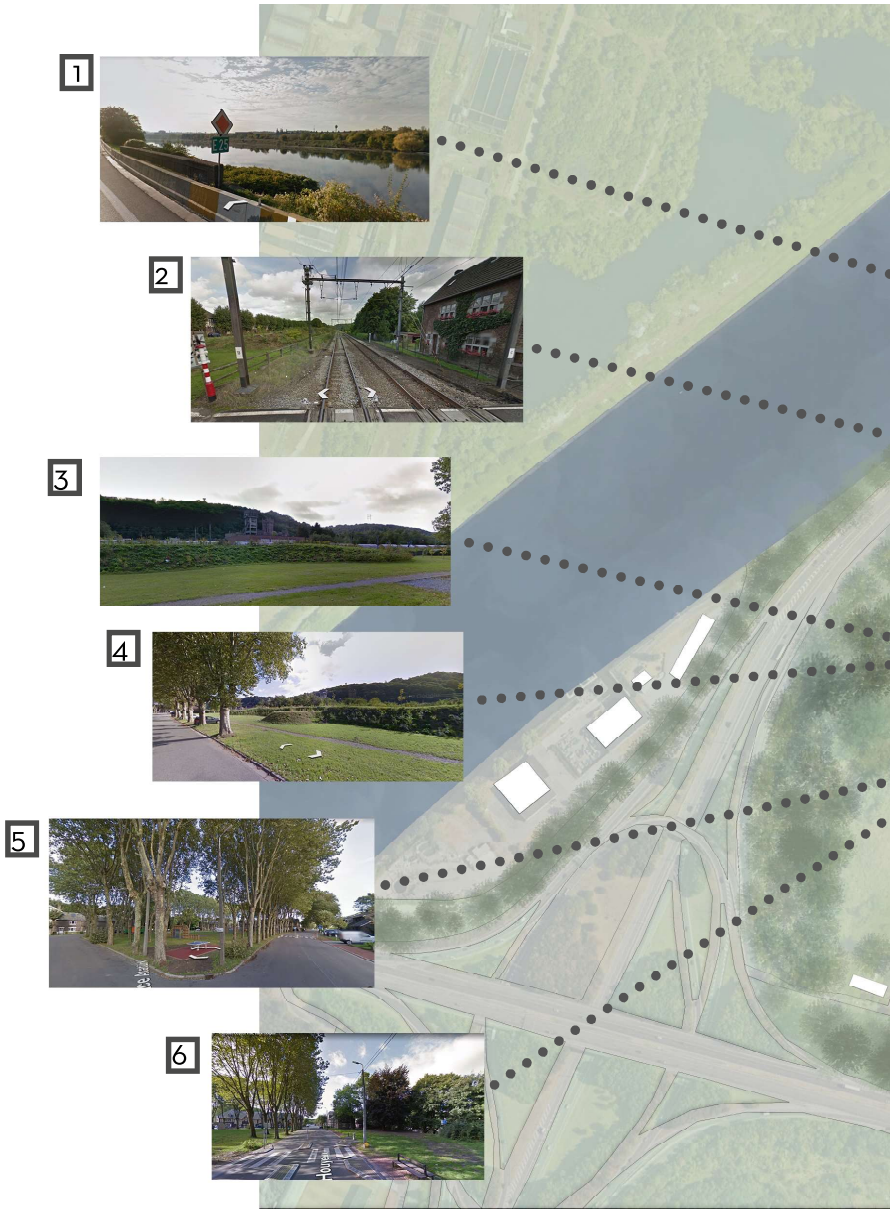
3.CASE STUDIES

4. REBIRTH OF CARBON

SITE ANALYSIS

PHOTOS FROM THE SITE

As it has shown in the photos, it can be seen that the site is seperated 4 pieces by the roads which are rail road and car roads. Therefore, transitional spaces are crucial for the unity in the site.
Also, the green connection can be used as one of the main strategies.
Hasard de Cheratte part can remain as it is and extensions and integrations are important during the process.




7


8


9


10

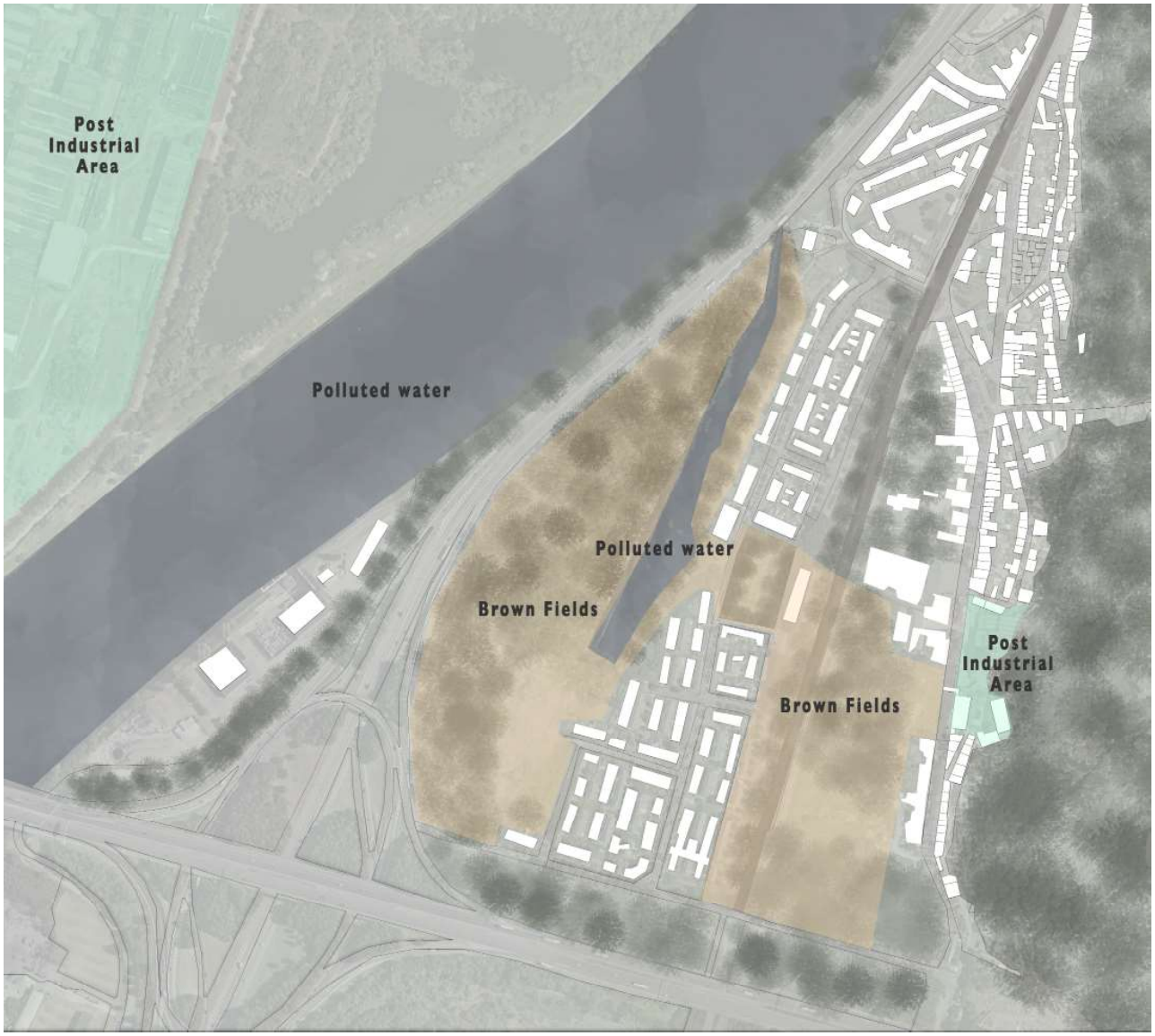

11

HASARD DE CHERATTE

OVERLOOK

POLLUTED AREAS

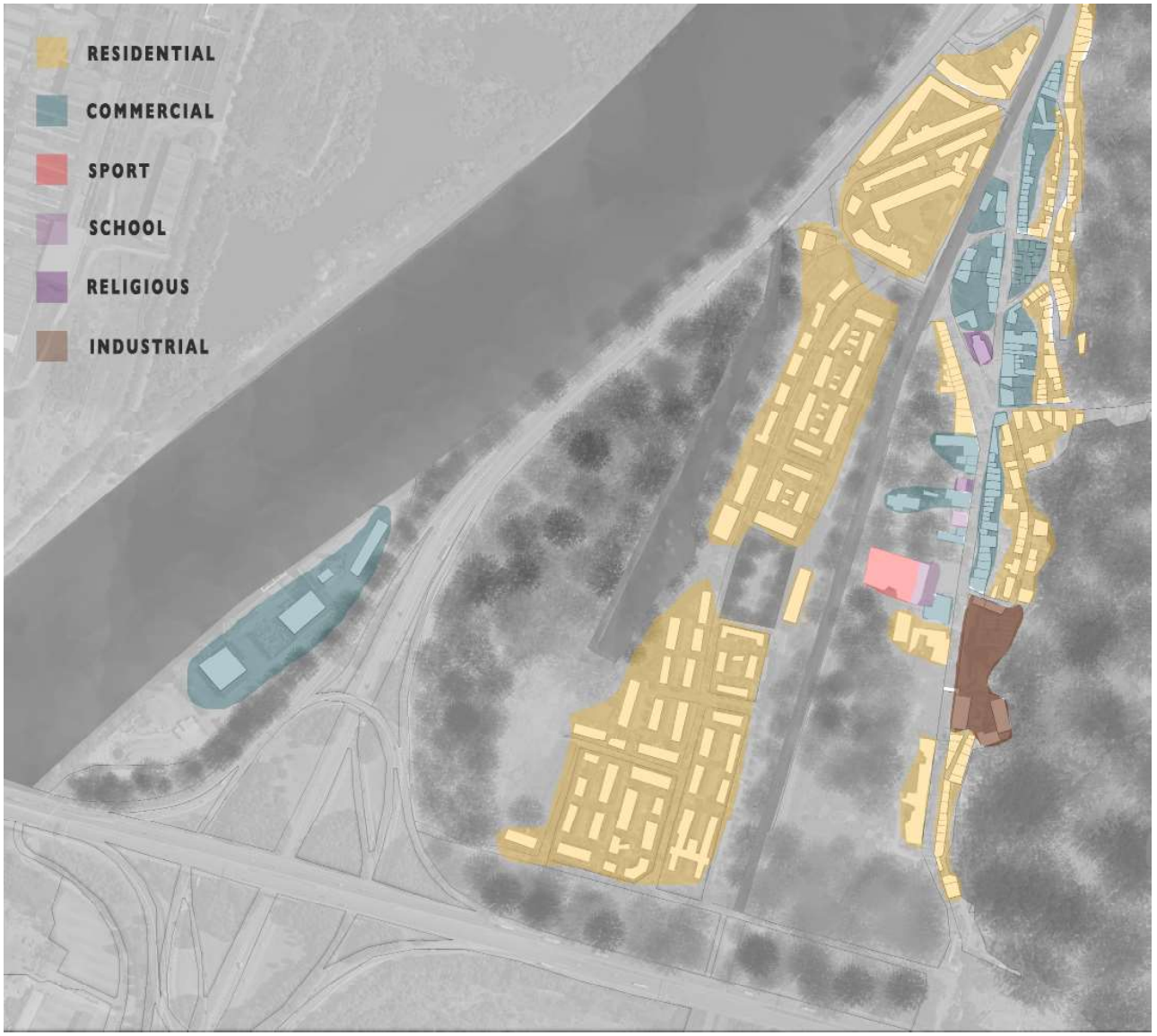
As it shown in the diagram,
the river and and especially the pond are dirty due to the previous industrial actions.
Also, due to the fact that there was coal mine the soil is contaminated as well. For these areas, the solutions have to be offered.



LANDUSE

The area mainly consist of residential buildings. Through main road, the usage changes to mixed.
The area has some educational places such as elementary school and its sport activity part. Moreover, that part has religious places as well like mosque and church.
The seashore is used as yatch club.

The building height mainly between 6 meters and 20 metres.



TRANSPORTATION

The train road is one of the main design subjects in the project due to the fact that it will have transit oriented development.

GREEN AREAS

The green has been seperated. In order to have a biodiversity in the system, the connections are needed. With an integration the ecosystem can be supported.

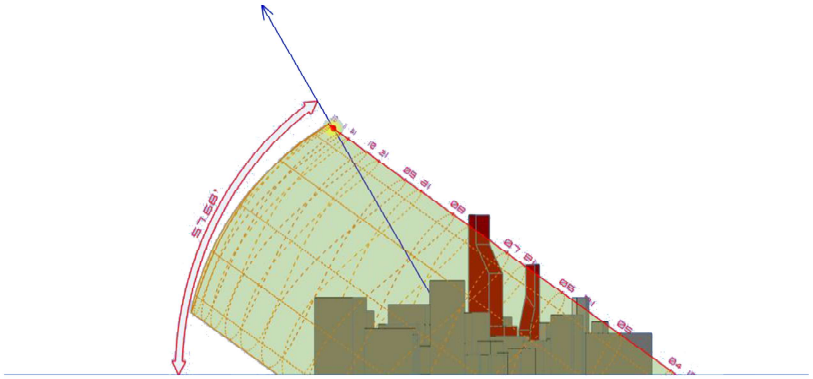
TOPOGRAPHY

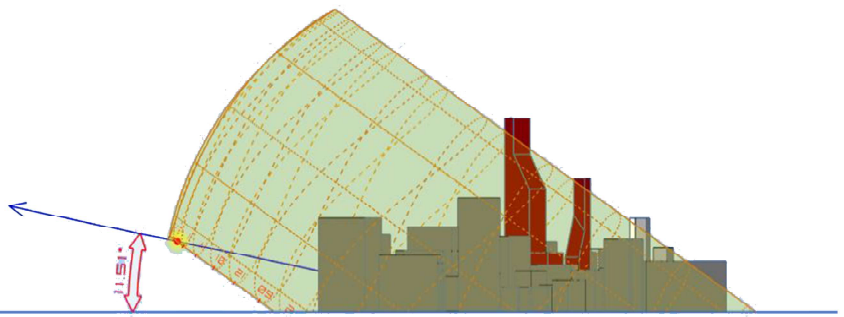
The site has laid down hilly sides. The between spaces does not have slope. The highest part of the site is 63 meters and the riverside is nearly 52 meters.

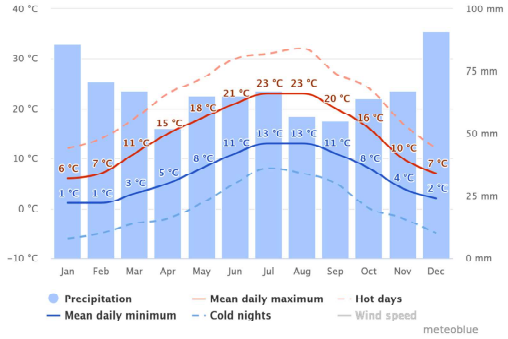
SUN, PRECIPITATION

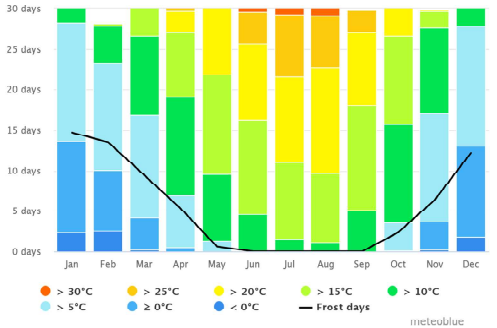
The sunlight comes to the site nearly at an angle of 57 degrees in summer, at an angle of 11 degrees in winter.

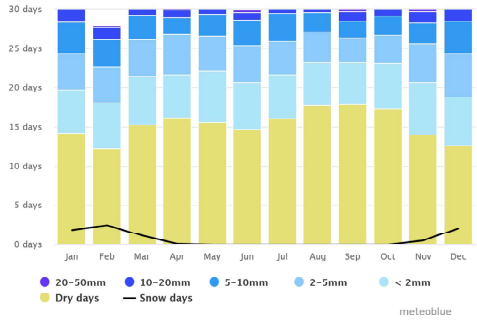
The rainy days dominate to the site. Therefore, the material usage, the canopies and natural canopies have to be considered.





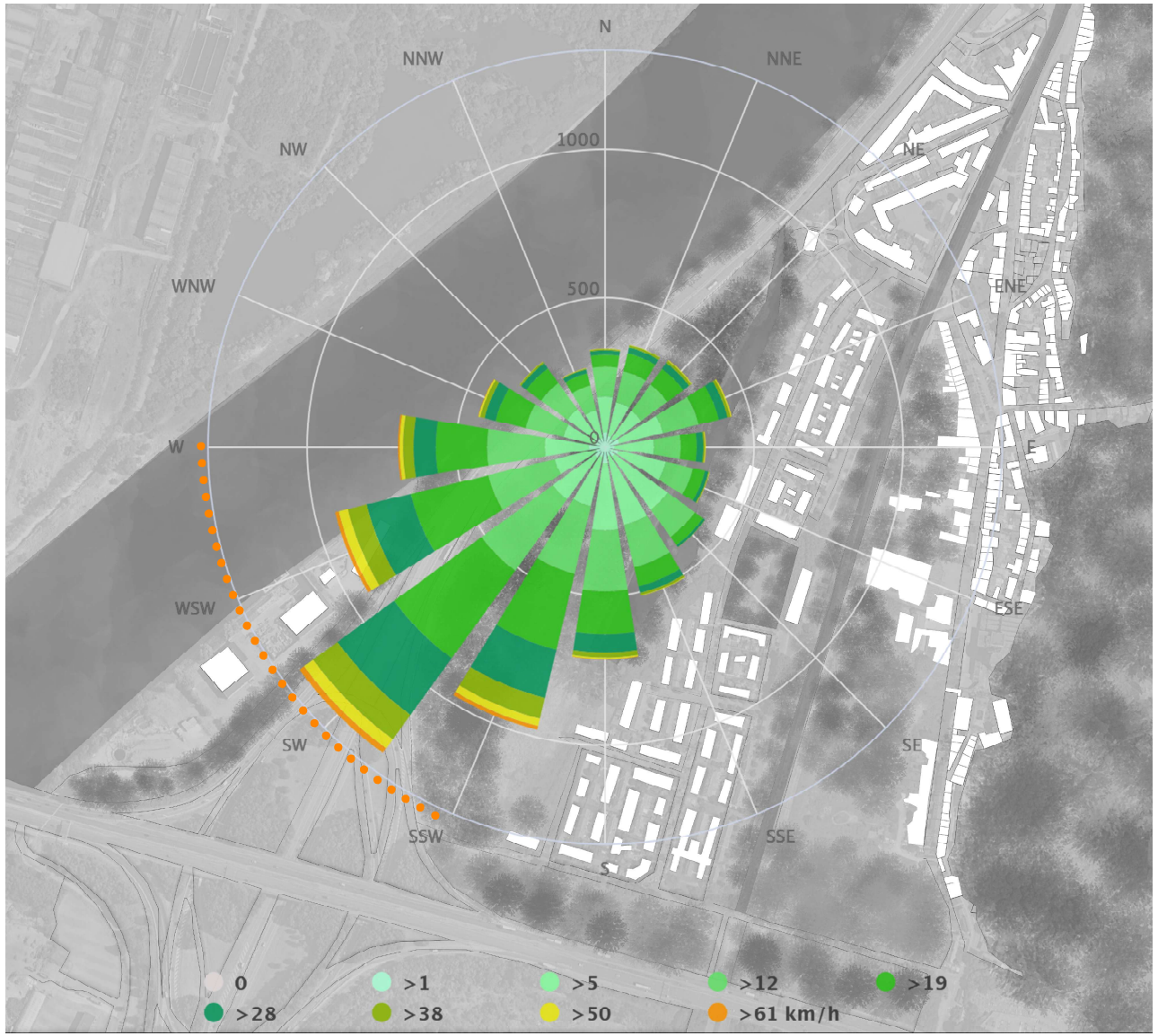






WIND

The wind goes with the stream in the site. The trees act as natural wind barriers in the site, so, the site is protected. However, the winds can be used as energy generator in that part by using wind turbines.



LITERATURE REVIEW

TRANSIT ORIENTED DEVELOPMENT

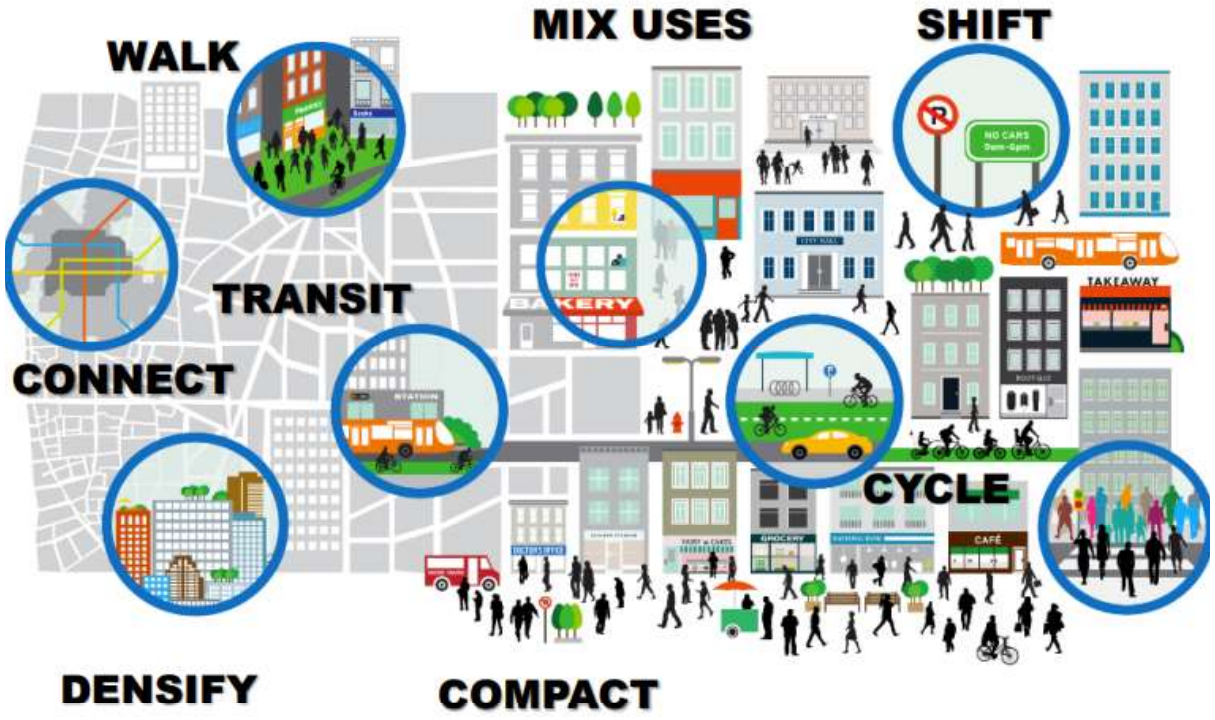
1.Quality Public Transit
The goal of a transport system is to connect a high number of riders with the city in a comfortable, efficient, and affordable way.

2.Active Transport
The interests of pedestrians and cyclists should be at the heart of urban planning. Decision making should shift residents—particularly car users—to active transport. Many commuters already take two non-motorized trips on a daily basis by walking to and from transit hubs to their homes or cars. It is important to build on this and encourage non-motorized transport holistically.

3. Car Use Management
Car usea and parking policies play an important role in creating a safe, human-oriented urban environment.

4.Mixed-Use Neighborhoods with Efficient Buildings
A mixture of land uses enhances the local economy by densifying and diversifying the design of the community. Mixed-use neighborhoods favor short trips by foot or bike. Similarly, buildings should minimize how much energy and water they consume and require for building and maintenance.

5.Neighborhood Centers and Vibrant Ground Floors
A built environment with adequate public space promotes social interaction between residents.



6.Public Spaces
The purpose of public space is not only to enhance public life and social interaction, but also to provide a safe environment for pedestrians and cyclists.

7.Community Participation and Collective Identity
Community participation is essential to building a vibrant, inclusive neighborhood that is safe and equitable. Stimulating community

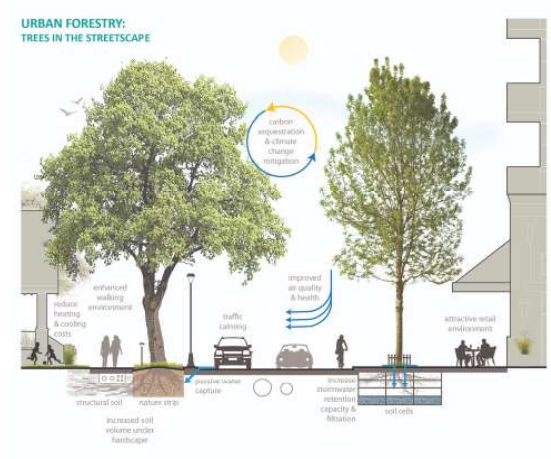
URBAN FORESTRY

Environmental Impacts
Urban forests mitigate the effects of urban heat island through evapotranspiration and the shading of streets and buildings. This improves human comfort, reduces the risk of heat stroke and decreases costs to cool buildings.[2] Urban forests improve air quality by absorbing pollutants such as ozone, nitrogen dioxide, ammonia, and particulate matter as well as performing carbon sequestration.

Mental Health Impacts
As an experimental mental health intervention, trash was removed from vacant lots. Some of the vacant lots were "greened", with plantings of trees, grass, and small fences. Residents near the "greened" lots who had incomes below the poverty line reported a decrease in feelings of depression of 68%, while residents with incomes above the poverty line reported a decrease of 41%.

Urban Wildlife
Urban forestry provides potential habitat for urban wildlife. In addition, it creates great opportunities for observing wildlife to the general public.

Social Impact
Urban forest related events such as planting festivals can significantly reduce social isolation problems, enhance people's experience and raise environmental



Urban forestry is defined as the planting, maintenance, care and protection of tree populations in urban settings. And the role of trees is an essential function of city planning and urban infrastructure. Planned connections of green spaces encompass not only parks and gardens, but also landscaped boulevards, river and coastal promenades, greenways and even simple street-side tree boxes. All of this requires strategic planning and a skilled workforce.

LANDSCAPE URBANISM

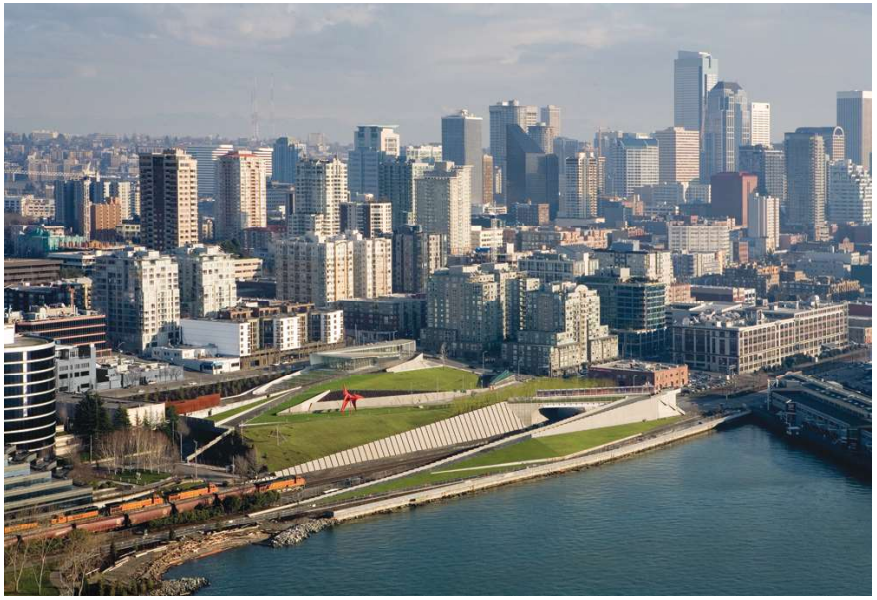
Landscape urbanism is the theory of urban planning through the medium of landscape. It promotes the general idea that cities are best planned and organised, not through building and infrastructure design, but through the design of landscape. awareness.
One of the leading theorists, James Corner, suggested the most important ideas for landscape urbanism are:

Process over time: Ecological awareness with regard to the built environment.

Horizontality: Horizontal alignment in landscapes, as opposed to vertical structuring.

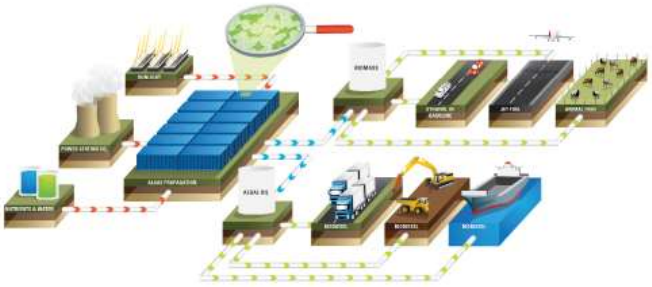
Working methods/techniques: Techniques should be adapted to the relevant environment.

Imaginary: The failure of 20th century planning is a result of 'the absolute impoverishment of the imagination to extend new relationships and sets of possibilities.'



ALGAE PRODUCTION

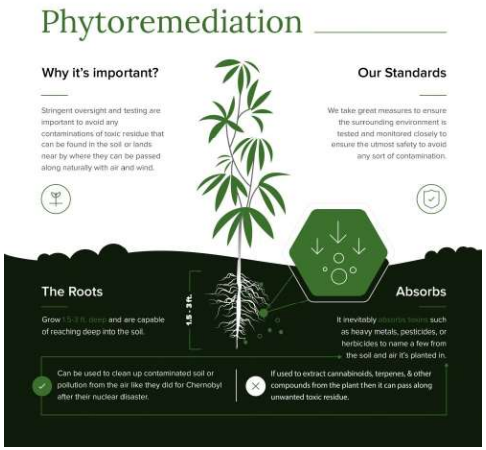
Algae Grow Fast
Algae Can Have High Biofuel Yields
Algae Consume CO_2
Like any other plant, algae, when grown using sunlight, consume (or absorb) carbon dioxide (CO_2) as they grow, releasing oxygen (O_2) for the rest of us to breathe.
Microalgal Biomass Can Be Used for Fuel, Feed and Food
Microalgae can be cultivated to have a high protein and oil content, for example, which can be used to produce either biofuels or animal feeds, or both. In addition, microalgal biomass, which is rich in micronutrients, is already used for dietary supplements to advance human health.
Algae Can Purify Wastewaters
Algae Can Be Used to Produce Many Useful Products
The Algae Industry is a Job Creation Engine

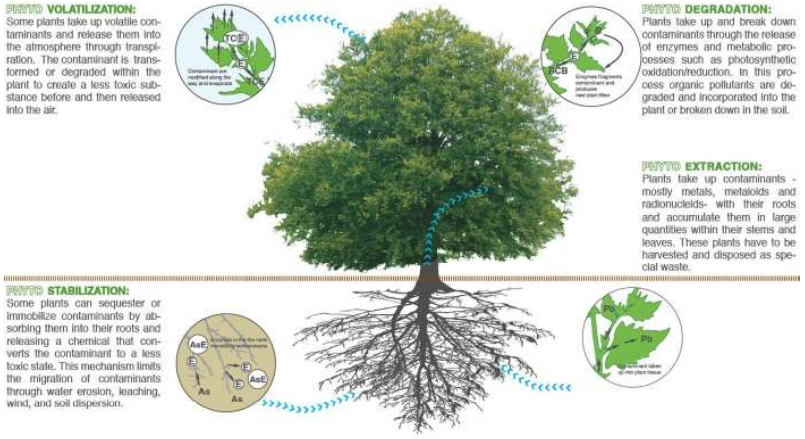


BROWN FIELD REMEDIATION

Advantages

•Removal or treatment of harmful substances
•Increased area property values
•Existing infrastructure maintained for location and community linkage
•Less land use than comparable greenfield developments
•Avoidance of urban sprawl
•Economic benefits from reinvestment in blighted properties
•Community pride and vitality

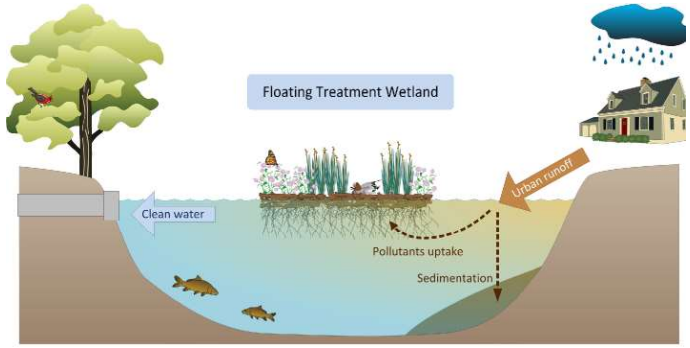




WETLANDS

Benefits

- Wetlands ensure fresh water for all of us
- Wetlands guarantee our food supply
- Wetlands purify and filter harmful waste from water
- Wetlands are nature's shock absorbers
- Wetlands store carbon
- Wetlands are critical for biodiversity
- Wetlands create sustainable products and livelihoods



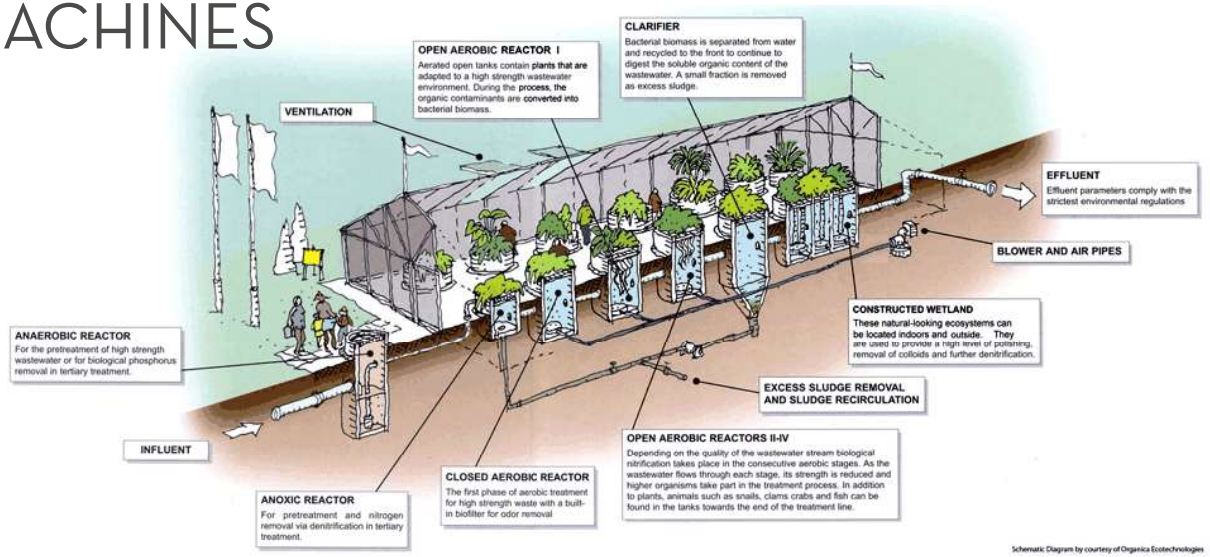
LIVING MACHINES

The Living Machine® is an emerging wastewater treatment technology that utilizes a series of tanks, which support vegetation and a variety of other organisms.

Advantages

• Capable of treating wastewaters to BOD5, TSS, and Total Nitrogen < 10 mg/L, Nitrate < 5 mg/L, and Ammonia < 1 mg/L.

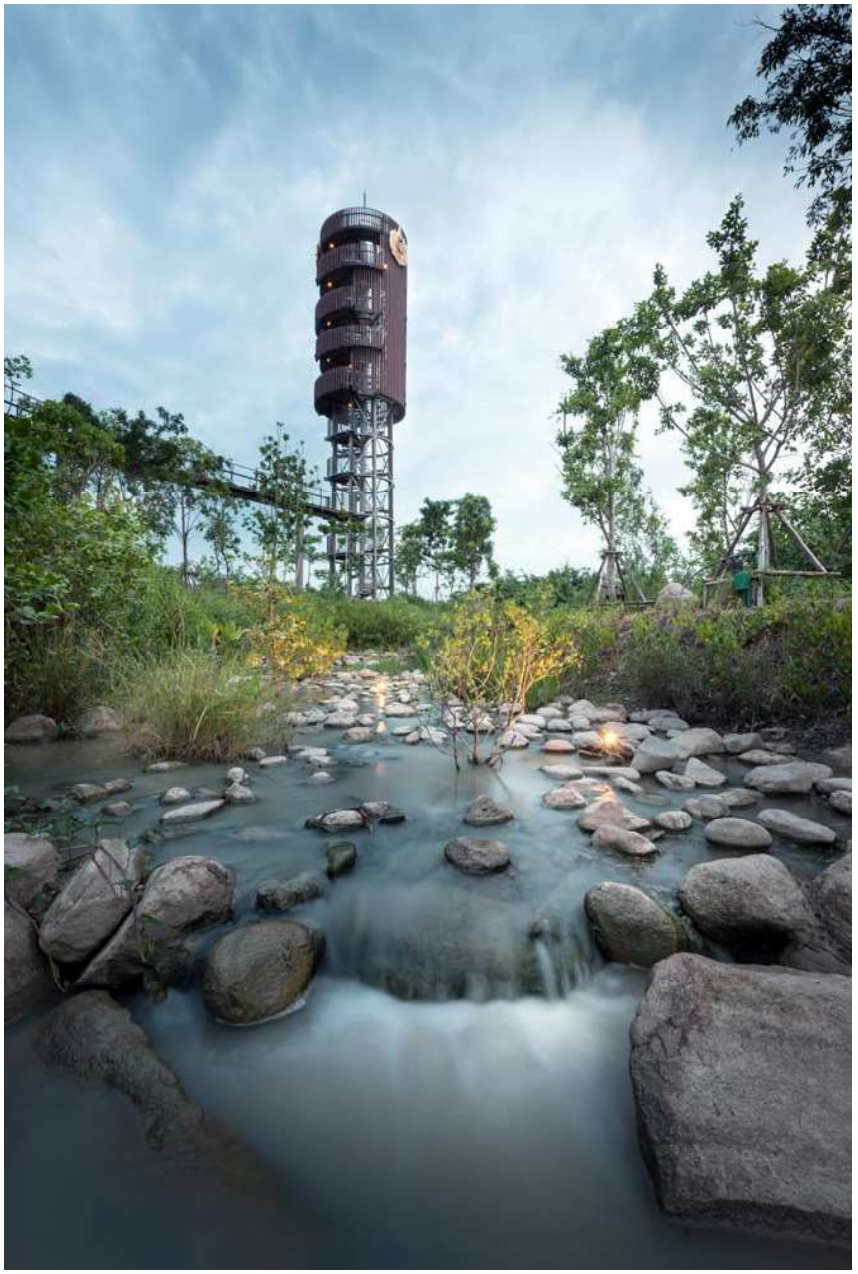
• Offers a unique, aesthetically pleasing environment for treating and recycling wastewater. This may be helpful when attempting to locate the treatment system in areas where the public opposes traditional wastewater treatment operations for aesthetic reasons.



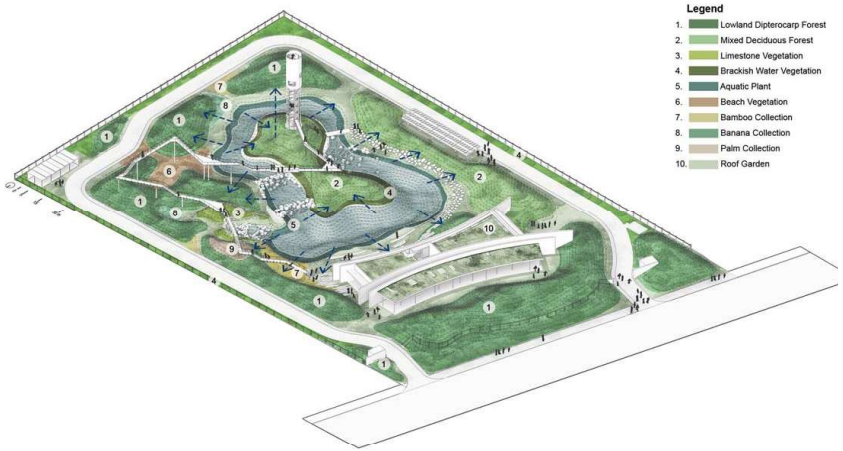
CASE STUDIES

THE METRO FOREST

Located at the Eastern fringes of Bangkok in the suburban district of Prawet, approximately 6 kilometers from the Suvarnabhumi International Airport, lies the The Metro-Forest Project. An ecological regeneration project designed as an outdoor exhibition space to cultivate environmental awareness and educate visitors about local forest ecology. The project, on an abandoned site, aimed to reclaim 2-hectares (4.75 acre) of valuable land and reverse the trends of suburban sprawl, urban heat island, and flood-prone developments through the incorporation of historically local (native and introduced) lowland tropical tree species. The design is intended to be more than a static garden sculpted by man but is more of a dynamic progression that is formed from ecosystem processes.



LOWLAND DIPTEROCARP FOREST

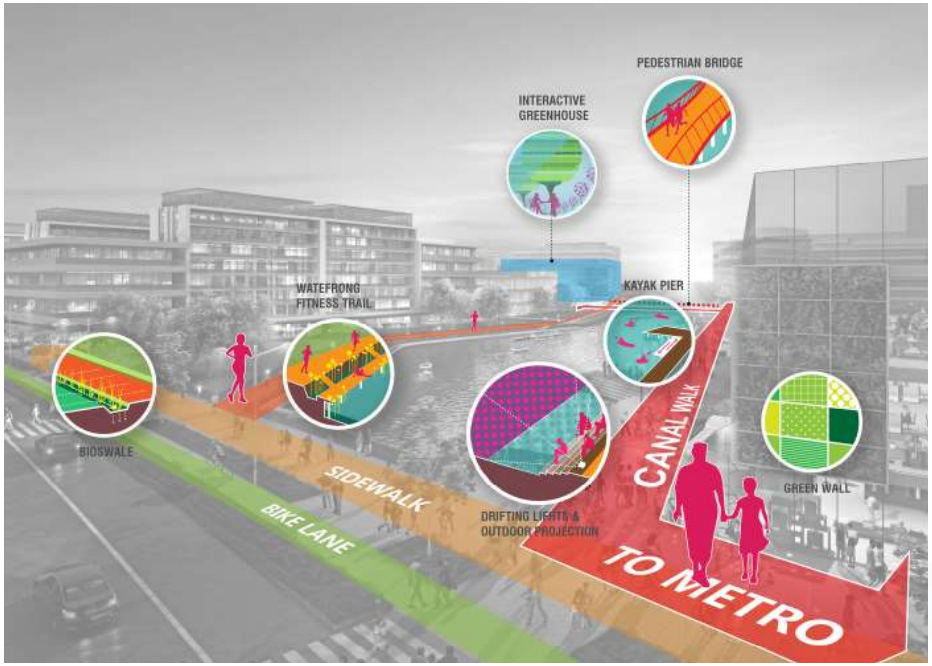


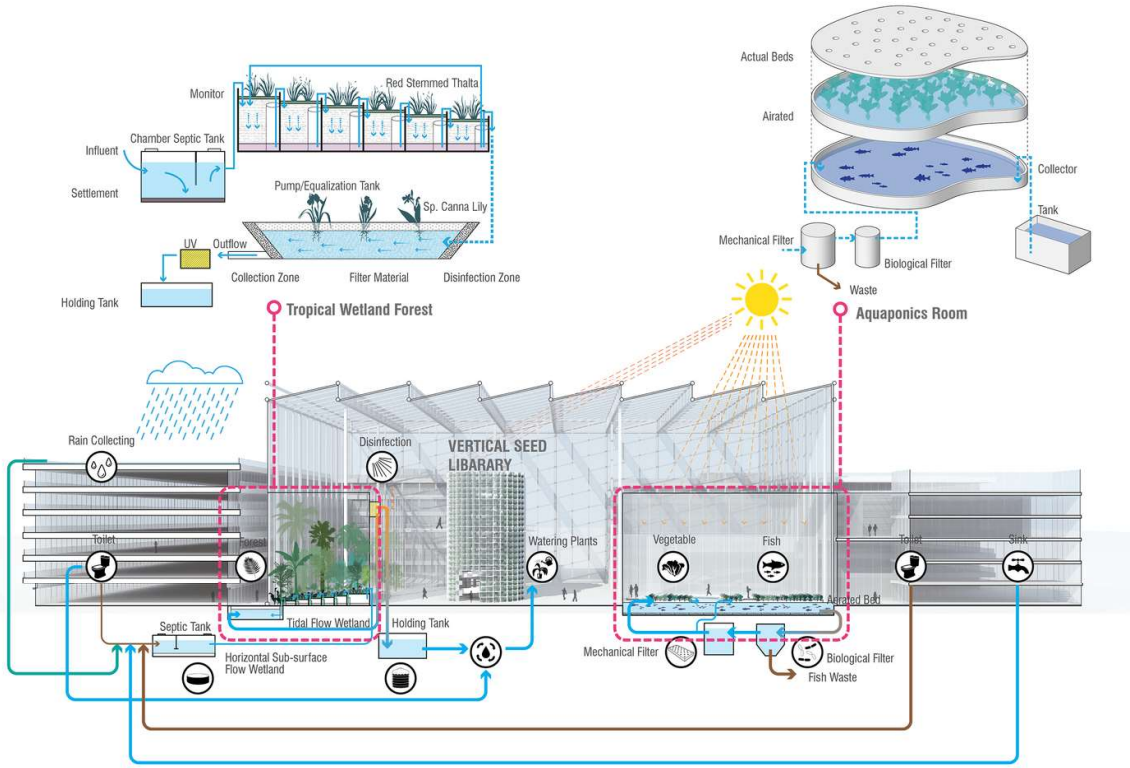
FOREST TYPOLO

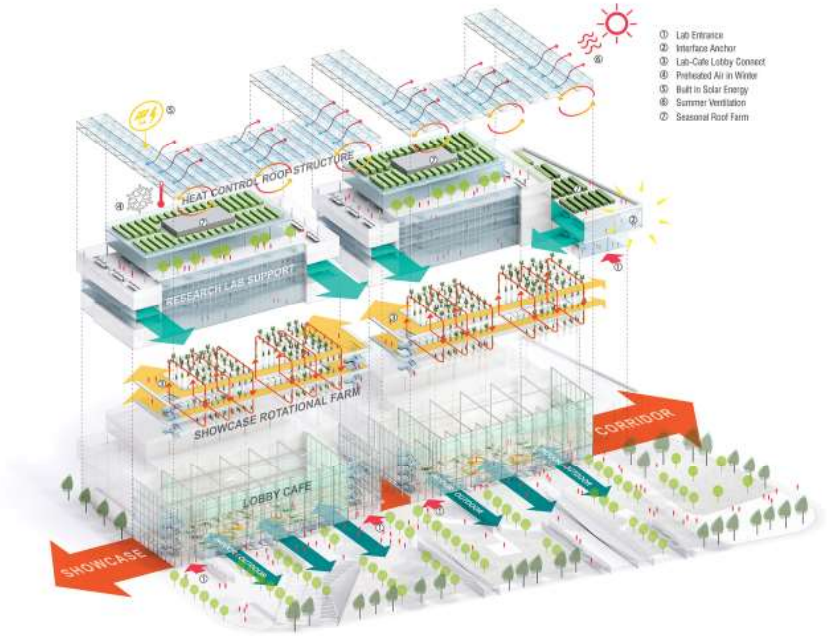
The Land Art inspired outdoor exhibition is intended to be a medium where the landscape will be constantly evolving so that visitors will always be welcomed by ‘new’ experiences during each visit. Able to experience the different levels of the canopy at the ground-level, along the skywalk, and within the observation tower, visitors will see Bangkok like never before. Rather than take the typical approach of Asian gardens that emphasize the aesthetics of the landscape, a different approach is taken to create a unique practice that has never been implemented in Bangkok and establish a new trajectory of landscape typologies, such as a natural wilderness for the future. A natural wilderness that is educational, fun, experiential, and could perhaps inspire urbanites to plant saplings and grow a forest in their own backyard.

SUNQIAO URBAN AGRICULTURAL DISTRICT

With nearly 24 million inhabitants to feed and a decline in the availability and quality of agricultural land, the Chinese megacity of Shanghai is set to realize the Sunqiao Urban Agricultural District, a 100-hectare masterplan designed by US-based firm Sasaki Associates. Situated between Shanghai's main international airport and the city center, Sunqiao will introduce large-scale vertical farming to the city of soaring skyscrapers. While primarily responding to the growing agricultural demand in the region, Sasaki's vision goes further, using urban farming as a dynamic living laboratory for innovation, interaction, and education.



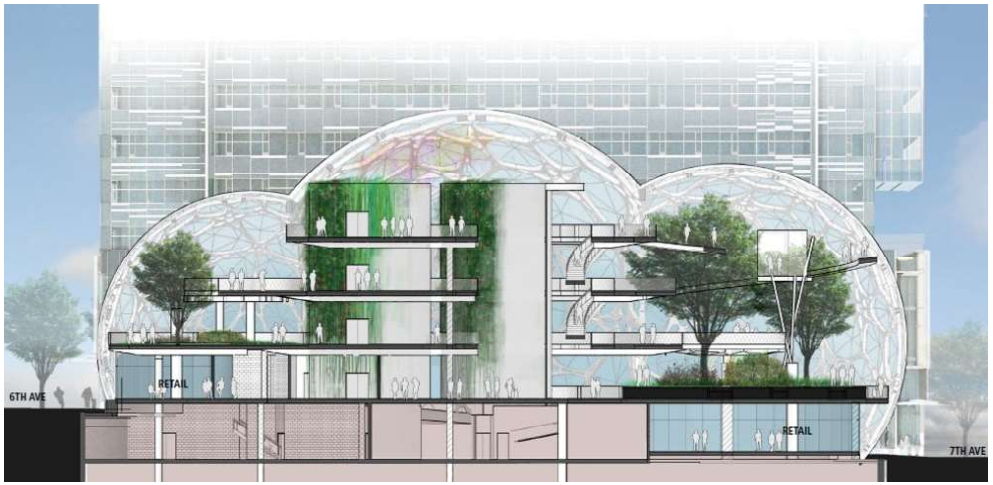




Sunqiao represents more than a factory for food production, however. Sasaki's masterplan creates a robust public realm, celebrating agriculture as a key component of urban growth. An interactive greenhouse, science museum, aquaponics showcase, and festival market signal an attempt to educate generations of children about where their food comes from. Meanwhile, sky plazas, office towers, and civic greens represent a desire to create a mixed-use, dynamic, active environment far removed from traditional, sprawling, rural farmlands.

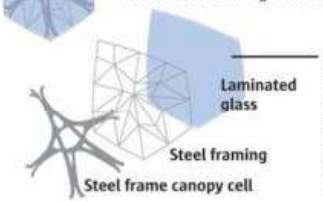
AMAZON SPHERES

Set within the landscaped headquarters, the Spheres are a building in a garden and a garden in a building. The plants represent about 400 species, some of which are extinct in the wild and others are quite rare. To select, nurture, and curate the selection of plants, Amazon hired a full-time horticulturalist, Ron Gagliardo, who had previously worked at the Atlanta Botanical Garden. The collection of plants, which will evolve over time, includes a 55-foot-tall fig tree named Rubi, a 40-foot Australian fern, orchids from Ecuador, and carnivorous pitcher plants.
Waterfalls and a pair of densely planted living walls create the sense of a jungle. Tokeep all of this flora happy, the climate in the Spheres is set at 72 degrees Fahrenheit and 60 percent humidity during the day, then shifts to 55 degrees and 90 percent humidity at night. The 67,000-square-foot Spheres represent just two percent of the Amazon project but serve as a magnet to bring people together. Open to Amazon employees, they offer a range of places to meet, work, and dine—from a wood-slatted “birds nest” to terraces with banquettes and chairs.



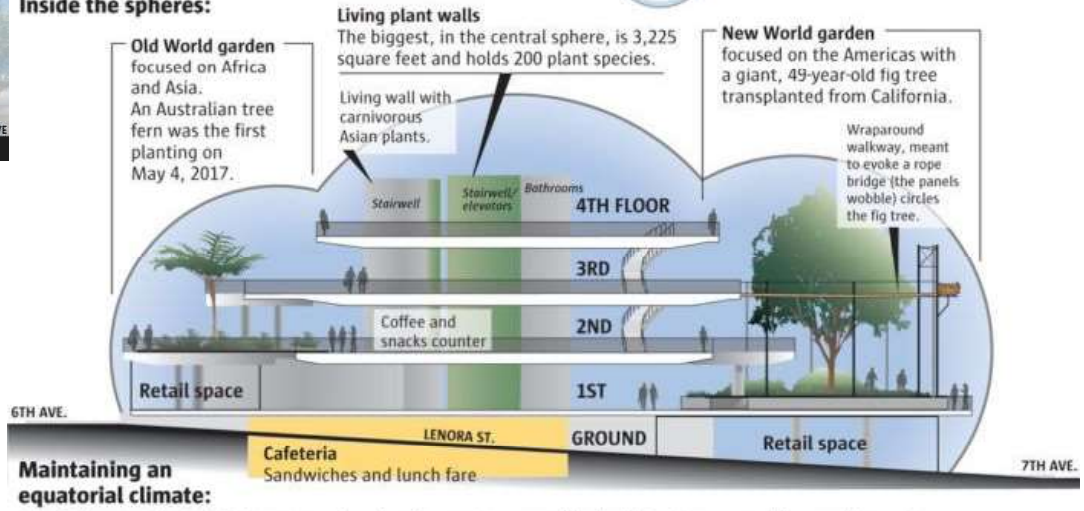
Amazon's spheres

The spheres are made using a system of steel frame cells over which steel framing holds laminated glass panels.



2,643 glass panels make up the spheres. Each has four layers of low-iron glass, with a coating designed to let the building absorb light for plant photosynthesis but reflect heat.

Inside the spheres:



Maintaining an equatorial climate:

The Spheres are kept at 72 degrees and 60% humidity (55 degrees, 85% humidity at night), akin to a cloud forest in Central America or Southeast Asia along the equator.

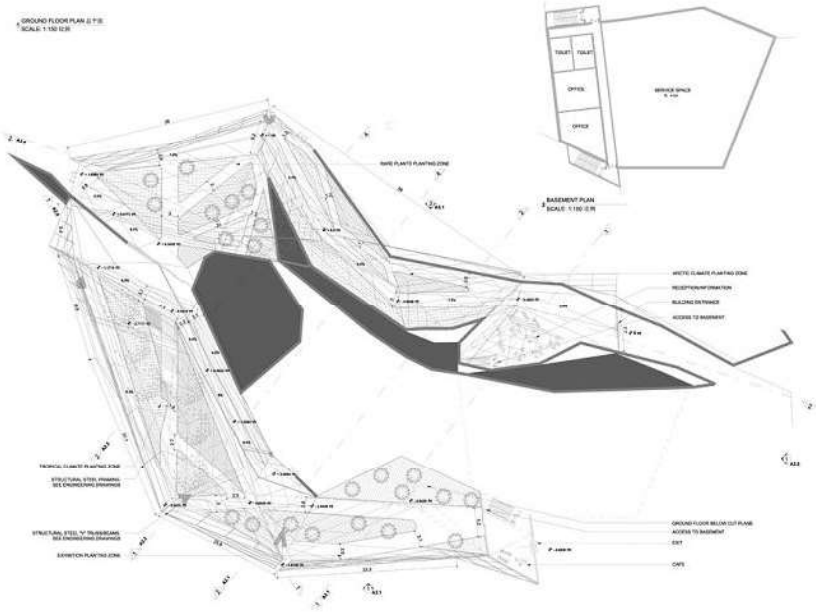
Heat is recycled from the same data-center complex that heats the surrounding Amazon towers and is piped into the concrete floor where it radiates out. Railings on the upper floors are lined with heaters where they meet the floor. In the main plant areas on the first floor of the Sixth and Seventh Avenue spheres are a few fake nurse logs or stumps, masking cool-air vents.

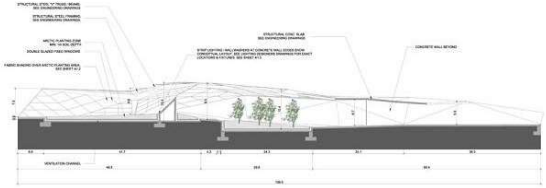
To supplement the natural light from the glass panels, custom interior lights help keep the light level similar to the equator year round. Sensors in the spheres adjust the light automatically in response to the weather outside.

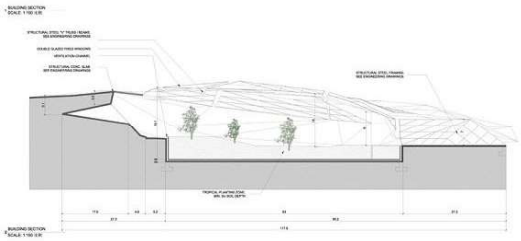
Source: Amazon

Reporting by **MATTHEW DAY**, Graphic by **MARK NOWLIN / THE SEATTLE TIMES**

XIAN GREENHOUSE







Visitors access the building through a prolonged cut, literally scooped up from the ground, emerging into a light-filled reception space. From here the visitor passes along a tessellated mesh of paths to three different climatic zones with corresponding plant environments. The greenhouse has a horseshoe plan, creating a loop that changes radically in section to accommodate a series of unique planting and spatial conditions. With the interior and exterior ground planes gradually shifting in relation to each other, the visitor experiences a sequence of visual enclosures alternating with long vistas out and across. The horseshoe shape also generates an interior open-air courtyard, making it the natural centre of the building and creating a three-dimensional web of interior and exterior circulation.

LOWLINE FOR NYC

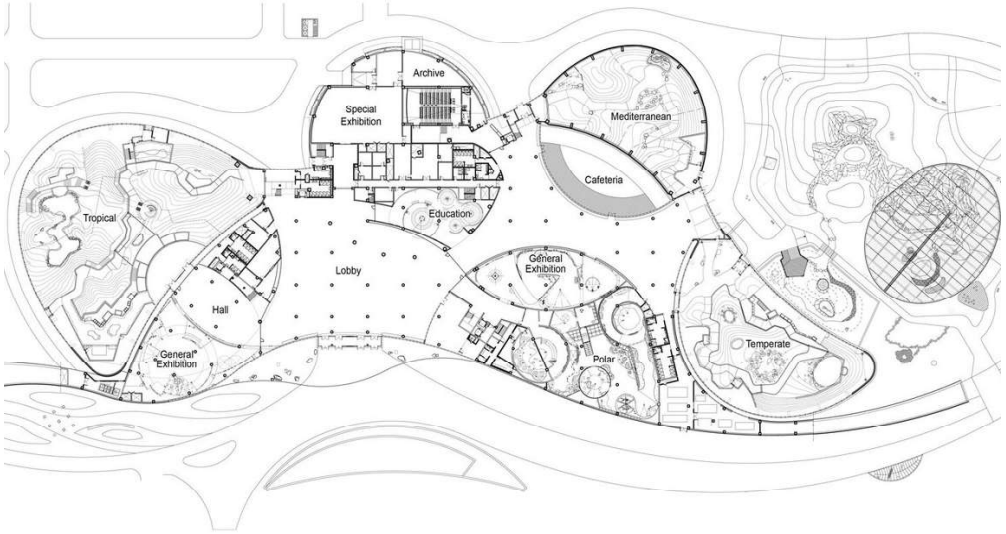
Although the Metropolitan Transit Authority (MTA) did express interest in the space last fall, the Lowline team was awarded conditional use due its high community potential.

Conceptualized in 2011, the Lowline seeks to utilize cutting edge solar technology to transform the abandoned Williamsburg Bridge Trolley Terminal located under Delancey Street into a one-acre underground public park. Here, sunlight is delivered underground, activating photosynthesis to create lush garden space year-round.

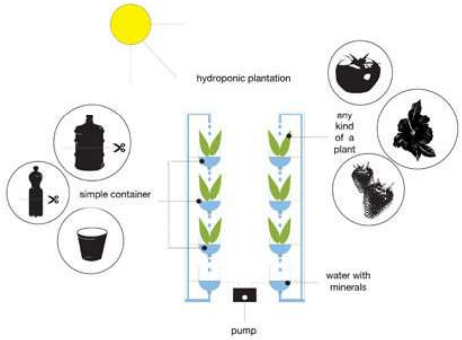
Courtesy of NYCEDCCourtesy of NYCEDCCourtesy of NYCEDC In addition to creating much-needed public space, the Lowline is hoped to set a model for adaptive reuse and cultivation of abandoned underground spaces, as well as “to shape the future of the City through innovation, deep community engagement, education, and youth development.”

ECORIUM

Within the Ecoplex lies the Ecorium, a landmark facility and a purpose-built exhibition facility. Designed by Samoo Architects & Engineers in collaboration with Grimshaw Architects, the Ecorium is composed of various greenhouses and controlled environments in order to reproduce the global ecosystem of five different climatic zones ranging from the tropical to the polar regions. Designed with the concept of 'Nature's Odyssey', the individual climate zones are grouped by a linear podium which also functions as the main exhibition circulation path providing various experiences to visitors.



HYDROPONIC PUMPING STATION



In an effort to revitalize an old pumping station in Pila, Poland, this first prize winning proposal by mode:lina successfully combines green thinking with eco-technology to turns a space into a place where you can learn, practice, and get accustomed to one of the best ways to help your environment - growing your own food. These three aspects: nature+mineral water+education are the base of their concept. By combining them with each other, they hope to once again promote the city and give back a pumping function to an old building. More images and architects' description after the break.

REBIRTH OF CARBON

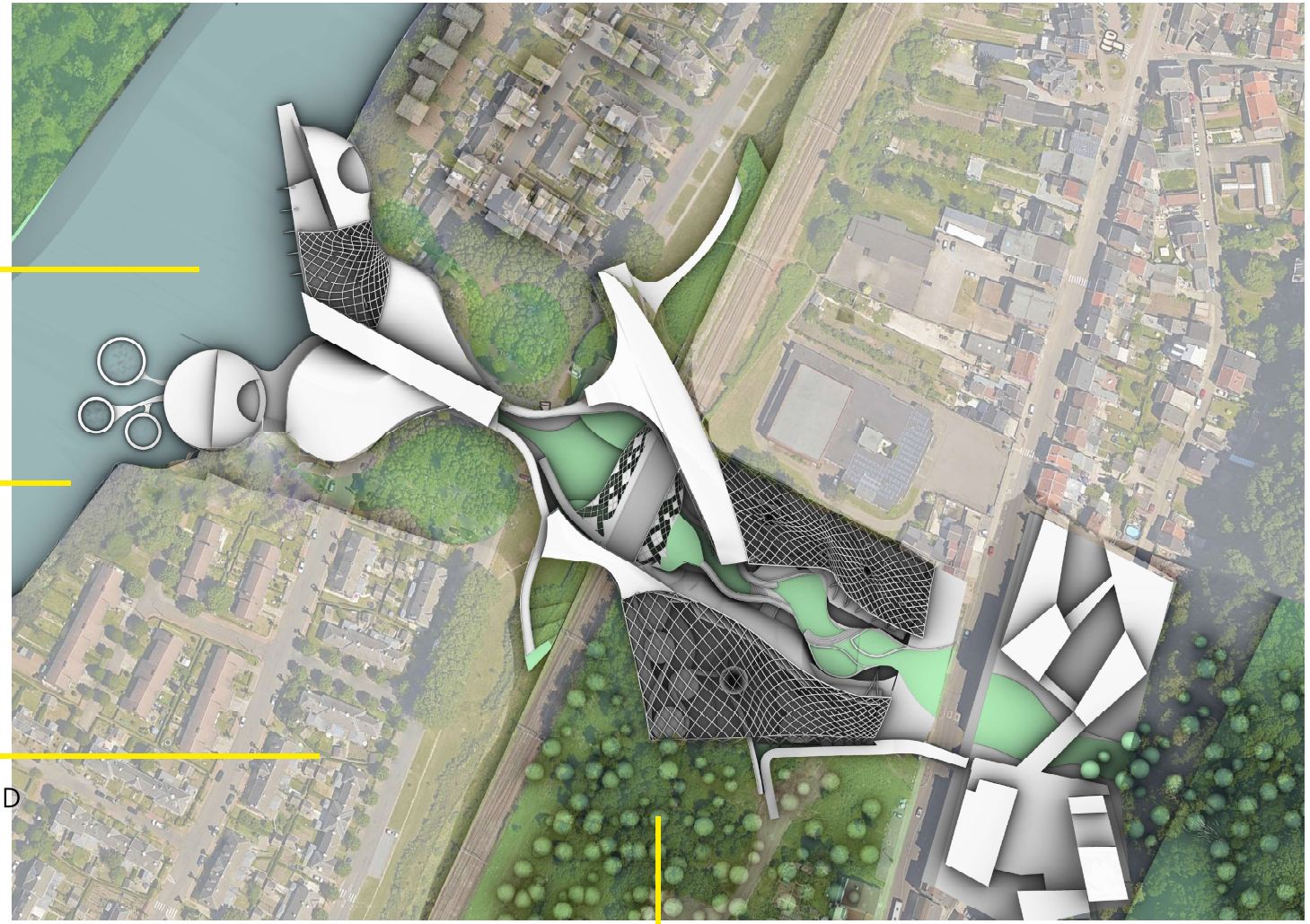
The concept has been appeared with the idea of making the polluted area self sufficient and cleaned.

MASTER PLAN

EXPANSION OF THE POND AND CONNECTION WITH THE RIVER

WETLANDS

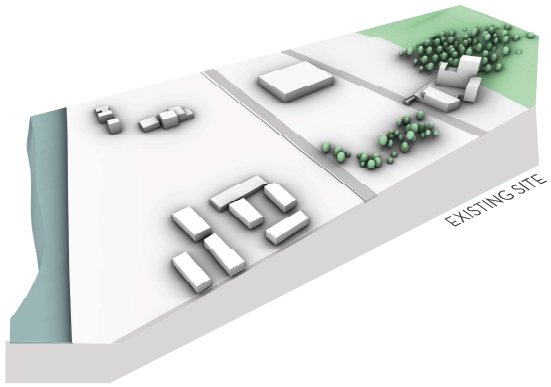
THE EXPANSION OF GREEN AXIS IN THE NEIGHBORHOOD

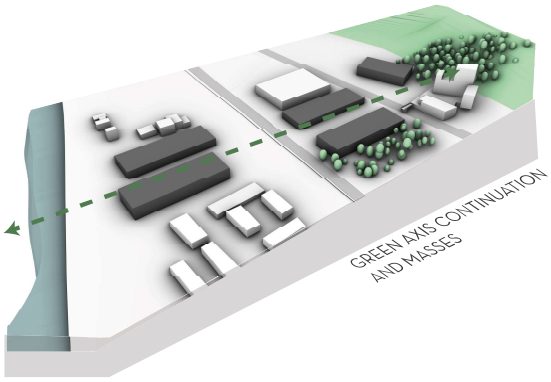


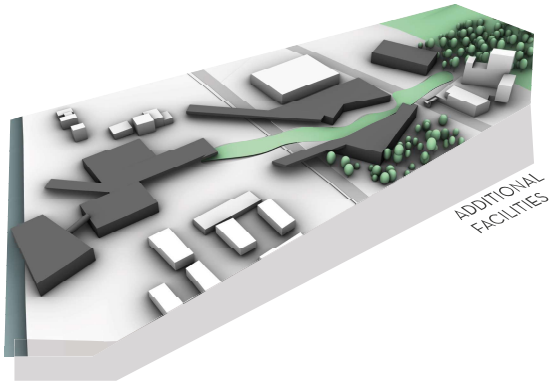
EXPANSION OF THE GREEN AREA

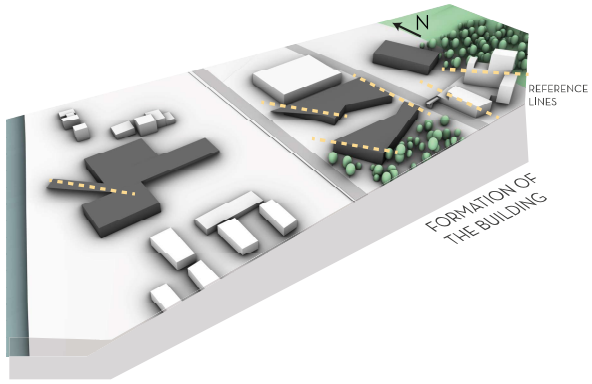
The building complex has been formed in the light of environmental and historical circumstances. Through the river the shapes get much curvilinear and it is an emphasis to the function.

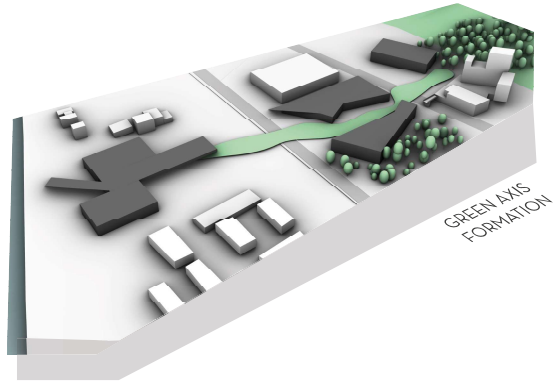
FORM AND FUNCTION

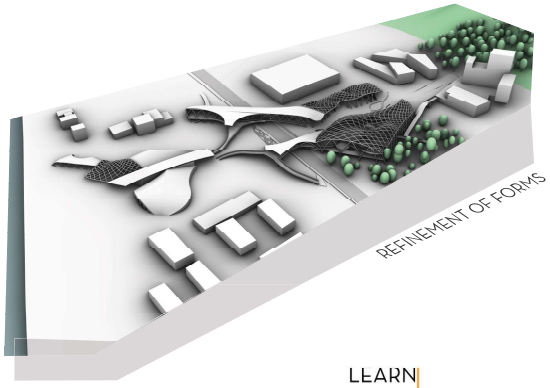


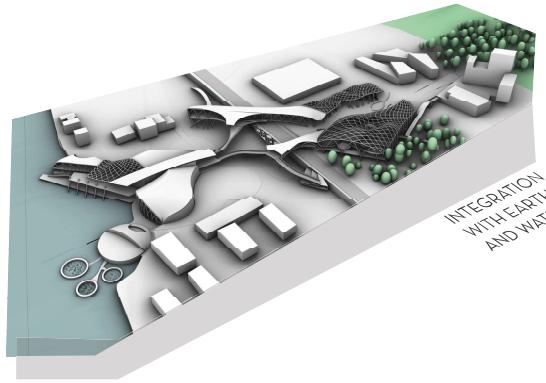


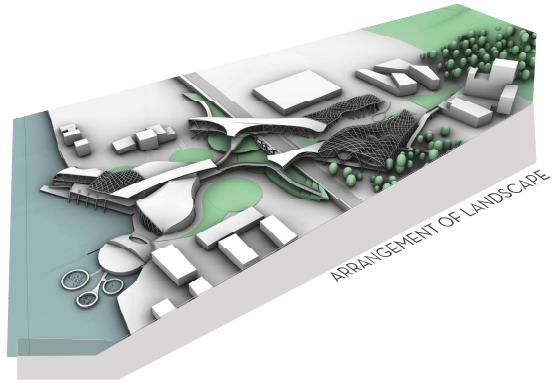


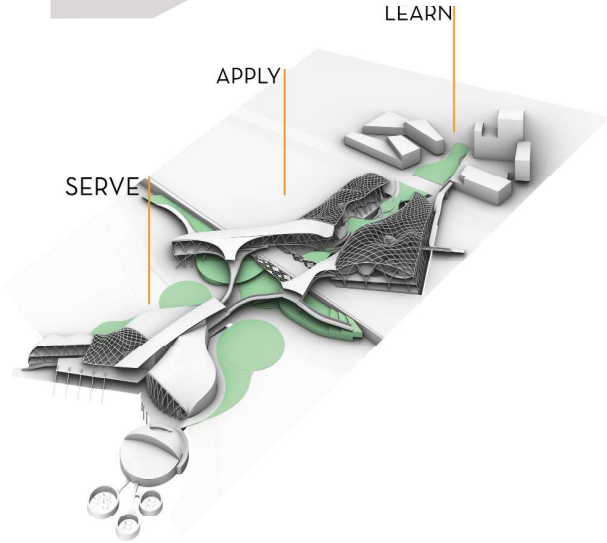








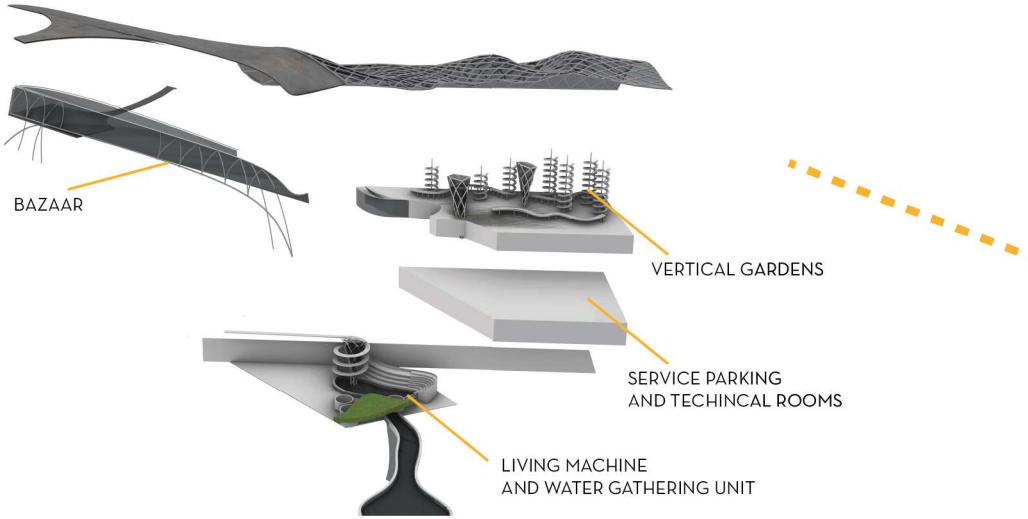


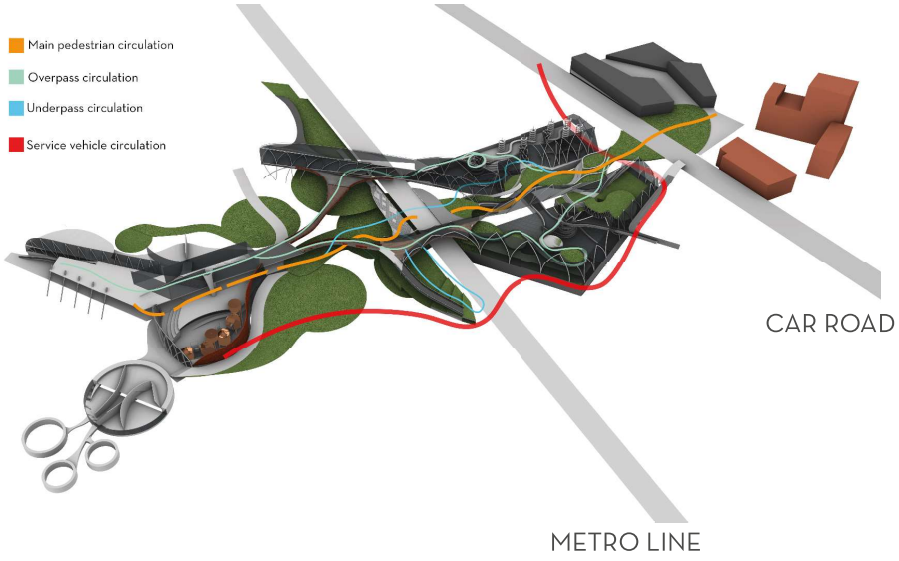


EXPLODED PLANS AND CIRCULATION

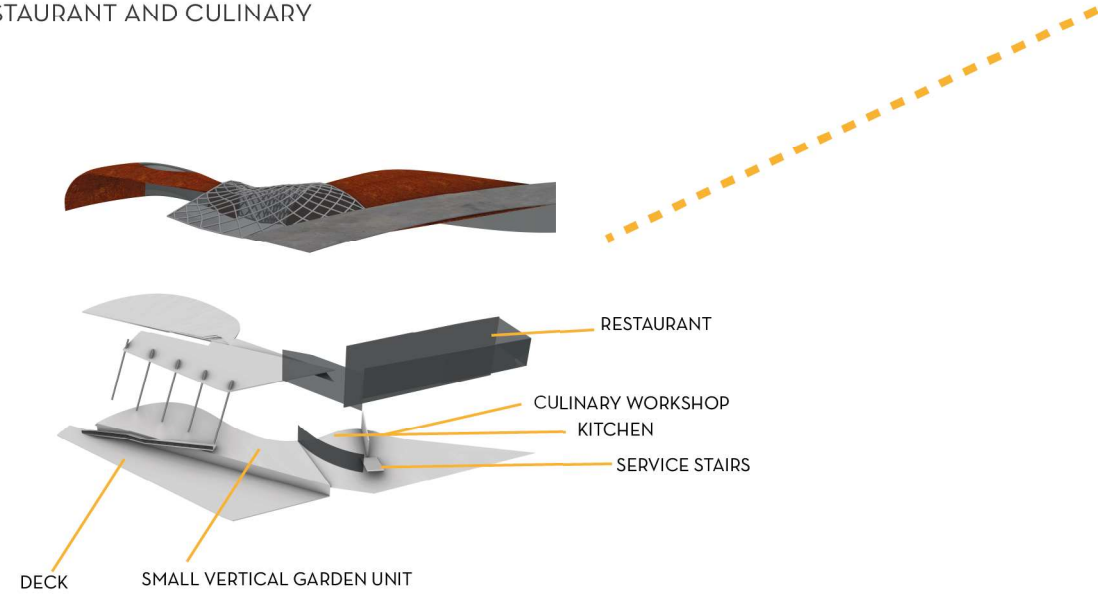
The historic part remain as museum to show the future and past and this purification process. Furthermore, the environment and agriculture courses will be added this part.
The core part will be used for agricultural and research purposes.
The river part will be brewery and restaurant as a celebration of this purification process.

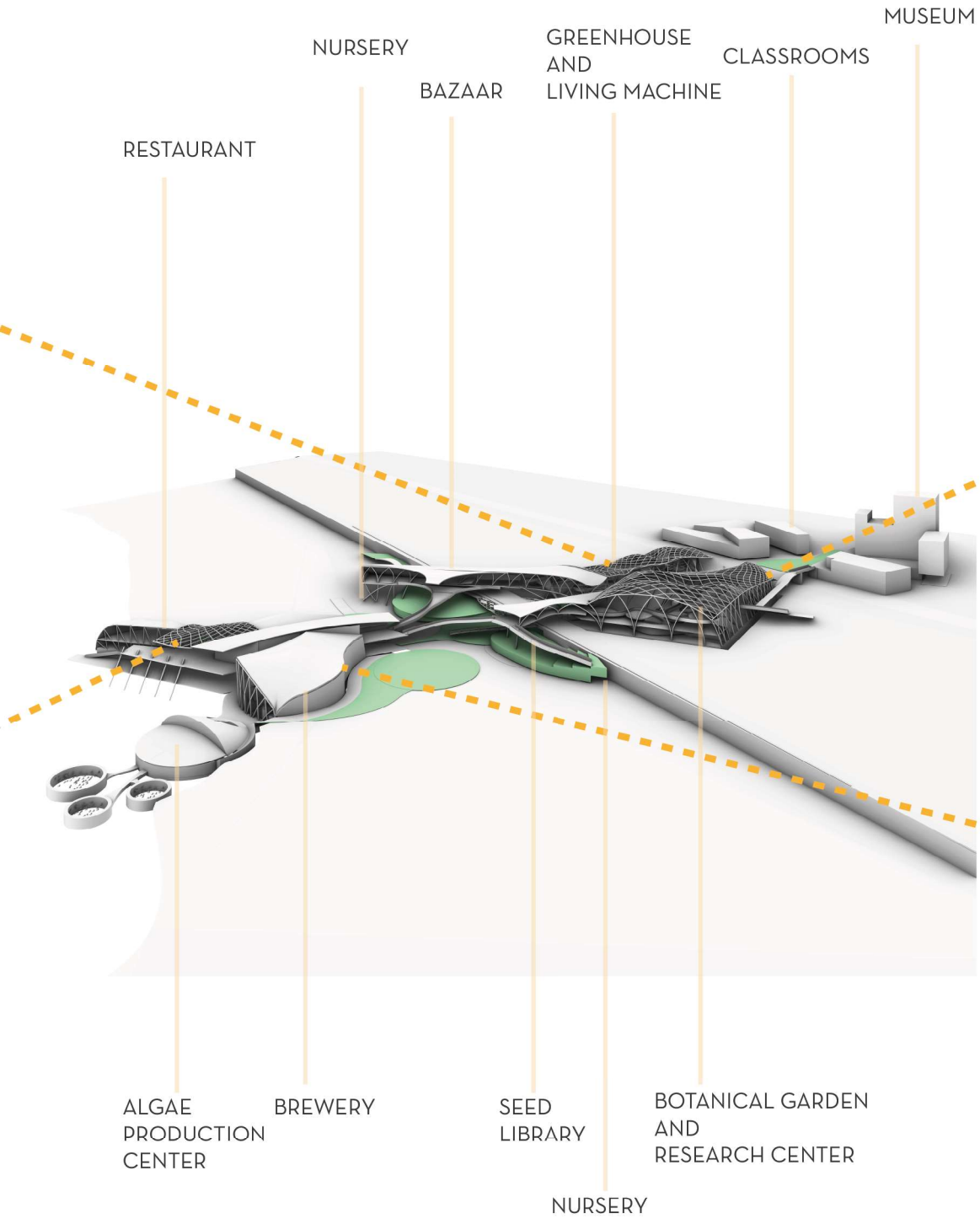
GREENHOUSE, LIVING MACHINE AND BAZAAR



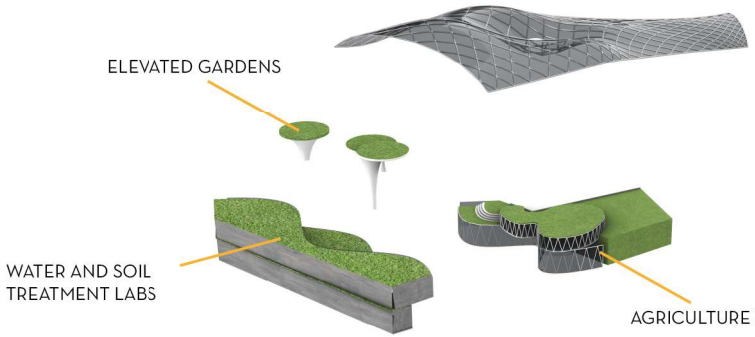


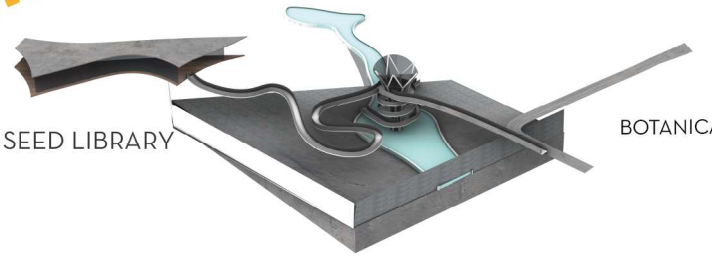
RESTAURANT AND CULINARY



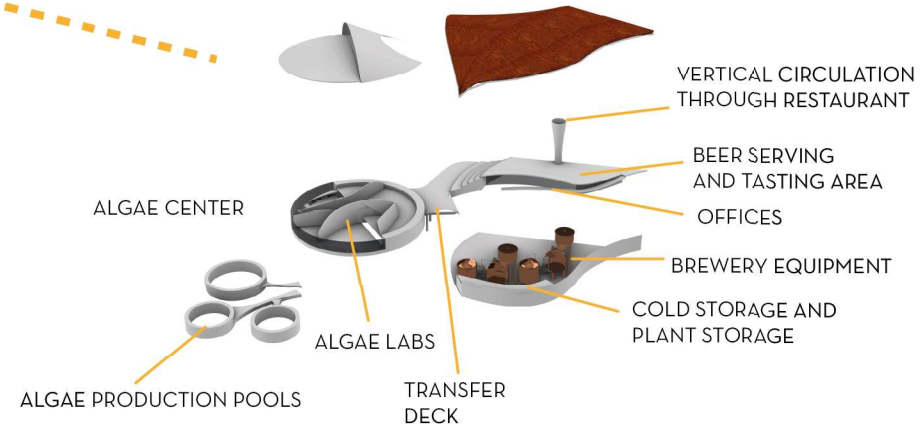


BOTANICAL GARDEN AND RESEARCH CENTER

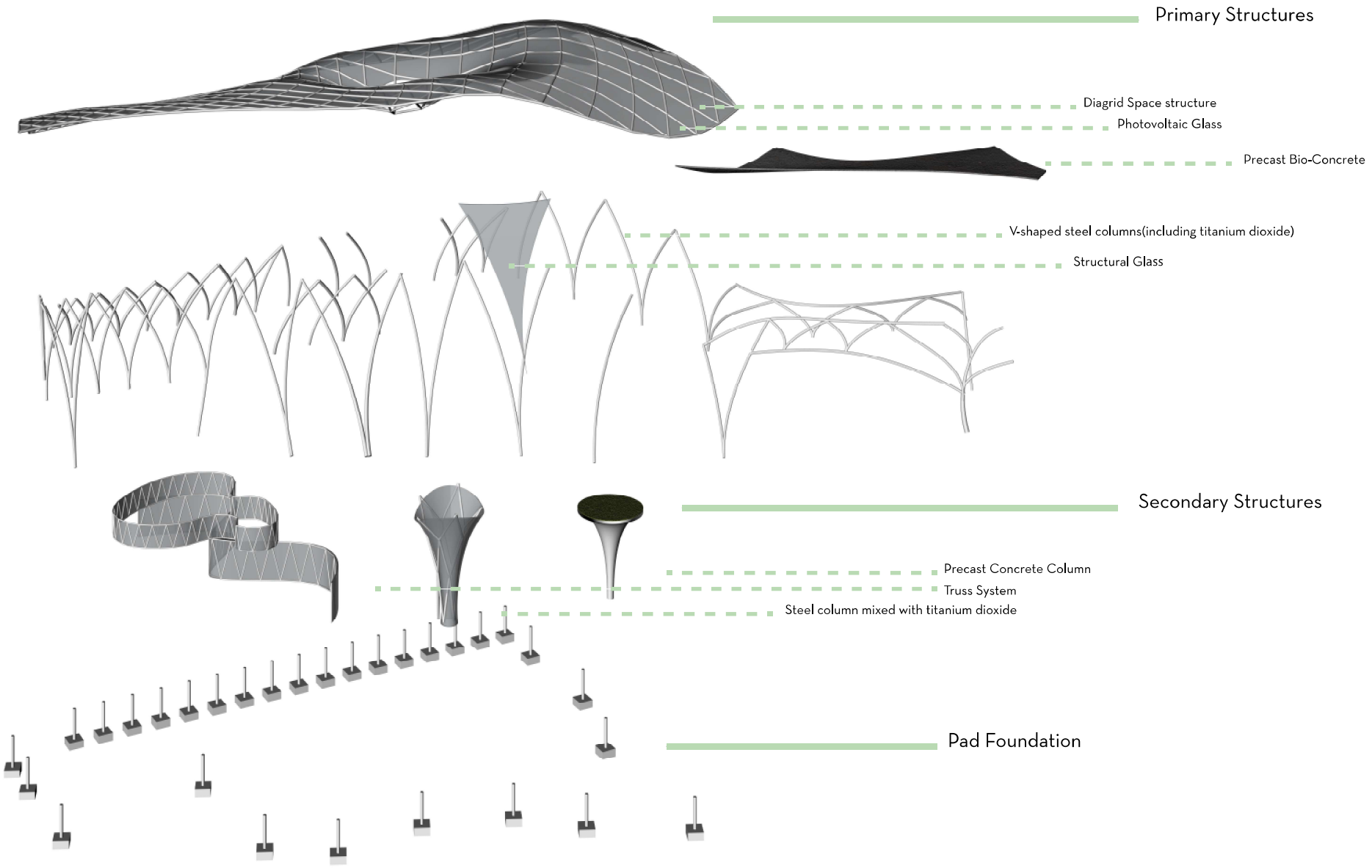




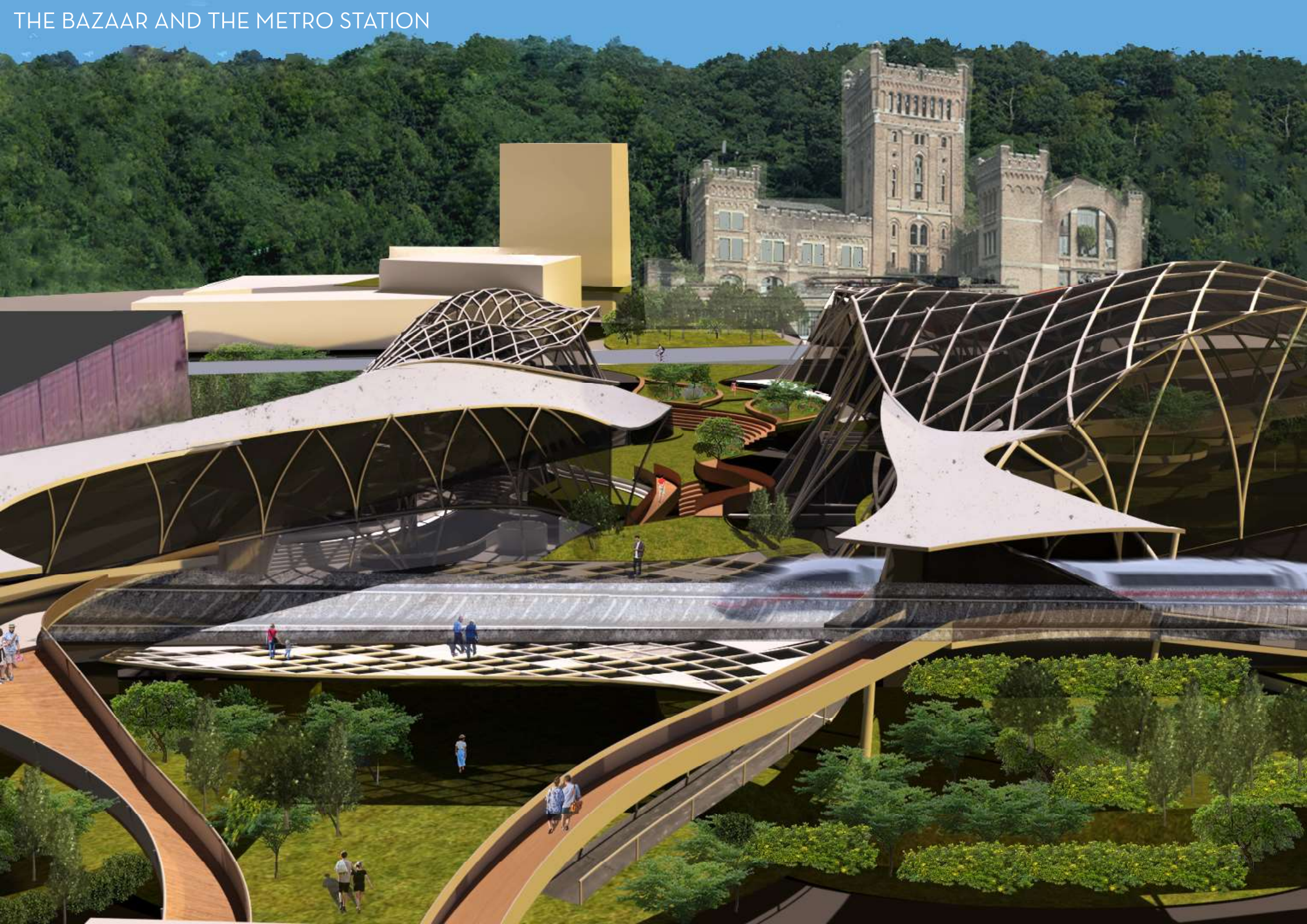
BREWERY AND ALGAE CENTER



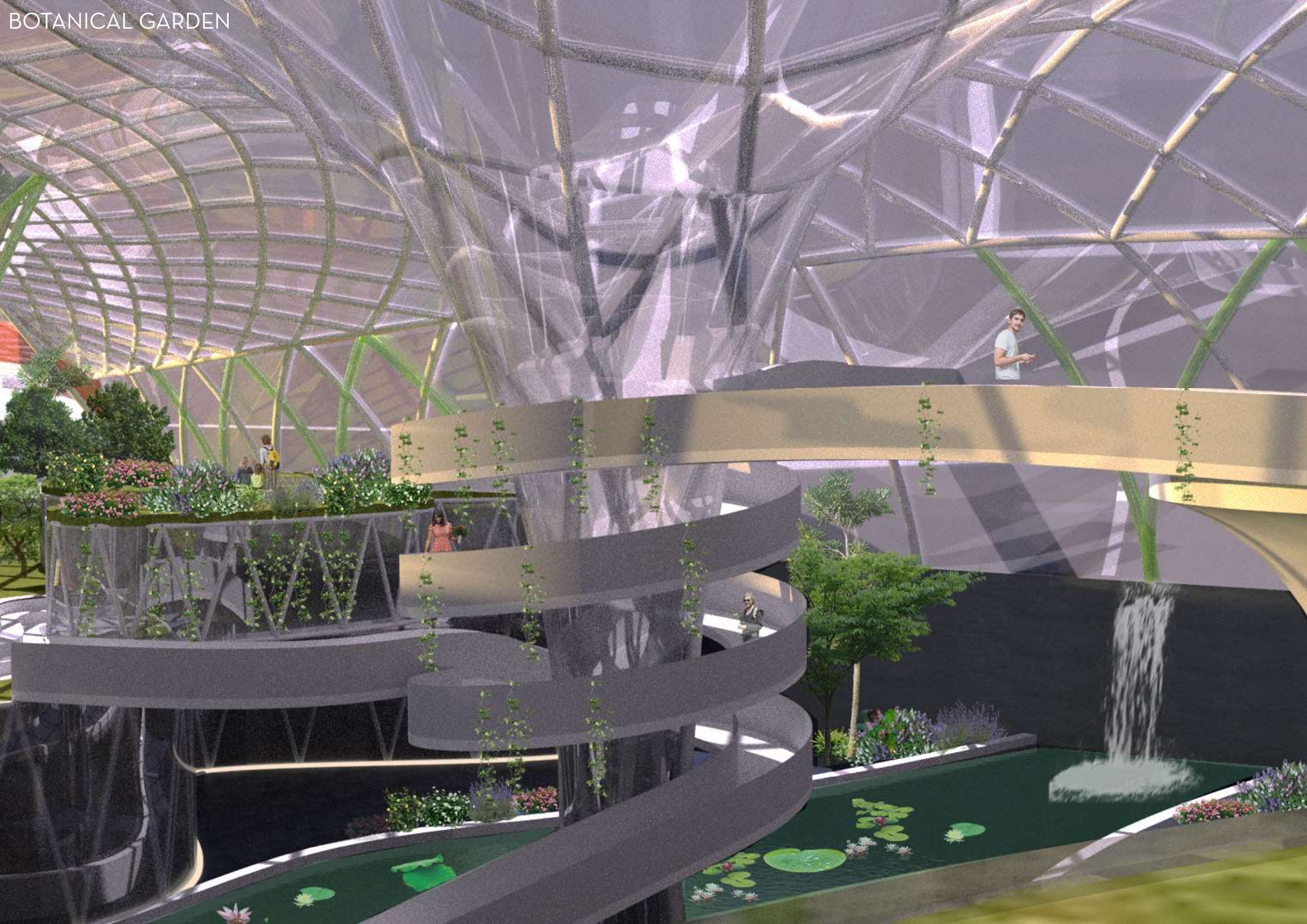
STRUCTURAL DIAGRAM



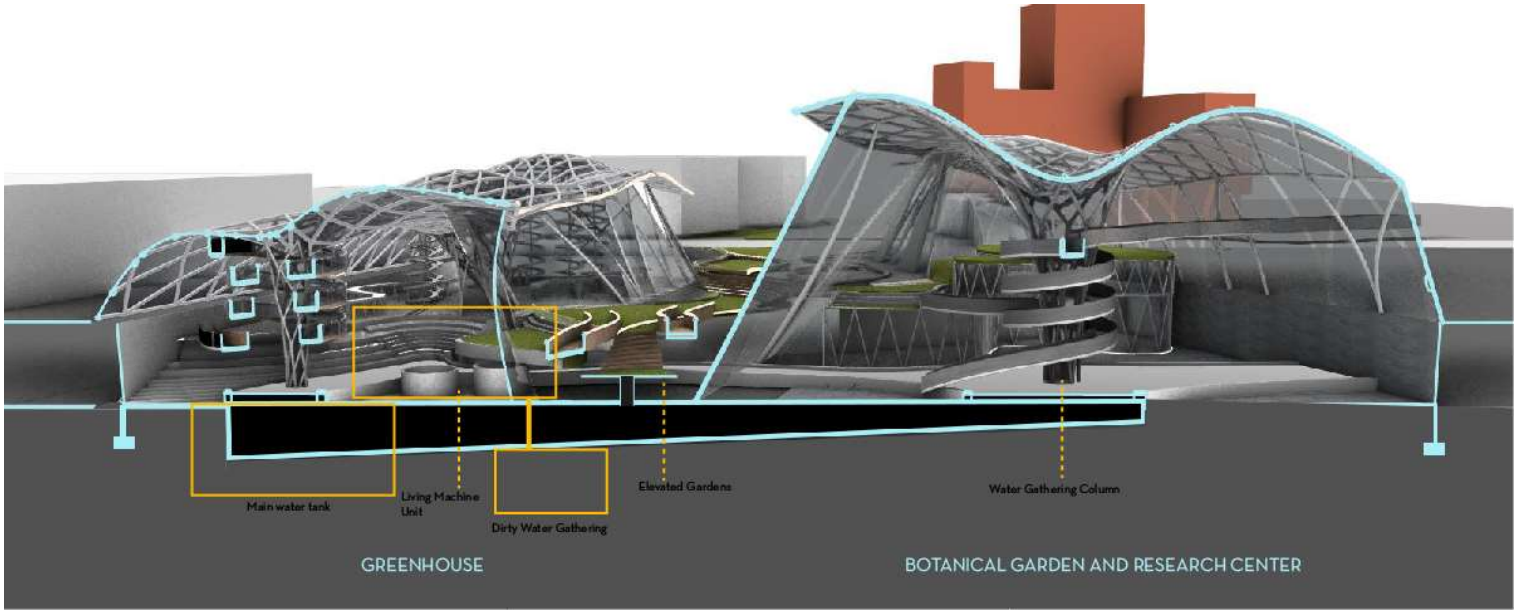
THE BAZAAR AND THE METRO STATION



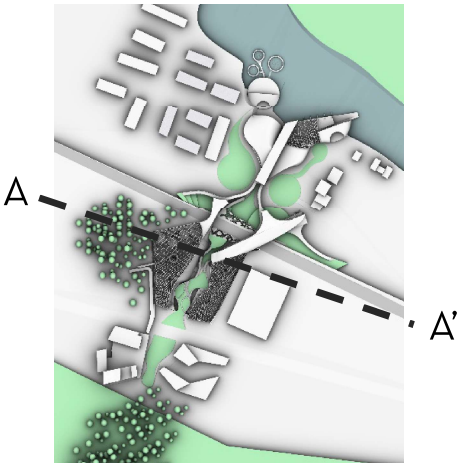
BOTANICAL GARDEN

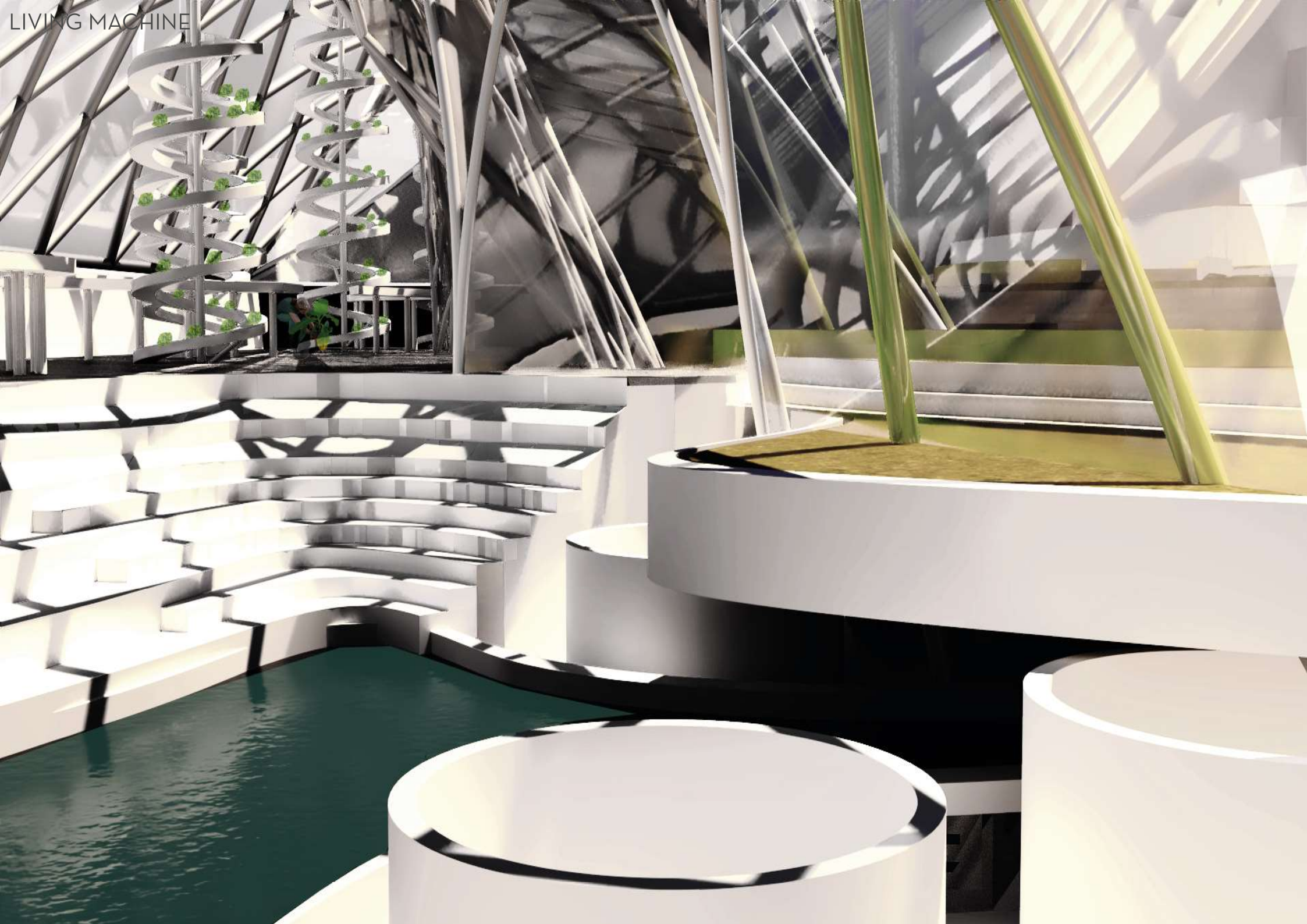


SECTION AA'

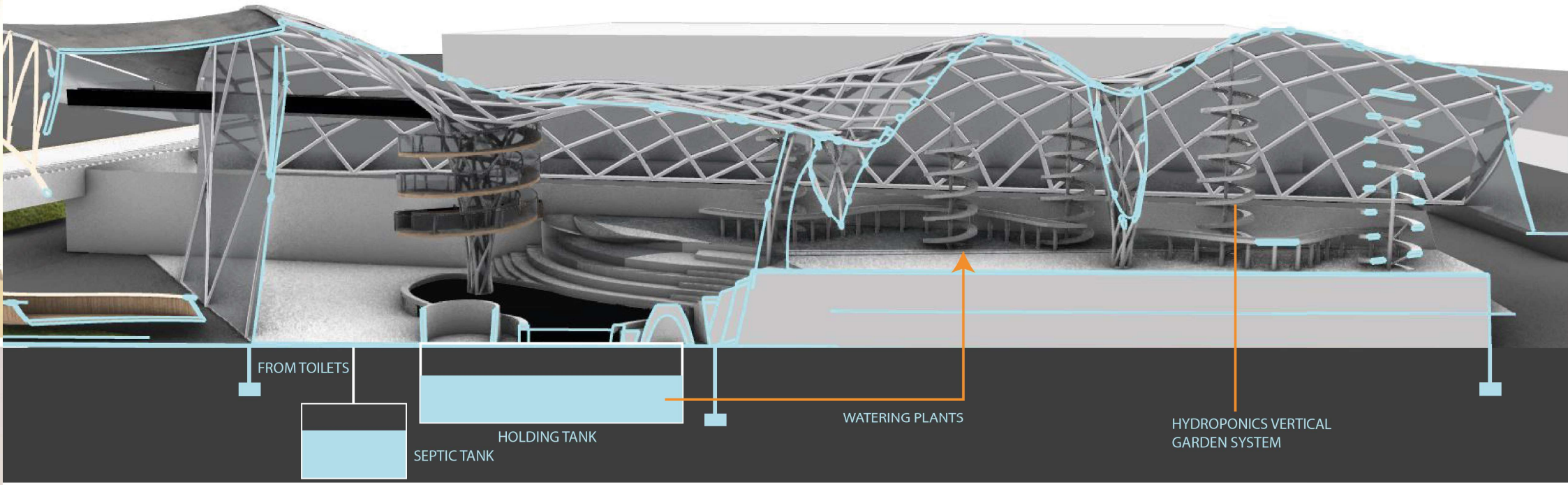


The water has been gathered by the columns. It is collected in one place with the slope which works with living machine as well. The water collected in the pools and the underground barrels.

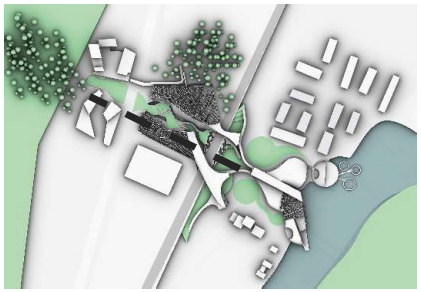




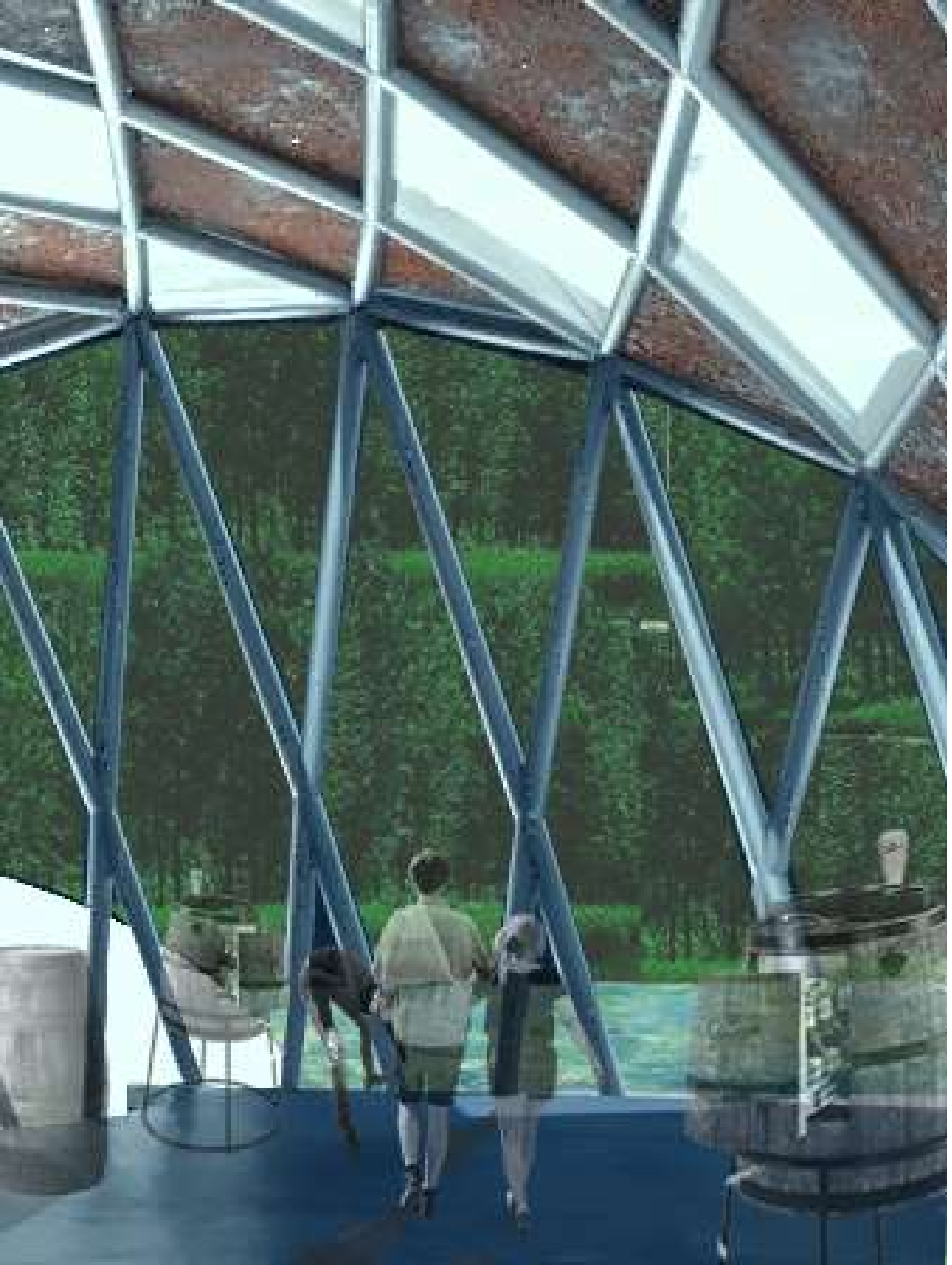
SECTIONBB'



The water system has been designed for both gathering and purification. Regarding the weather conditions, water harvesting is one of the best sustainable options in Belgium.

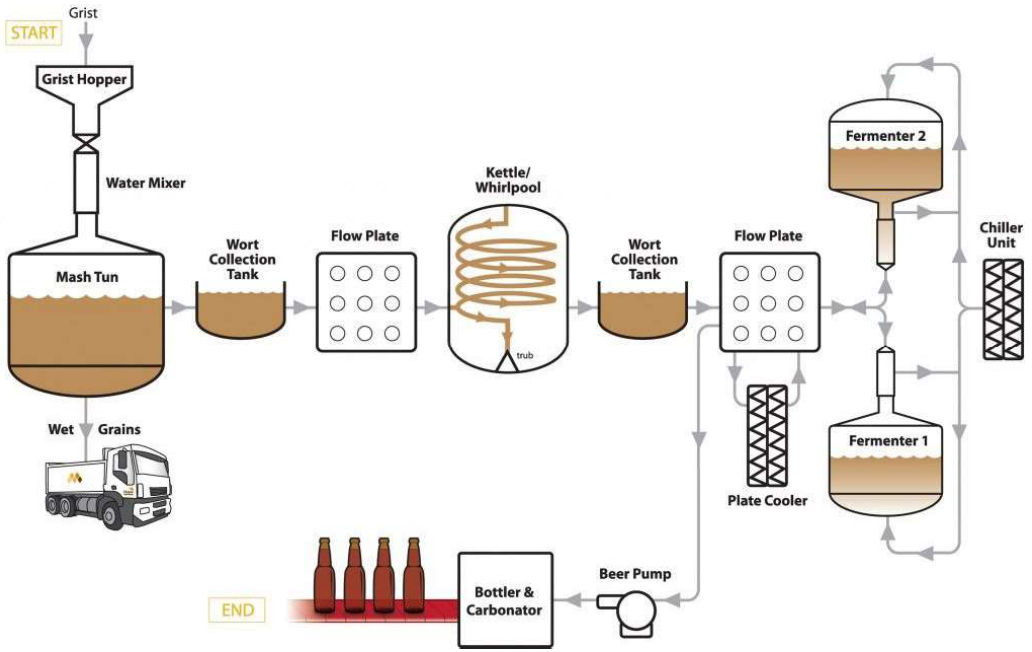


BREWERY



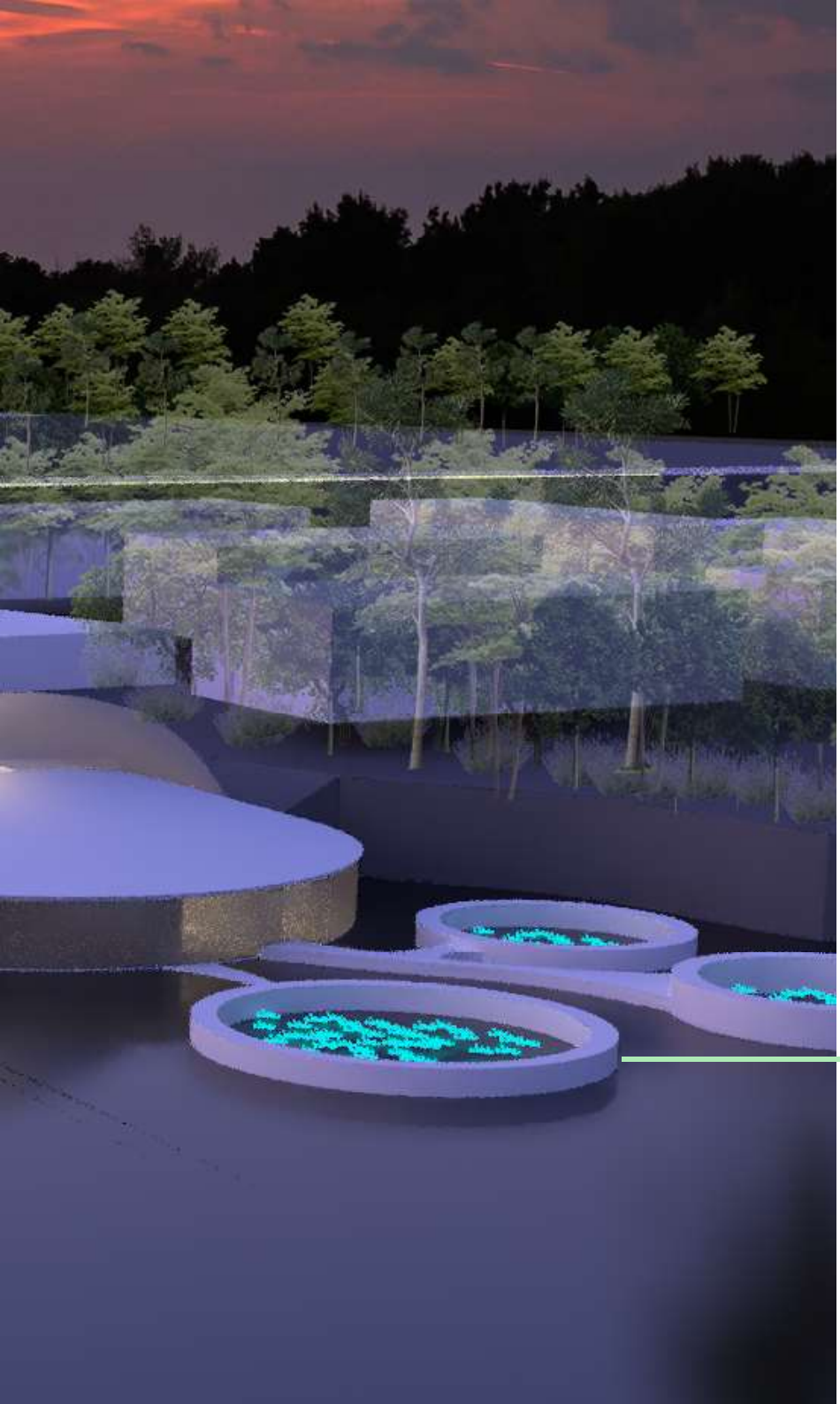
ALGAE BREWERY

BEER MAKING PROCESS



Algae beer is a cleaner option to the brewery. Therefore, the area has been designed with connection between algae production center and brewery. The experience in brewery aims to use space as workshop as well.

BREWERY AND RESTAURANT



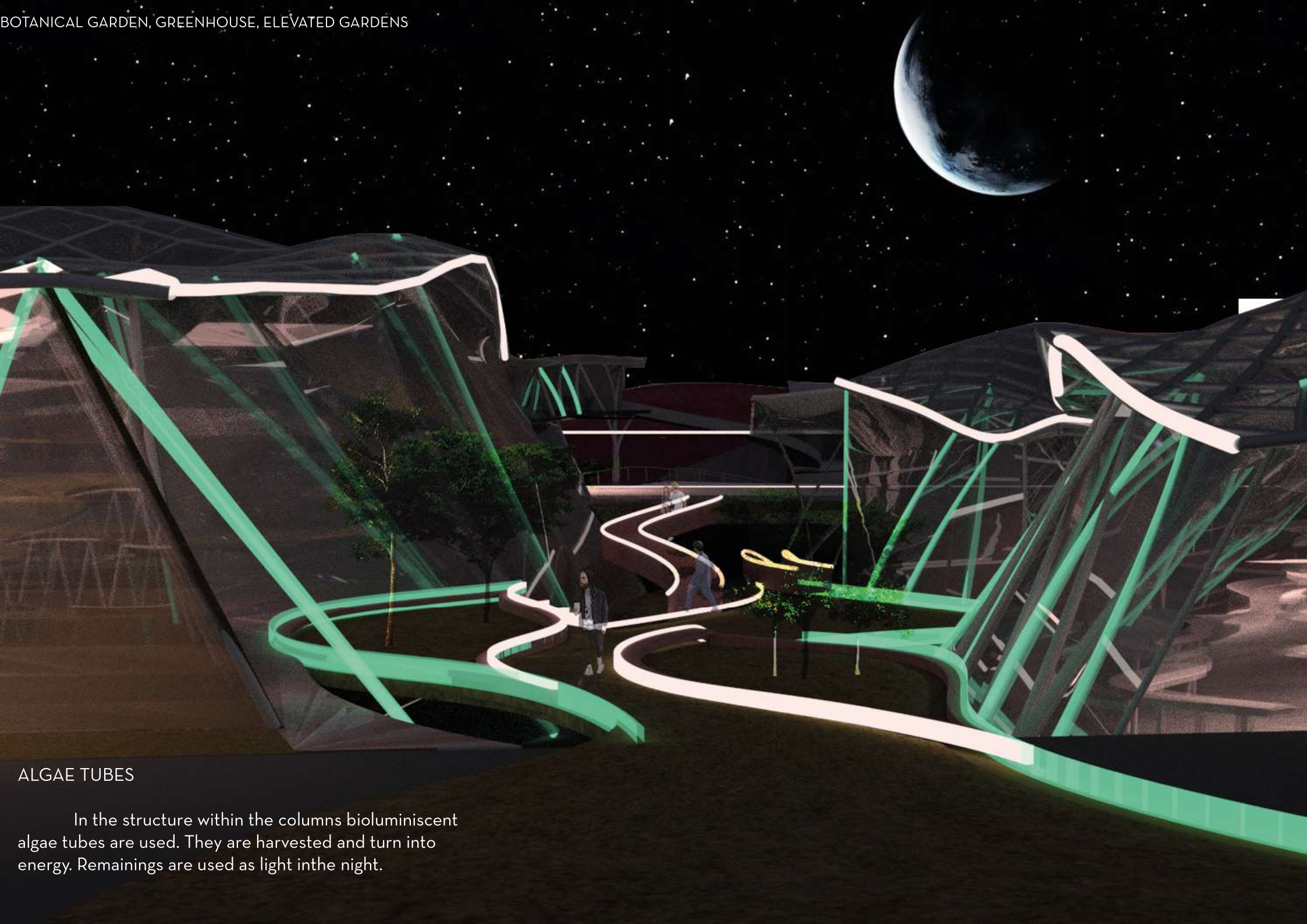
ALGAE PRODUCTION

AS FOOD AND VITAMINS
(Spirulina, sea weed,vitamins)

AS FUEL
(Clean energy)

ALGAE POOLS

Algaes are used in purification of the water. Addition to this, it is used for food source. In the site, the fuel will be used to get energy. The remaining part will be sold.



ALGAE TUBES

In the structure within the columns bioluminiscent algae tubes are used. They are harvested and turn into energy. Remainings are used as light inthe night.