

RETHINKING THE WORLD EXPO

A Thesis

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ABSTRACT

RETHINKING THE WOLRD EXPO

Throughout history, the World's Fair has brought together nations to share accomplishments, technological advances, industrial might, architectural experimentation, and cultural identity. World's Fair buildings are largely temporary structures, which often leave a significant carbon footprint and sites that are difficult to adapt after their use. Additionally, the current nature of World's Fairs tends to favor specific countries through their pavilion sizes, dollars invested, and prominence within the broader master plan. More recently, fairs of this size tend to increasingly rely on private investors, pressuring the pavilions to act more as advertisements for specific companies or industries than as cultural representations of a given. This project tries to bring the world "architecturally" together and becomes a world Expo for all people through the design of an alternative World's Fair. To more accurately represent the multiple cultures at the World's Fair, I will: assess historical case studies to find successful examples; analyze the funding structures that further some agendas while minimizing others; analyze afterlife of previous world fairs; and spatially analyze World's Fair sites to understand how they spatially prioritize some countries and ultimately leave an unsustainable carbon footprint. As a design proposal, I intend to redefine the current trend of making monumental pavilions and plan to instead make sites more equitable for all cultures involved. To do so, I will explore ideas to make the Expo transnational for all people around the world instead of country based pavilions, as well as try to create a new expo format in order to address the afterlife of the expo and its equity.

Keywords: Transnational, Culture, Gathering space, structure, afterlife



WORLD FAIR HISTORY

How it started..?



Figure 01 : Paris Exposition 1889

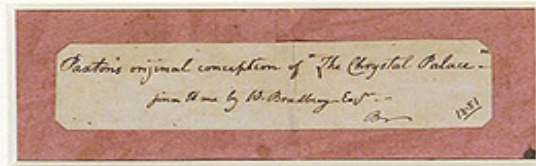
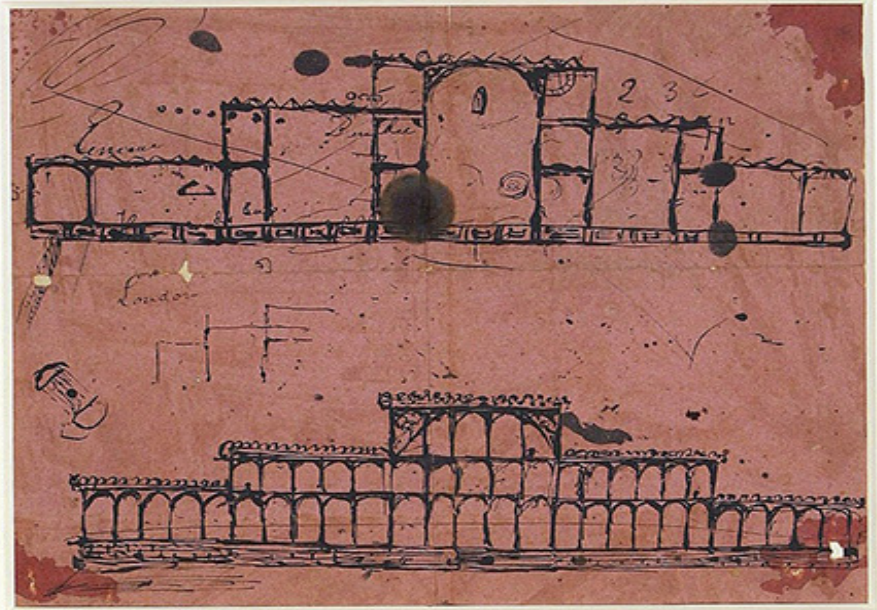
A huge worldwide exhibition intended to highlight national accomplishments is known variously as a world's fair, global fair, world exposition, or universal exposition (also referred to simply as a "expo"). These exhibitions have a variety of personalities and take place all around the world.

World fairs got their start in the French national exposition tradition, which peaked with the Paris-based French Industrial Exposition in 1844. Other national exhibitions in continental Europe and the UK were held after this fair.

To begin with the first worldwide industrial exhibition which was held in London, UK in 1851, The Great Exhibition of the Works of Industry of All Nations, the purpose and the theme was to present the industrial progress and inventions to the world. It was a single building in which all industrial products and developments were gathered. Needless to say the first world fair had a significant impact on next world's fairs as a new organization with great architecture with itself.

The Crystal Palace structure was designed by Sir Joseph Paxton, who was botanist and gardener, to host 1851 World exhibition in London to display industrial production and inventions around the world.

The building was 1848 feet long and 408 feet wide and highest part was 108 feet. The Structure was cast iron and plate glass which was outstanding in that era. The Geometry and the form of the building was limited by manufacturer's products. For instance, maximum sheet of glass was around 10 by 50 inches, thus the building's size and scale were followed by the specific dimensions. 293,000 sheets of glass were used which was remarkable in that era.



PAXTON'S INITIAL SKETCH FOR EXHIBITION BUILDING, 1850
Figure 02

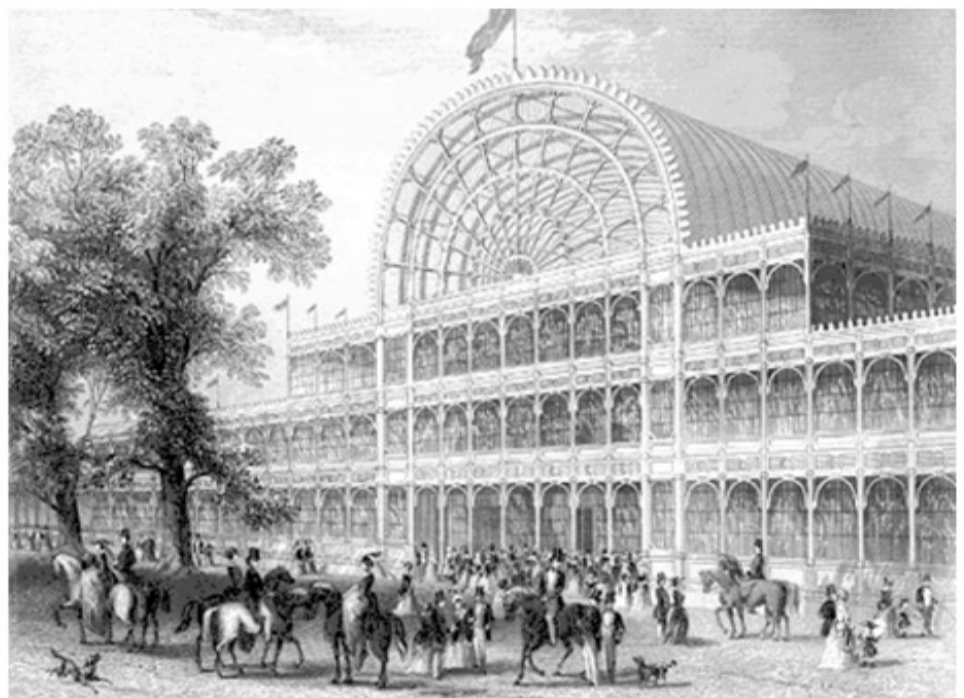


Figure 03 Crystal Palace, London, UK 1851



Figure 04: Crystal Palace, London, UK 1851

The building components were produced and put together in an incredibly short amount of time. Each module was identical, self-supporting, and easy to assemble. All of the building's components were able to be mass-produced, thus the building became relatively cheap to be installed. The Crystal Palace needed no heavy masonry for supporting walls or foundations due to its relative light weight.

Britain and its colonies were located on the west side of the building, and the international exhibitors had the western side. The Exhibition was divided into four different categories such as raw materials, machinery, manufacturers, and fine art.

SOME VALUABLE
& INTERESTING
STRUCTURES
THROUGHOUT
WORLD FAIR'S
HISTORY

UNEXECUTED DESIGN BY JAMES BOGARDUS

This unexecuted design had a form of amphitheater with a diameter of 365 meters and a central tower including an elevator.

Using an elevator in a large scale was one of the earliest utilization of a new invention in the world fair.

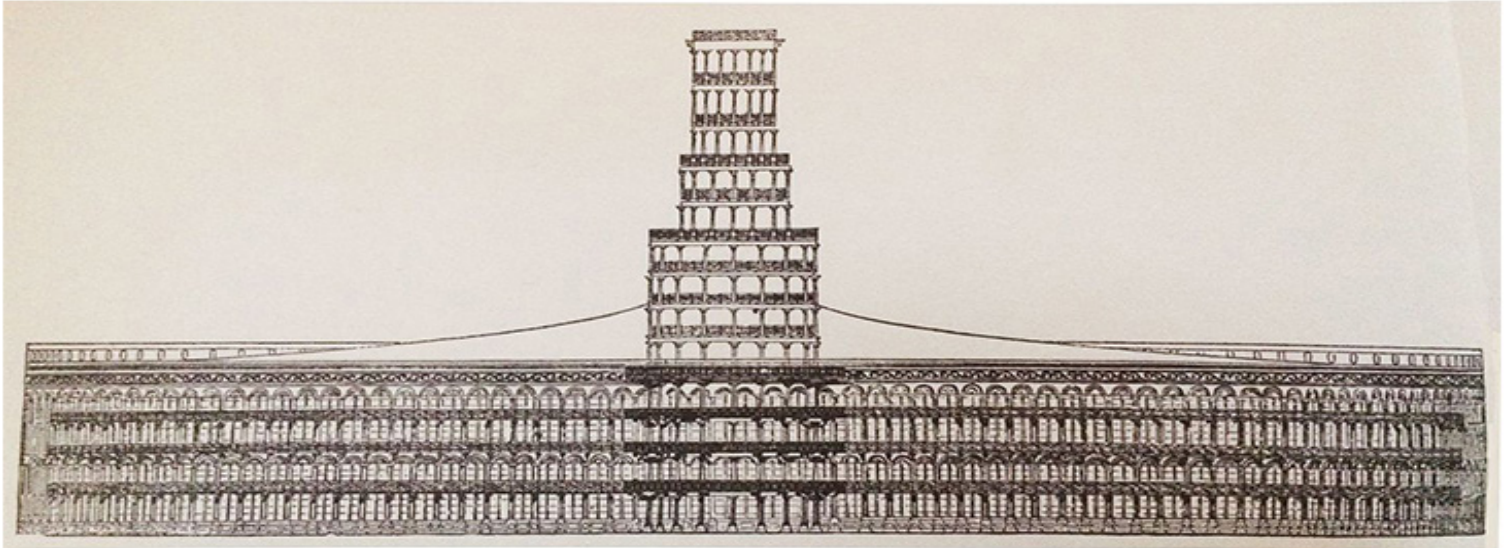


Figure 05

JAMES BOGARDUS UNEXECUTED DESIGN NEW YORK FAIR 1853

RIGHT ARM & TORCH OF STATUE OF LIBERTY

The other interesting project occurred in the world fair was the right arm and torch of Statue of Liberty that first presented to the American public at the 1876 fair. The inner construction was designed by Gustave Eiffel who designed Eiffel tower for Paris 1889 fair.



Figure 06: Right Arm & Torch of Statue of Liberty



Figure 07: Hall of Machines, Paris Expo 1889

PARIS 1889 FAIR

Compare to Paxton's crystal palace design which the building design was limited in construction elements, Hall of Machines' design had a structure with unprecedented dimensions at that time and It was a huge step in structural design development.

EIFFEL TOWER

THERE WERE TWO BUILDINGS ATTRACTED ATTENTION IN PARIS 1889 FAIR. EIFFEL TOWER AND HALL OF MACHINES. EIFFEL TOWER WAS DESIGNED TO COMMEMORATE THE ANNIVERSARY OF FRENCH REVOLUTION OF 1789.



16 juin 1888



10 Juillet 1888



26 Décembre 1888



20 Janvier 1889



THE 1937 INTERNATIONAL EXPOSITION ONCE AGAIN HELD IN PARIS AFTER FIVE PREVIOUS WORLD EXPOS IN THIS NOTABLE CAPITAL. THE TWO ICONIC NAZI GERMANY AND SOVIET UNION CENTERED THE ATTENTION TO THEMSELVES AS THEY PLACED RIGHT ACROSS EACH OTHER. HITLER DECIDED TO WITHDRAW FROM PARTICIPATION, BUT ALBERT SPEER, HITLER'S FAVORITE ARCHITECT CONVINCED HIM TO PARTICIPATE AS SPEER DESIGNED A GIANT PAVILION AGAINST THE SOVIET UNION TO SHOW A BULWARK AGAINST COMMUNISM. ALTHOUGH THE THEME WAS ARTS AND TECHNIQUES IN MODERN LIFE SOME PART OF THE EXPO TURNED THE EXPO INTO A COMPETITION BETWEEN GREAT RIVALS IN POLITICS.

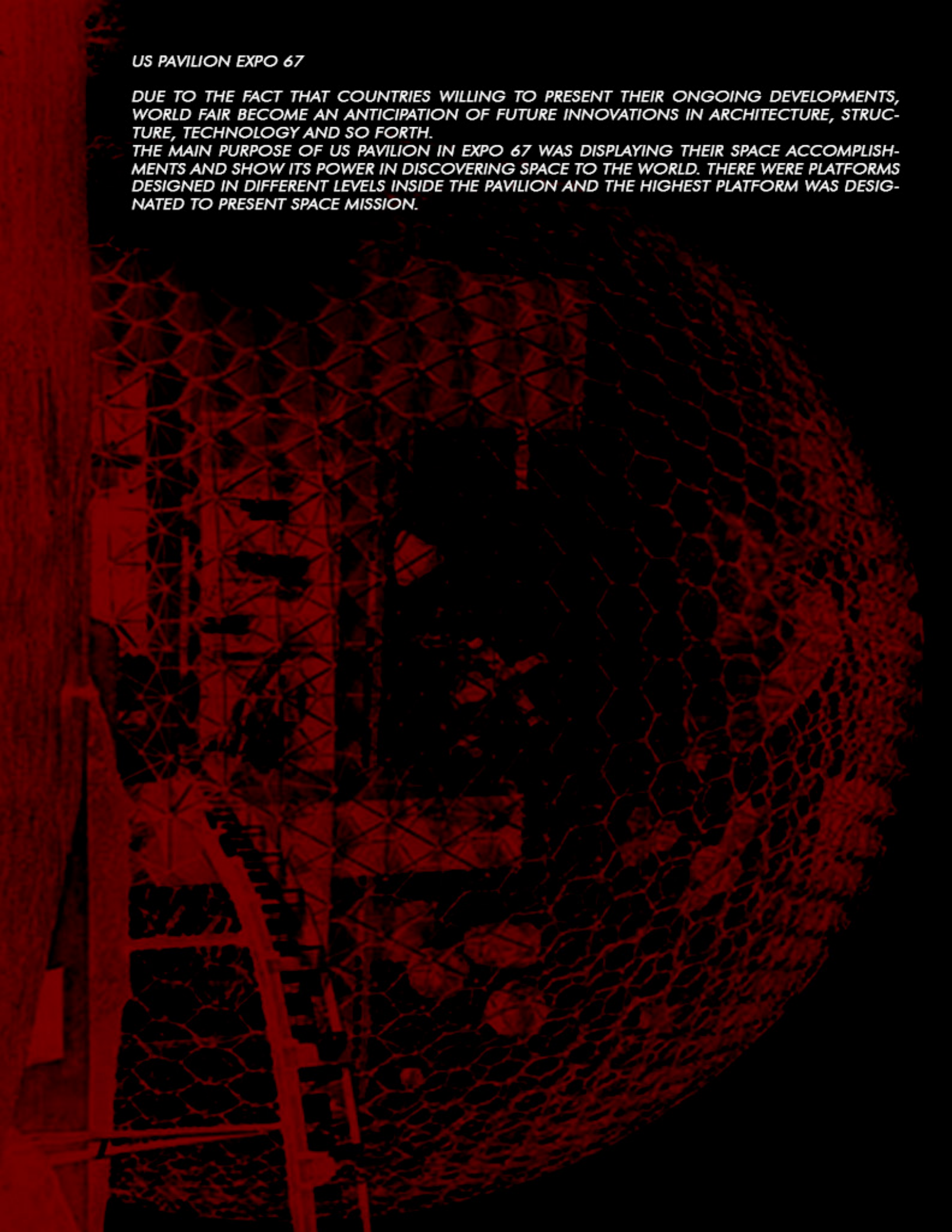


Figure 08: Soviet Union and Nazi Germany Pavilions

US PAVILION EXPO 67

DUE TO THE FACT THAT COUNTRIES WILLING TO PRESENT THEIR ONGOING DEVELOPMENTS, WORLD FAIR BECAME AN ANTICIPATION OF FUTURE INNOVATIONS IN ARCHITECTURE, STRUCTURE, TECHNOLOGY AND SO FORTH.

THE MAIN PURPOSE OF US PAVILION IN EXPO 67 WAS DISPLAYING THEIR SPACE ACCOMPLISHMENTS AND SHOW ITS POWER IN DISCOVERING SPACE TO THE WORLD. THERE WERE PLATFORMS DESIGNED IN DIFFERENT LEVELS INSIDE THE PAVILION AND THE HIGHEST PLATFORM WAS DESIGNATED TO PRESENT SPACE MISSION.

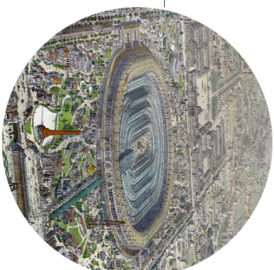


WORLD FAIRS HISTORY TIMELINE

LONDON

10.4 hectares
6.0 m visitors

Crystal Palace, one single building hosting the fair
The building construction was unique for its own time. Using modular elements in design and construction.
The afterlife: Dismantled and re-built in other location. In 1936 the great building was destroyed by fire.



15.2 hectares
6.8 m visitors

The 186,000 pounds profit from the exhibition was used to purchase a land in south Kensington. Royal Albert Hall and the Victoria and Albert museum were built after.

1867

NOVELTIES:

The Hydraulic Elevator
Artificial limbs
The rocking chair

Elliptical form

Paris Exhibition was innovative in many respects. It was the first time that an exhibition included thematic pavilions in addition to a main building. There were amusement park in the grounds surrounding the building. Theme pavilions became a hallmark of later fairs

PARIS



NOVELTIES:
Colt Revolvers
False Teeth
The telegraph

1876

NOVELTIES:

The sewing Machine
The Telephone
The Typewriter

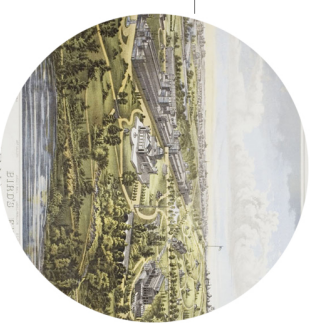
PHILADELPHIA

115 hectares
10 m visits

The site was one and half times bigger than that of largest previous exhibition.
The site was chosen at some distance from the city center in Fairmont park by the River Schuylkill, the largest urban park in the county. Space was required for 250 small and big buildings.

New hotels were on the site. (the Globe hotel, one of the several new hotels.)

- Art Gallery
- Horticultural building
- For the first time guest nations were allocated separate pavilions to present their own product
- Ohio House
- Machinery Hall
- The hand and torch of the statue of Liberty



PARIS

96 hectares
32.2 M visits

Eiffel Tower: The tower was given structural rigidity by a network of girders, the force of wind reduced by tapering the tower toward its apex and by anchoring it to a giant reinforced concrete foundation. The semicircular arches separating the legs are actually decorative, not part of the structural support system. Construction lasted from 1887 to 1889.

1889

Galerie des Machines: the building constructed with unprecedented dimensions. A width of 55 meters and a length of 420 meters (Demolished in 1910)

NOVELTIES:

Eiffel Tower
Galerie of machines
The Phonograph



BARCELONA, SEVILLE

Barcelona Seville
118 hectares 134 hectares
2.5 m visits 0.8 m visits

Barcelona 1929 remains famous for the German Pavilion – the “Barcelona Pavilion” designed by Ludwig Mies van der Rohe. The other exhibition buildings have been forgotten throughout time.

Two sites were named for the first time at the same time: Barcelona and Seville. In Barcelona, the principal themes were to be “Industry”, Spanish art, and sports. And in Seville the theme was to exhibit Spain’s colonial wealth.

1929

There were several movements waging stylistic war on the Barcelona site. Art Deco, Catalan Modernism and noucentisme.

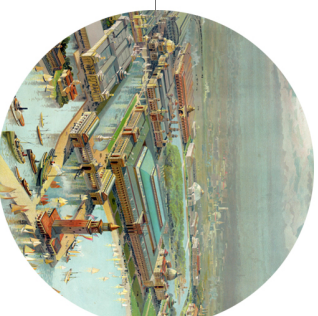
It was not the first time that an extraordinary work of exhibition architecture was not immediately recognized as such: both the Eiffel Tower 1889 and Le Corbusier’s Esprit Nouveau Pavilion 1925.

CHICAGO

290 hectares
27.5 m visits

The Size of the exhibition sites became increasingly large and surpassed the European expositions. Frederick law olmsted was developing a park before the exposition Jackson park was chosen for hosting the Expo. It was 10 km distance from the centre of the city
Water became a key element to design the site and organizing the buildings. Canals and artificial lakes connected to Lake Michigan were planned as a system to define the position of different buildings.

1893



CHICAGO

170 hectares
40 m visits

Known as 'A Century of Progress International Exposition', held along the Chicago lakefront (three mile stretch and artificial land). In the midst of the great depression, the exhibition was a sign of hope to help the dismal economy.

Louis Skidmore was chosen as chief of design, and the site was divided up between multiple architects, and each architect was responsible for the design of his own section.

1933

Impressive Buildings:

- Travel and Transportation building by Holabird, Bennet, and Burnham
- Sky Ride, and elevated tram system ran between 628 ft towers placed 2000 ft apart
- The House of Tomorrow by Keck and Keck (3 lvl octagonal structure).
- The Crystal House (3 story structure with walls of glass panels)
- The Italian Pavilion by Adalberto Libera, with its giant fascias strands out to represent the Fascist movement.



200 hectares
41.5 m visits



1958

The Atomium designed and constructed to be a symbol of peace in the midst of cold war, containing bars and a restaurant, it had nine spheres which the idea derived from a molecule that was magnified 150 billion times.

Similar to the Eiffel Tower, the surrounding community argued that the building was disproportionate to the surrounding context, and it was fiscally inappropriate. But, the building survived after the world fair like Eiffel tower and became a symbol of Brussels.

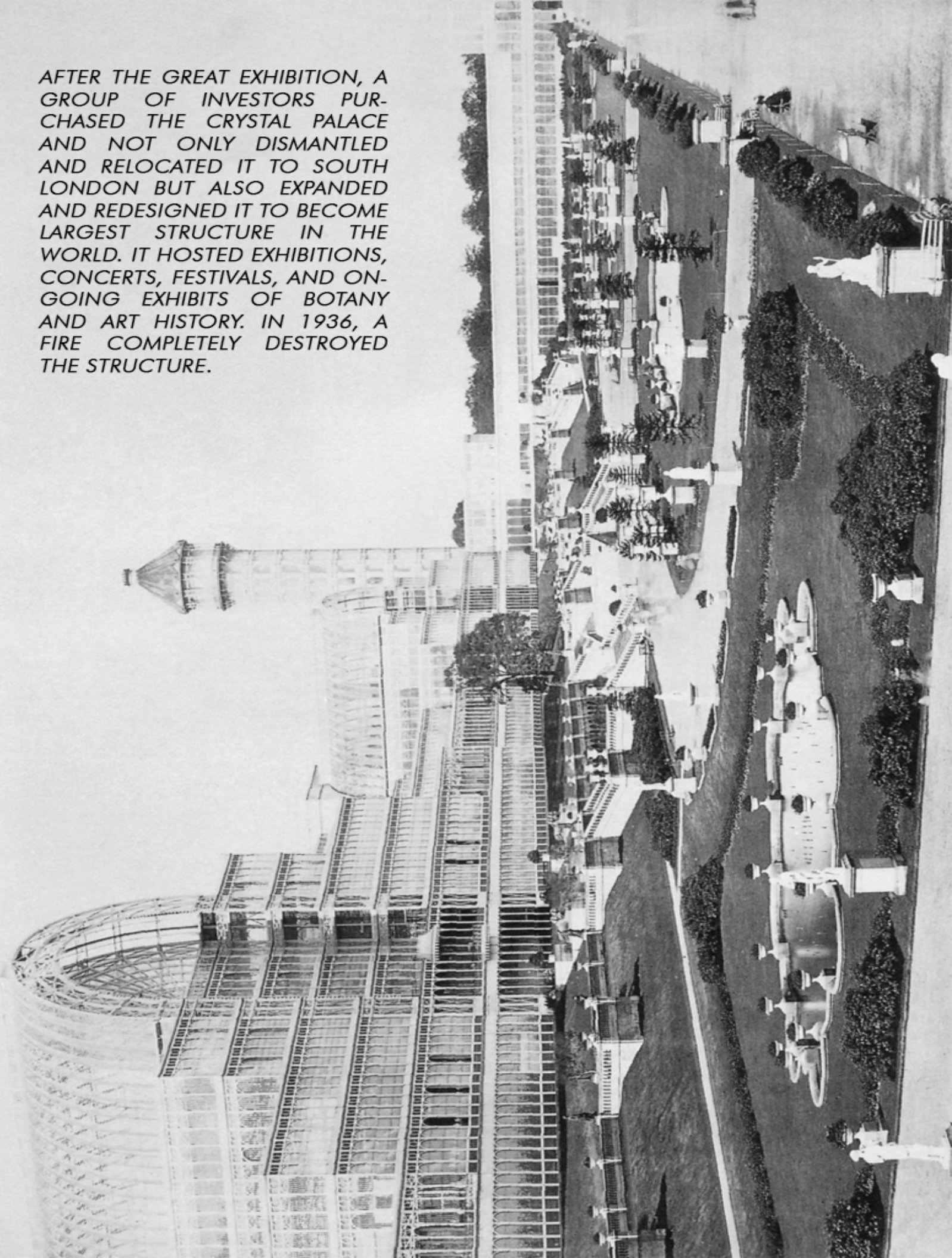
Hyperbolic Paraboloid pavilion designed by Le Corbusier
German Pavilion designed by Egon Eiermann
Brazilian Pavilion designed by Sergio Bernardes
Civil Engineering Pavilion

BRUSSELS

WORLD FAIRS AFTERLIFE

World fairs afterlife has always been questioned since the purpose of the world expos is mostly providing a situation for countries to exhibit their accomplishments for a short period of time. Thus, most pavilions after world fairs will be demolished or dismantled due to their temporary functions. In this regard, there is no trace of majority of World Expos throughout history which makes world fairs sites and buildings relatively unimportant after their existence.

AFTER THE GREAT EXHIBITION, A GROUP OF INVESTORS PURCHASED THE CRYSTAL PALACE AND NOT ONLY DISMANTLED AND RELOCATED IT TO SOUTH LONDON BUT ALSO EXPANDED AND REDESIGNED IT TO BECOME LARGEST STRUCTURE IN THE WORLD. IT HOSTED EXHIBITIONS, CONCERTS, FESTIVALS, AND ON-GOING EXHIBITS OF BOTANY AND ART HISTORY. IN 1936, A FIRE COMPLETELY DESTROYED THE STRUCTURE.



The crystal palace exhibition had a noticeable influence on art and design education, global trade and relation and also tourism. The exhibition also served as a model for the numerous global exhibitions that emerged after it.



Figure 09: Crystal Palace after fire

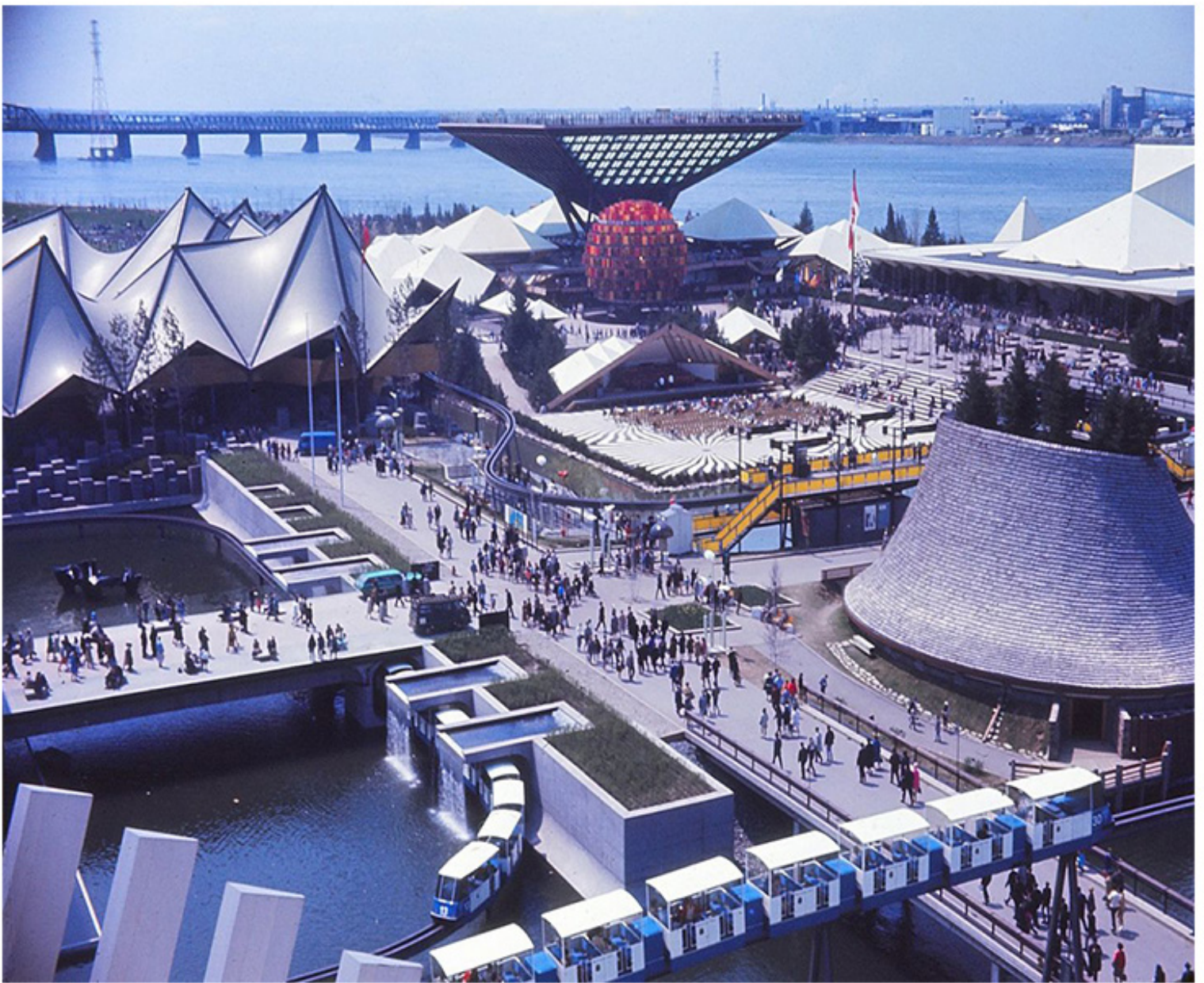


Figure 10: Expo 67, Montreal, Canada

The site and the most of the pavilions remained in use after Expo 67 ended in October 1967 as Man and His World, a summer event that occurred from 1968 until 1984. By then, the majority of the structures, which were not intended to last after the initial exhibition, had deteriorated and were dismantled. The original location of Expo 67 on Saint Helen's Island and Notre Dame Island was turned into a municipal park maintained by the city of Montreal after the majority of pavilions and artifacts were destroyed between 1985 and 1987.

FUTURE PLANS FOR DUBAI EXPO



Figure 11: Dubai Expo

Expo City: a model global community for the future

Some pavilions in Dubai will stay after the exhibition ends. The sustainable, human-centric smart city will reuse at least 80% of the Expo-built infrastructure, including LEED Gold and Platinum-certified buildings. As an integrated mixed-use community, it will carry on and fulfil Expo's founding vision to be an ecosystem to connect, create and innovate.



Figure 12: Dubai Expo Afterlife

RESEARCH METHODS

The information this project needs before the initial design would be regarding to previous world fairs outcomes, afterlife, long-term/ short-term uses, and previous pavilions. Different techniques for gathering these information would be library research, diagramming, and design research. Following, I will be describing two primary reserach methods I am going to use for the thesis.

Comparisons. Since I am studying the history of World fairs and history of pavilions in different time, location. Comparing the gathered information would help me to find my design approach for the thesis. By doing so, there would probably be multiple strategies from each design or group of projects which I can find suitable ideas and bring them to my thesis. (Design diagram from the precedents)

Scenarios. My thesis is about designing a world fair for future so technically it is an anticipation of future world's fair and I need a scenario/story regarding to how I am going to organize the next possible world fair for people and countries.

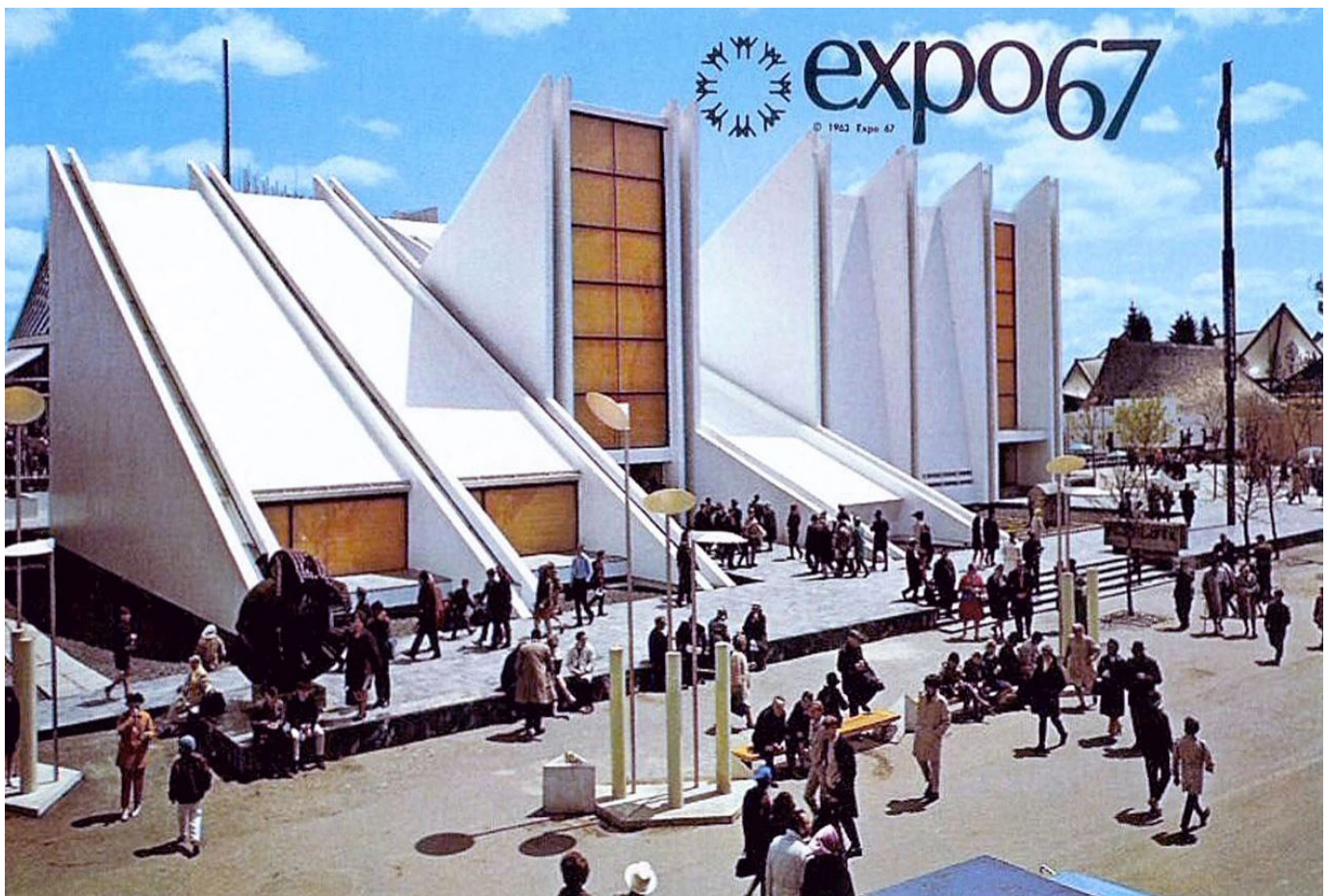


Figure 13: Yugoslavia Pavilion expo 67

THESIS STATEMENT

Given that World's expos have lost many of their initial capacities to represent global ideas on an architectural stage, and also operate as an unsustainable temporary mega-project, I question how World's Fairs can be more inclusive of disparate identities to better reflect world cultures, while simultaneously cultivating a more sustainable afterlife.

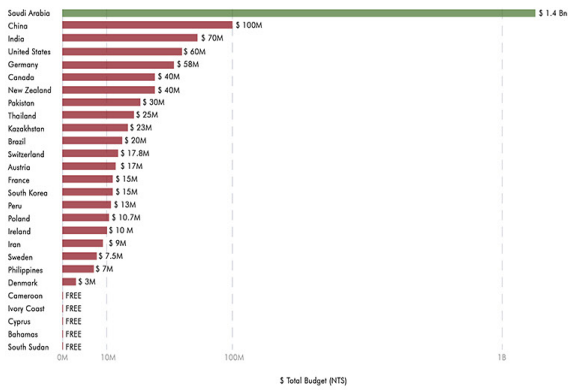


There are two largely unresolved issues when it comes to World fairs. The Afterlife and inclusivity of the world expos has always been questioned.

Since it is a temporary event most of the pavilions had been dismantled and demolished after the fair. There is no any trace of most of them since the first world fair. New York world fair 1939 For example, when it closed in the last week of October 1940, about \$75 million worth of construction (in 1940 dollars) had to be dismantled on a deadline.

Montreal 67 for instance, there were 95 pavilions and only five left. You can see that these green areas are still green but all those pavilion are gone. Milan Expo for example, all these facilities and pavilions dismantled and only two or three left. And right now it is a vast area of land.

BUDGET INVESTED FOR EACH PAVILION, DUBAI EXPO 2020



SAUDI ARABIA, SOUTH KOREA, CANADA PAVILIONS

LYBIA, VENEZUELA, CYPRUS PAVILIONS

The layout of world expos is not inclusive. Not all countries have equal opportunities to represent themselves. The more money countries invest in their pavilions, the better and bigger pavilions they can have and the more visitors they attract at the end.

The chart is for budget invested for each pavilion in Dubai Expo. Saudi Arabia spent 1.4 Billion \$ just for their pavilion and the second place was China with 100 M, India 70 M, and it comes down but there were countries that got free pavilions in Dubai Expo. Some countries either don't have the budget to pay that much or they don't want to spend that much. And there is a huge gap between Saudi Arabia, South Korea and Canada's pavilions and Lybia, Venezuela, and Cyprus in terms of design and the scale. Needless to say that visitors would like to visit those countries because they have bigger and nicer looking pavilions. So countries don't have equal opportunities to represent themselves.

PRECEDENT



EXPO MILAN 2015, CONCEPTUAL MASTER PLAN BY HERZOG AND DE MEURON

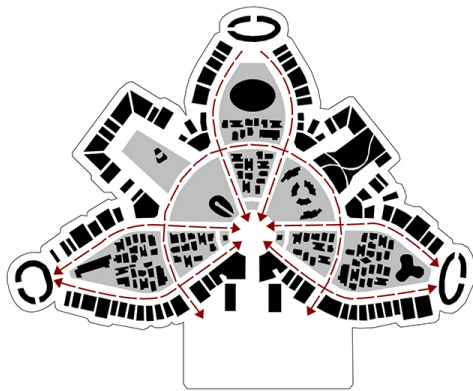
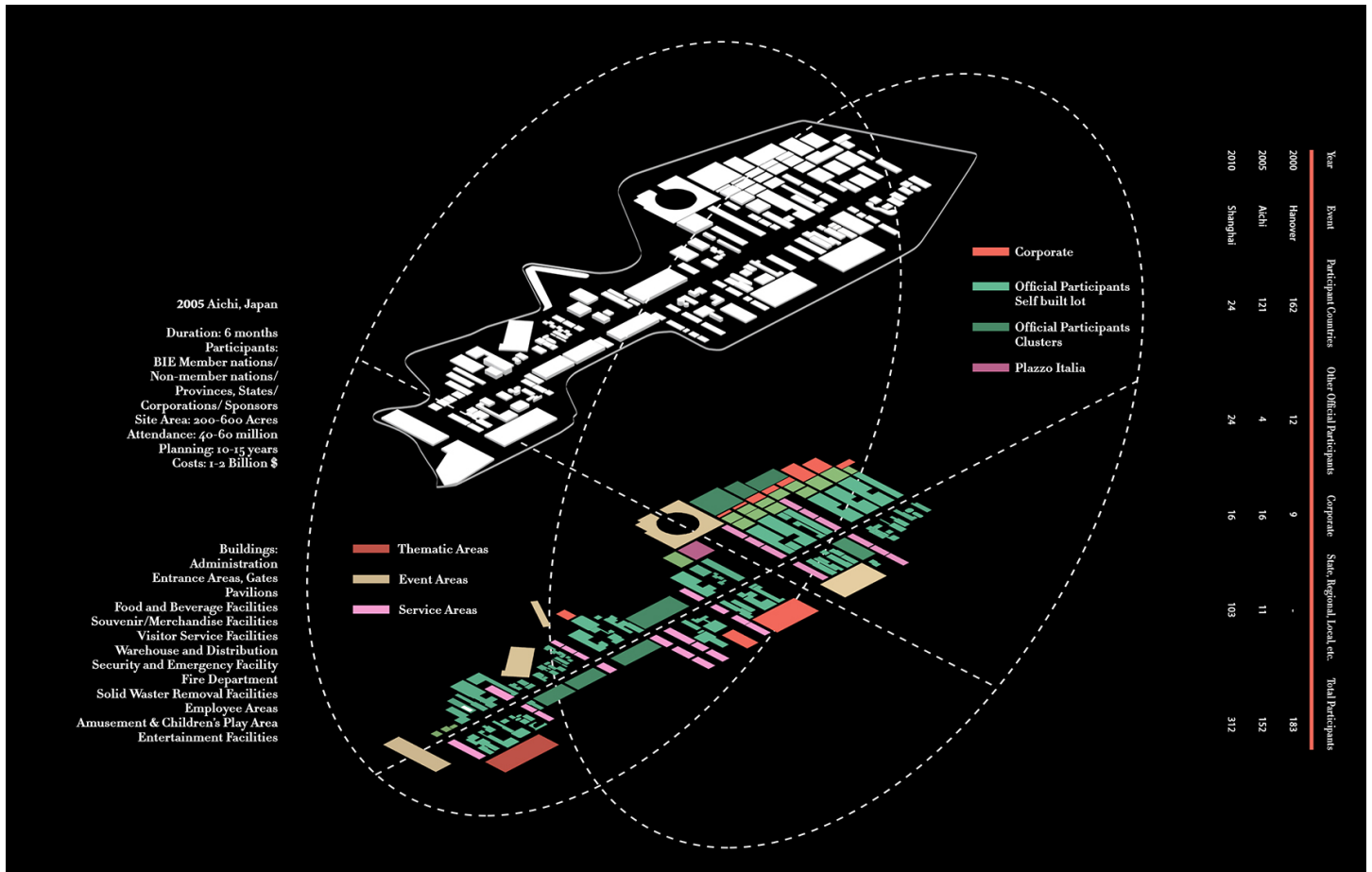


WHAT A BORE AND A WASTE OF MONEY AND RESOURCES. WE DECIDED ONLY TO ACCEPT THE INVITATION TO DESIGN THE MILAN MASTERPLAN IF OUR CLIENT WOULD ACCEPT A RADICALLY NEW VISION FOR A WORLD EXHIBITION; ABANDONING THESE MONUMENTS OF INDIVIDUAL NATIONAL PRIDE THAT HAVE TURNED ALL EXPOS SINCE THE MID. NINETEENTH CENTURY INTO OBSOLETE VANITY FAIRS.

**"THE CONTENT OF THE EXHIBITIONS SHOULD MAKE THE COUNTRIES
LOOK DIFFERENT, NOT THE SIZE OF THEIR PAVILIONS."** JACQUES HERZOG



COMPLEX DRAWING



DUBAI EXPO 2020



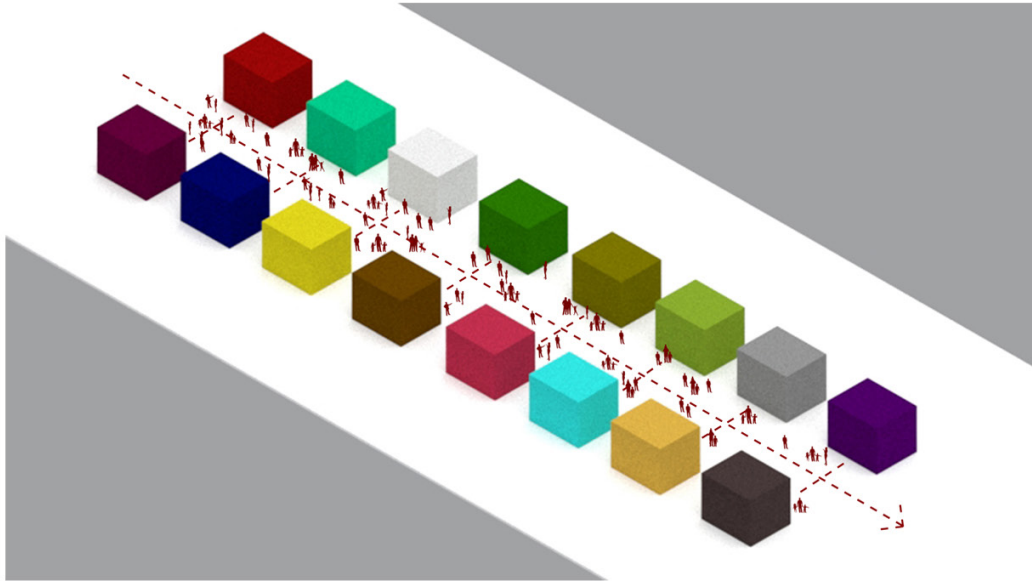
MILAN EXPO 2015

I started with recent expos, tried to dissect the Milan Expo and break it down into pieces to understand how world expos operate. How much of the site includes pavilions, outdoor events, corporates, service areas and what other supportive buildings are needed.

Moreover, have a big picture of Dubai Expo and Milan Expo, how big the sites are and how the circulation works.

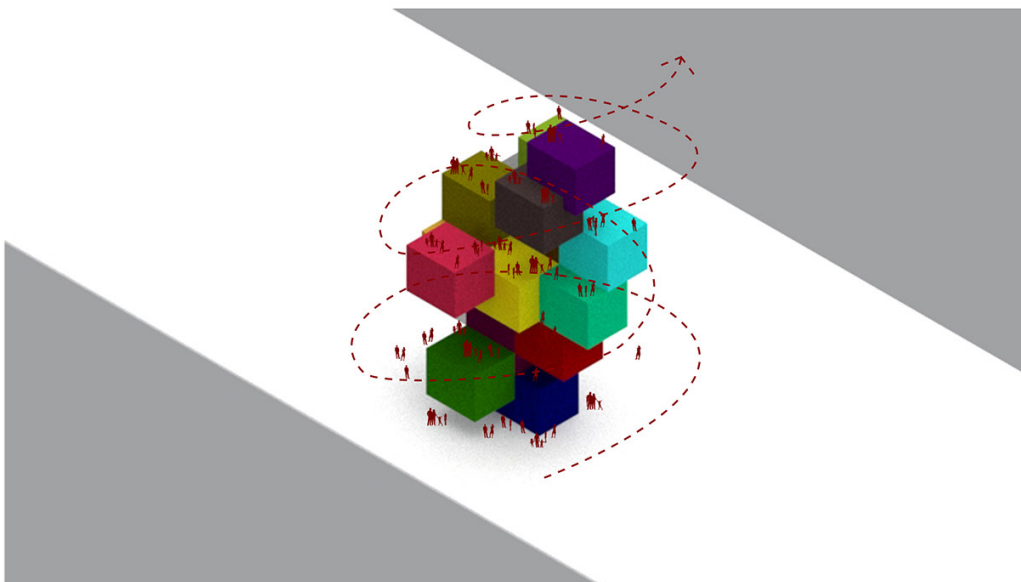
Dubai Expo site was 300 Acres and Milan Expo was 200 Acres. Two major axes of circulation, and pavilion were on each side. Dubai Expo had 3 main gates and a central plaza that circulations ended up in the center of the site.

DESIGN DECISIONS



Existing Condition

Depending on which pavilion is fancier and bigger in scale, it gets more attraction and more number of visitors. Pavilions are located in a large site and people check the pavilions one by one.



Eliminating the Gap

Merging the countries together in order to eliminate the gap and separateness between them. Visitors will go on a journey in this expo to explore all countries together instead of checking the pavilions one by one.

There is a huge gap between countries who participate. Countries that can spend more money on their pavilions will attract more people and countries that cannot spend or don't want to spend millions of dollars will not get enough attention. More than that, we don't know what these countries are actually representing. There are multiple forms of identities within each nation and in this global event, it is important to consider what we are experiencing within these pavilions. So what we are looking for is something beyond national identities, Something **Transnational**.

So the idea is to bring a new **identity** to the Expo, and change the experience of this event. Now how people experience it is, there are pavilions next to each other and people go visit one by one and if we consider 30min on average, they probably visit 15-20 countries at the end.

But what my idea is to eliminate the nations' names and remove the gap between them and bring all in one. And in this way people will go on a journey of experiencing all in one instead of one by one.

And now there are not countries who participate, there are people from all around the world, that can apply to be there. And I thought what brings people together in daily basis, **Food** is probably the most important one. **Music**, **Art**, and **sport** are four major categories that expo is organized under these four.

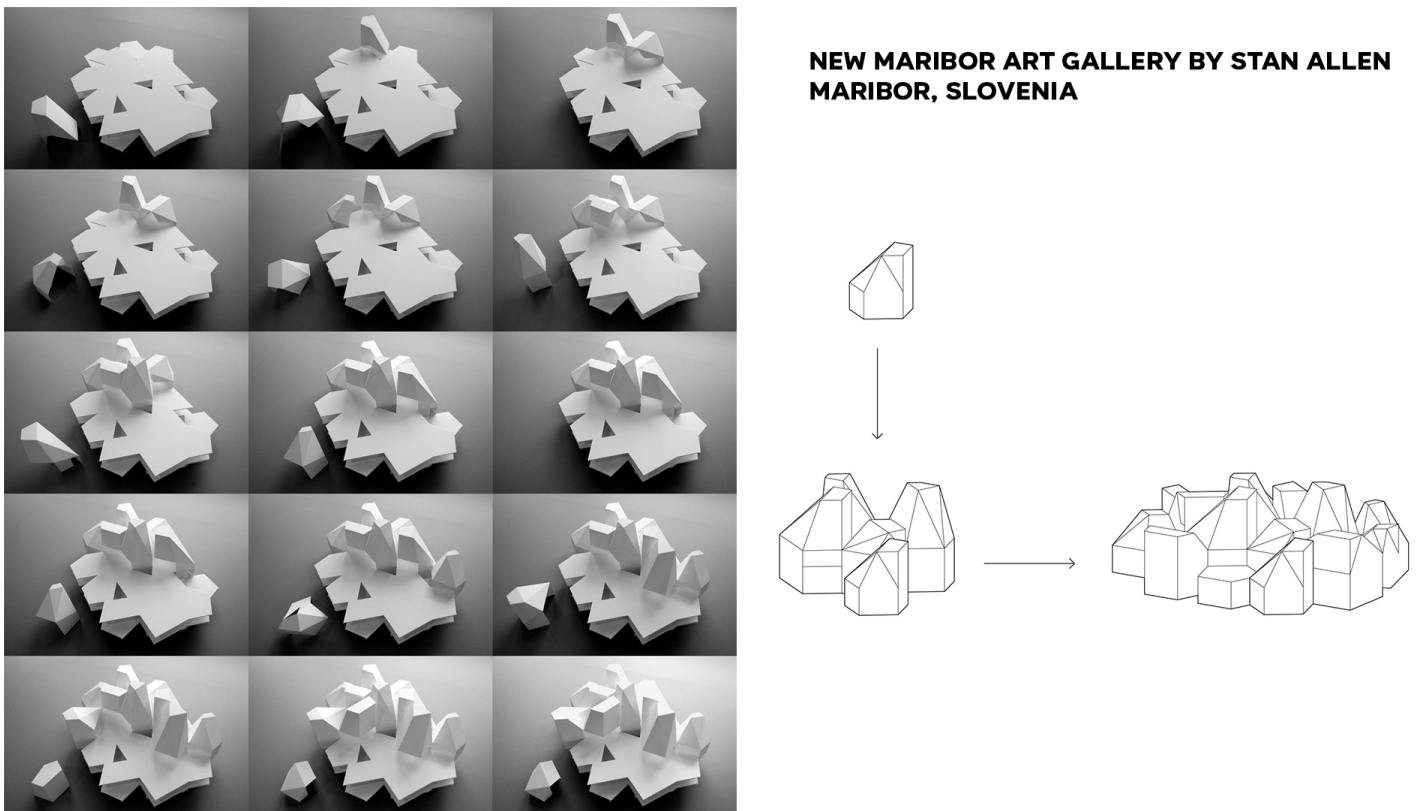
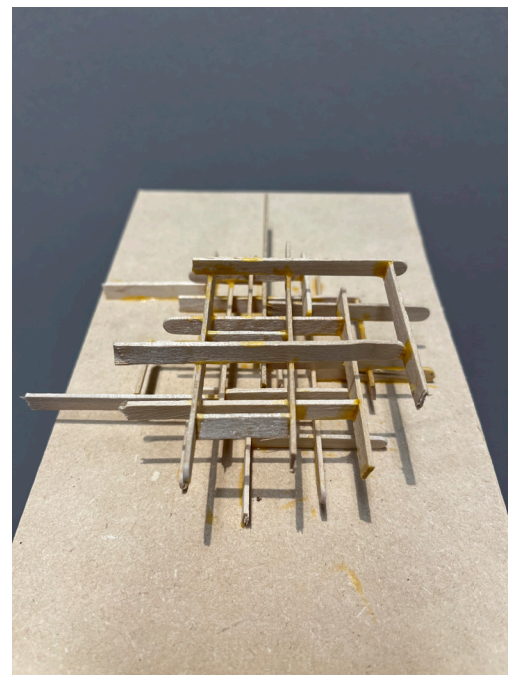
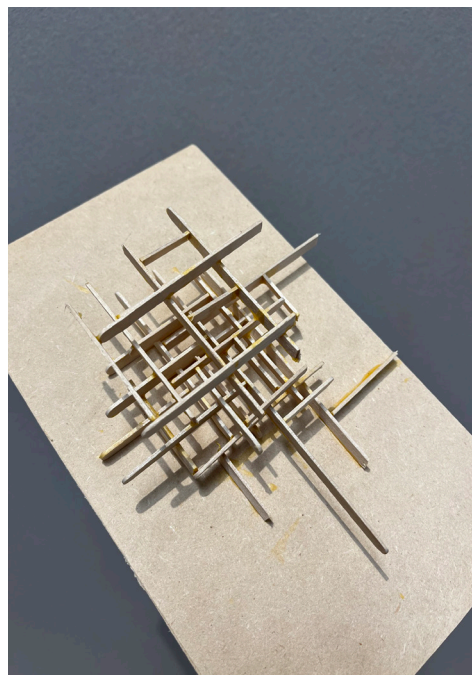


Figure 14: Art Gallery by Stan Allen

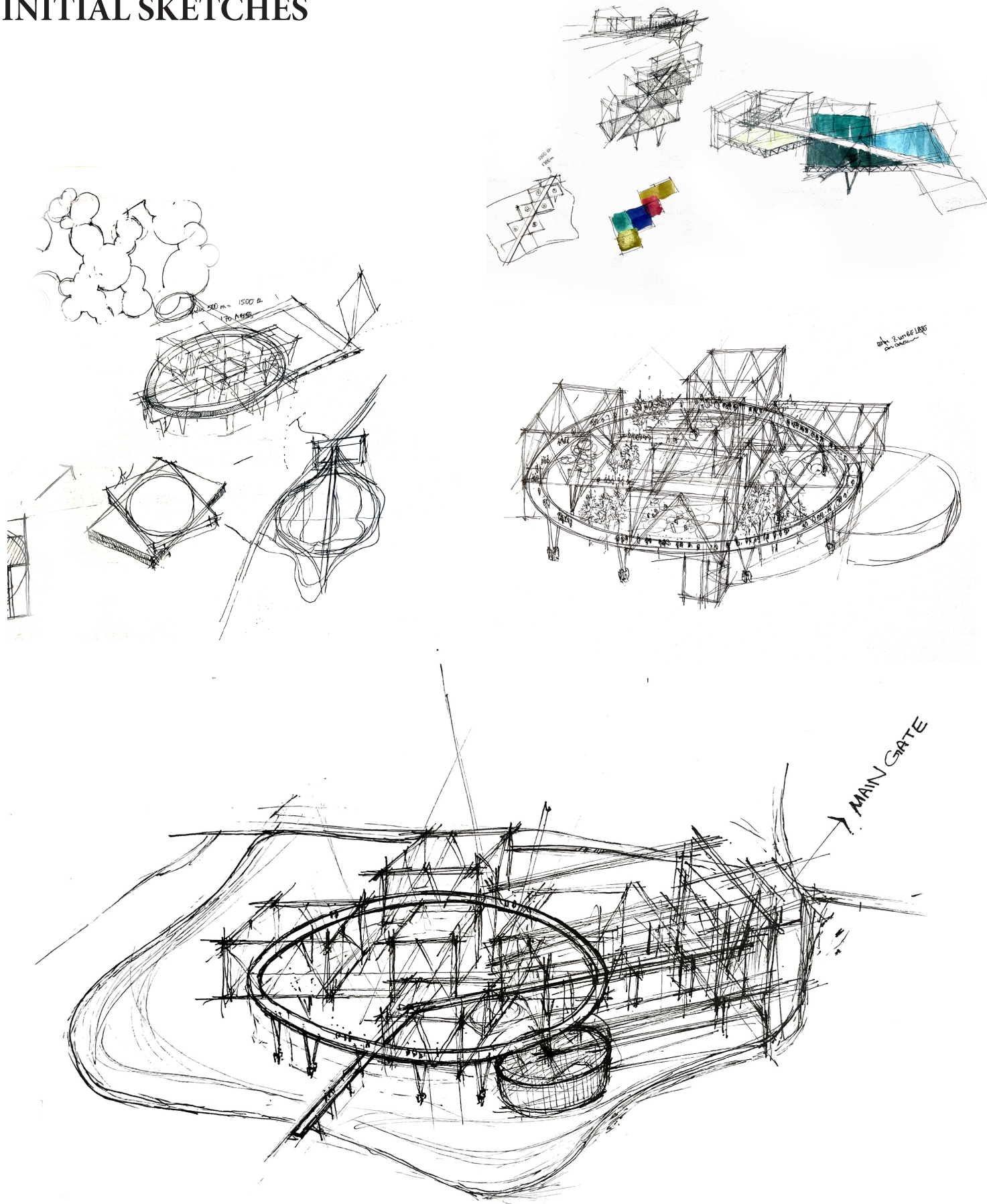
WUNDERKAMMER



So my design started with my Wunderkammer model. This is an abstract way of organizing the expo. these boxes represent the clusters and the different colors represent the categories. And they are all in one structure and people would experience all in one.



INITIAL SKETCHES



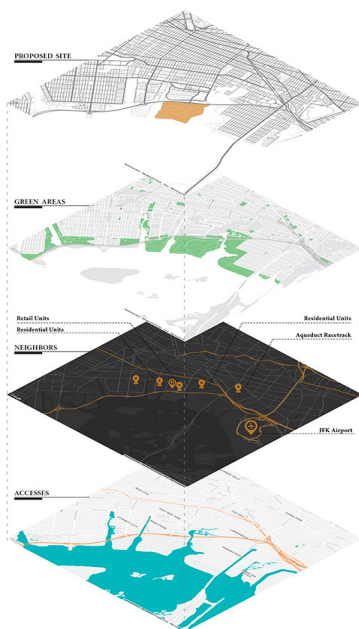
SITE SELECTION

World fairs mostly were located in minor cities such as Montreal 67, OSAKA 70, Hannover 2000, Zaragoza 2008, to help the city to be seen and bring tourists to the site. In this regard, for developing the forgotten area I believe this site could be a good option.

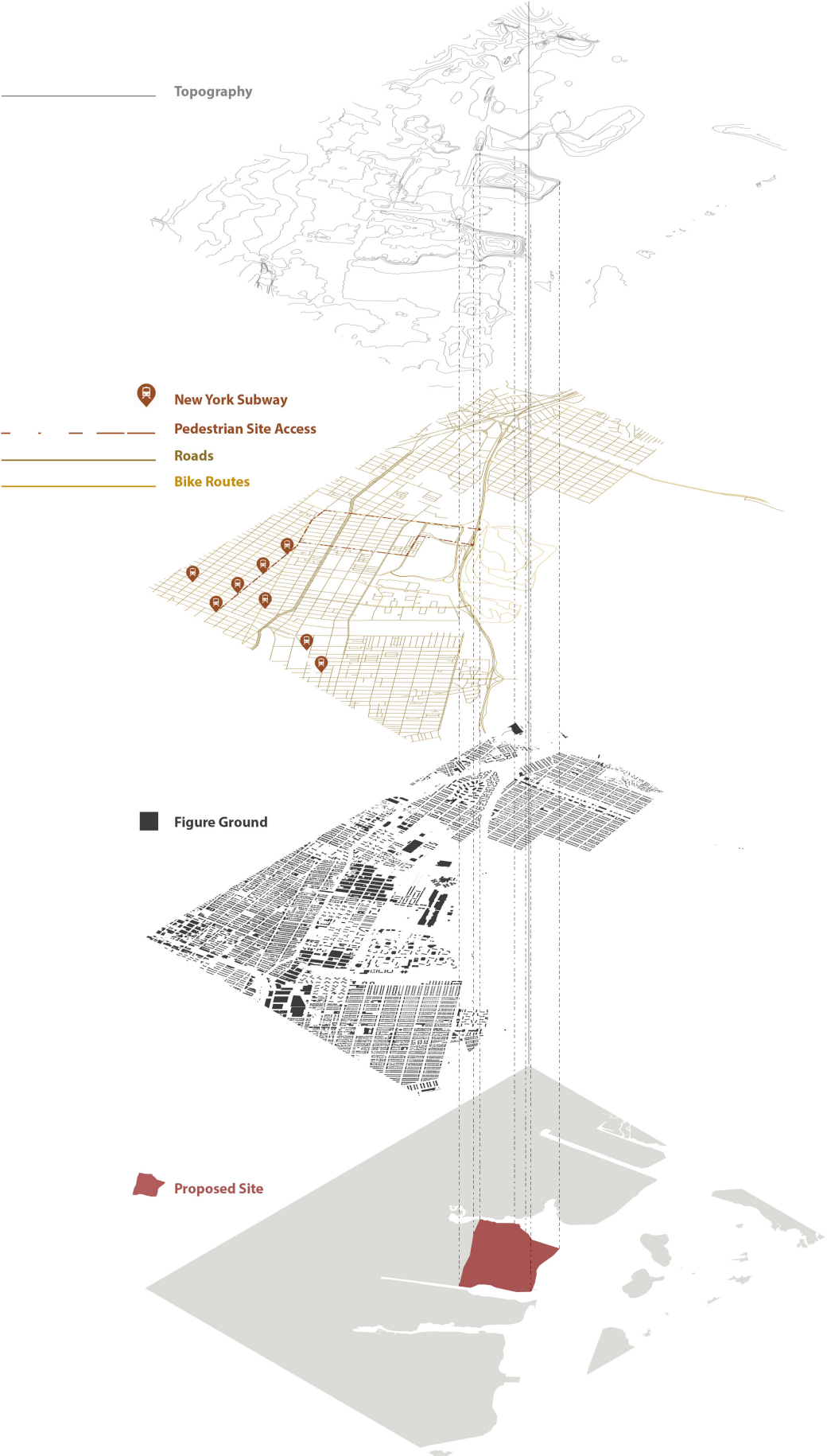
I picked the site in New York, Brooklyn area. There were couple reasons for it. First, Manhattan is already packed so we wanted to bring the attention to this side of the New York. Second, New York hosted the expo twice so its history is tied to world fairs. And it is one the most diverse cities in the world which can be beneficial for visitors.

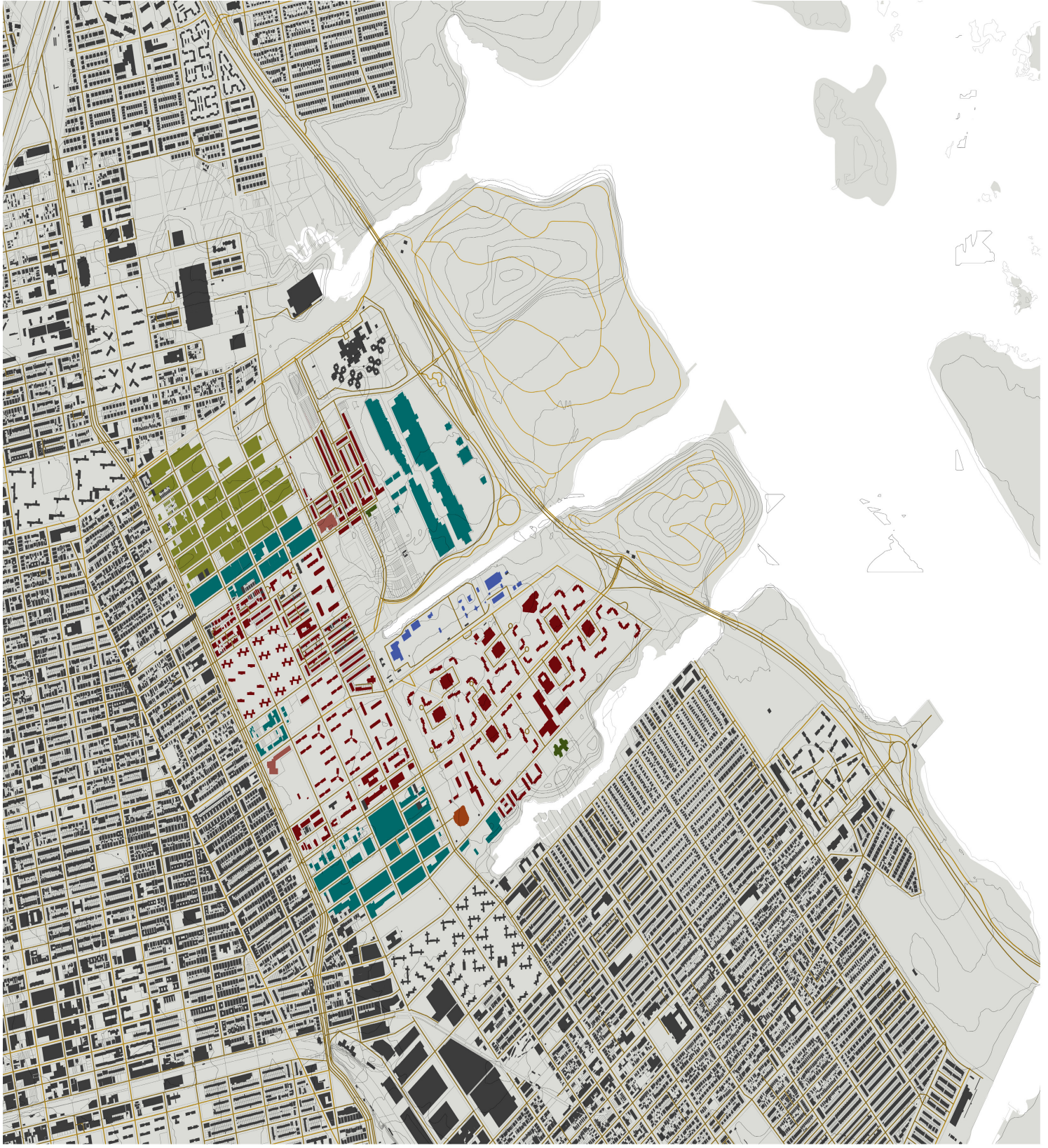


NEW YORK SITE ANALYSIS

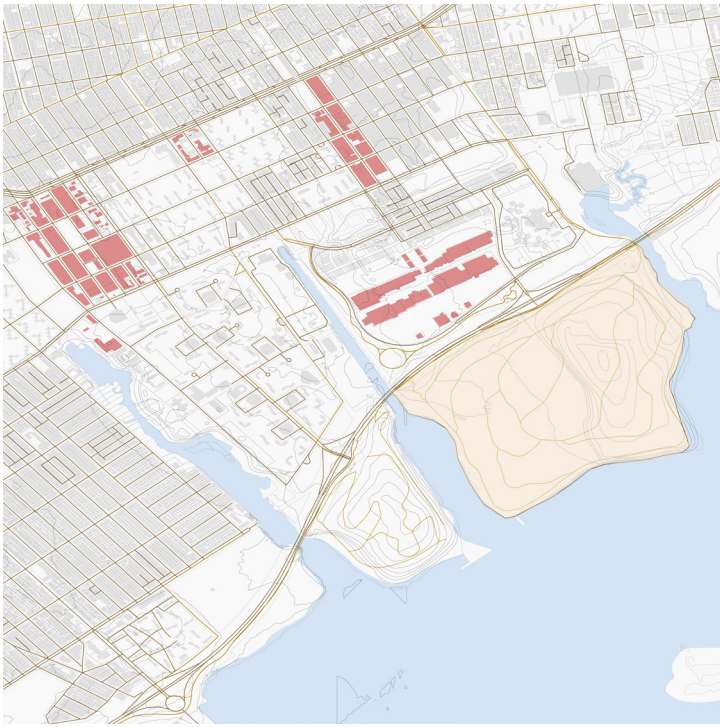


SITE ANALYSIS

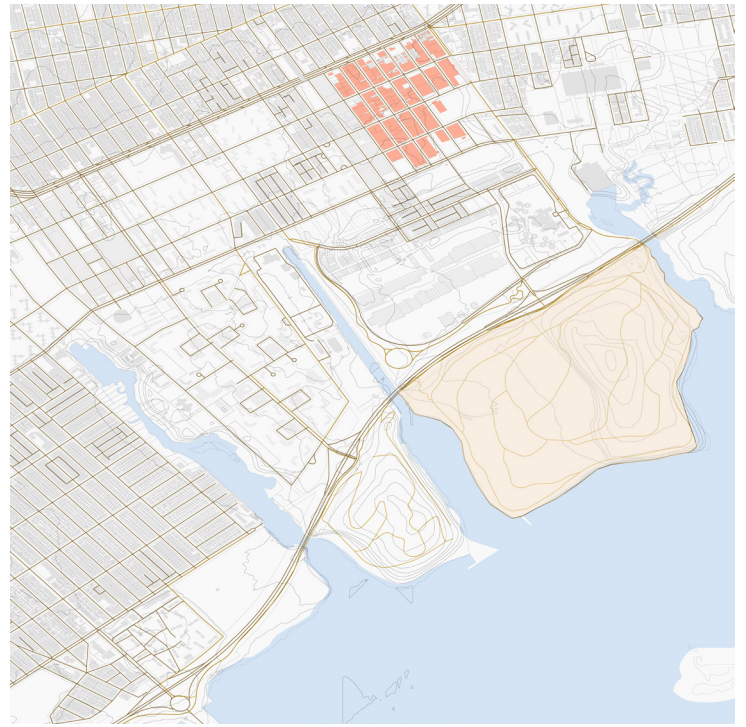




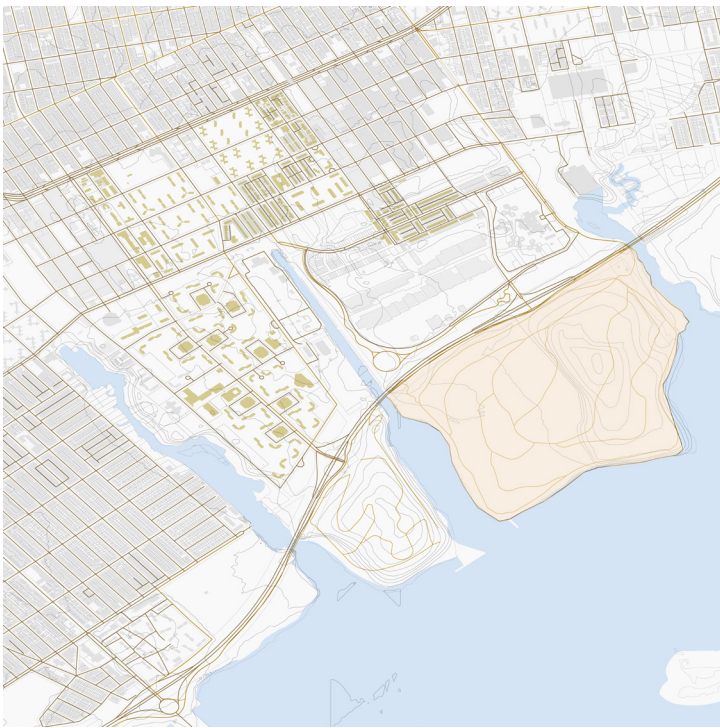
- Residential
- Commercial
- Industrial
- Healthcare
- Education
- NYC Water department
- Worship



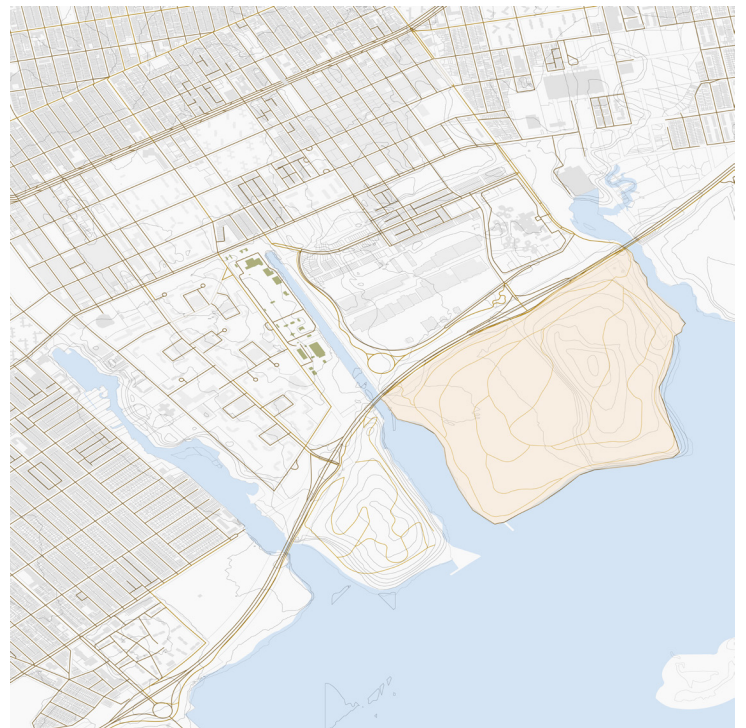
COMMERCIAL



INDUSTRIAL



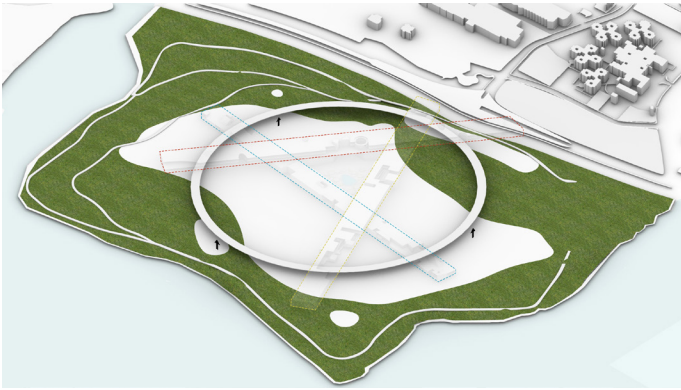
RESIDENTIAL



NYC WATER DEVELOPMENT

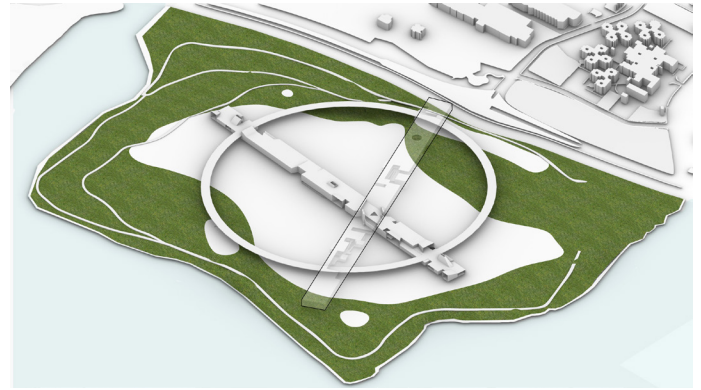
The site size is around 300 Acres national park. There is bicycle track around the site and it does not have much more than bicycle tracks on it. So One of the main idea is not only destroy the site to put pavilions on it but also develop the site for the future use. Moreover, It is very close the JFK airport the last subway station is relatively adjacent to the site in 20 minutes walking distance.

DESIGN PROCESS



1. Circular Pathway

Elevate the path 60ft high of the ground and place the three bars on it.



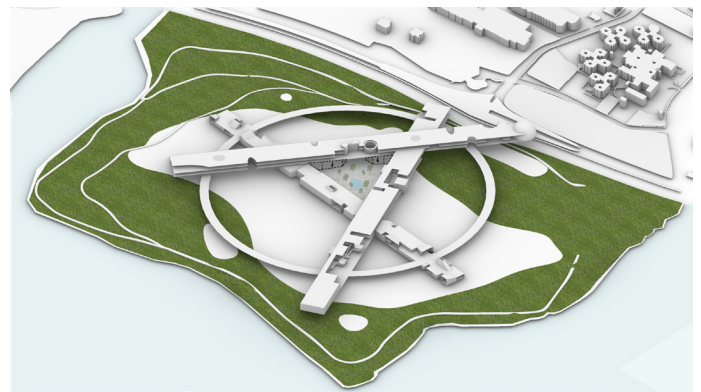
2. Art Section

Elevate the Art bar 30ft of the ground and carved it out in a way to define interior spaces and provide light for interior spaces.



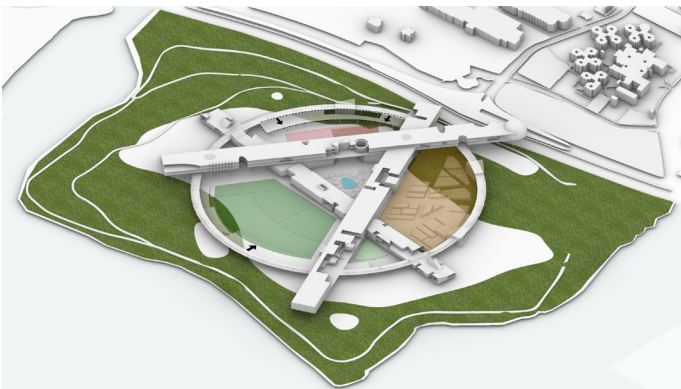
3. Music Section

Place it on top of the art bar which the first floor of the music section intersects with second floor of the Art Section.



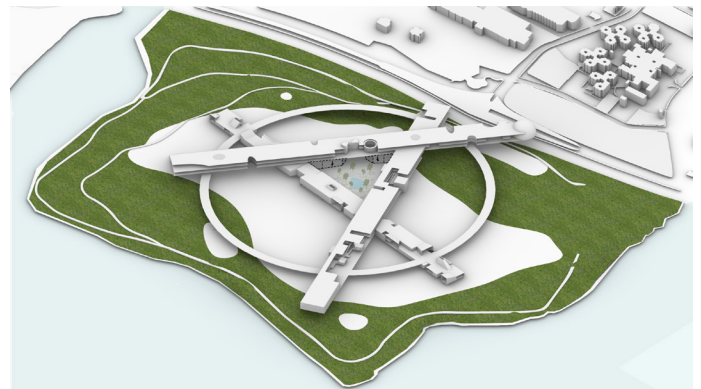
4. Sport Section and Food Plaza in the Center

Food Plaza is the central gathering space in this project where people can experience different types of food here.



5. Outdoor Functions

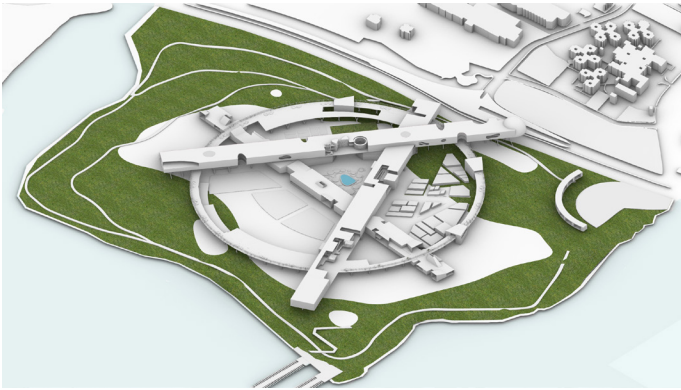
There will be outdoor concert venues, outdoor sport fields and international, supportive buildings within the big circle.



6. Accesses

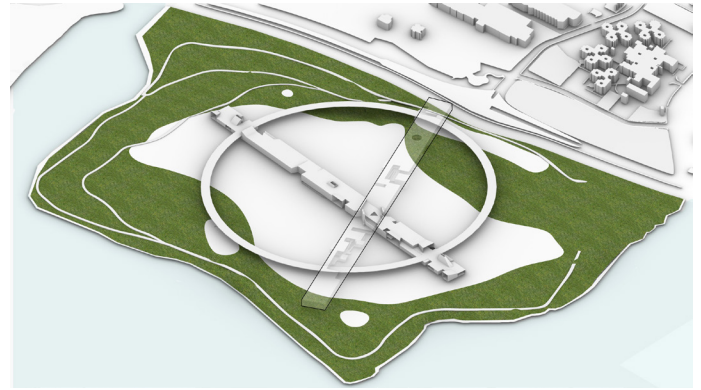
There are one primary entrance from the land and one secondary entrance from the bay to the Expo.

DESIGN PROCESS



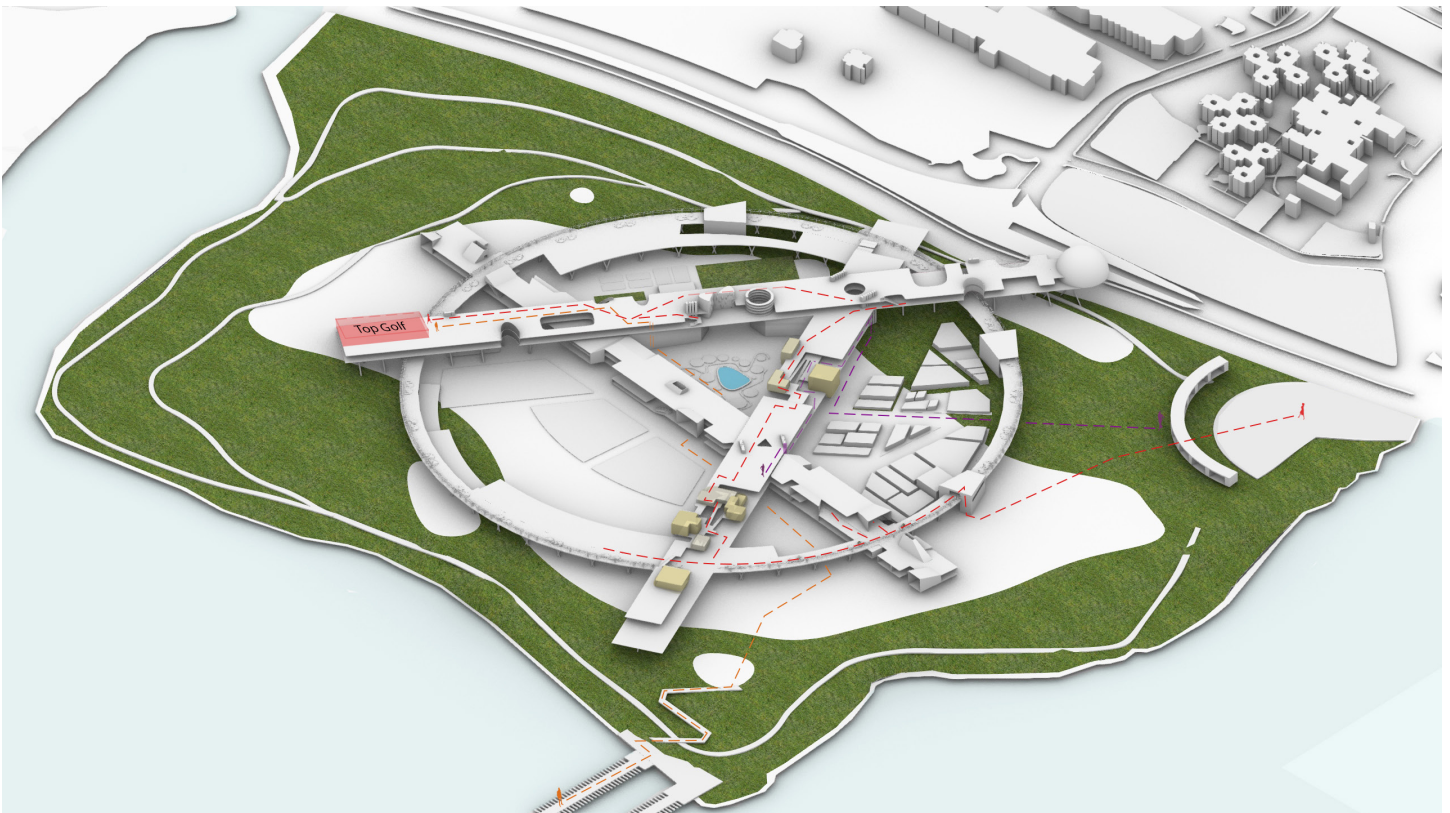
7. Full Circle

The transportation is provided by the Expo from different locations in New York.



8. Walking Distance

Getting from one end to another in one bar takes 10 min on average.



9. Circulation

There are multiple options for people to circulate through the complex and experience the sequence of spaces

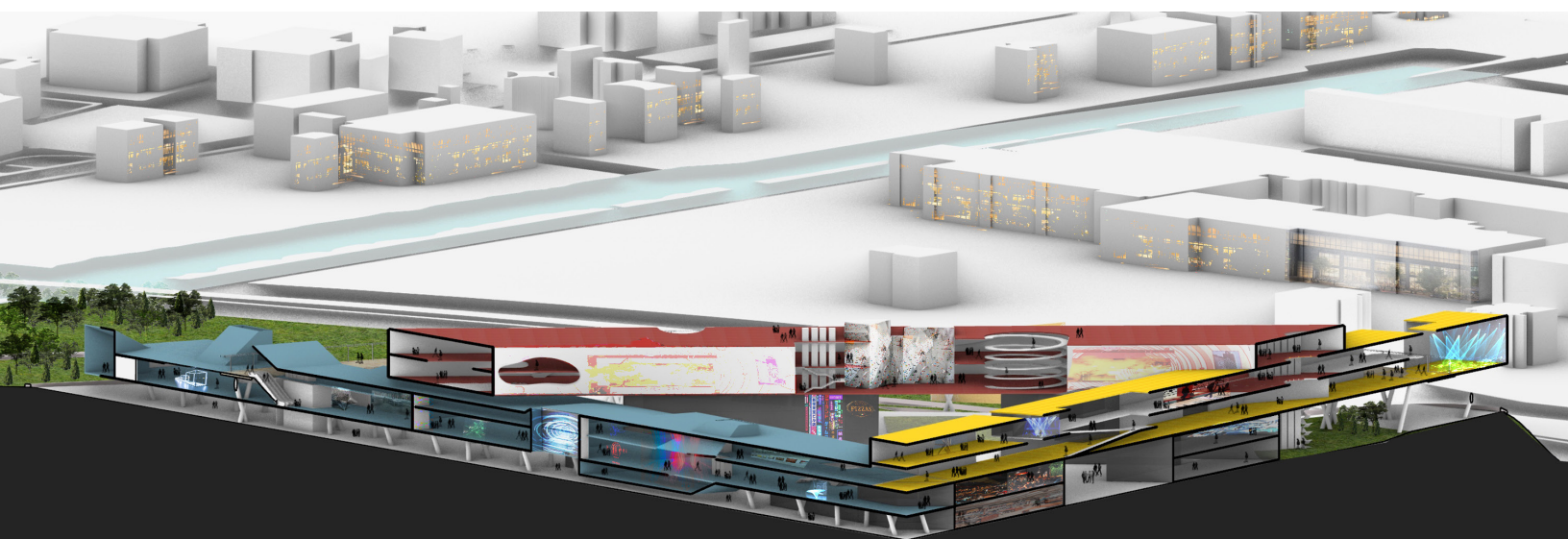
The design starts with circular pathway as a unifying field elevated 60ft of the ground. It is 2200 ft wide and there would be three bars for four categories on top of it. Art, Music, Sport, and the intersection of them creates the food in the center as a central plaza.

Each bar is 2000 ft by 200 and 60 ft high. Each bar is carved out differently because they have different functions in them. And by doing this I was able to provide interior spaces, getting natural light, creating visual connection between bars, and have the openings which are corresponding to its surrounding.

The bars are stacked on top of each other which the first floor of the music intersects with the second floor of the art, and the first floor of the sport intersects with the second floor of the music. Whatever we have indoor, we have outdoor as well. There will be outdoor concert venues in this area, outdoor sport events in this area and supportive buildings, corporations, internationals pavilions and other required buildings within the big circle.

Because all these spaces are interconnected, there are multiple ways of getting from one point to another. If one person (A) is coming from the land and one person (B) is coming from the bay and they want to go to the top golf in this corner in sport section, person A can be on the ground level, pass the outdoor concert venues, go to central plaza, take the elevator and go inside and then reach there, whereas person B can be on the circular pathway go inside the music and pass all these activities, and then get to the sport section.

In diagram below the activities and circulations are shown. If you're in Art space which more people start from there, you can go to indoor food or change your level and visit the music and move on to the sport and this way is how you can circulate through the space. Way finding is also important in such a complex building and that's why color is used so people can identify where they are standing and where they are heading.



SITE PLAN



FIRST FLOOR PLAN (ART SECTION)





GARDEN PATH VIEW



INTERIOR ART SECTION VIEW

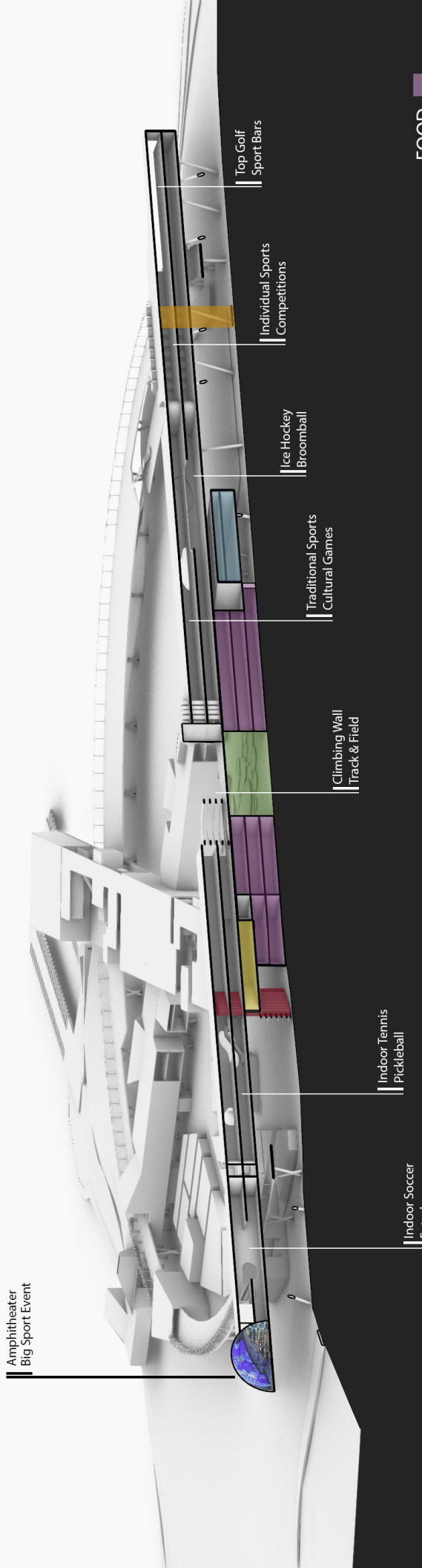


CENTRAL FOOD PLAZA

On the circular path, a garden path, a peaceful space is designed for people to get in or out of indoor spaces. They can sit there and enjoy their time watching bay and interacting with others.

In the central plaza, people will experience something that they usually cannot experience. There would be food from all around the world. They can experience indian street food, French café, Chinese food, Persian food, mediterranean food, and I designed a common table that people can take their food and sit there and enjoy their food together. Just imagine the Smell of food and the trees around and sound of water and live music is playing and people are interacting with all things around. That's why people want to go to World Expos and have vibrant time.

Amphitheater
Big Sport Event



- FOOD
- MUSIC
- ART
- CENTRAL
- V. CIRCULATION
- EGRESS

Top Golf
Sport Bars

Individual Sports
Competitions

Ice Hockey
Broomball

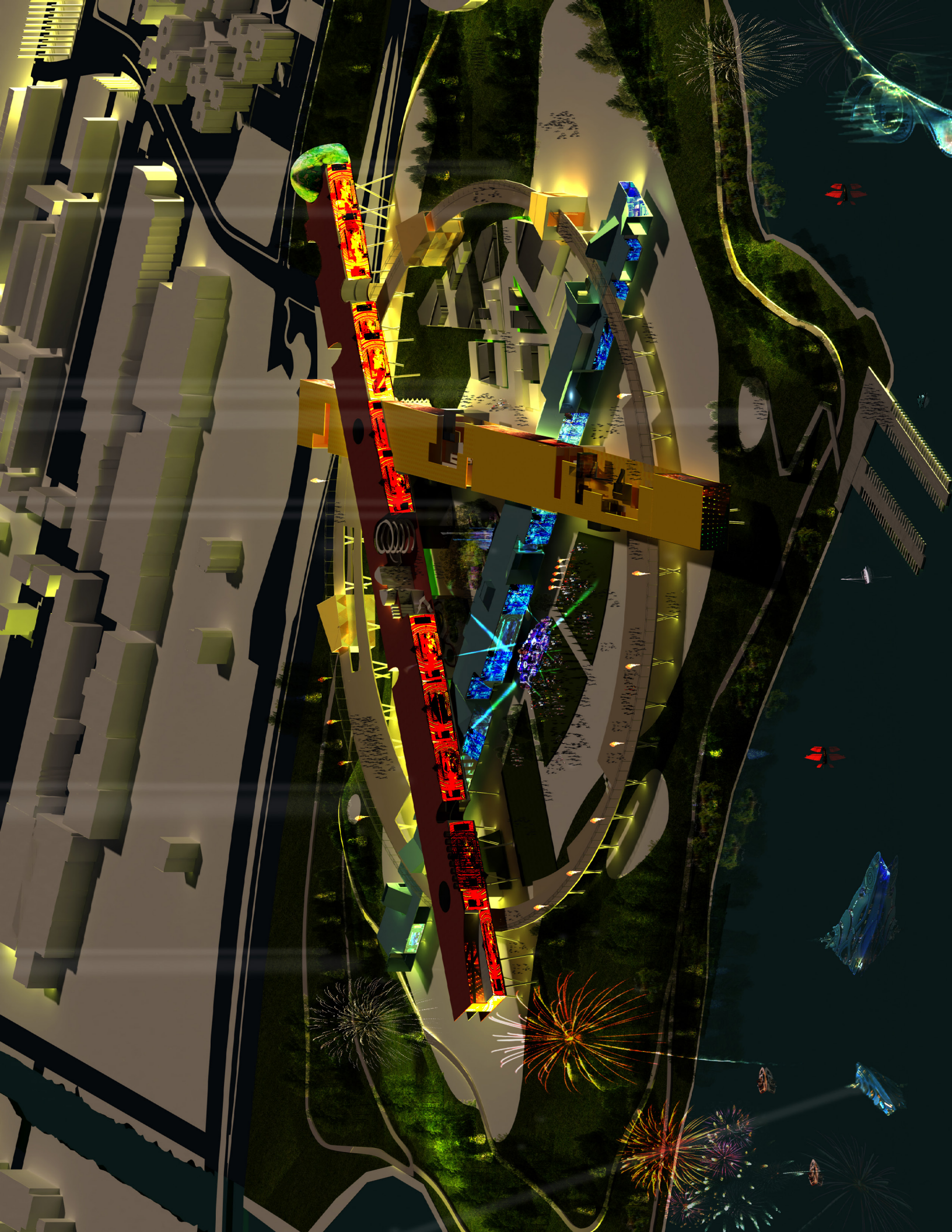
Traditional Sports
Cultural Games

Climbing Wall
Track & Field

Indoor Tennis
Pickleball

Indoor Soccer
Futsal





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