

QATAR BEYOND DOHA

By  
Sara Katami

A Senior Honors Thesis

Presented to  
the Faculty of the Gerald D. Hines College of Architecture  
and Design  
University of Houston

In partial fulfillment  
of the requirements for the degree of  
Bachelor of Architecture

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*"The most dramatic difference occurring along the southern borders of Qatar where massive sand-dunes rise abruptly from a level desert plain...Even the low, flat plains are full of interest for here one may encounter evidence of ancient settlers, not by digging, but right on the surface, where wind, sun and rain have played their part in eroding the substrate."*

In the book "The Heritage of Qatar", authors Peter Vine and Casey Paula provide an insight into Qatar's history through its natural history and culture. The artificiality of landscape in Doha has replaced the once bare desert land of Qatar. In Doha, development and building technology focuses on integrated and master-planned communities, a generic building type that shifts from Qatar's local tradition. In the area outside Doha, technology is seen through its historical and ecological context. The desert of Qatar, with its vast open landscape, is structured by a series of land depressions, sinkholes or caves, sand dunes, mangroves, and salt flats known as "sabkhas". Aside from Qatar's desert ecological context its historical context is expansive. Bedouins, abandoned fishing villages, coastal mosques and ruins of ancient forts makeup its heritage. Modernization has brought much change to the Bedouins who occupied the desert. This thesis critiques the mechanistic manipulation of the inhospitable landscape and proposes live and learn space in conjunction with the ecology of the desert land.



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(Fig.1) History Collage

### The Country and its Inhabitants

Before the discovery of oil in Qatar, it's main commodity of income consisted of pearls from the surrounding seas, with most of Qatar's inhabitants engaged in pearling. Pearling was an important part of its history as the country had few natural resources. The pearling season is divided into three periods; a 40-day 'cold dive' period which begins in April, followed by a long stint which lasts from May to the end of September in which ships sail to areas where the oysters grew, and finally a short period of about three weeks usually on pearl banks near the coast.

The inhabitants of Qatar can be divided into two groupings: the Bedouins, meaning dwellers, and the settled people known as *badhar*. These two groupings differed in their way of settlement, the settled population occupied the northwest, north, and east oriented towards the sea and its pearl-fisheries. The Bedouins occupied the interior grazing-grounds of Qatar with no permanent settlement. For a better understanding of how the inhabitants of Qatar were able to live in this inhospitable landscape, the focus of this thesis will take a closer look at the Bedouins of Qatar.

## **The Bedouins and their Tents**

North and South Bedouins of Qatar are noticeably different in their migration pattern, ranging from an almost stationary life to frequent moving. The Northern Bedouins made short and infrequent movements using lorries and donkeys for common means of transport. The Northern Bedouins spent a period ranging from three to eight months occupying a single area of the desert. The camps of the North can be characterized as stable, due to their appearance, traces left behind, and their internal organization and order of their tents.

The Bedouins of the South compared to the North were not as settled in their movements, as their way of life is characterized by frequent movement and mobility. The camel became the main means of transportation and their frequent moving was due to grazing season and hunting opportunities. During hot seasons the camps would be situated near wells, with their tents being smaller in contrast to the North.

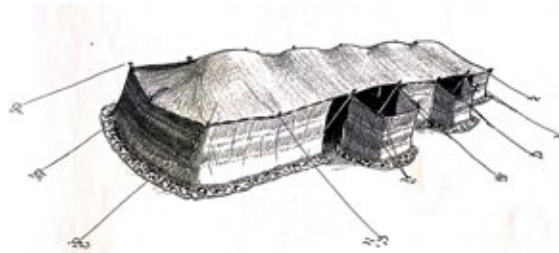


**(Fig.2) Northern tent**

The tents of the Northern Bedouins are characterized by uniformity in appearance, construction, furnishing, and use. The tent is closed on all sides with inner rooms

completely screened off from the outside world. (Fig. 2)

The front side of the tent incorporates extensions of the side-canvas. The extension allowed for the "kitchen" area to remain sheltered around the hearth while allowing the smoke to escape and natural light to enter. (Fig.3)



**(Fig.3) Tent extension**

The tents of the Southern Bedouins in contrast to the North are open from the front, lower in height, and are haphazardly pitched with no uniformity in their appearance due to the frequency of moving and the variable weather. (Fig.4)



**(Fig.4) A Southern Bedouin tent**

## **Modernization and its Effect**

### **Traditional vs. Current Architecture**

"Those best placed to guide Doha's development may not be architects or planners but rather those that inhabit it most intensely: its people. Doha's urbanscape resembles the multiplicity of cultural environments found in most cities with highly transnational populations. Therefore, in considering its heritage and renewal, we need to see beneath the physical surface of buildings and urban spectacle and consider the 'shadows' of a city as a source of inspiration and also social justice." (Alraouf, pg.6)

While Qatar's architecture follows its traditional culture, much of its development is gradually becoming more "westernized". Old downtown Doha now sees a rise in skyscrapers, traditional markets replaced with an influx of glass clad, air-conditioned shopping centers, construction materials replacing stone and dirt with steel, concrete, imported lumber, granites, marbles, and limestone. With such drastic changes, it poses a question of whether the new generation will not remember the way of life that defined Qatari culture.

While some of Qatar's traditional architecture is still present in how current buildings are being built, a sense of unoriginality is evoked. Qatar's attempt at preserving its heritage strays from staying true to traditional use and craftsmanship of materials.



(Fig.5) Doha's commercial center now



(Fig.6) Doha's commercial center 1968



(Fig.7) Drawing depicting old market

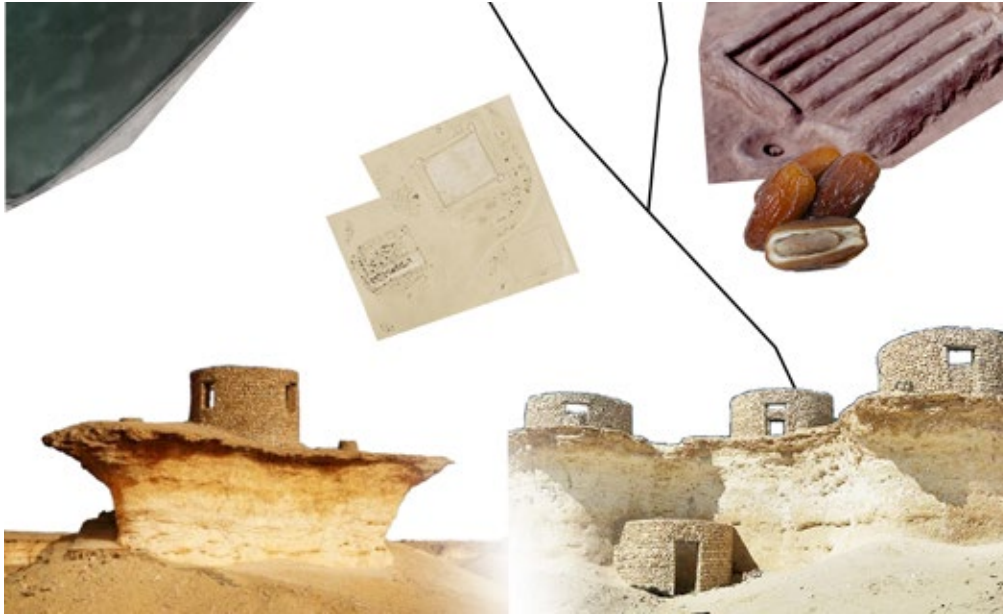


(Fig.8) Qatar Mall



Desert Fabric

History



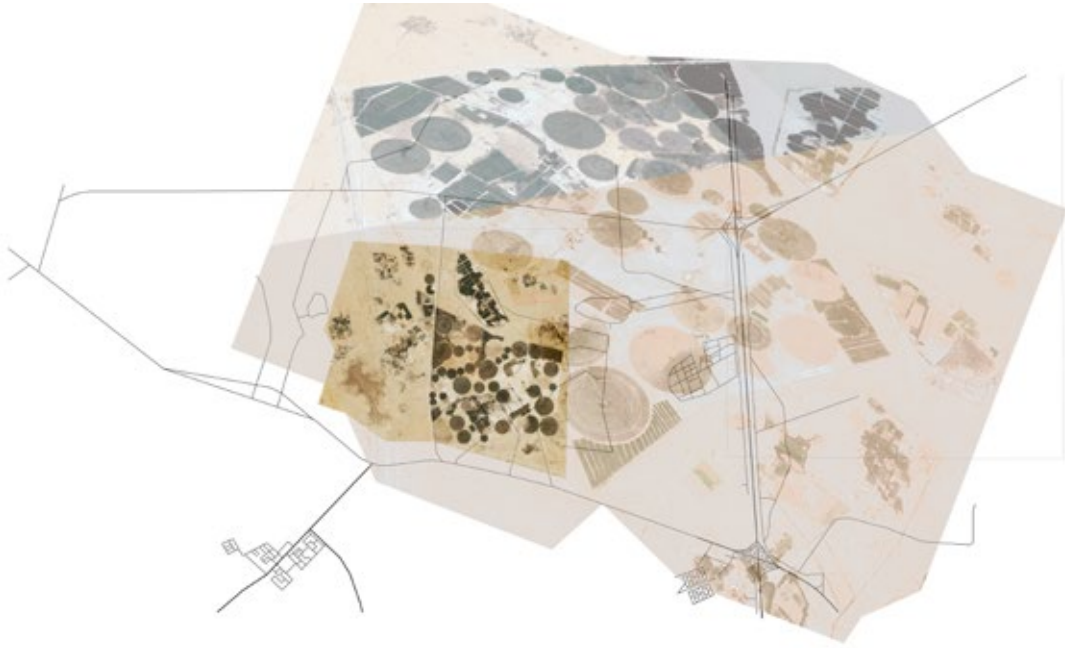
(Fig.9) Fort Collage

The historic forts of Qatar are rooted deep in its history. The forts have several uses, most forts are used for military purposes, while others serve as forts for production of 'debis' (syrup), or as a jail for criminals.



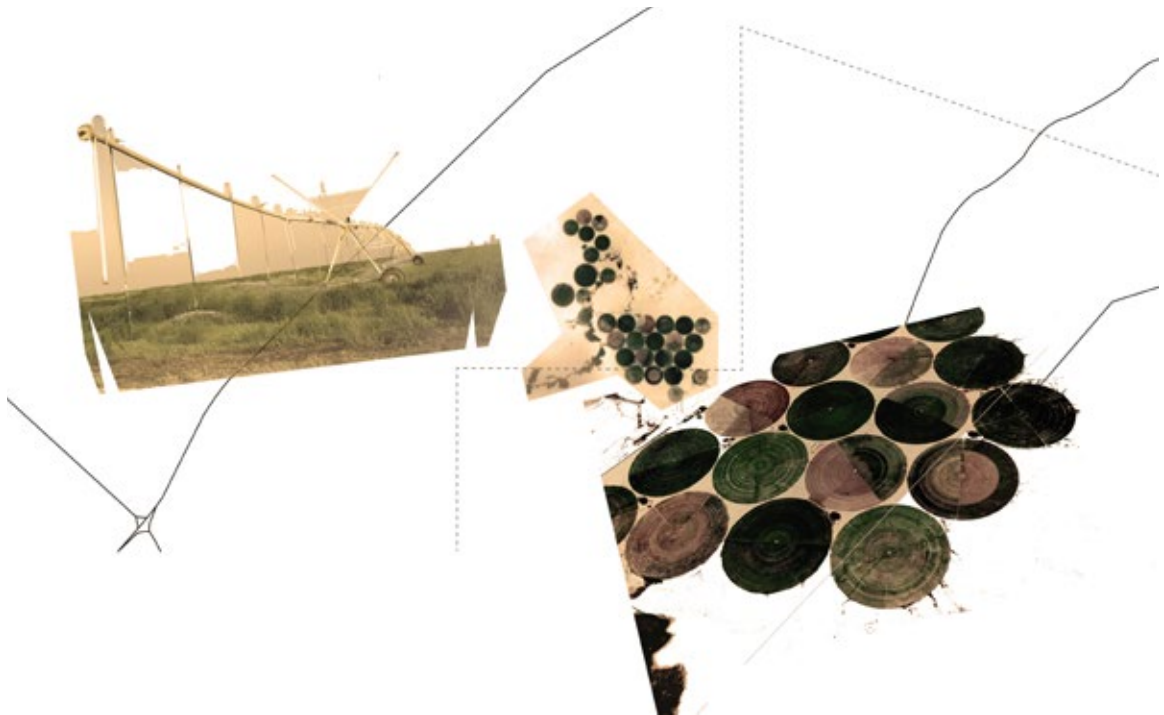
(Fig.10) Fort Collage

## Grass Farms



**(Fig.11) Grass Farm Collage**

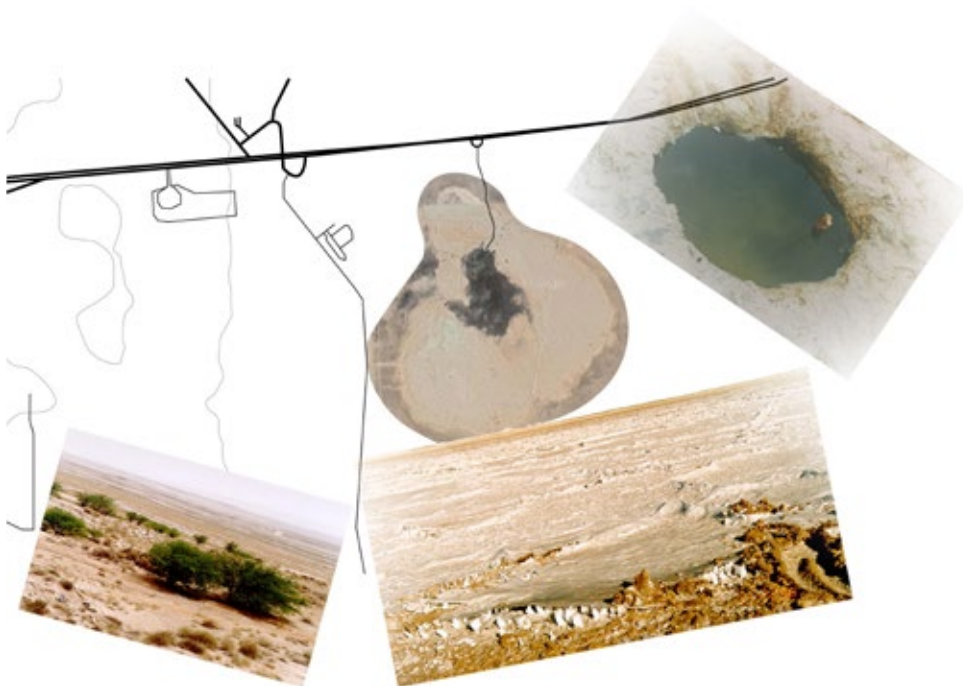
Qatar established grass farms in its desert. Rhodes grass is sought as a solution for getting rid of wastewater from Doha 's sewage treatment works. These farms are also supplemental for animal fodder.



**(Fig.12) Grass Farm Collage**

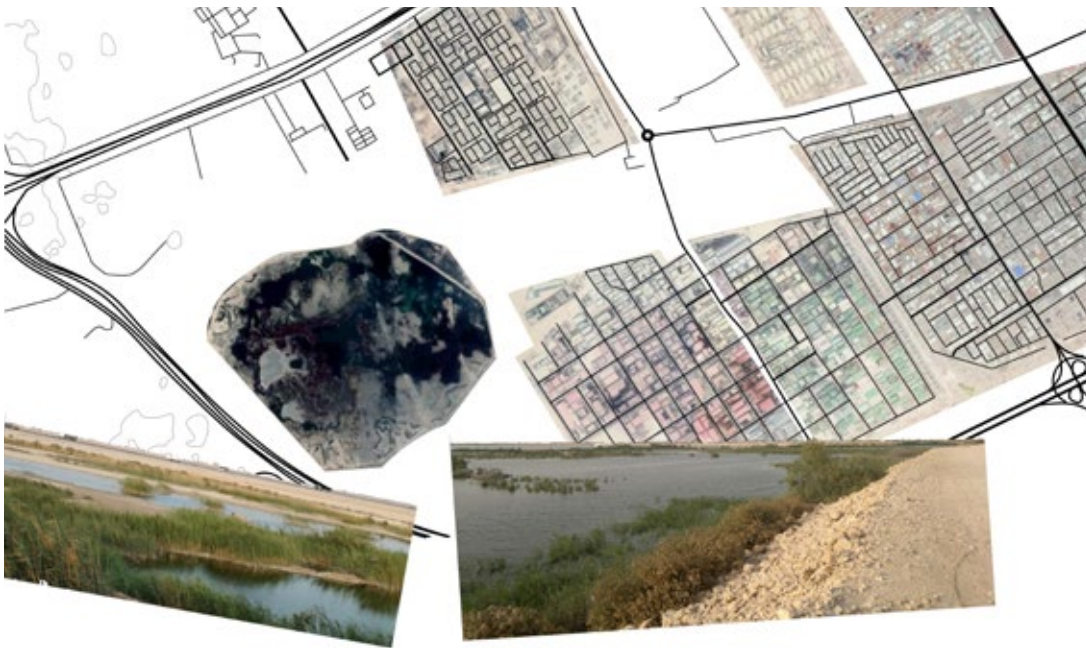


## Body of Water



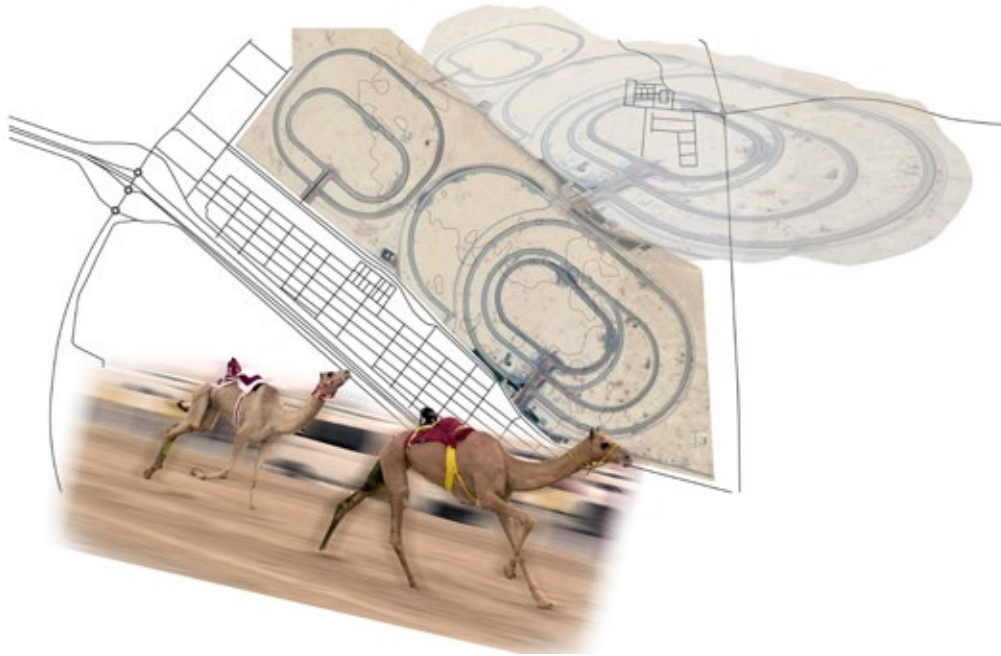
(Fig.13) Sabkhas Collage

Qatar's desert ecology is composed of man-made and natural bodies of water. A series of in-land sabkhas is a result of these naturally made bodies of water. Sabkhas represent a very distinctive geomorphologic feature in the Qatar peninsula.



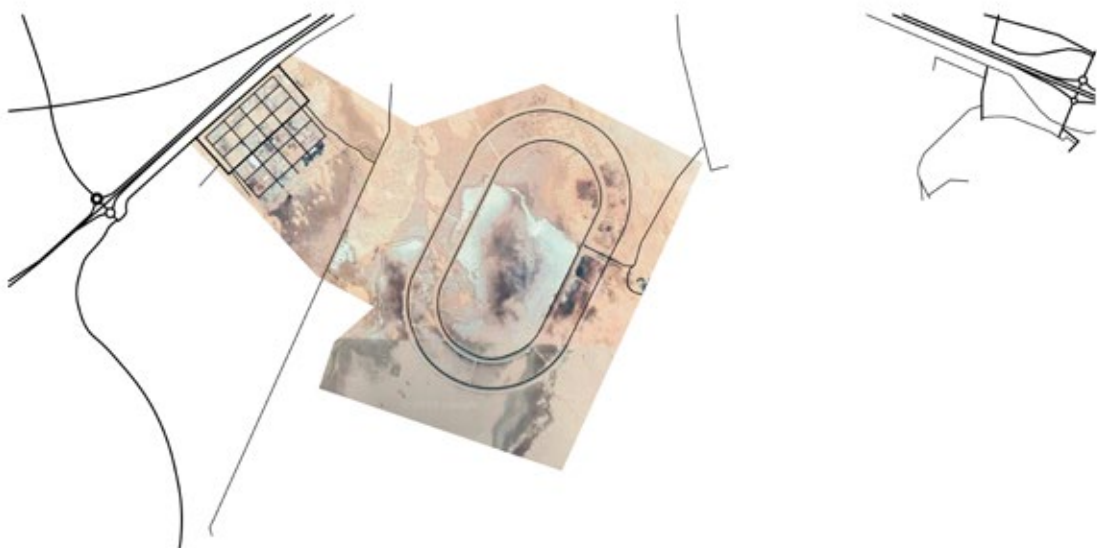
(Fig.14) Man-made Body of Water

## Desert Activities



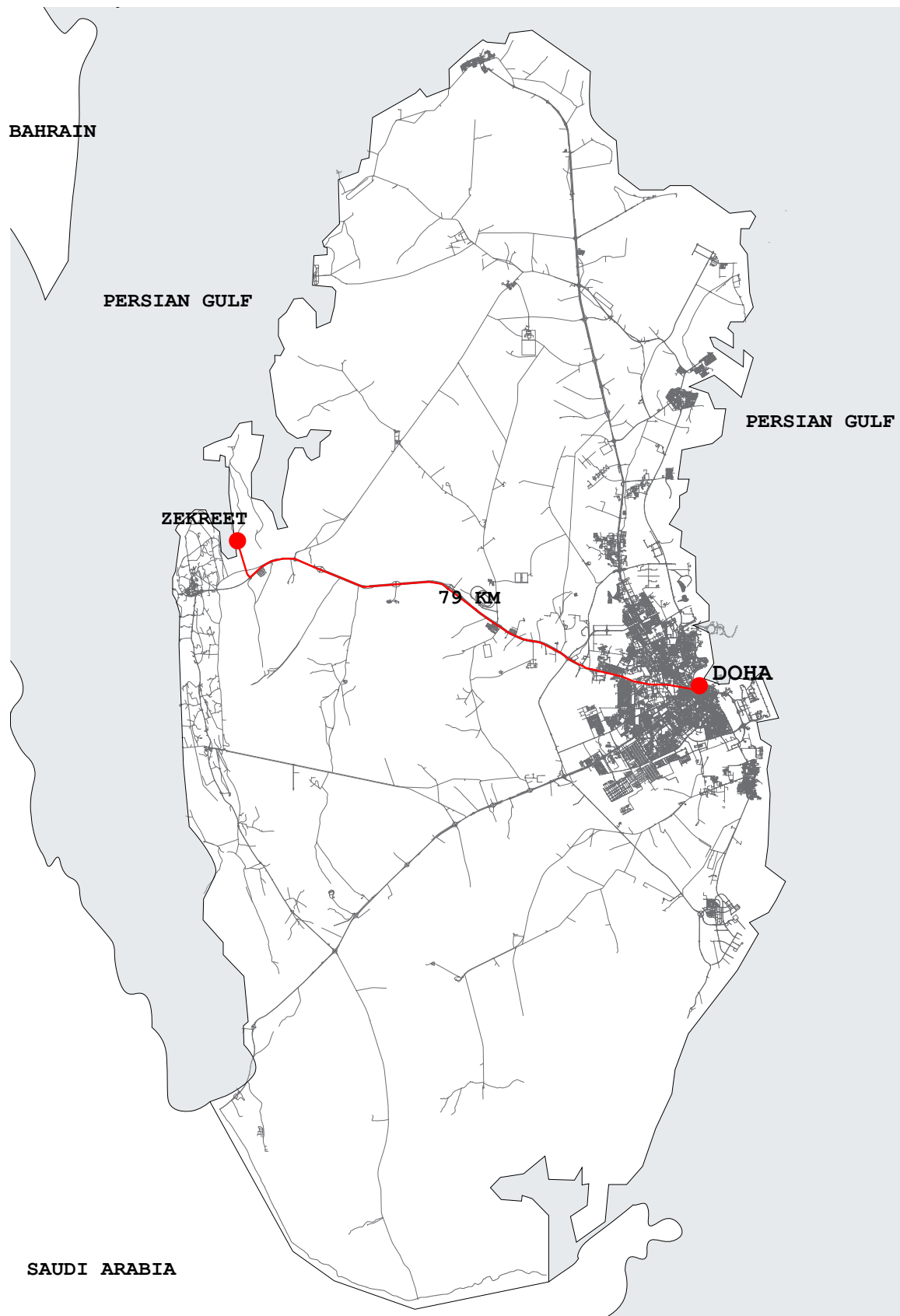
(Fig.15) Camel Racing Track

Some of the mechanistic interventions of the desert fabric can be found in the activities that are enjoyed outside of the city. Camel racing is an integral part of Qatar's history and culture, a form of entertainment for weddings and now a tourist attraction.



(Fig.16) Abandoned Camel Racing Track

## CITY TO DESERT



### History

Zekreet, a village in north-western Qatar, was built up in the 1940s after oil operations commenced in Qatar. This included the construction of a harbor for oil equipment and a number of small houses which eventually developed into a village.

With the discovery of oil for the first time in Qatar in 1936 the western side of the Bay of Zekreet accommodated the first shallow-water harbor in Qatar to be used by oil companies in order to unload their equipment. Food supplies and fresh water from Bahrain were also imported here.

The harbor brings growth and formation to the modern village of Zekreet, however it is made obsolete by Mesaieed Harbor in 1952.

As with most settlements in Qatar, seawater intrusion contaminates the coastal aquifers.

### Zekreet Village

The village of Zekreet was established inland opposite to the bay with access to existing water wells on the Zekreet Peninsula. Many villagers from eastern Qatar migrated to the Dukhan region in the 1950s to find work in the oil industry. Estimates in 1950 put the number of men at 200 and women at 250 in the emerging village of Zekreet which leads to Zekreet opening its first primary school for boys in 1957 with a capacity of 45

students and a primary school for girls in 1960, making it the first settlement in the region to establish a formal school.

In January 2019, it is estimated that Zekreet has about 7,000 laborers living in the village.

### Physiography

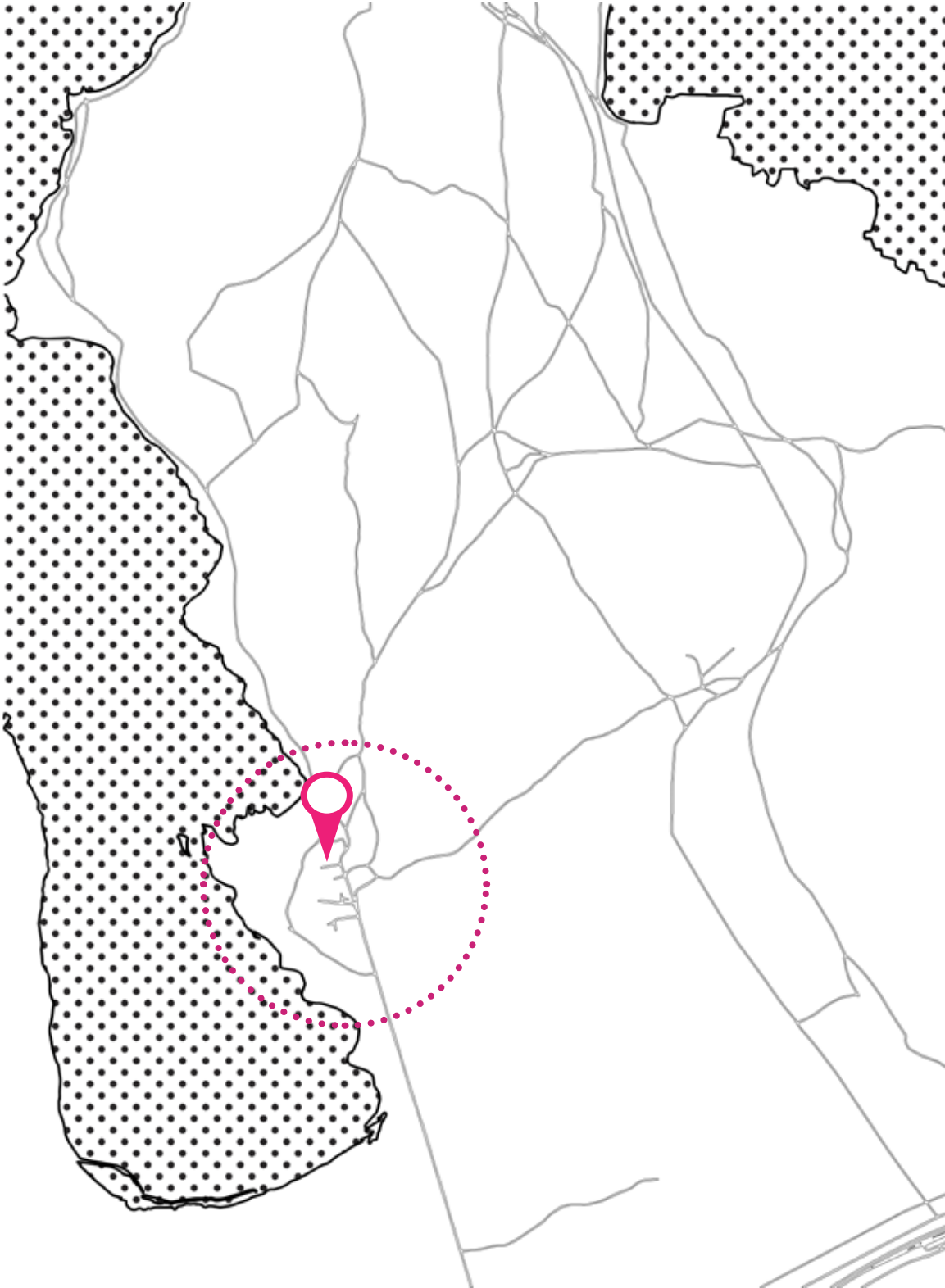
Zekreet is situated in the Zekreet Peninsula composed of erosional landforms such as foothills, mesas and gypsum plateau.

### Effect of Modernization

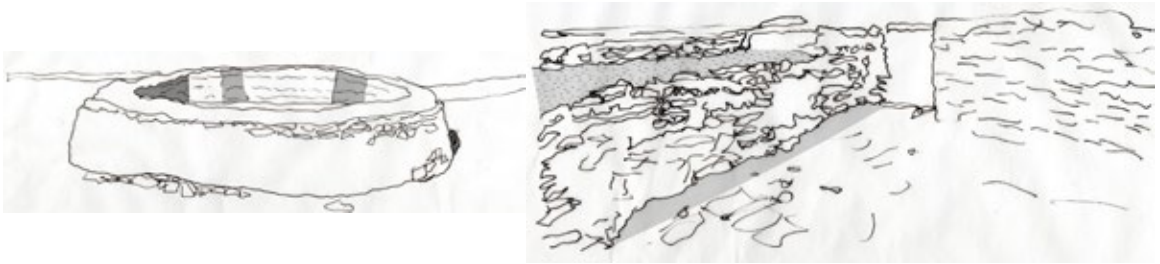
In the 1950s, the Arabian Peninsula's northwestern coast was a desolate desert. The vast desert sands was marked out by a simple set of huts. But a very different landscape has emerged over the past 60 years, and especially over the last quarter century. The area is now teeming with vibrant towns, with the discovery of crude oil spurring rapid growth and modernization. (Olmstead and Tessler, p1)

Construction materials in use before the mid-20th century included stone, adobe, a crude cement made of impure calcareous rock taken from the Persian Gulf floor, and date palm and juniper wood. Since then, steel, concrete, light alloys, imported lumber, local stone – especially granites, marbles, and limestone – and Hejaz slates have been increasingly used by construction.

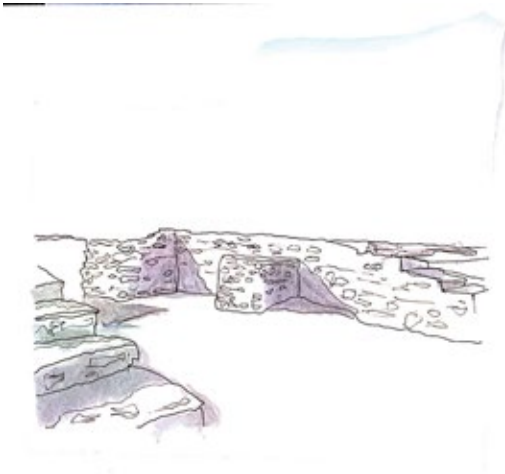
## Site Analysis



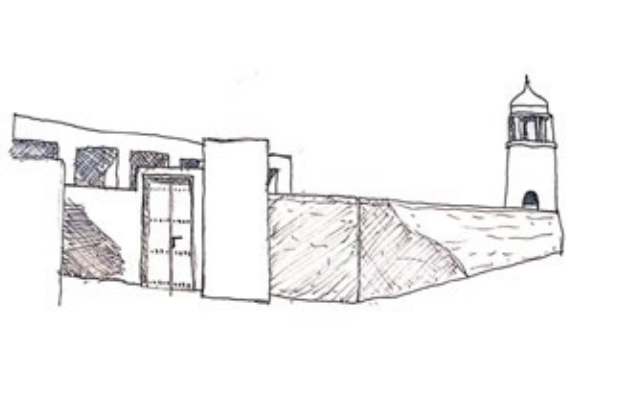
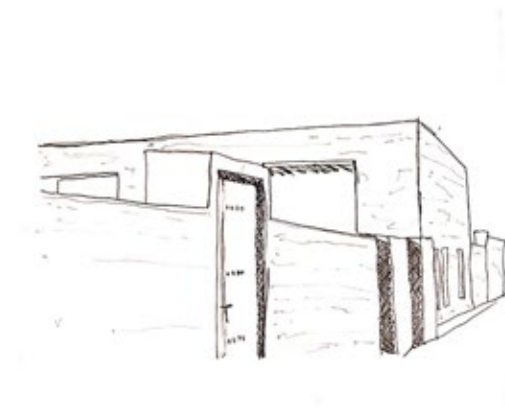




History



Heritage



## **Program**

This thesis aims to: redefine humans relationship with the resources and environment in which they live in, taking a closer look at how previous settlements used the desert landscape, the problem of modernization, and to rethink how people can live with the desert.

"A sprawling city of concrete buildings, traffic lights, ring roads and soda stalls; air conditioning is the rule; the waterfront area has been reclaimed, and much of the filth removed; a large merchant class has grown up and social life has become more conventional and 'big city'." (Fromherz 2012)

Qatari citizens, who have suffered the most stifling heat and who have been forced to survive on brackish water at one time, can now live almost endlessly in an air-conditioned, climate-controlled bubble, moving between five-star hotels, shopping malls and universities. (Fromherz 2012)

Even in the early years after World War II, it was possible for a man to be "modern" and "westernized" in his public life but to retire to a "traditional" and "oriental" life in his own home. Today, there are few in the Middle East whose houses are not penetrated by radio and television. In this process, messages generated by modernization have extended into every bedroom in the Middle East. (Polk, pp.101)

## **Program Strategy**

Create a temporary tent shading element to accommodate 3000 people/month.

### **Programs:**

- Temporary Exhibit
- Courtyard
- Education
- Performance Space
- Cooking Space
- Majlis (Male+Female)
- Restrooms+Showers

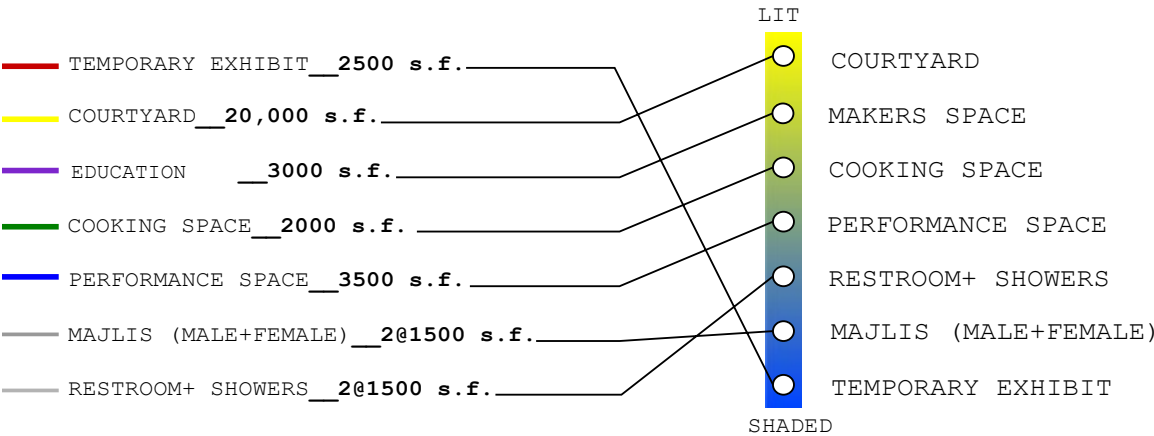
### **Tent Operation:**

- Tent operates over a 5 month period
- Certain number of people accepted every month
- All day access to spaces except for exhibit
- Courtyard can be broken up further to accommodate other activities
- Period of stay: 1 day-1 week

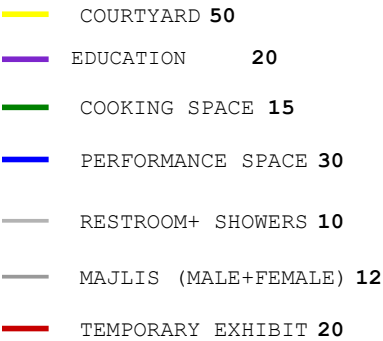
Program Analysis

Program Area

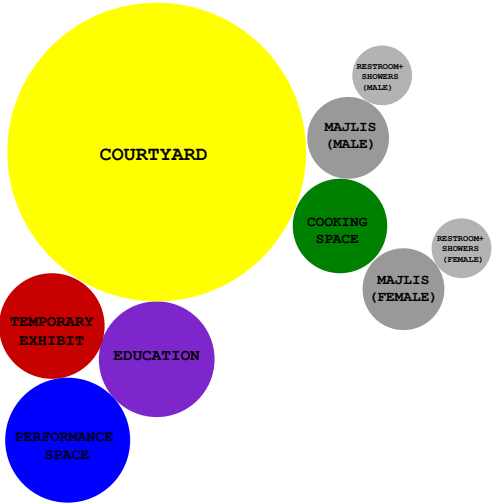
Program Arranged by Lighting Needs



Program Height (in feet)



Program Adjacencies





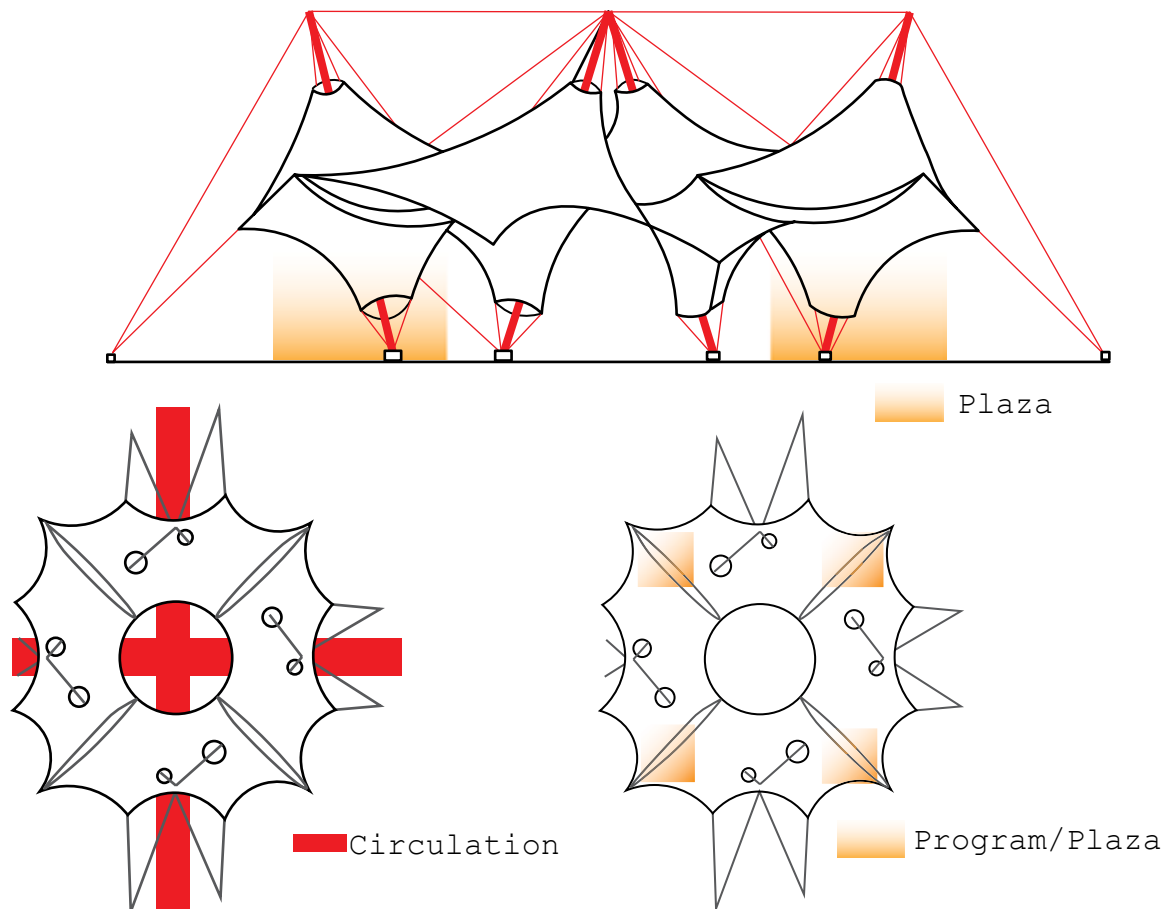
# **PRECEDENTS**

## Skysong at ASU Campus / FTL Design Engineering Studio



(Fig.17) SkySong Shade Structure

The SkySong shade structure is built around a densely landscaped grand boulevard lined by ground-floor shops and restaurants with offices above. The sculptural tensile structure acts as a center piece for the overall development. It provides a shaded center courtyard with four plazas for cafes, restaurants and social interaction. Made from PTFE glass fabric, the structure is approximately 50,000 sq ft of area.

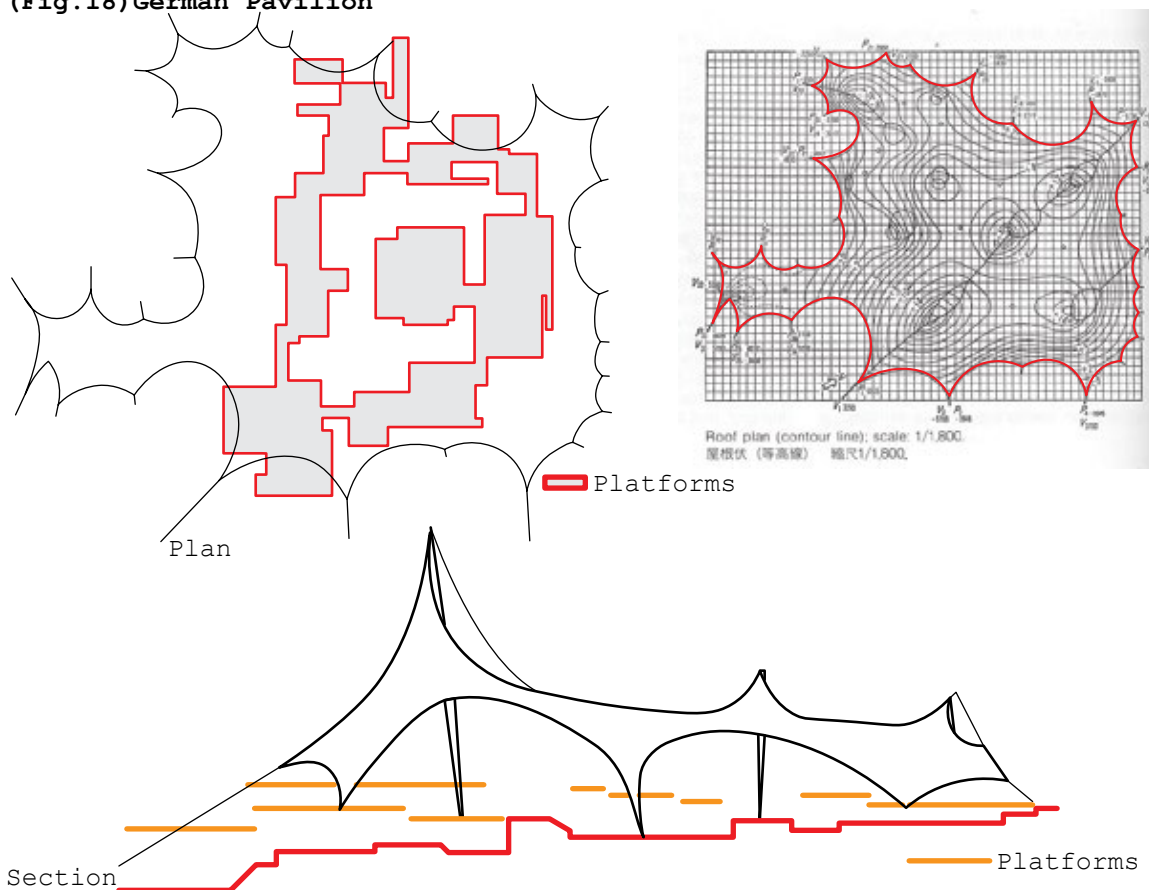


# German Pavilion, Expo '67 / Frei Otto and Rolf Gutbrod



(Fig.18) German Pavilion

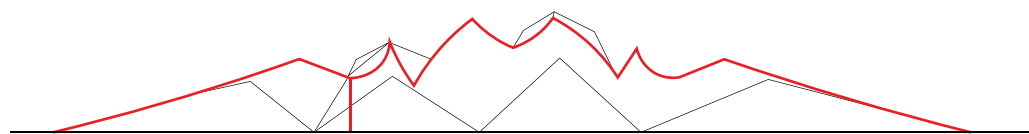
"Frei Otto and Rolf Gutbrod attempted, with this competition-winning project, to create a man-made landscape. The cavernous interior contained modular steel platforms arranged at different levels. The entire area was covered by a single membrane of irregular plan and varying heights. Its contours were determined by the high points of the masts and the low points where the membrane was drawn, funnel-like, down to the ground. Eye loops filled with clear plastic material accentuated these points and the saddle surfaces they created. The pre-stressed membrane consisted of a translucent skin hung from a steel wire net, which, by eye, ridge, and edge ropes, was connected with the mast heads and anchor blocks." (Glaeser.p109.)



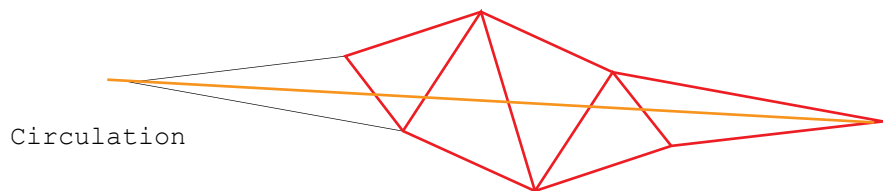


(Fig.19) JNBY Structure

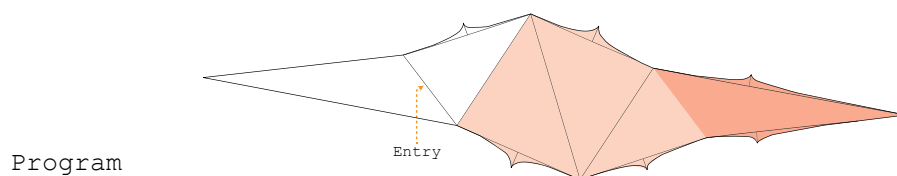
The structure is based on the formation of origami triangles, combined with the use of the latest parametric design tools and topological analysis. The structure can be assembled into many possible combinations, be easily transformed from one form to the next and easily deconstructed for transportation or storage. The structure consists of 6 inter-locking components, sharing 3 varied designs. Iterations of the design was achieved from a process of continuous deformation and manipulation of one triangular surface, resulting in a shape which corresponds to the overall layout.



Section

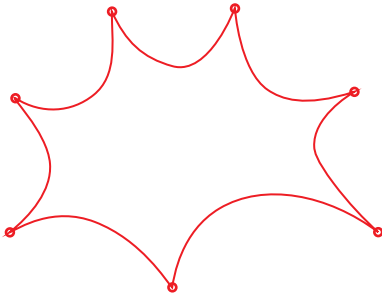


Circulation



Program

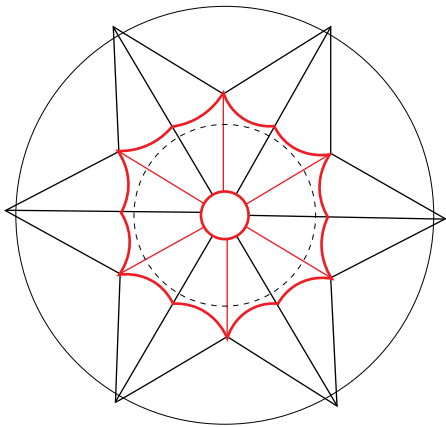
## Work of Frei Otto



### Shelter Pavilion

Federal Garden Exhibition  
Cologne, Germany 1957

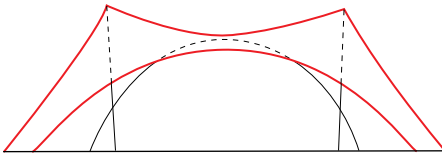
Saddle-type membrane with 1 support  
point and 6 anchor points  
Height of pole: 6 meters (20 feet)  
colored cotton canvas, edge wire  
ropes, spindle-shaped pole



### Dance Pavilion

Federal Garden Exhibition  
Cologne, Germany 1957

Radial ridge-type membrane with central  
tension ring, 6 support points, and 6  
anchor points  
maximum diameter: 31.50 meters (103 feet)  
maximum height: 10 meters (33 feet)  
coated, translucent cotton canvas,  
radial and edge wire ropes, 6 lattice  
steel masts



### Hangar Tents

Mass-produced by L. Stromeyer and  
Company  
Konstanz, Germany, since 1957

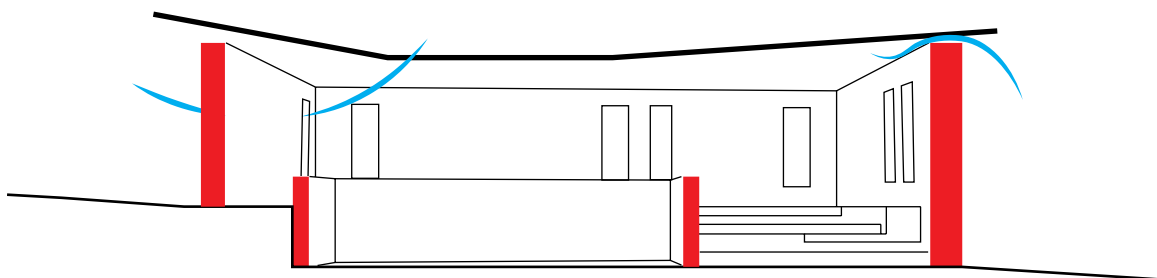
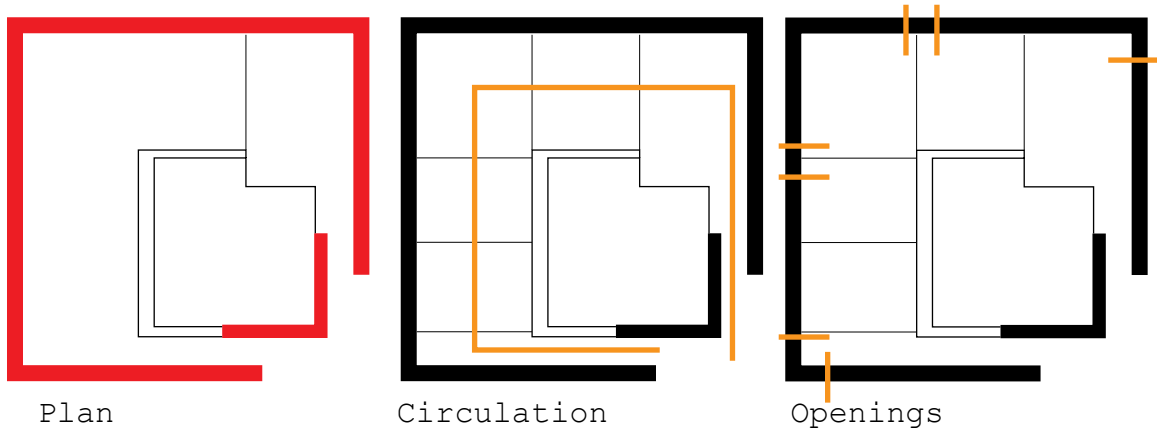
Parallel ridge-type membrane with 2  
support points  
and 6 anchor points per unit tent model  
3 units— 36 x 30 meters (118 x 98 feet)  
height at center: 8.50 meters (28 feet)  
cotton canvas or synthetic fabrics,  
connector wire ropes,  
poles with spring tensioning devices,  
anchors

## Framed Escape Library / eskaapi



(Fig.20) Library Space

A library built with local materials such as earth and wood, uses environmentally friendly architecture, water-efficient construction and often re-purposed local materials. Thick, rammed earth walls pierced with tall, narrow windows insulate the library from the outside. The library and its furniture form one whole entity. The detached roofing and vertical windows provide ventilation, while the earth walls keep that coolness circulating through the entire building.



Section showing rammed earth, windows, and ventilation

## Observation Tower Negenoord / De Gouden Liniaal Architecten

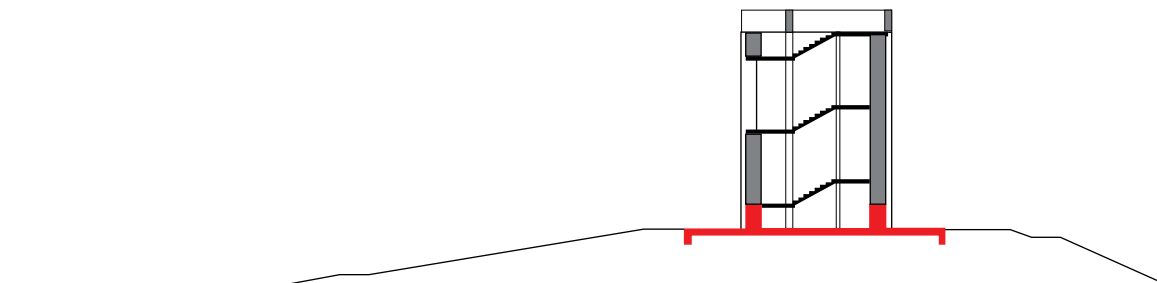


(Fig.21) Observation Tower

The observation tower is crafted with the local materials excavated from the Maas area: earth, clay and gravel. The exterior walls are constructed using the rammed earth building technique. Inside, the central core with stairs is made out of concrete. On each of the landings of the staircases a different view opens up to the environment. The views determined triangular shape and the position of the cut-off corners was.



Plan showing rammed earth, openings, and circulation



Section showing rammed earth, openings, and circulation

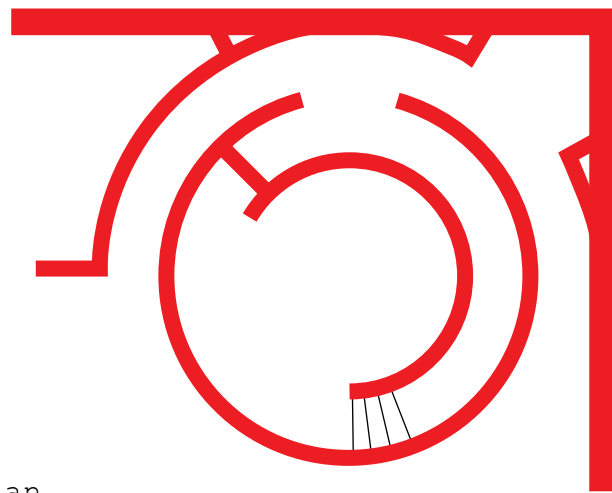


## Observatory in the Desert / Contemporary Architects Association

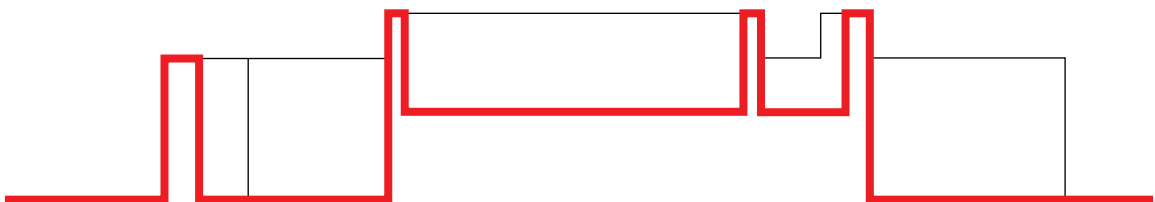


An observatory in the desert of Esfahak, Iran, is comprised of three circles within each other. The center-most circle is the highest one, with the two other circles encompassing a single person passageway that leads to the center. The foundation of the adobe brick structure is joined together using mortar, with a 45 degree rotation for every adobe brick measuring 2 cm x 2 cm and 0.5 cm thick.

(Fig. 22) Observatory



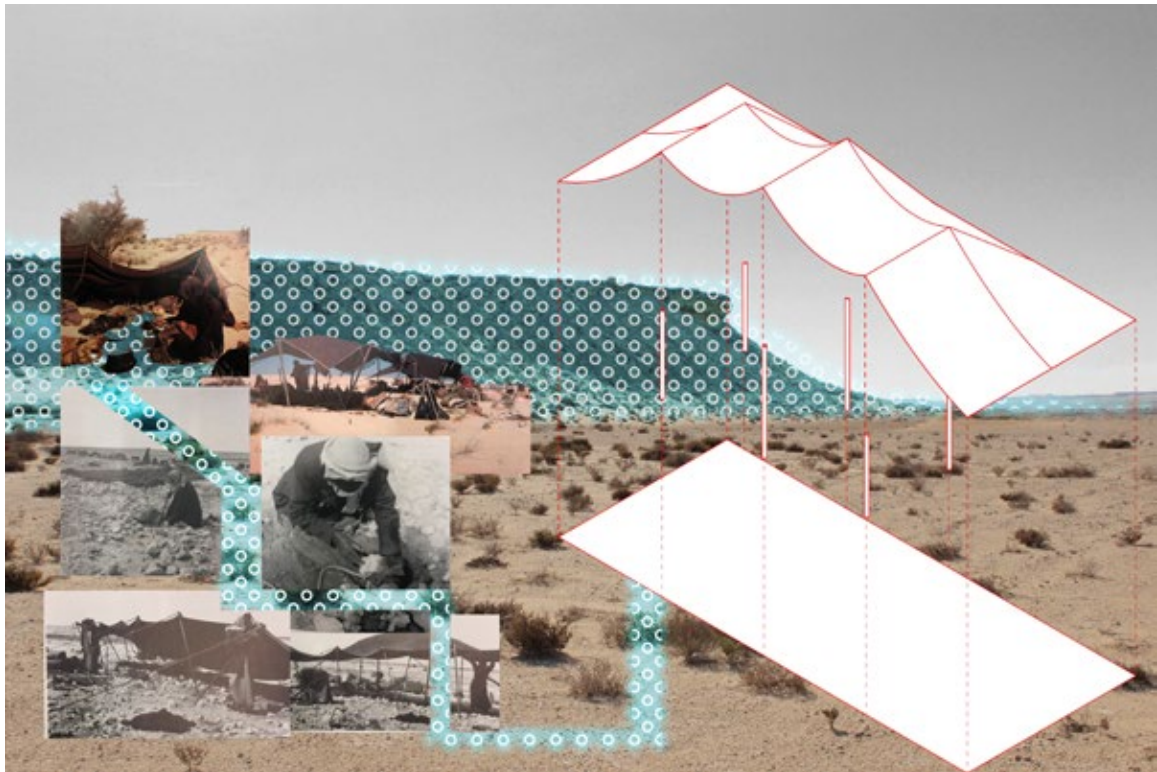
Plan



Section



# **DESIGN , CONCEPT + STRATEGY**



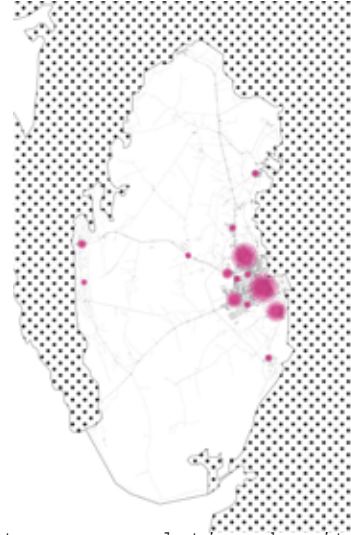
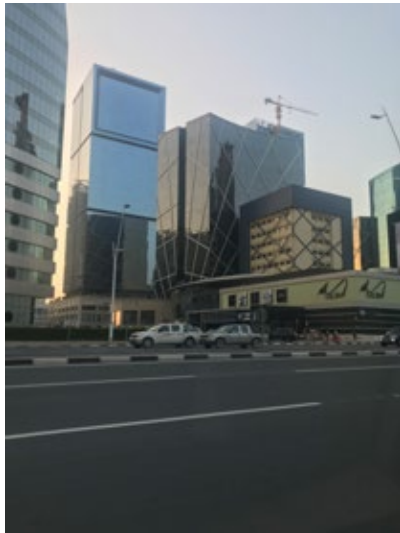
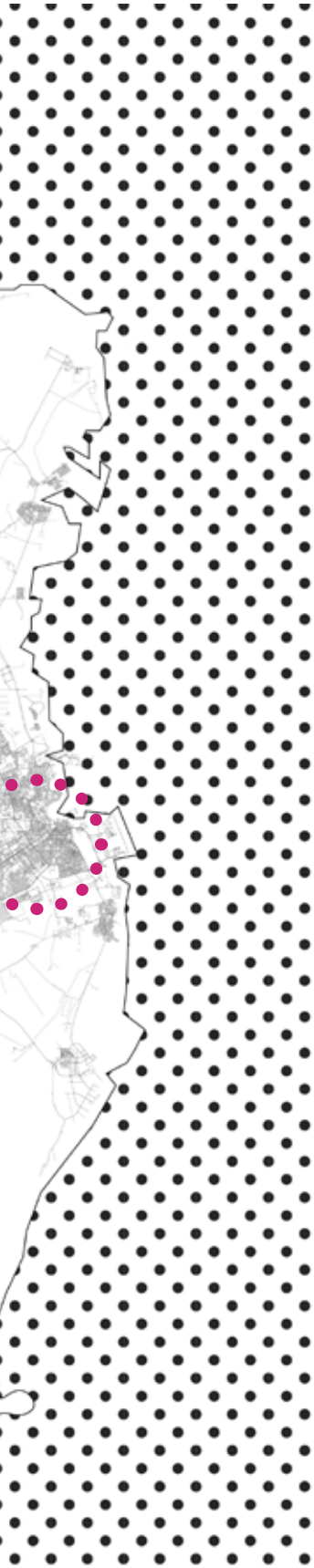
(Fig.23) Concept Collage

The tent is one of the earliest forms of shelter, it is associated with those who wander and nomads. The tent is used as a form of shelter in most primitive days, supporting different living functions. It became a necessary equipment for the Nomadic tribes that needed shelter from the harsh desert weather, it also served as a way of welcoming and hosting guests.

Using the information and analysis of a Bedouin tent along with an understanding of visual and parametric algorithm programs, new technology is used to generate a fluid and dynamic temporary element in the desert. The design strategy will include studying how wind, light, and heat can affect the design of the tent and space below.

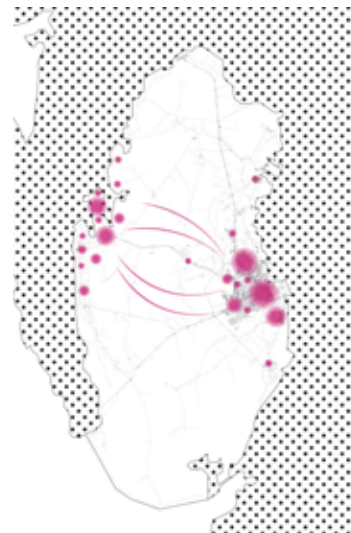
## Contrasting typology





*Current area population density*

The purpose of this thesis is to critique the modernistic approach of Doha to the inhospitable landscape while comparing it to the calmness of the empty desert. One can argue that today's approach of using an air conditioned concrete and glass clad skyscrapers is needed to combat the inhospitable landscape. While that may be true, the bedouins have once braved through the heat using nothing but the dirt and stone around them including their tents. The design aims to serve as a memory piece.

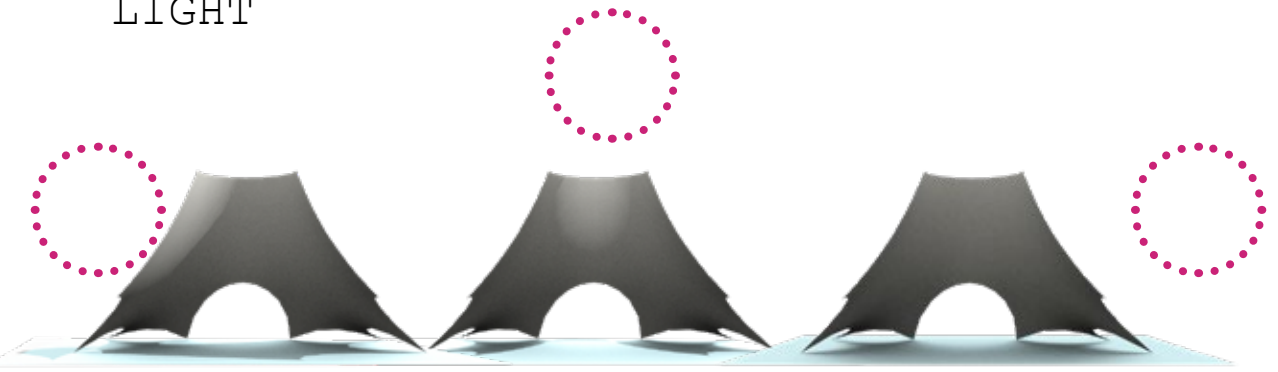


*Goal with design implementation*

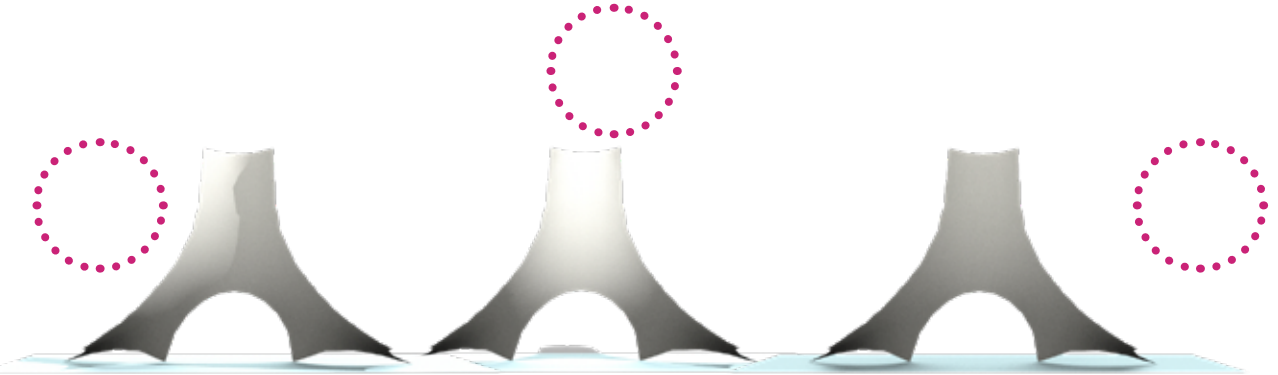


LIGHT

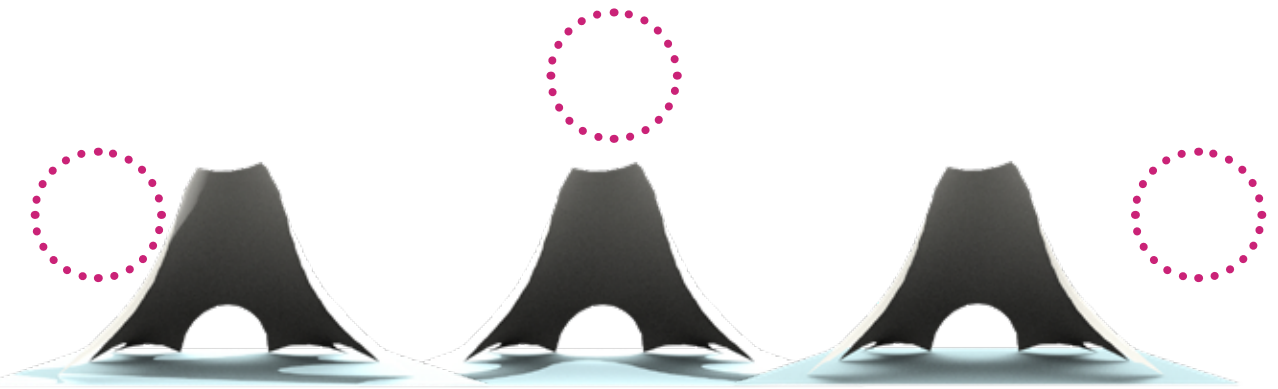
ITERATION 1



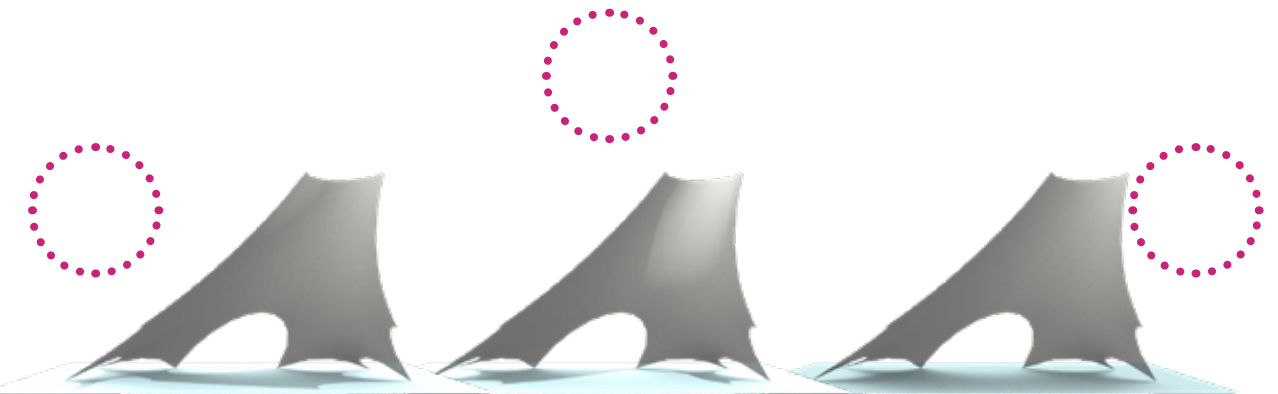
ITERATION 2



ITERATION 3

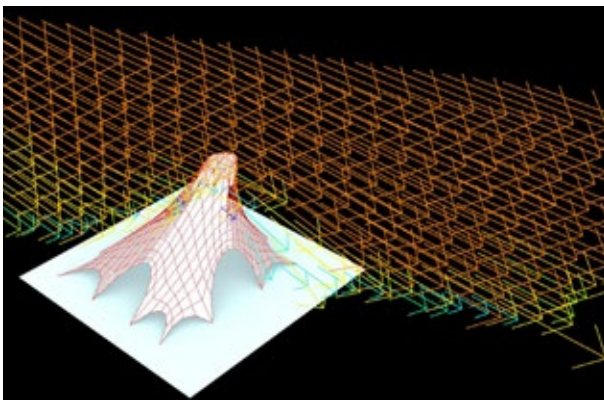
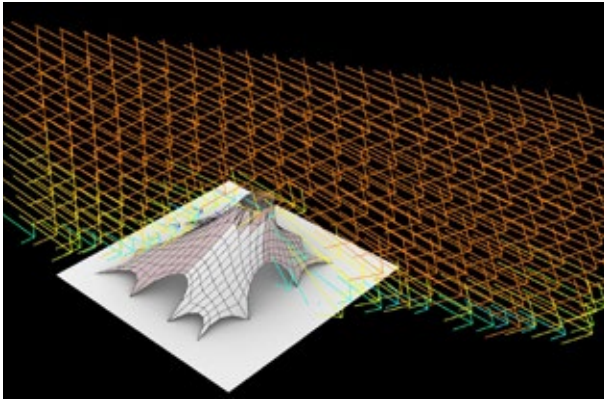
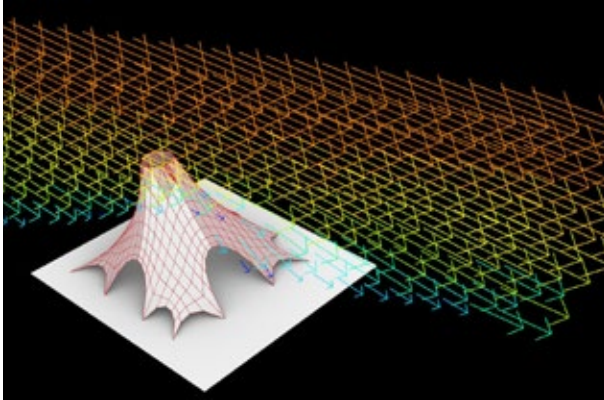
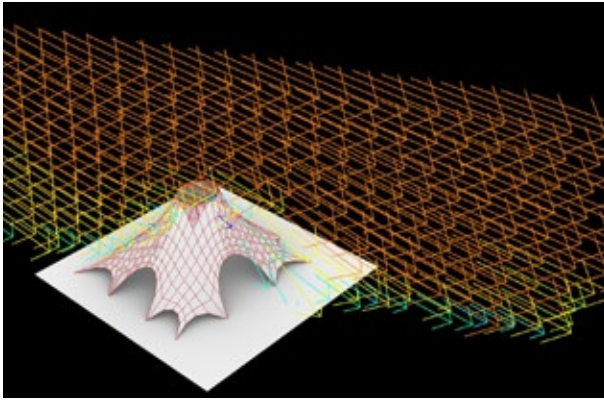


ITERATION 4

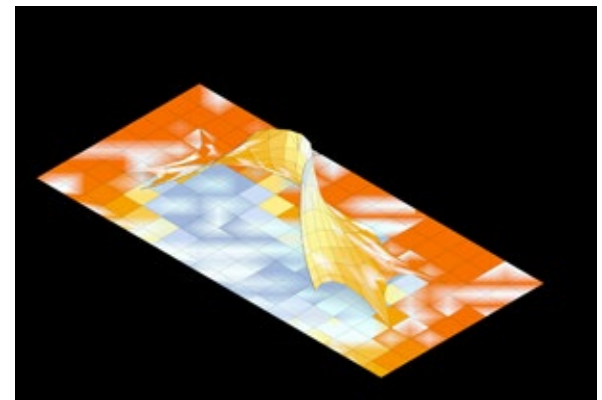
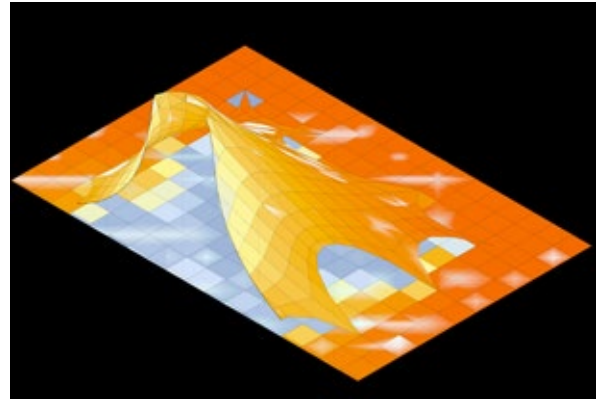
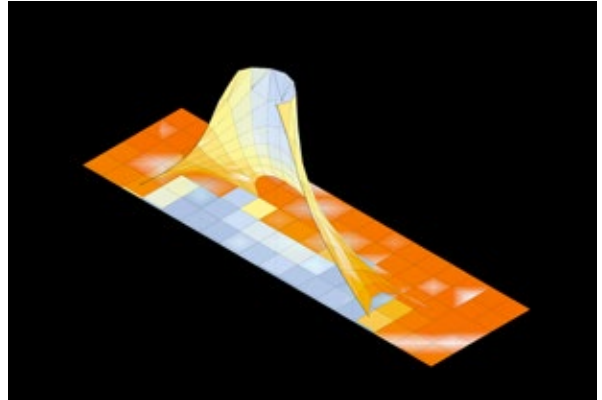
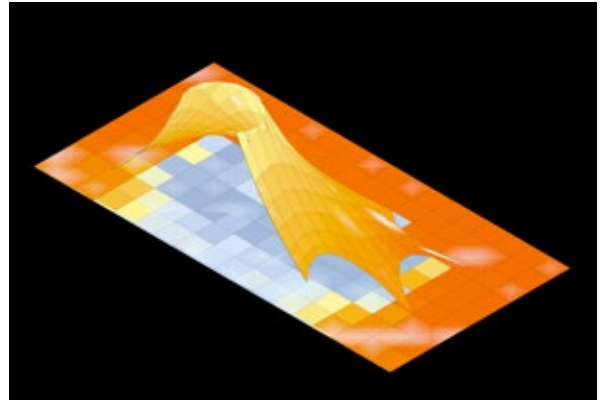


*Drawings show how each element interacts with the tent structure.*

WIND

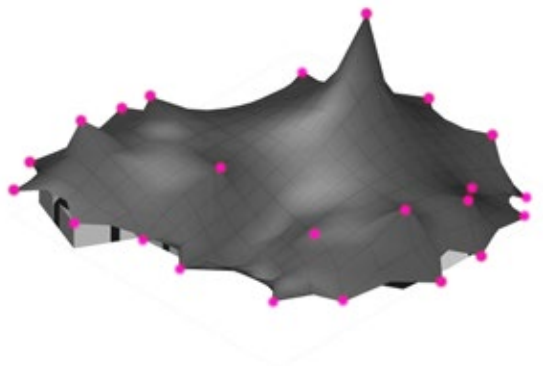
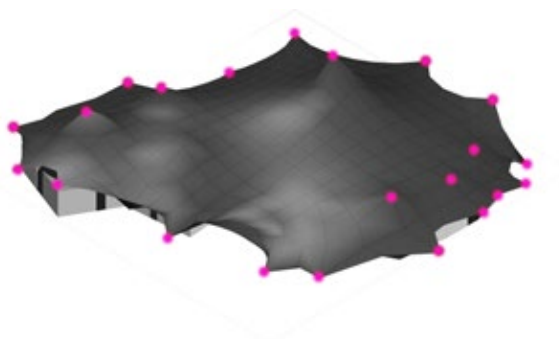
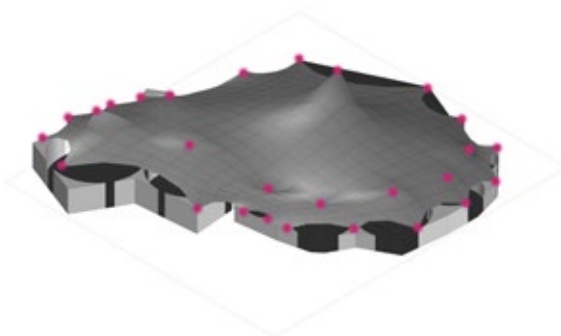
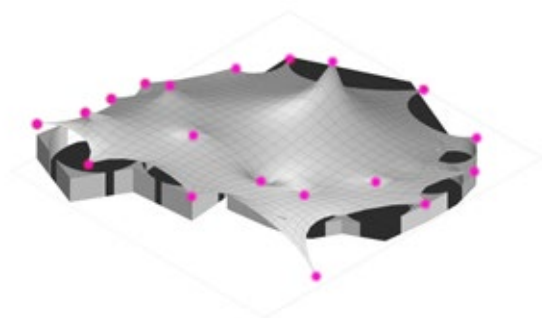
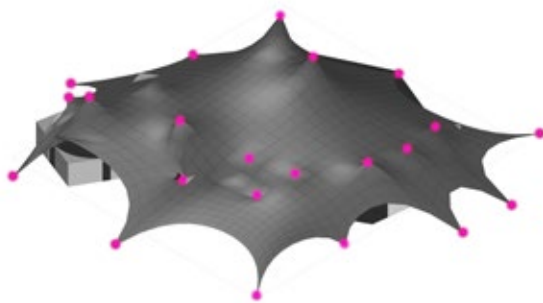
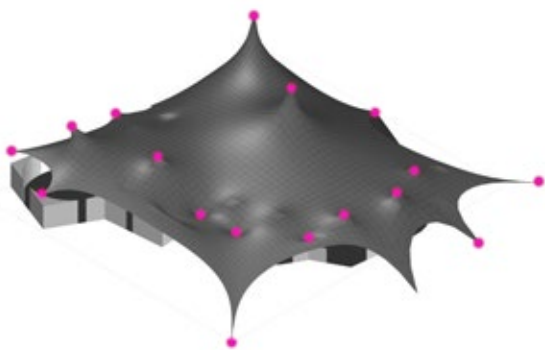


HEAT

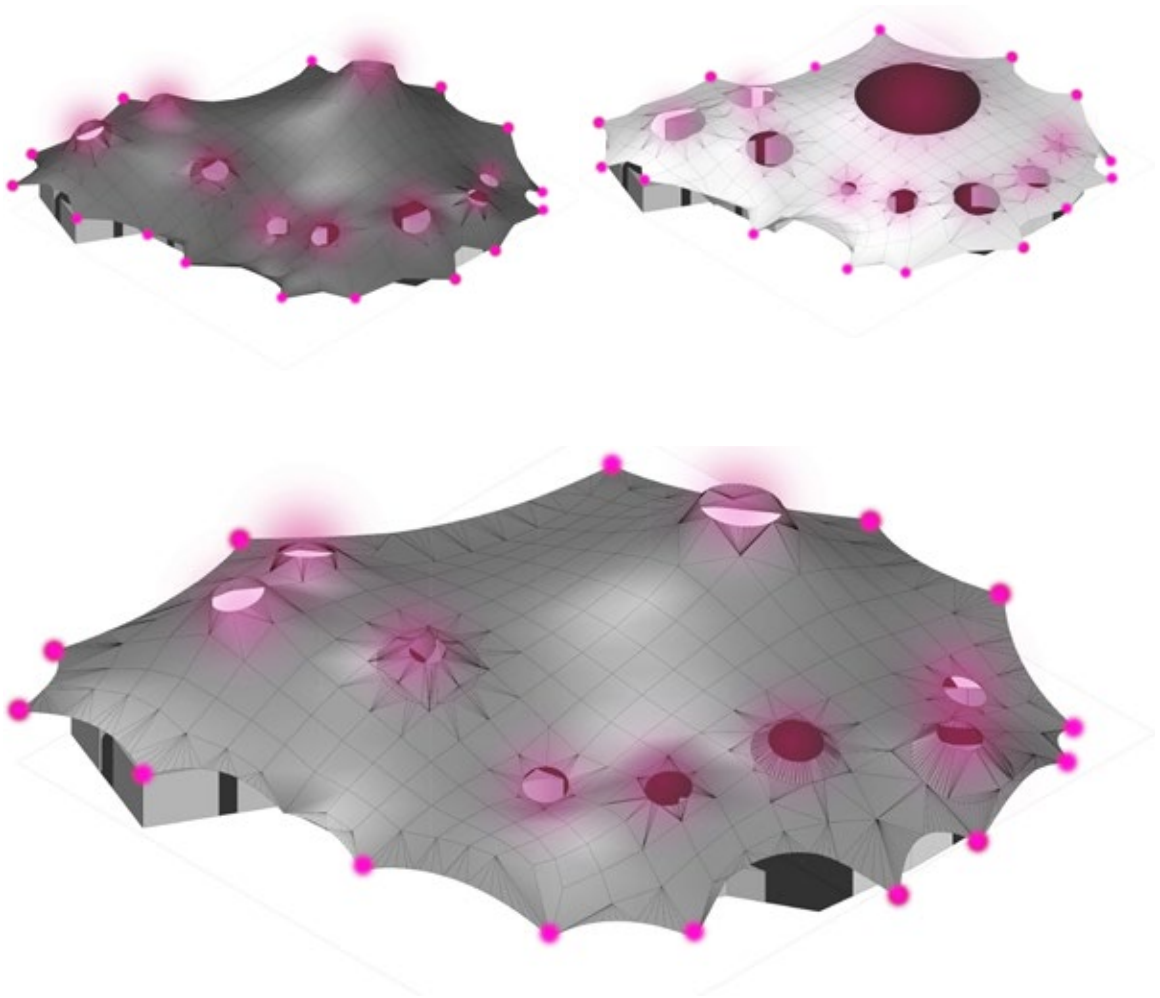


*Drawings show how each element interacts with the tent structure.*

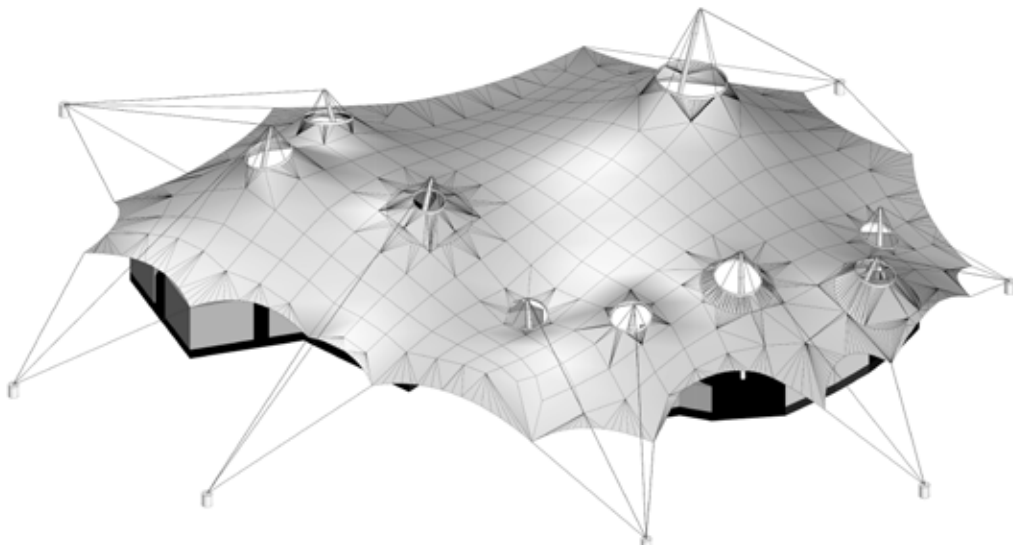
*Isometric showing the iterations of the tent structure and anchor points*



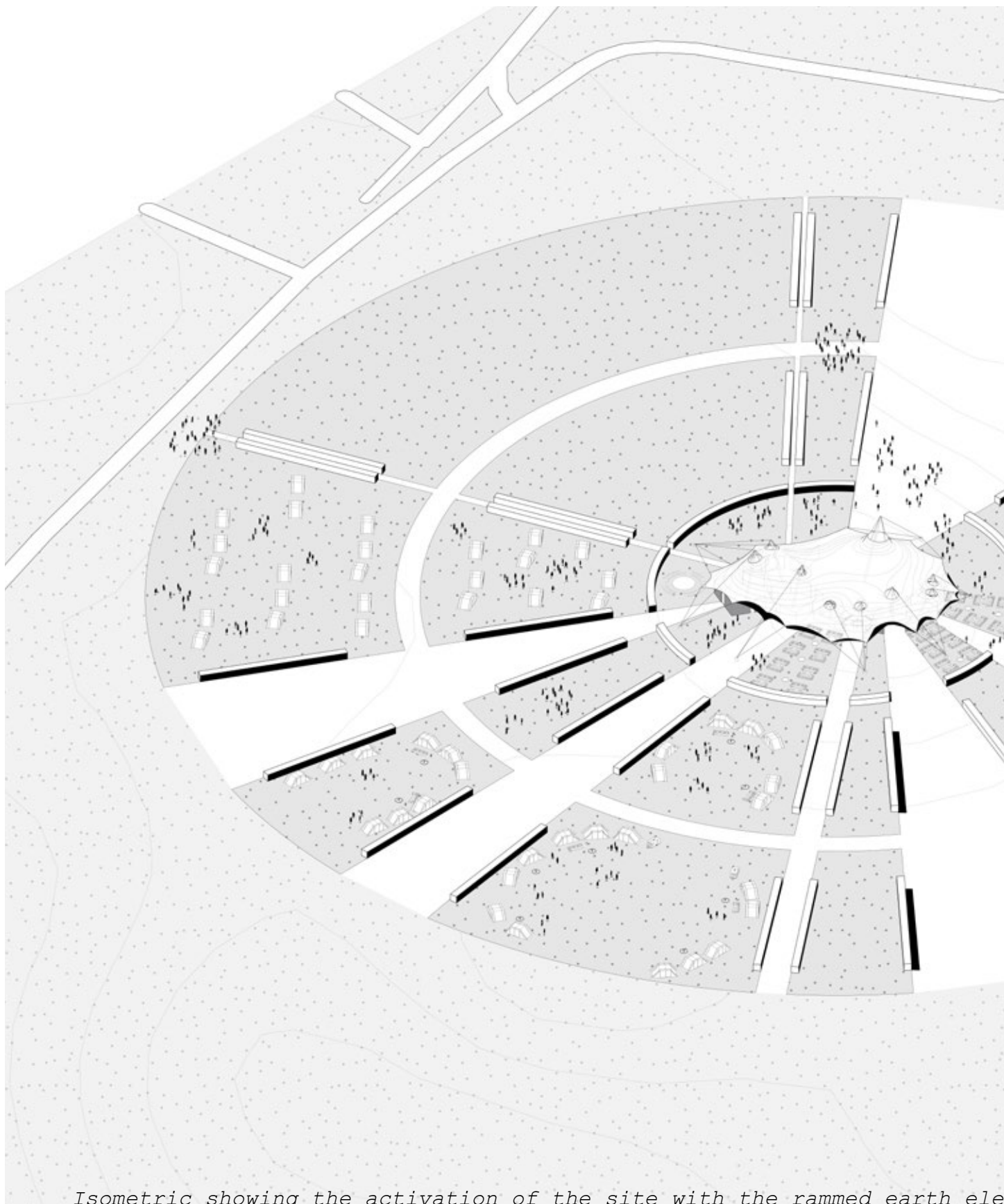
*Isometric showing openings being introduced*



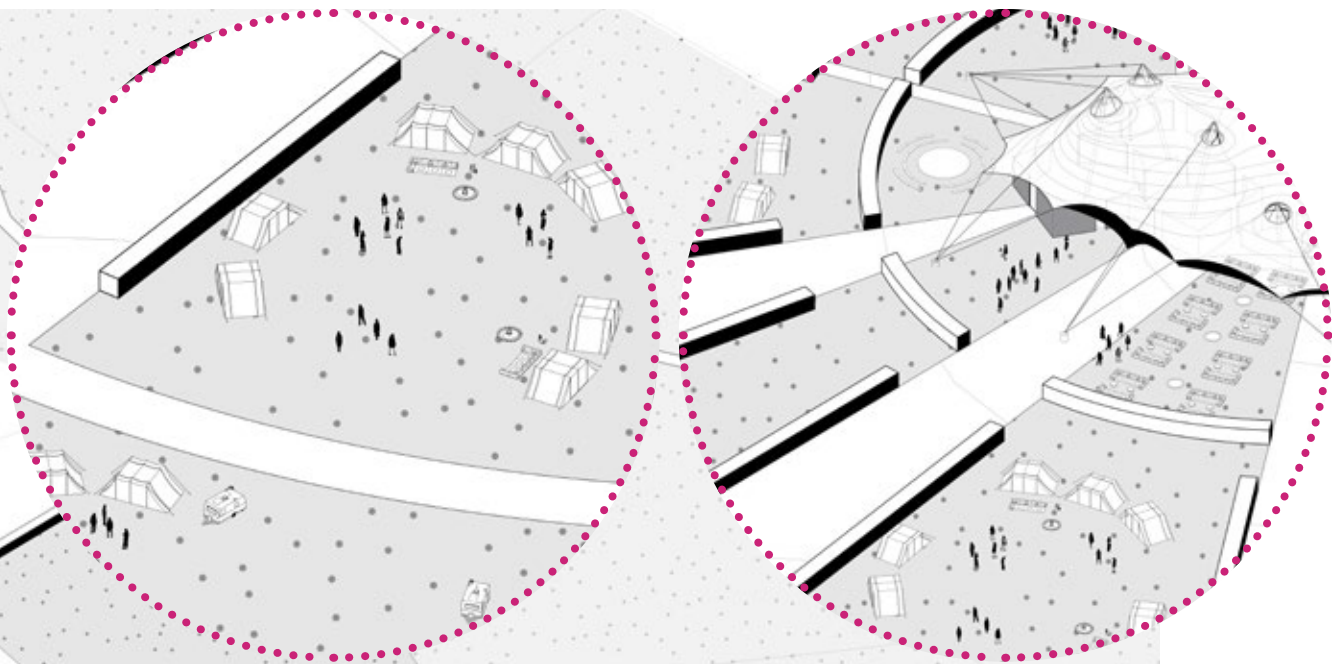
*Isometric showing final product*



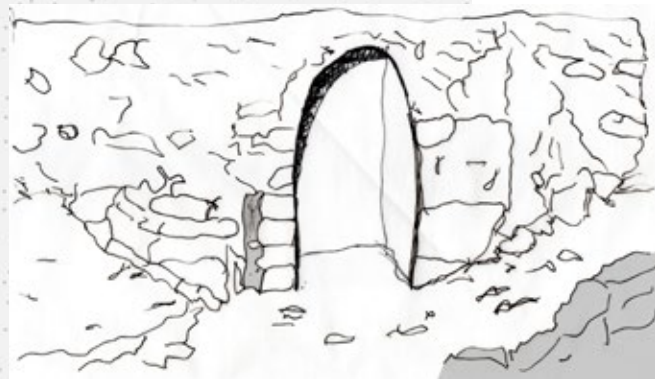
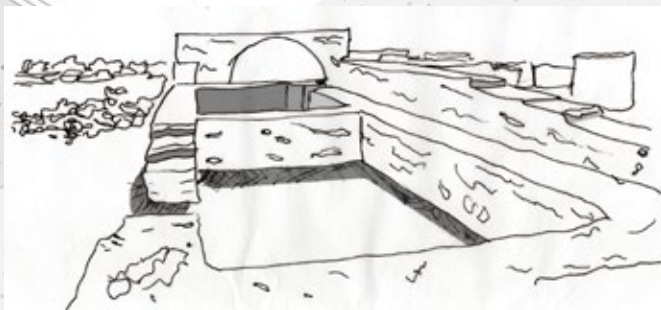
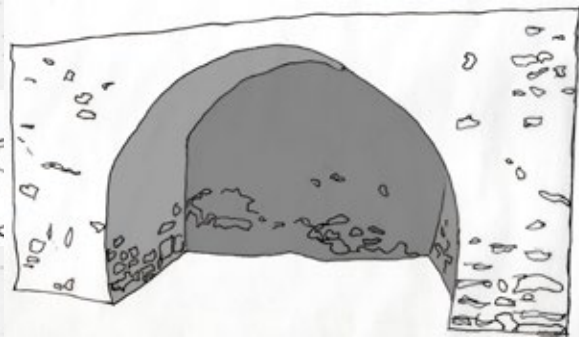




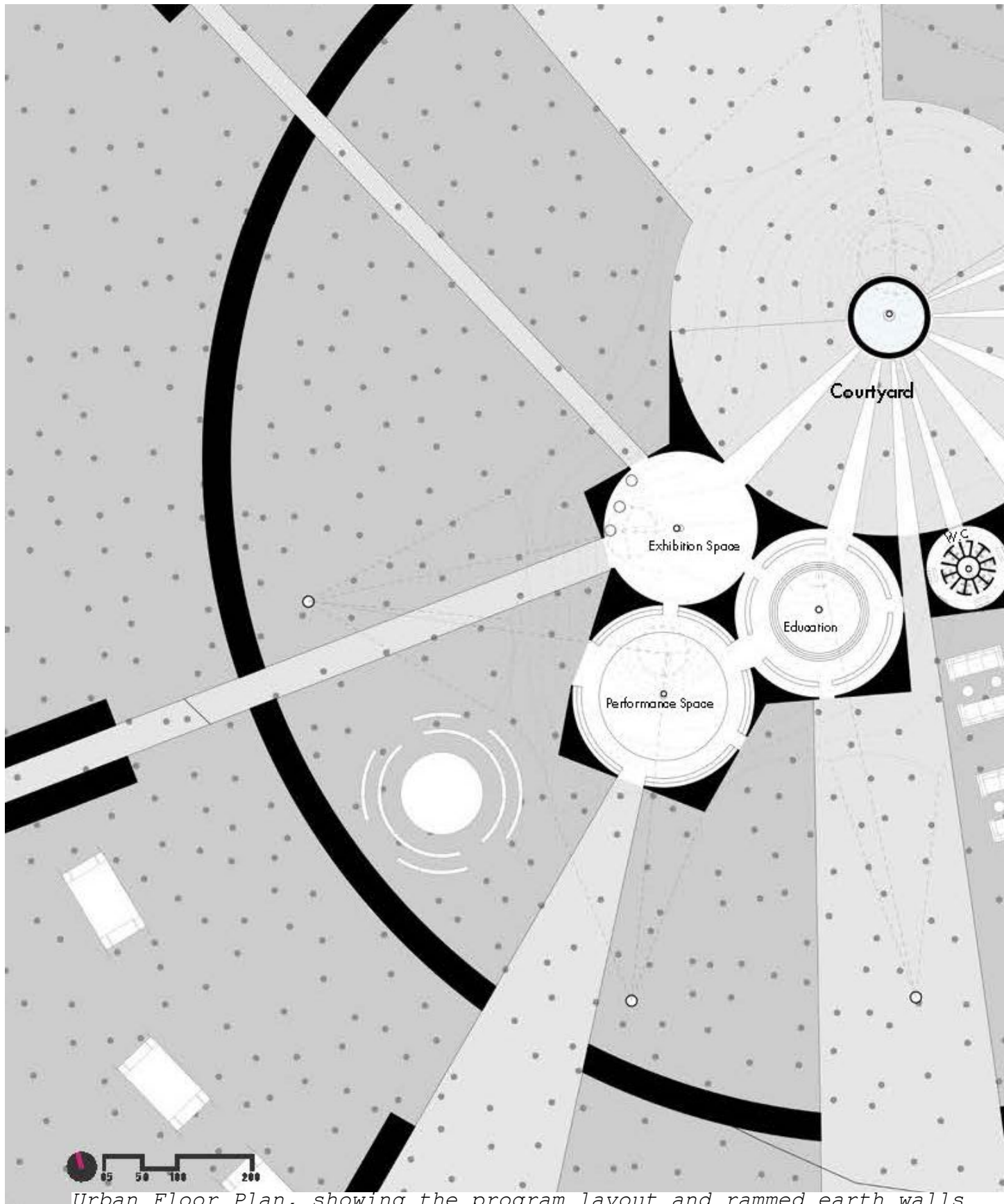
*Isometric showing the activation of the site with the rammed earth ele*



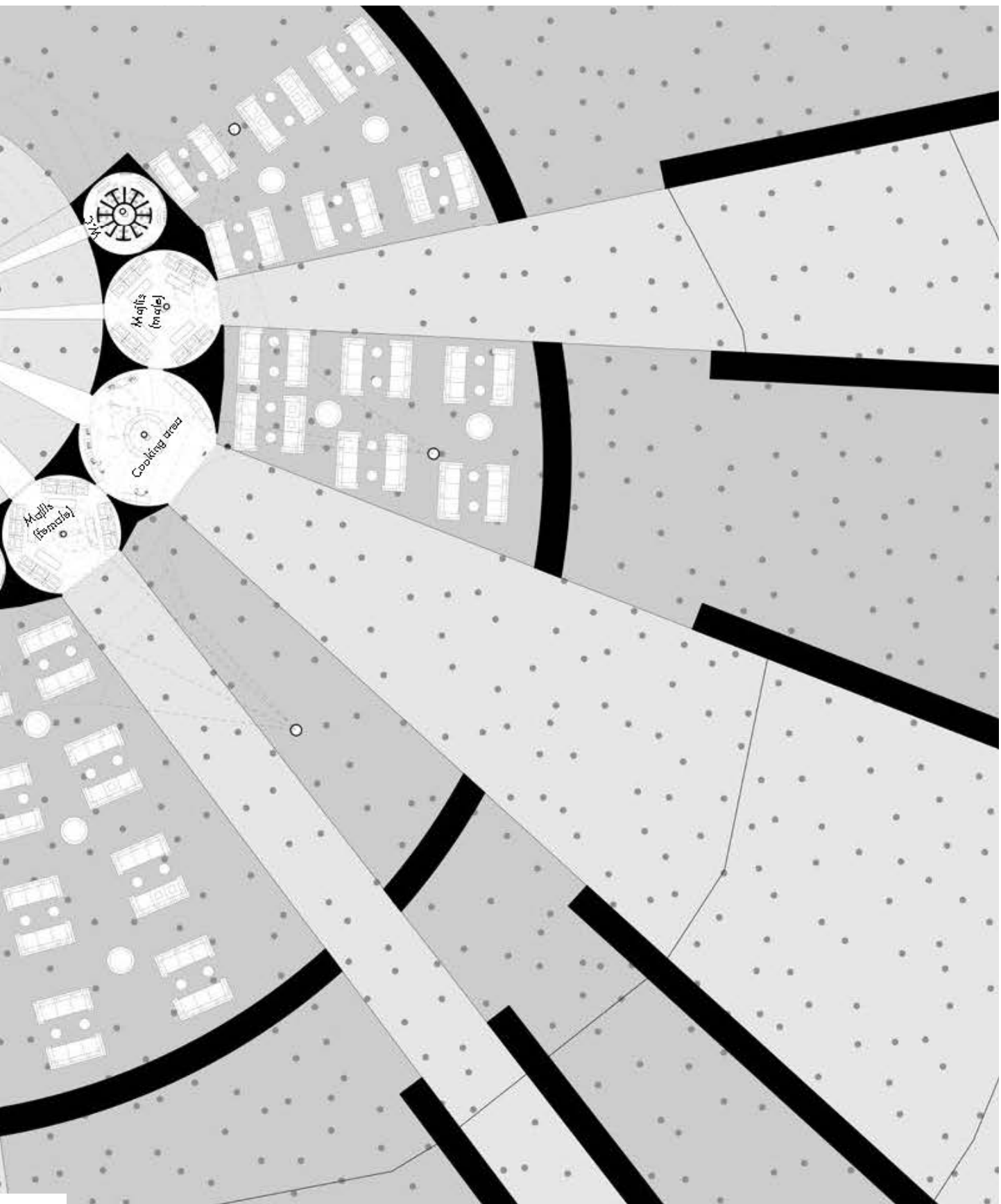
Traditional Influences

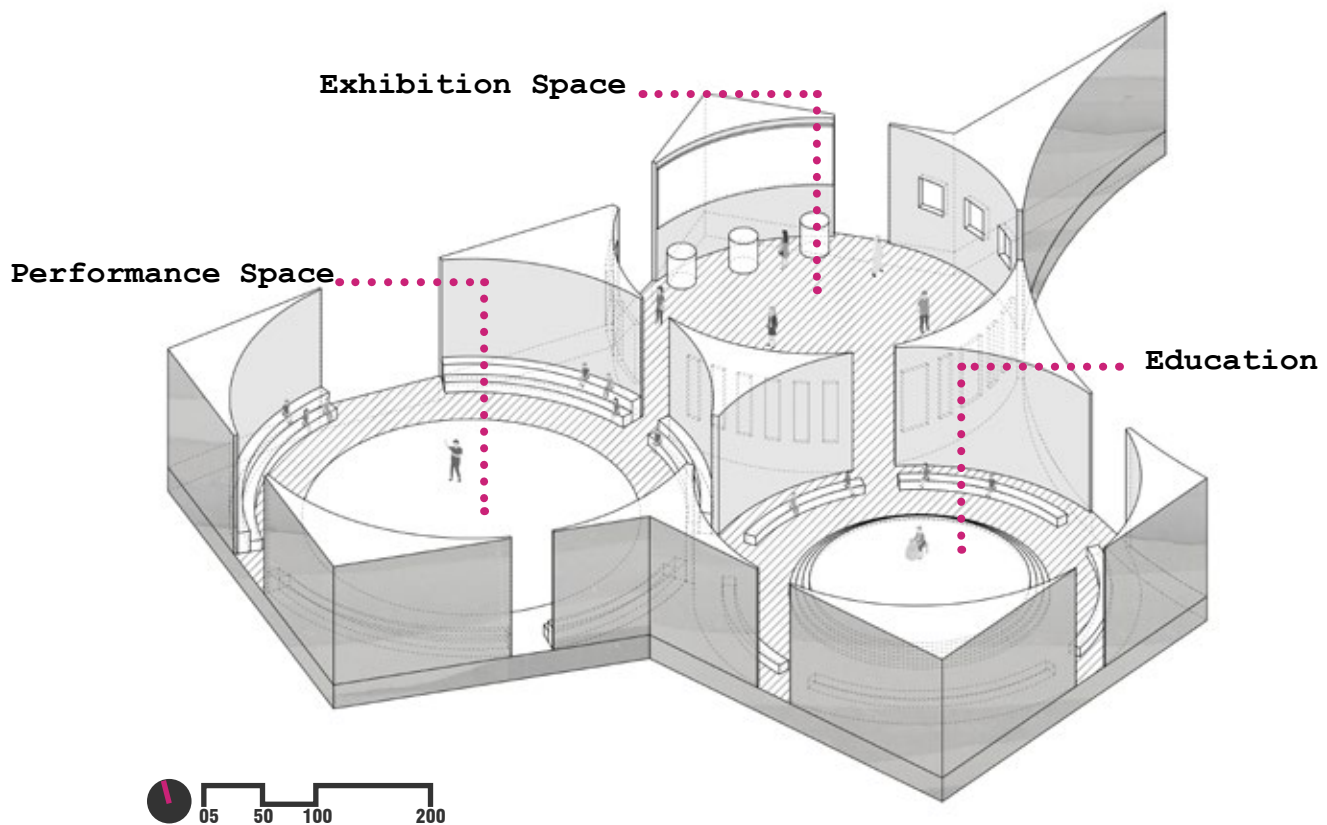
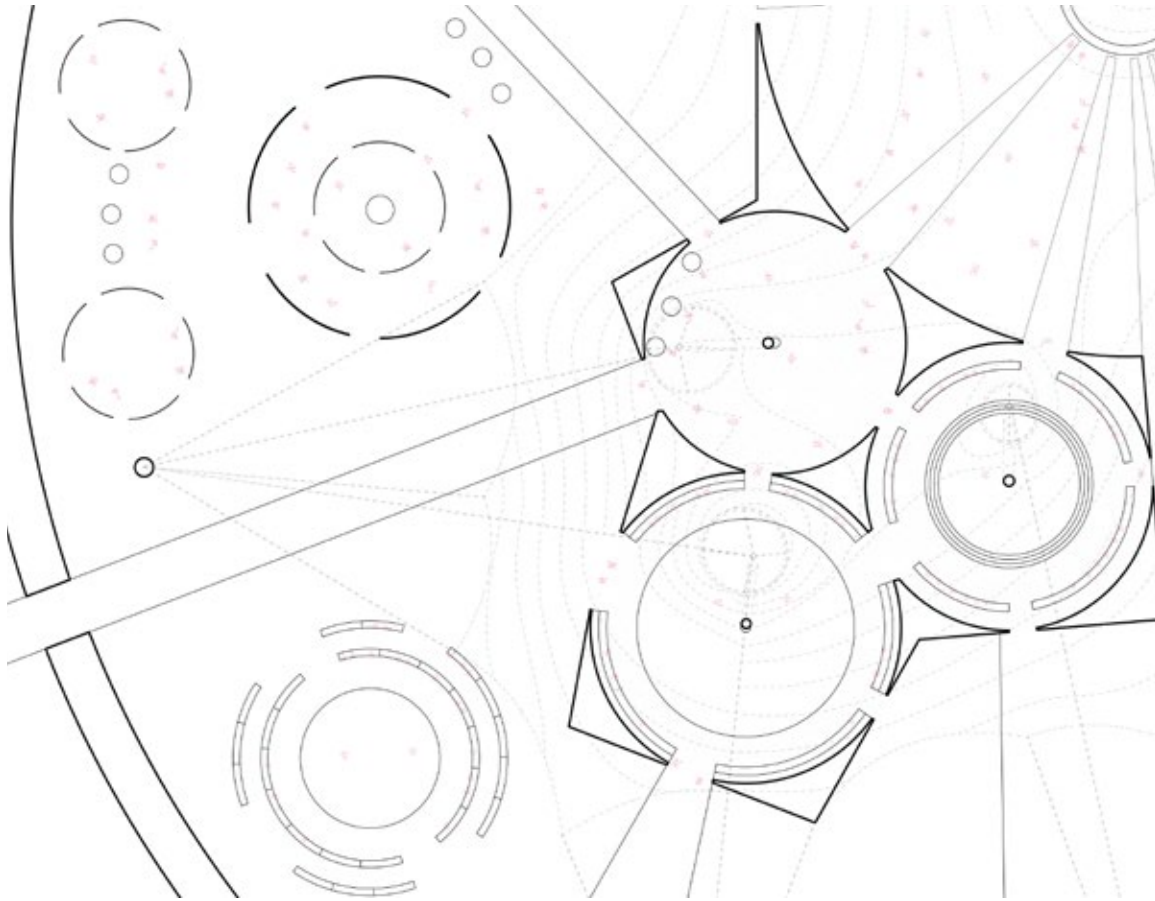




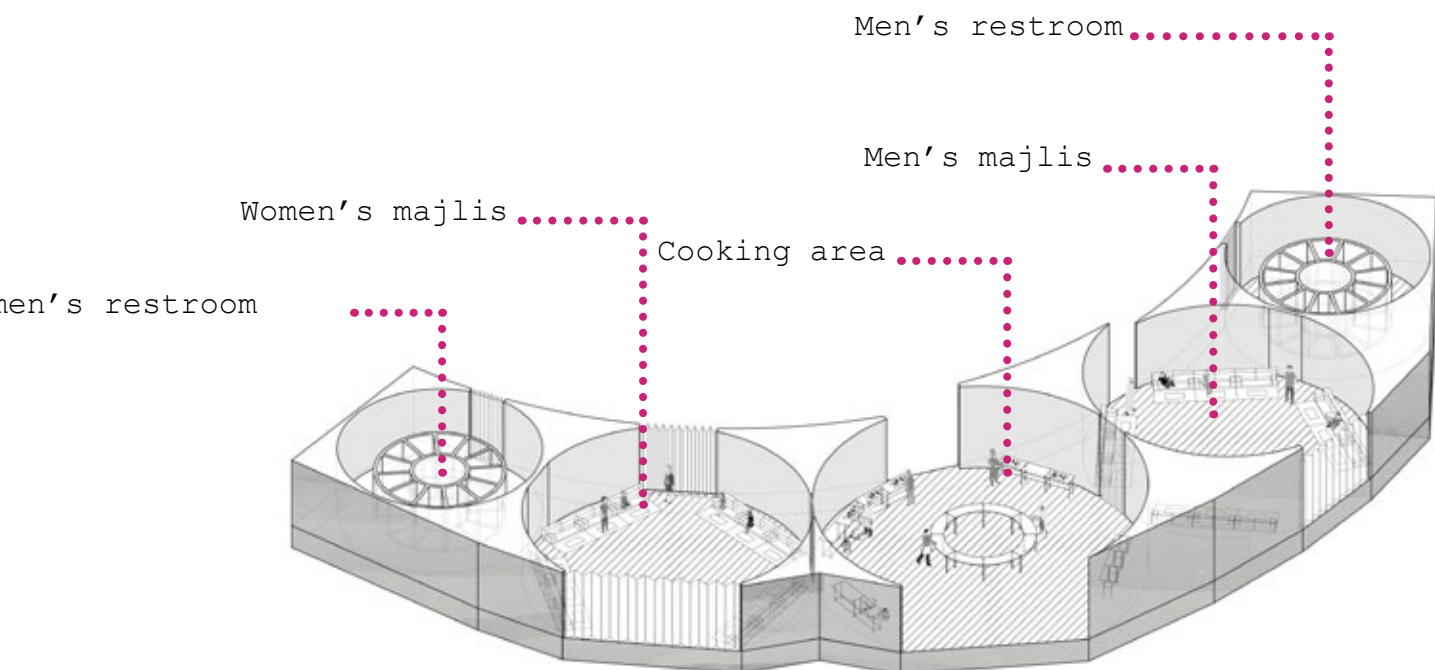
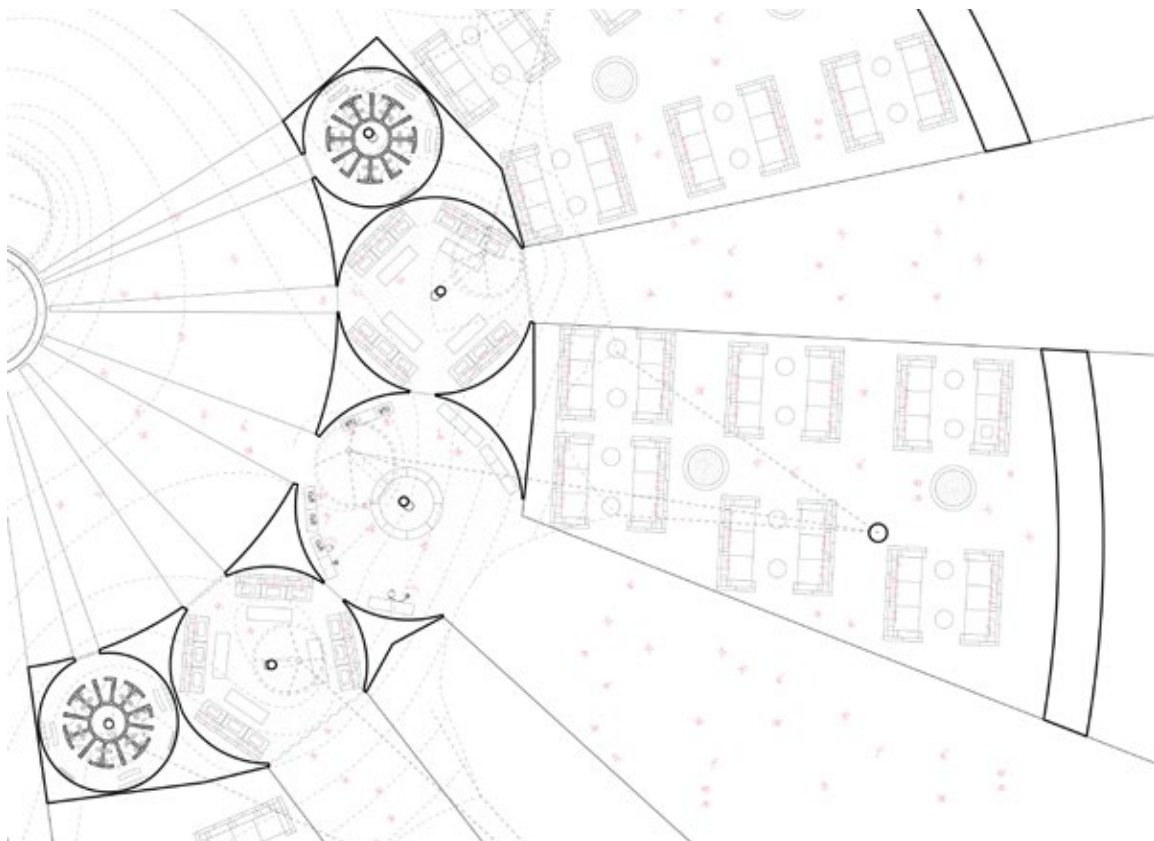


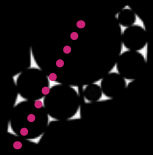
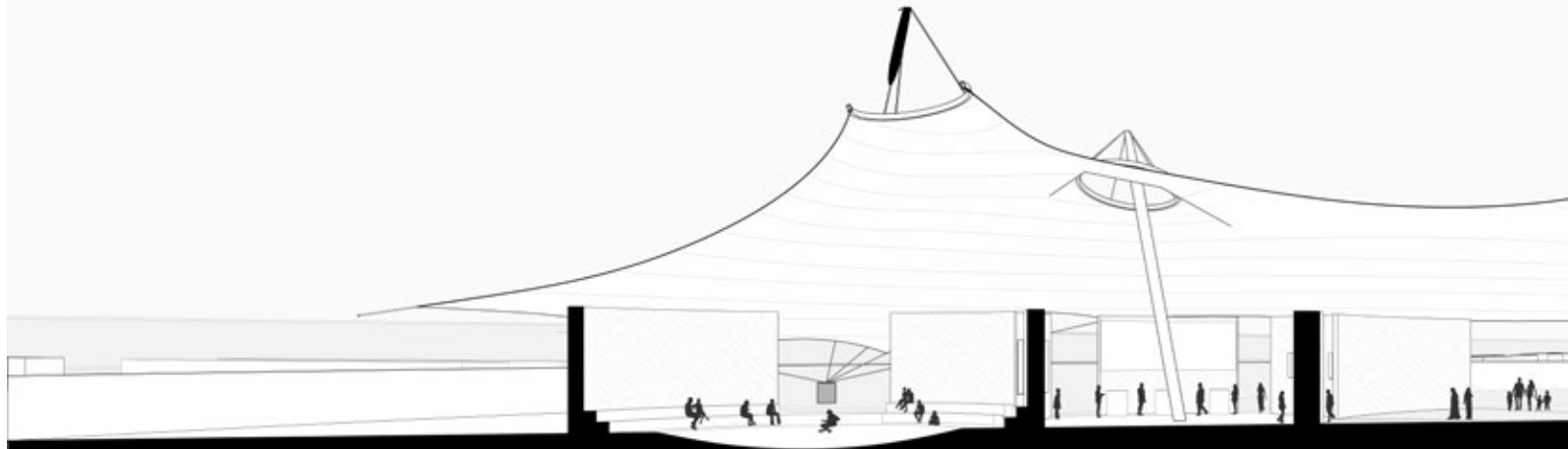
*Urban Floor Plan, showing the program layout and rammed earth walls*



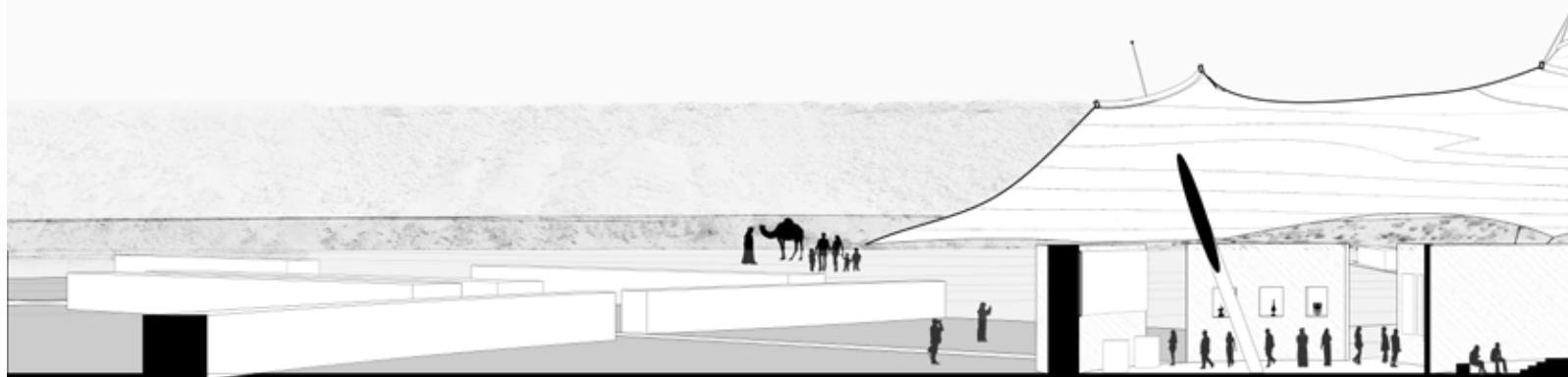


Wom

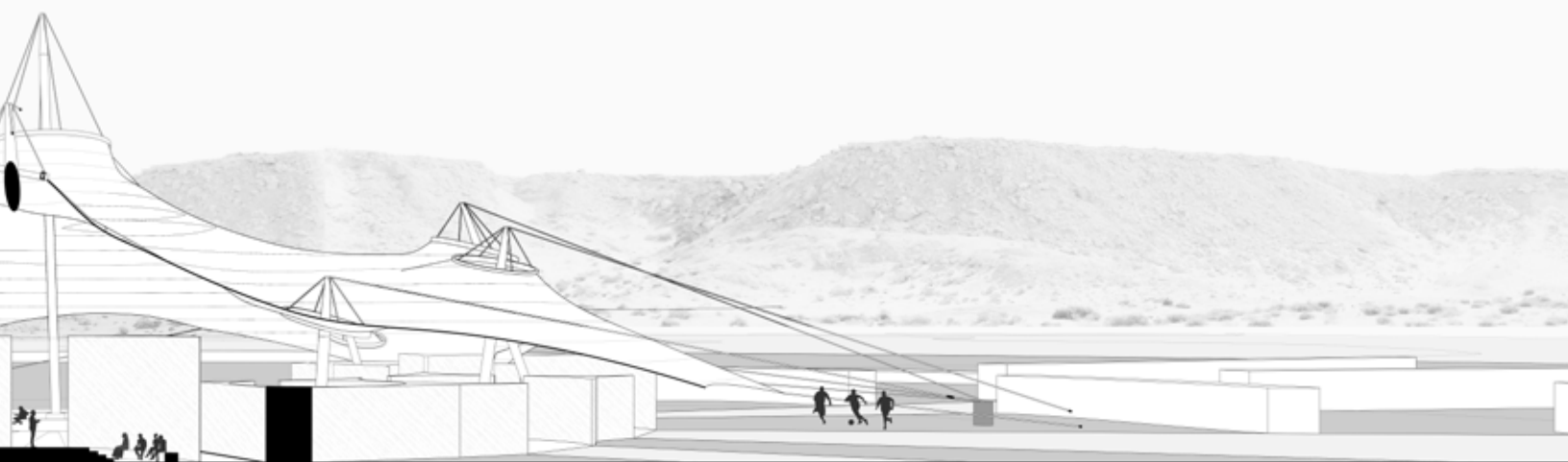
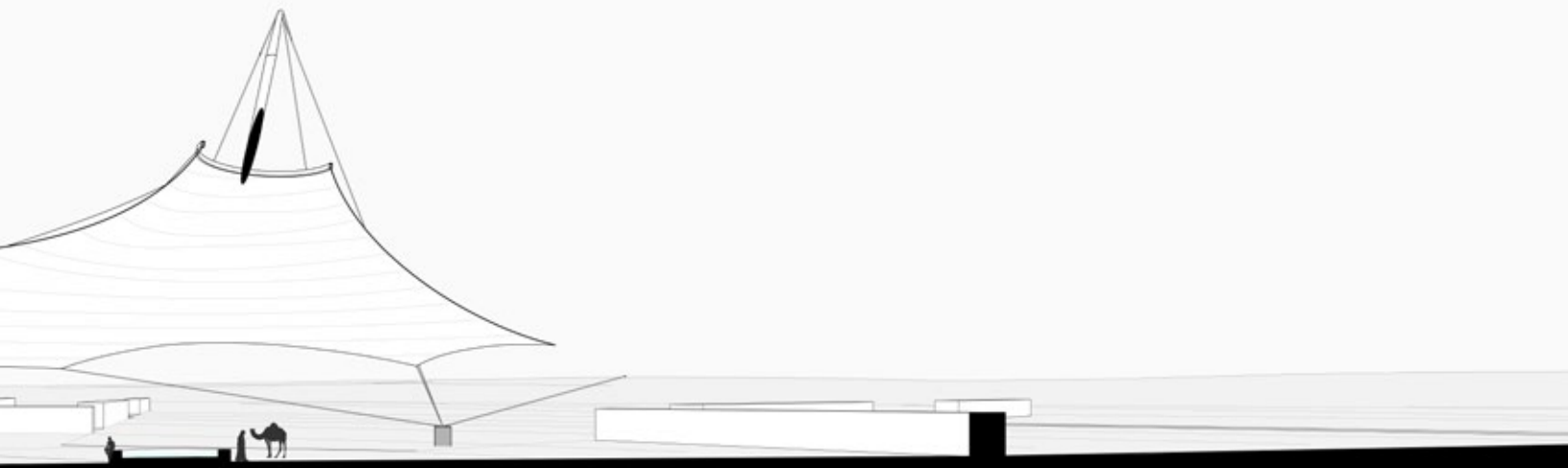




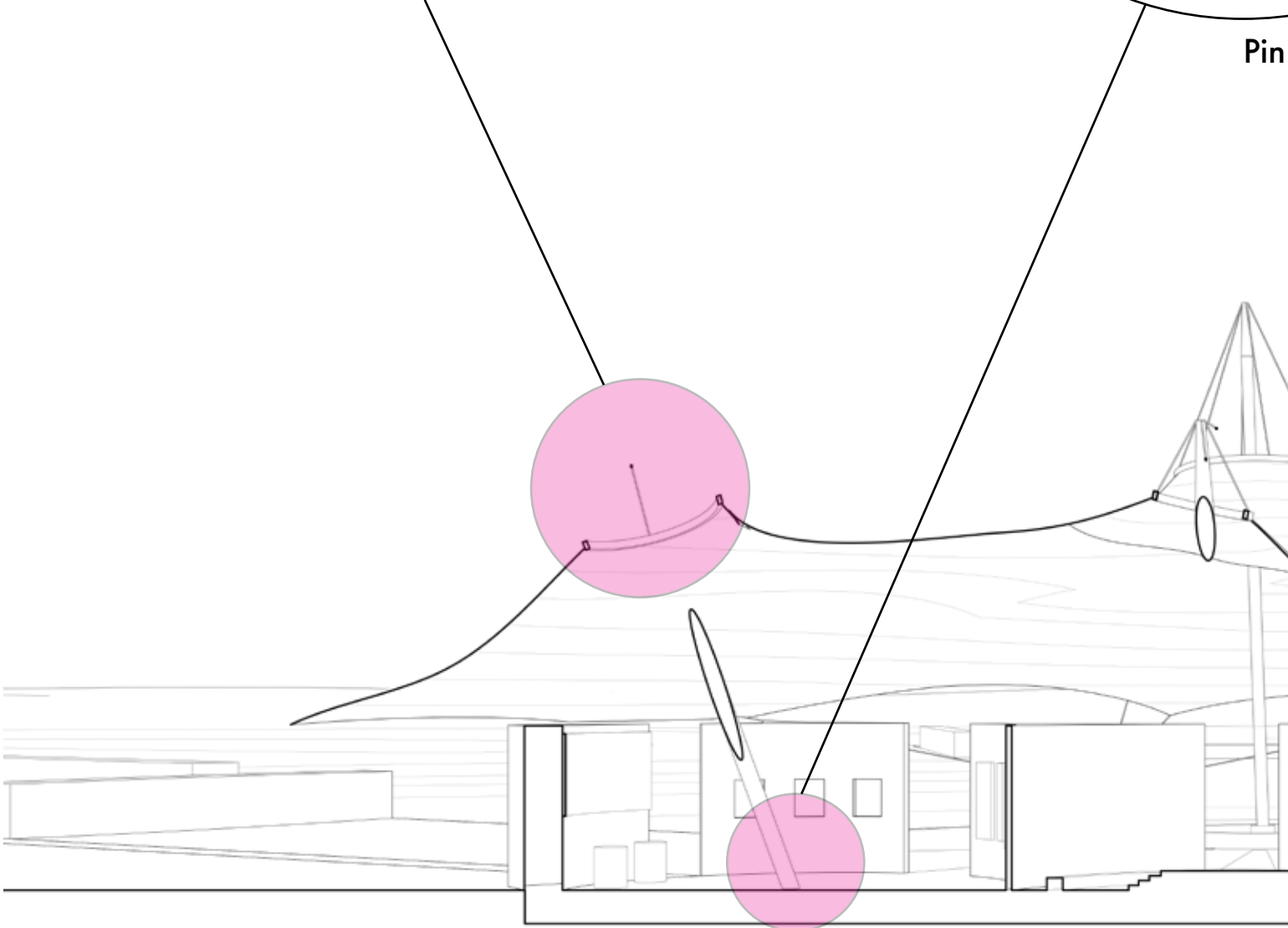
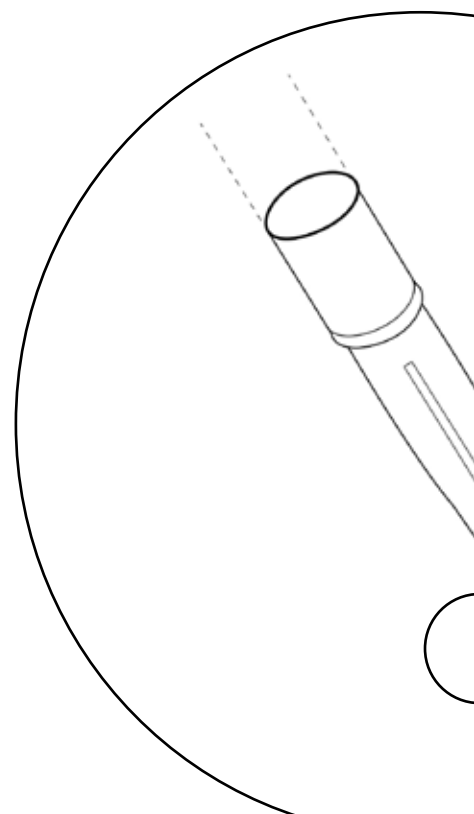
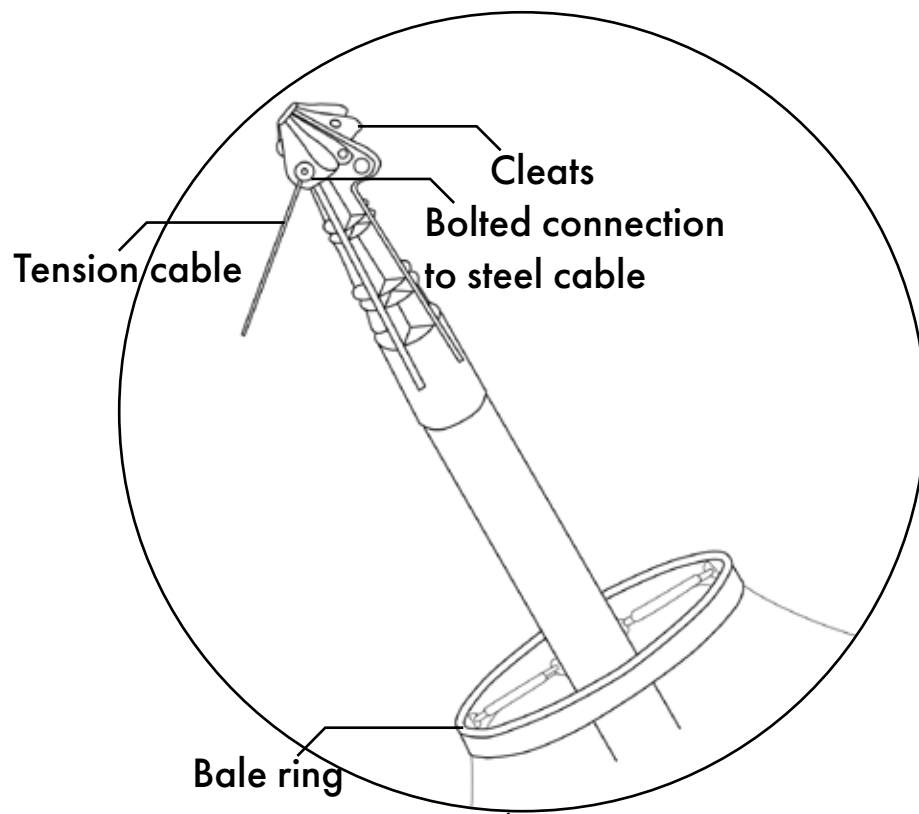
Section through Performance Space + Courtyard

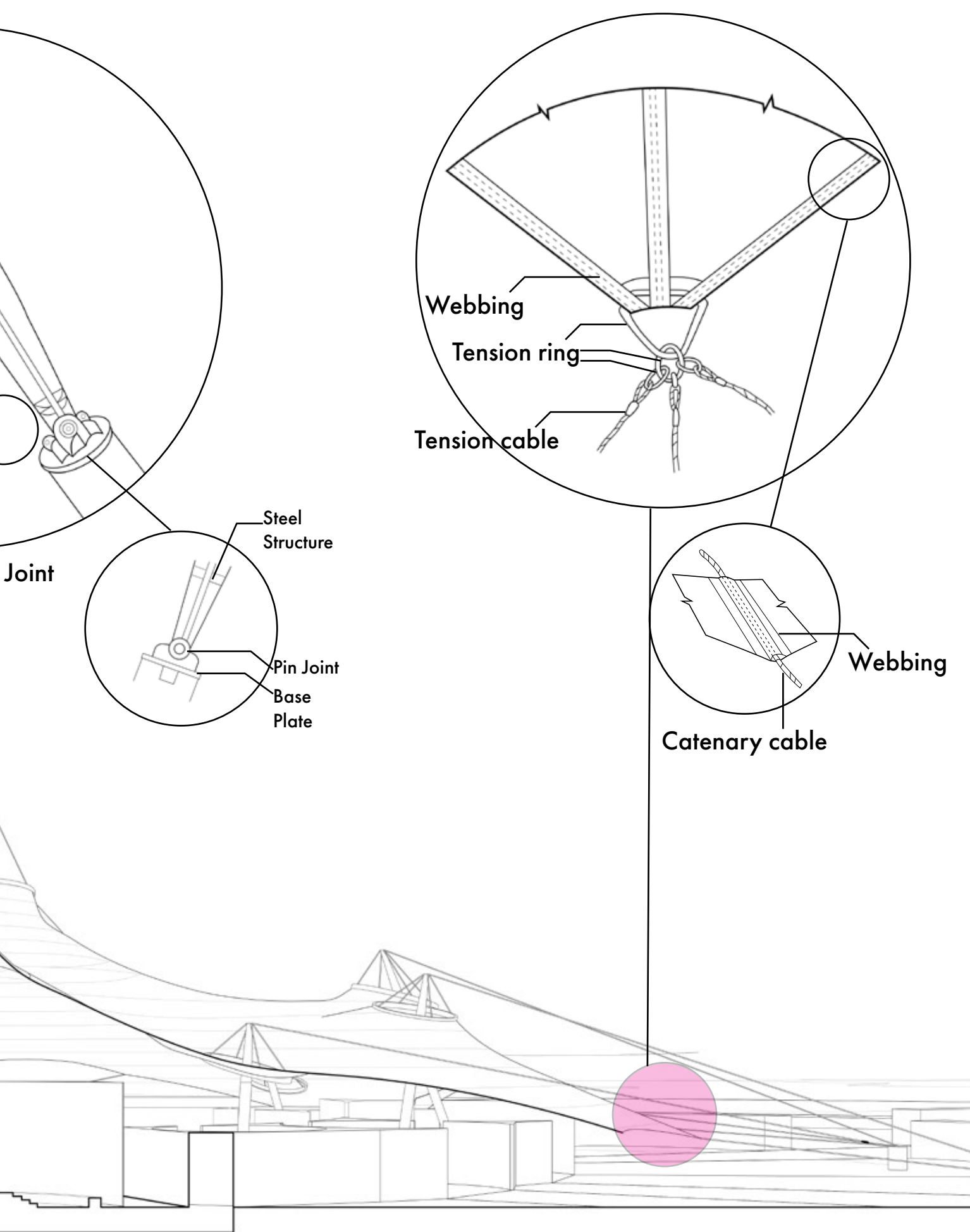


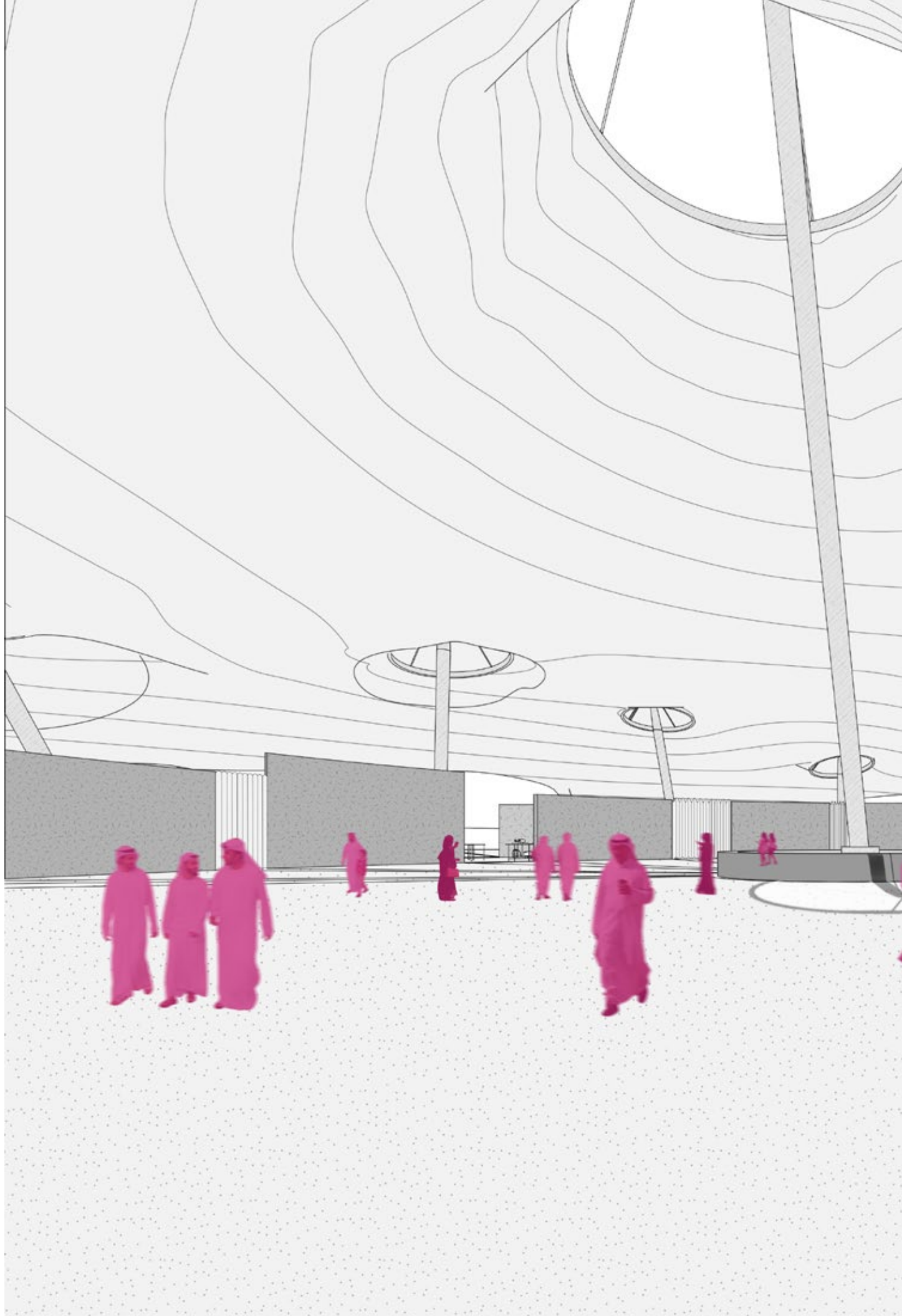






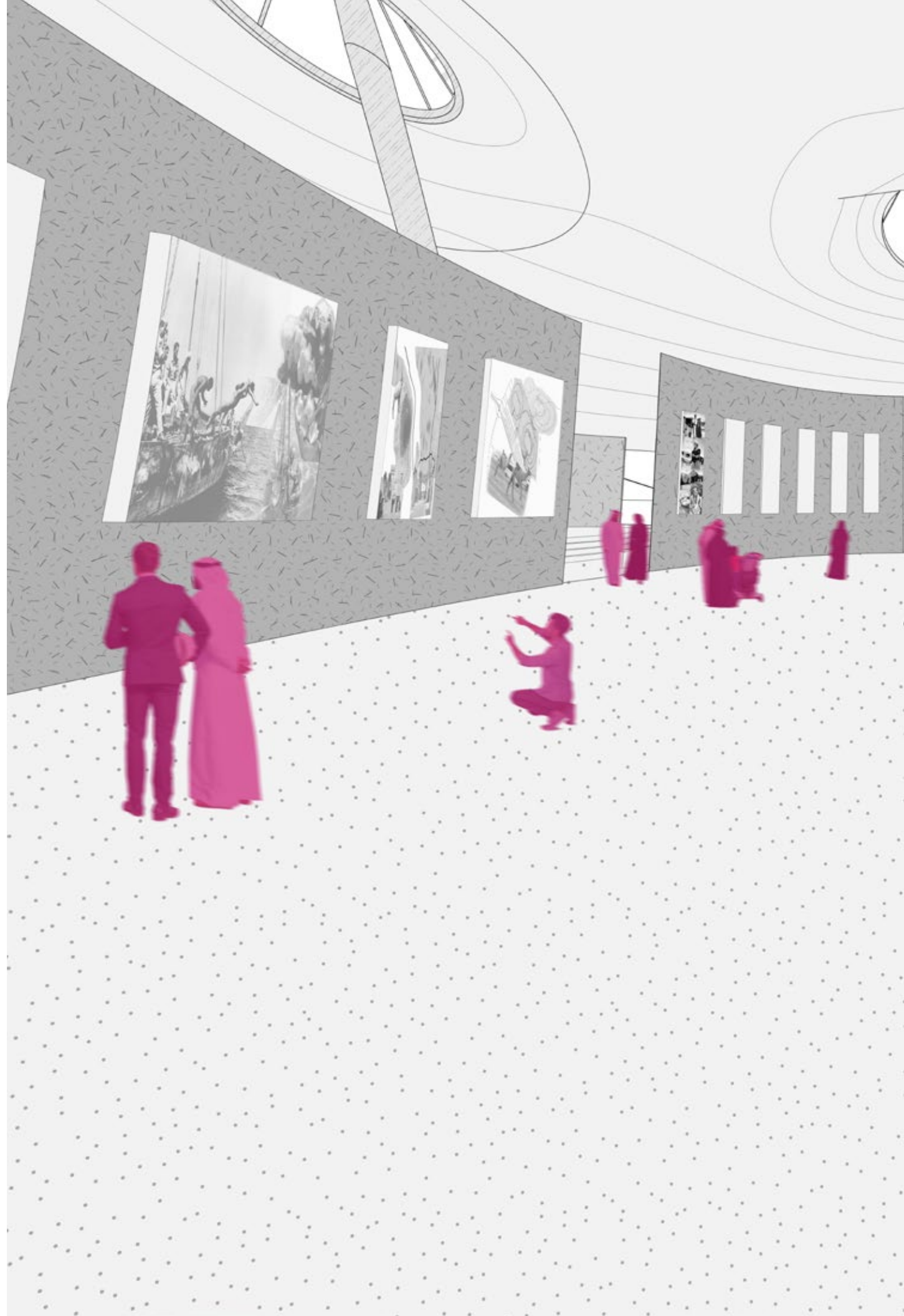


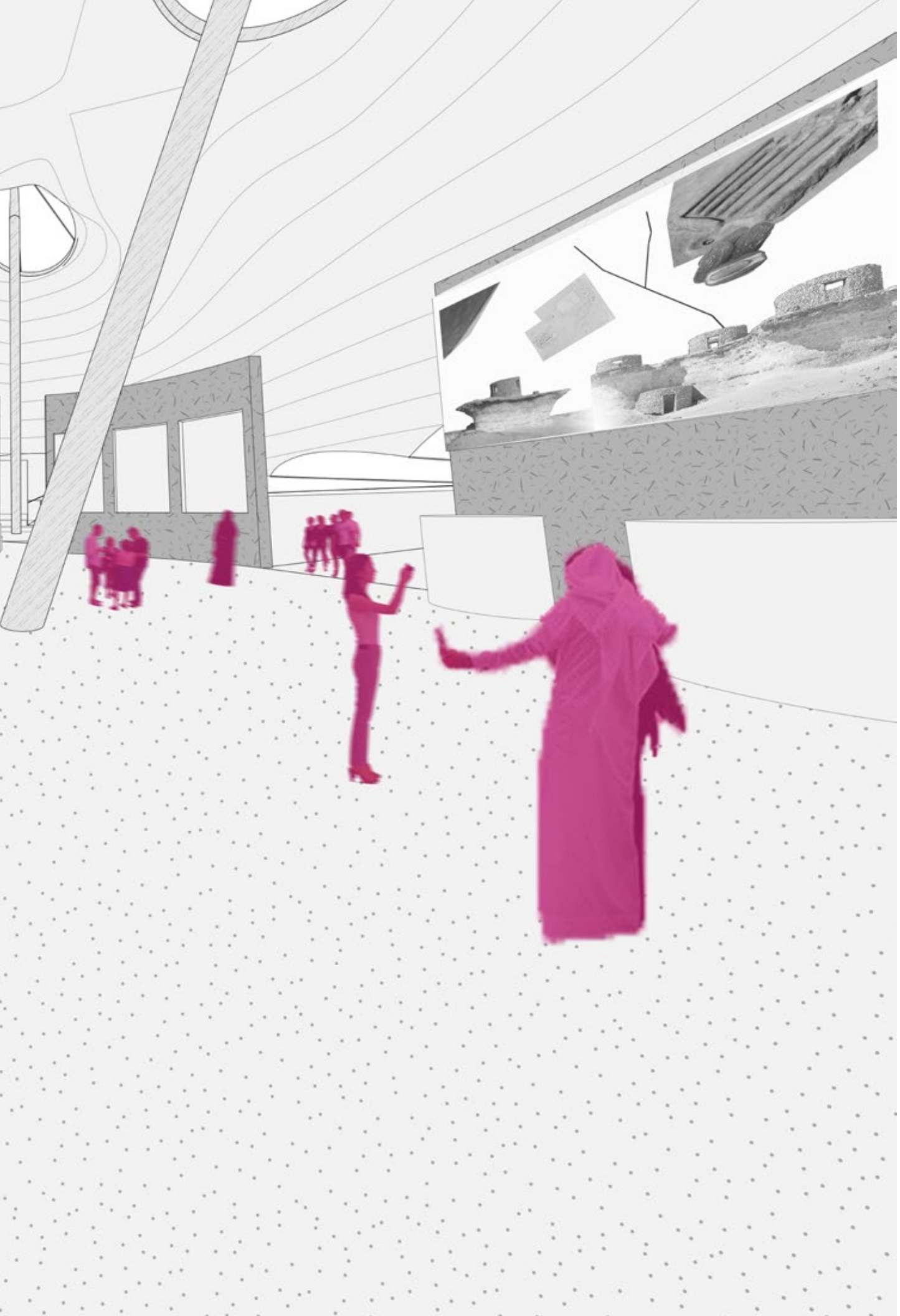


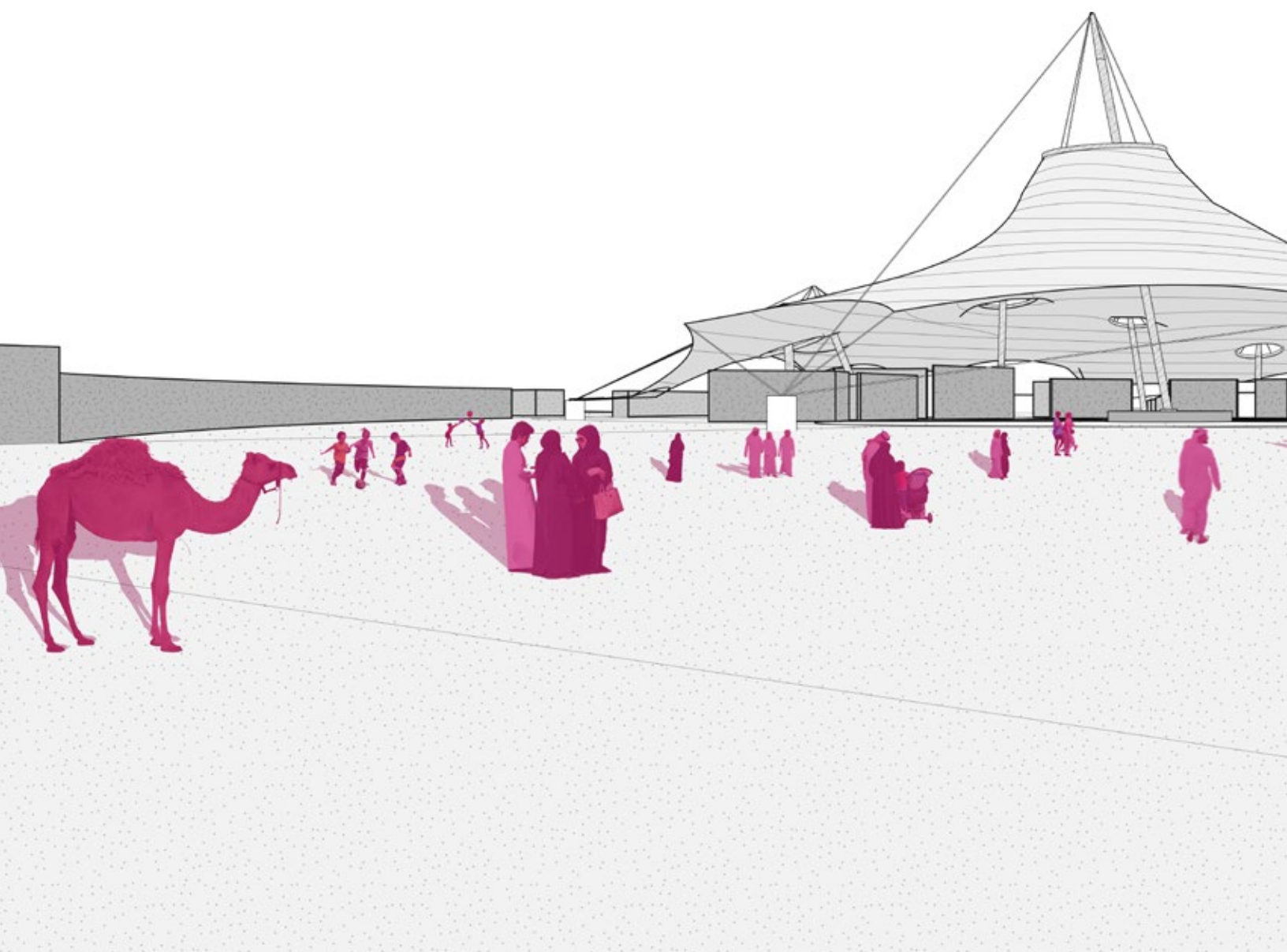




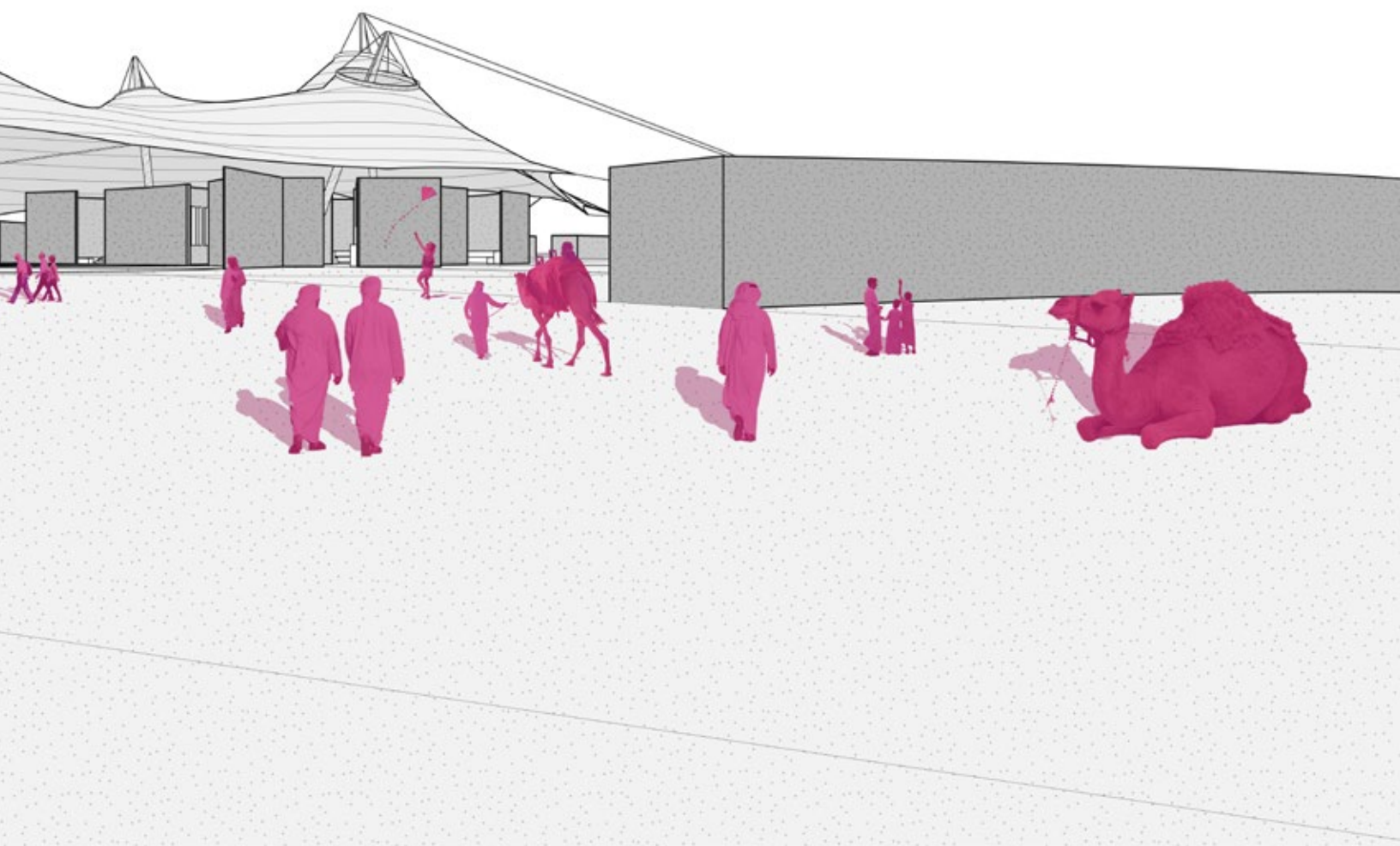














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# **Image References**

Figure 1; History Collage; own image

Figure 2; Ferdinand, Klaus, and Ida Nicolaisen. *Bedouins of Qatar*. The Carlsberg Foundations Nomad Research Projet, 1993.

Figure 3; Ferdinand, Klaus, and Ida Nicolaisen. *Bedouins of Qatar*. The Carlsberg Foundations Nomad Research Projet, 1993.

Figure 4; Ferdinand, Klaus, and Ida Nicolaisen. *Bedouins of Qatar*. The Carlsberg Foundations Nomad Research Projet, 1993.

Figure 5; Downtown Doha; own image

Figure 6; Old Doha / <https://www.businessinsider.com/doha-qatar-then-and-now-2014-2#then-heres-what-the-skyline-of-the-qatari-capital-of-looked-like-in-1977-1>

Figure 7; Khulayfī Muḥammad Jāsīm. *Traditional Architecture in Qatar*. National Council for Culture, Arts and Heritage, Museums & Antiquities Dept., 2006.

Figure 8; Qatar Mall; own image

Figure 9; own image

Figure 10; own image

Figure 11; own image

Figure 12; own image

Figure 13; own image

Figure 14; own image

Figure 15; own image

Figure 16; own image

Figure 17; "Skysong at ASU Campus / FTL Design Engineering Studio" 11 Aug 2009. ArchDaily. Accessed 15 Mar 2020. <<https://www.archdaily.com/31562/skysong-at-asu-campus-ftl-design-engineering-studio/>> ISSN 0719-8884

Figure 18; David Langdon. "AD Classics: German Pavilion, Expo '67 / Frei Otto and Rolf Gutbrod" 27 Apr 2015. ArchDaily. Accessed 15 Mar 2020. <<https://www.archdaily.com/623689/ad-classics-german-pavilion-expo-67-frei-otto-and-rolf-gutbrod/>> ISSN 0719-8884

Figure 19; "JNBY / HHD\_FUN" 15 Feb 2011. ArchDaily. Accessed 15 Mar 2020. <[https://www.archdaily.com/111922/jnby-hhd\\_fun-architects/](https://www.archdaily.com/111922/jnby-hhd_fun-architects/)> ISSN 0719-8884

Figure 20; "Framed Escape Library / eskaapi" 03 Feb 2018. ArchDaily. Accessed 15 Mar 2020. <<https://www.archdaily.com/888008/framed-escape-library-eskaapi/>>

Figure 21; "Observation Tower Negenoord / De Gouden Liniaal Architecten" 18 May 2017. ArchDaily. Accessed 15 Mar 2020. <<https://www.archdaily.com/871476/observation-tower-negenoord-de-gouden-liniaal-architecten/>>

Figure 22; "Observatory in the Desert / Contemporary Architects Association" 17 Jun 2017. ArchDaily. Accessed 15 Mar 2020. <<https://www.archdaily.com/873615/observatory-in-the-desert-contemporary-architects-association/>>

Figure 23; own image