

# DEDICATION

A special feeling of gratitude to my loving parents, whose encouragement and push for tenacity ring my ears,,and keep me moving forward. **My father**, the man I'll always look up to, and my first teacher who encouraged and believed in me, the man that no words can describe.. **My mother**, a strong & gentle soul who taught me to have faith, believe and work hard and that so much can be done with so little the reason behind my self confidence and ambition, the person behind all my motivations...

My brothers and sisters,,who always stood by my side and cheered me up and supported me never the less.

My second father and supervisor **Dr. Saleem alzain** who lit up my love for architecture and always backed me up.

To the most amazing teacher I had the pleasure of being her student **T. Yasmeen othman sgady**, and my friends who helped me and guided me through these five years

To every single one of my friends who I actually see them as family, who walked alongside me and were the reason that I kept getting up every time I fell. People that I'll always carry them with me in my heart.

# THANKS & APPRECIATION

Words can't express my gratitude for those who always stood beside me, encouraged me and always believed in me.

I would like to thank specially teachers, who always kept pushing me forward.

My family that always made me feel like I'm destined for greatness and always encouraged me.

My friends who I call family, people that I can't replace with the stars.

(Osama Alsayed, Mohamed Omer Mahmoud, Zoey Elamin, Mohamed abdullah, Mohamed Almubarak, Ahmed Osama, Yageen omer, Abdullah Awooda, Radwa Abdullah) and all those who were forgotten by words and remembered in the heart.

The people I look up to, the people who helped me always and stood by me. Words will never be enough thanks (Yasmeen othman, Hind kareem, Ahmed salah, Anwar Abd Alaal, Rahma Sarhan).

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# CHAPTER ONE (1)

# INTRODUCTION

## **PROJECT DIFINITION:**

-The project is a multi-function project that provides education, production, marketing, & galleries of fine & applied arts works & products.

-The word **COMPLEX** is used to express the multi-functionality of the project.

## **PROJECT IMPORTANCE:**

1. Development of the art facilities in the country.

2. Increasing the art production & products & the local income from these products.

3. The multi function project (educational, cultural, investment).

4. Linking the local idea of art with the modern concept.

5. Providing employment chances for graduates & unemployed.

6. Reflecting the local cultural identity and strengthening it.

7. Improving tourism movement.

## **PROJECT DIMENSIONS:**

1. ECONOMICAL: Providing income from marketing art products & galleries.

2. FUNCTIONAL: Mix use of functions in one project (complex).

3. ENVIROMENTAL: Fusing the design with the surrounding nature and outdoor activities as an expression of art.

The building outdoor expression of art & creativity.

4. BEAUTY: Expressing the building main function (ART).

Expressing creativity & imagination which are all expressions of art.

## **Reasons for Choosing This Particular Project:**

### GENERAL REASONS:

1-manifest the role of the arts in shaping the community and giving it identity.

2-create an environment that's prepared enough to embrace social and cultural events.

3-attract youth towards art in a safe academic environment.

4-preserve the beautiful different types of art in Sudan and mix it up in a modern and unique way.

PERSONAL REASONS:

1-my passion towards art made an impact on me choosing this project.

2-I wish to see art becomes an essential part of our community.

# CHAPTER TWO (2) DATA COLLECTION



## LITERATURE REVIEW:

### 2-1 WHAT IS ART?

**Art** is the expression of human creative skill & imagination, typically in a visual form such as painting, sculpture, producing works to be appreciated primary for their beauty or emotional power. (The art of renaissance).

**Art** is the various branches of creative activity, such as painting, music, literature, & dance. (The visual arts).

**Art** plays a major role in society & nation development as a cultural factor & a symbol of creativity. Which also represents the creativity of its surroundings as well as giving the national identity for the county. That develops the architectural style.



### 2-2 CLASSIFICATIONS OF ART:

Traditional and contemporary arts are known to be very diverse, it contains:

Architecture, music, opera, theatre, dance, painting, drawing, sculpture, fashion, cartoon, printmaking, photography and many other.

Those activities are commonly referred to as "the arts" and are classified into many overlapping categories, and the following are the generally classified categories:

#### 2-2-1 Fine Arts:

This category includes those artworks that are created primarily for aesthetic reasons ('art for art's sake') rather than for commercial or functional use. Designed for its uplifting, life-enhancing qualities, fine art typically denotes the traditional, Western European 'high arts', such as:

- **Drawing:** Using charcoal, chalk, crayon, pastel or with pencil or pen and ink.
- **Painting:** Using oils, watercolor, gouache, acrylics, ink and wash, or the more



old-fashioned tempera or encaustic paints.

- **Printmaking:** Using simple methods like woodcuts or stencils, the more demanding techniques of engraving, etching and lithography, or the more modern forms like screen-printing, foil imaging or giclee prints.
- **Sculpture:** In bronze, stone, marble, wood, or clay.
- **Calligraphy art**

### 2-2-2 Visual Arts:

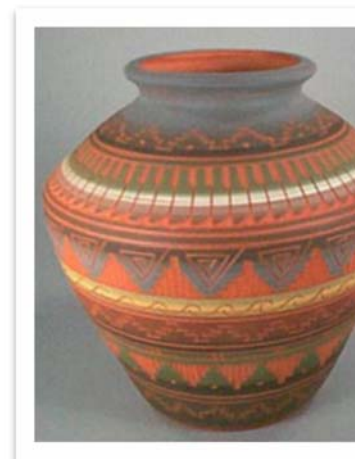
Visual art includes all the fine arts as well as new media and contemporary forms of expression such as Assemblage, Collage, Conceptual, Installation and Performance art, as well as Photography, and film-based forms like Video Art and Animation, or any combination thereof. Another type, often created on a monumental scale is the new environmental land art.

### 2-2-3 Plastic Arts:

The term plastic art typically denotes three-dimensional works employing materials that can be molded, shaped or manipulated (plasticized) in some way: such as, clay, plaster, stone, metals, wood (sculpture), paper (origami) and so on. For three-dimensional artworks made from everyday materials and "found objects", also can be called Junk art.

### 2-2-4 Decorative Arts:

This category traditionally denotes functional but ornamental art forms, such as works in glass, clay, wood, metal, or textile fabric. This includes all forms of **jewelry** and **mosaic art**, as well as ceramics, (exemplified by beautifully decorated styles of ancient **pottery** notably Chinese and Greek Pottery) **furniture**, **furnishings**, **stained glass** and **tapestry art**.



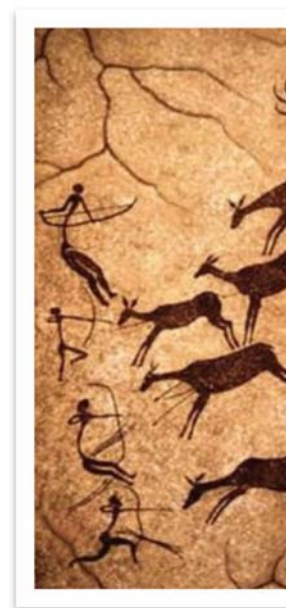
### 2-2-5 Performing Arts:

This type refers to public performance events. Traditional varieties include, **theatre**, **opera**, **music**, and **ballet**. Contemporary performance art also includes any activity in which the artist's physical presence acts as the medium. Thus it encompasses, mime, face or body painting, and the like. A hyper-modern type of performance art is known as **Happenings**.



### 2-2-6 Applied Arts:

This category encompasses all activities involving the application of aesthetic designs to everyday functional objects. While fine art provides intellectual stimulation to the viewer, applied art creates utilitarian items (a cup, a couch or sofa, a clock, a chair or table) using aesthetic principles in their design. **Folk art** is predominantly involved with this type of creative activity. Applied art includes **architecture**, **computer art**, **photography**, **industrial design**, **graphic design**, **fashion design**, **interior design**, as well as all decorative arts.



## 2-3 HISTORY OF ART:

The history of art is the history of any activity or product made by humans in a visual form for aesthetical or communicative purposes, expressing ideas, emotions or, in general, a worldview.

### **ART HISTORY TIMELINE:**

#### 2-3-1 Prehistoric art:

##### **The stone age:**

it's when the first tangible artifacts of human art that have been found ,and the first demonstrations that can be

considered to be art by humans appeared. Humans practiced hunting and gathering and lived in caves, where cave painting was developed, and the first traces are generally worked stone, wood or bone tools. Then humans engaged in agriculture and built increasingly complex societies, religion became more important and the production of handicrafts commenced.

### **The metal age:**

it's the last prehistoric phase, as the use of elements such as copper, bronze and iron proved to be a great material transformation for these ancient societies. When humans could smelt metal and forge metal implements, this enabled them to make new tools and weapons.

### **2-3-2 Ancient art:**

In the first period of recorded history, art began alongside the invention of writing. Which was generated primarily by the need to keep tax and commercial records.

**Mesopotamian art:** (modern day Syria and Iraq). Mesopotamian architecture was characterized by the use of brick, lintel and the introduction of construction elements like arc and vault, large temples with the form of a terraced step pyramid. There were also palaces walled with a terrace in the form of a ziggurat, where gardens were an important feature. The Hanging Gardens of Babylon was one of the Seven Wonders of the Ancient World.

Music was developed in this region between 4th and 3rd millennium BCE for use in Sumerian temples, where priests sang hymns and psalms to the gods.

**Ancient Egyptian art:** Egypt had an elaborate and complex works of art which were produced by professional artists and craftspeople, who developed specialized skills. Egypt's art was religious and symbolic. The architecture is characterized by its



monumental structures, Painting of the Egyptian era used a juxtaposition of overlapping planes. The images were represented hierarchically, applied arts were developed in particular woodwork and metalwork.

**Greece and Etruria:** Greek and Etruscan artists built on the artistic foundations of Egypt, further developing the arts of sculpture, painting, architecture, and ceramics. The body became represented in a more representational manner.

**Rome:** Roman sculpture is often less idealized than the Greek precedents. Roman architecture often used concrete, and features such as the round arch and dome were invented.

### 2-3-3 Medieval to contemporary eras:

**Early Christian art:** the dominance of the church insisted on the expression of biblical truths and the denial of the material world.



**Renaissance and Baroque:** it is the return yet again to valuation of the material world, and this paradigm shift is reflected in art forms, which show the corporeality of the human body, and the three-dimensional reality of landscape.

**Neoclassicism to Realism:** The 18th and 19th centuries included Neoclassicism, Romantic art, Academic art, and Realism in art.

### 2-3-4 Modern and Contemporary “postmodern art”:

**Modernism:** is a philosophical movement that arose from wide-scale and far-reaching transformations in Western society in the late 19th and early 20th centuries. Among the factors that shaped modernism were the development of modern industrial societies “industrial revolution” and the rapid growth of cities, followed then by the horror of World War I. Modernism also rejected the certainty of Enlightenment thinking, and many modernists rejected religious belief.

**Postmodern art:** is a body of art movements that sought to

contradict some aspects of modernism or some aspects that emerged or developed in its aftermath. In general, movements such as intermedia, installation art, conceptual art and multimedia, particularly involving video are described as postmodern.



### Art in the modern days of Islam in Sudan:

-This entire heritage, past and present, constitutes the base on which the modern days of Islam in Sudan. It is traditional Qoranic School. Which continued to exist from as early as the 9th century AD until the present day, It teaches art as a practice, but not as an objective. Yet its artistic impact on the Sudanese child seems to be important.



### Sudanese modern and contemporary art:

-Contemporary Sudanese art world did not experience a war of styles, nevertheless, there is a relatively strong art movement, which is highly experimental. In its own way this movement is modernist and seeking to globalize in spite of the rather restrictive conditions under which hundreds of Sudanese artists are working.

-Two most famous forms of art education in Sudan now are the fine and applied arts faculty and music and drama faculty.

### Some of the influential Sudanese artists:

- Ahmed Abdurrahman "calligraphy artist".
- AbdelKarim AlKabli, "singer".
- Abubakr El-shiekh "director and script writer".-
- Rashid Diab "artist".

## 2-7-1 CASE STUDIES:

### 2-7-1 LOCAL CASE STUDY: (Rashid Diab art center):



**LOCATION:** Khartoum - Aljerif west - west of steen st.

**TOTAL AREA :** 3150m<sup>2</sup>

#### TARGETS:

1. Presenting Sudanese art & artists to the world.
2. Raising the local abilities of Sudanese art students.

**STRUCTURE:** used load bearing walls with concrete slabs.

**ACTIVITIES:** painting - sculpture - drawing - colouring.

**COMPONENTS:** galleries - studios - outdoor theater - Administration - Advertisement.

#### The Gallery:

Is one of the finest features of the center. The leading venue for contemporary arts is Sudan. The gallery is unique for the selection of paintings, drawings, etching, sculpture & photography. as well as chosen works from the workshops. the overall space is designed to make use of natural light & colour.

each window was placed to bring in minimum heat & therefore used less energy in cooling.



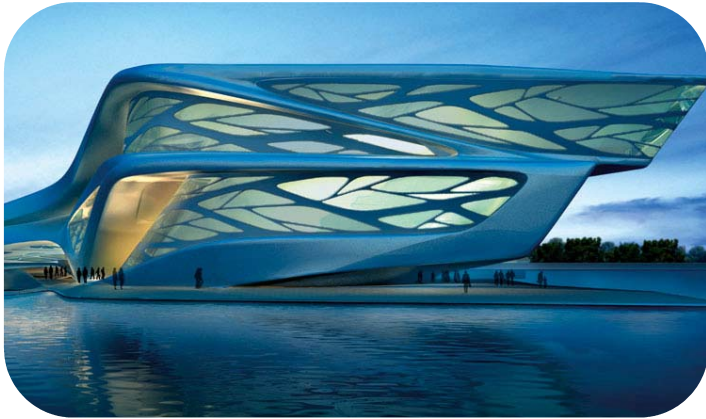
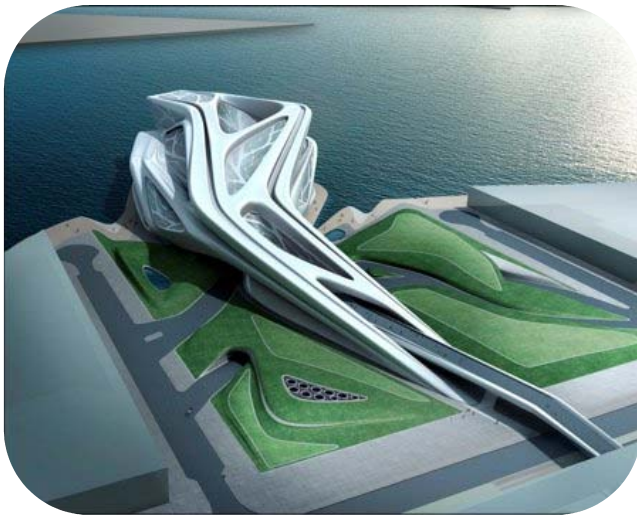
### **ADVANTAGES:**

1. Maximum use of natural lighting.
2. Reuse of local materials.
3. Corridors views on yard.
4. The use of green element.





## 2-7-2 REGIONAL CASE STUDY: ABU DHABI PREFORMING ART CENTER :



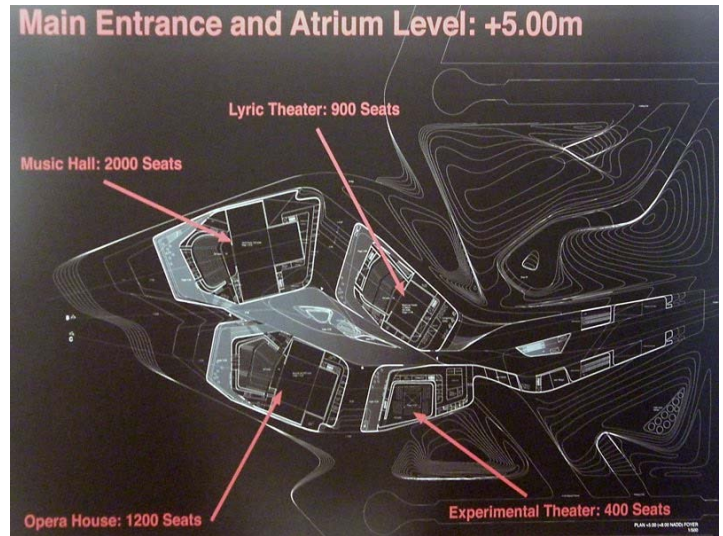
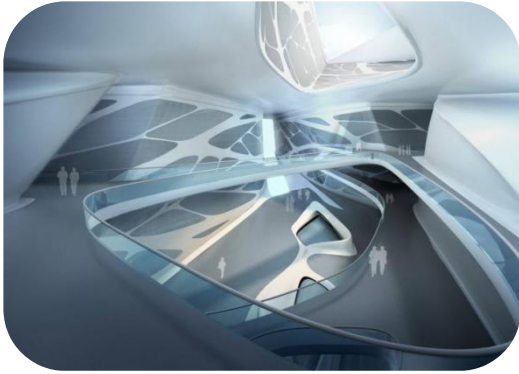
**ARCHITECT:** Zaha hadeed.

**TOTAL AREA:** 52381 m2.

**LOCATION:** Abu Dhabi - UAE.

### **COMPONENTS:**

- THEATERS &MUSIC HALLS: 16283 m2.
- PERFORMING ART INSTITUTE: 3557 m2.
- CONFERENCE HALLS CENTER: 3849 m2.
- OTHER SPACES/BACKSPACES: 28692 m2.
- Organic building (62m height).
- 5 music concert halls.
- opera hall.
- classic theater with total seating of 6300 seats.



## **ADVANTAGES:**

1. Maximum use of natural lighting.
2. The Building sectors are connected with a big void with skylight top that gives modern interior looks.
3. The organic design gives smooth movement between the sections.
4. The use of surrounding environment (Contour levels).
5. Clear Entrance & lobby.
6. The Use of natural light corridors.



## 2-7-3 GLOBAL CASE STUDY: THE NATIONAL ART CENTER - TOKYO:



**LOCATION:** Tokyo - Japan.

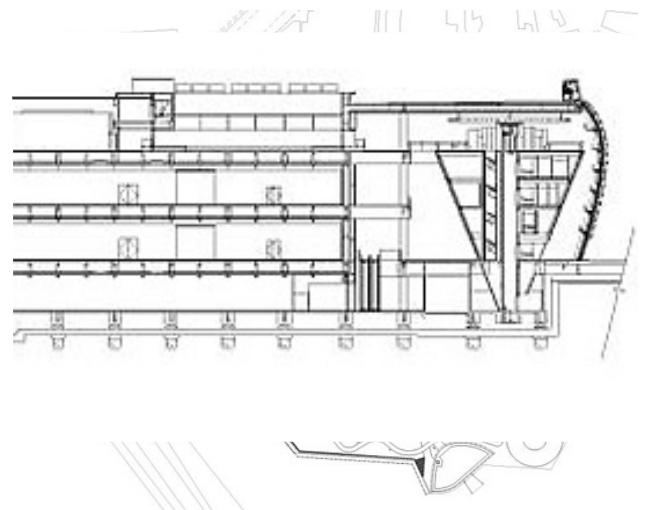
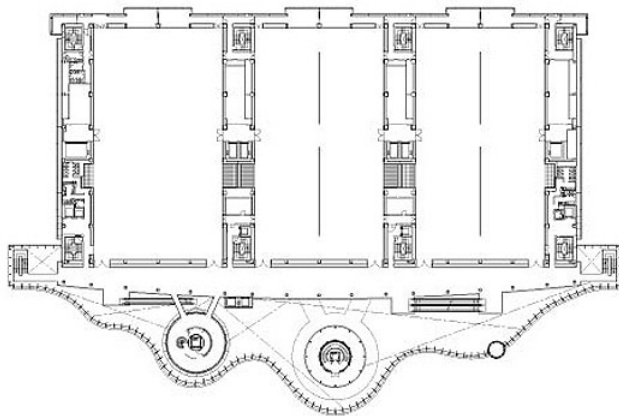
**ARCHITECT:** Kisho Kurokawa.

-The national art center is one of the biggest art institutes in Japan & is linked to Roppongi city center with a main st.

Elevations are using curtain wall sheeting supported by glass pillars to ensure direct sunlight.

The design concept is taken from bamboo trees.

Galleries: 2000 m<sup>2</sup> free of columns used moveable partitions.

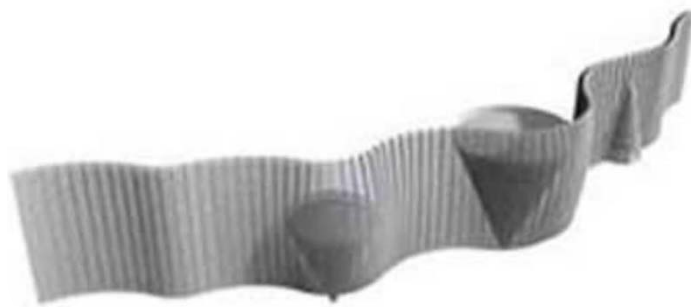


## **ADVANTAGES:**

1. Applying building to surrounding environment.
2. Main lobby is the major mass.
3. Natural lighting methods.
4. Steel fabric elevation sheeting.
5. The Galleries are all connected with the wave shaped lobby.

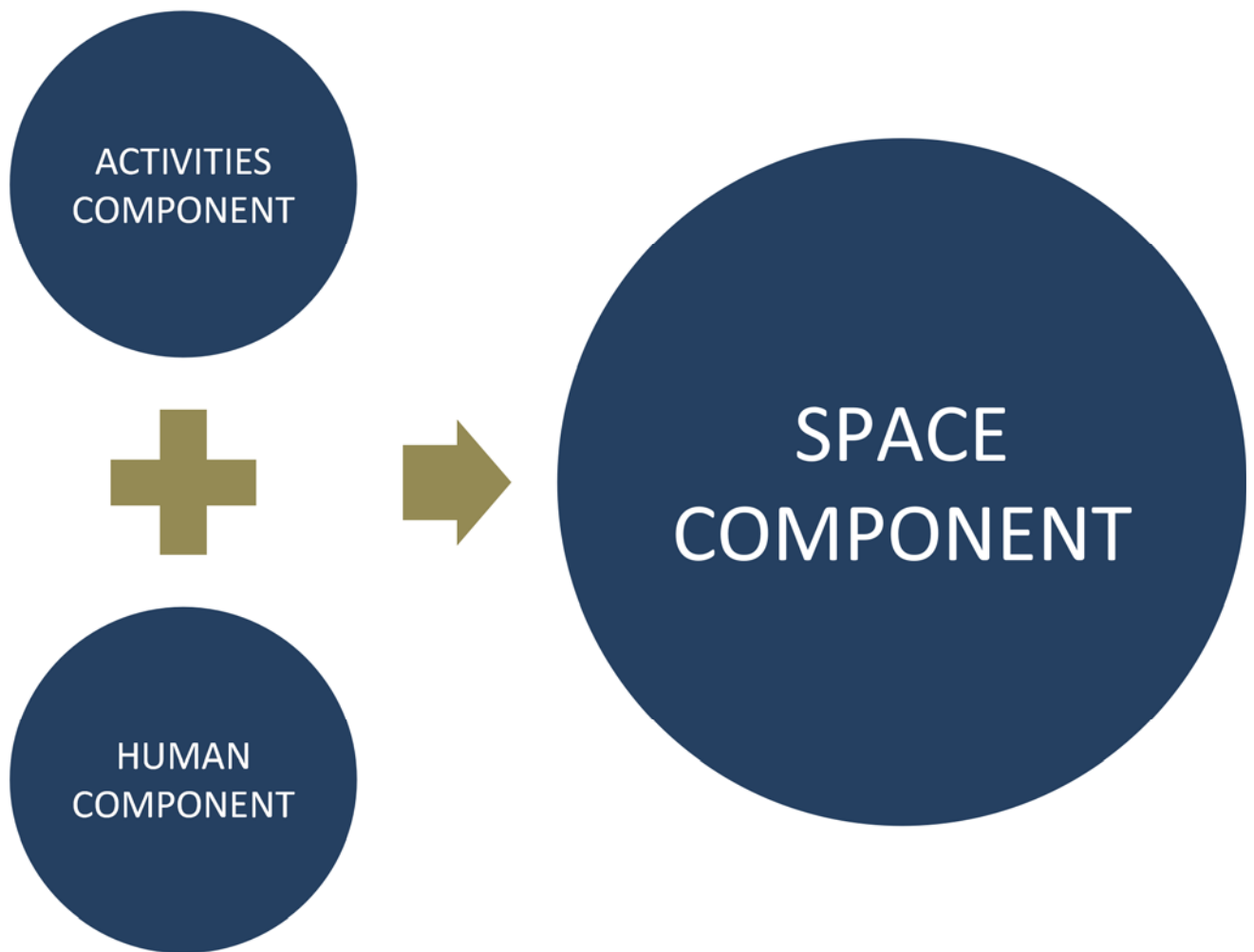
## **Structure:**

Used steel frame coloumns with steel sheeting.

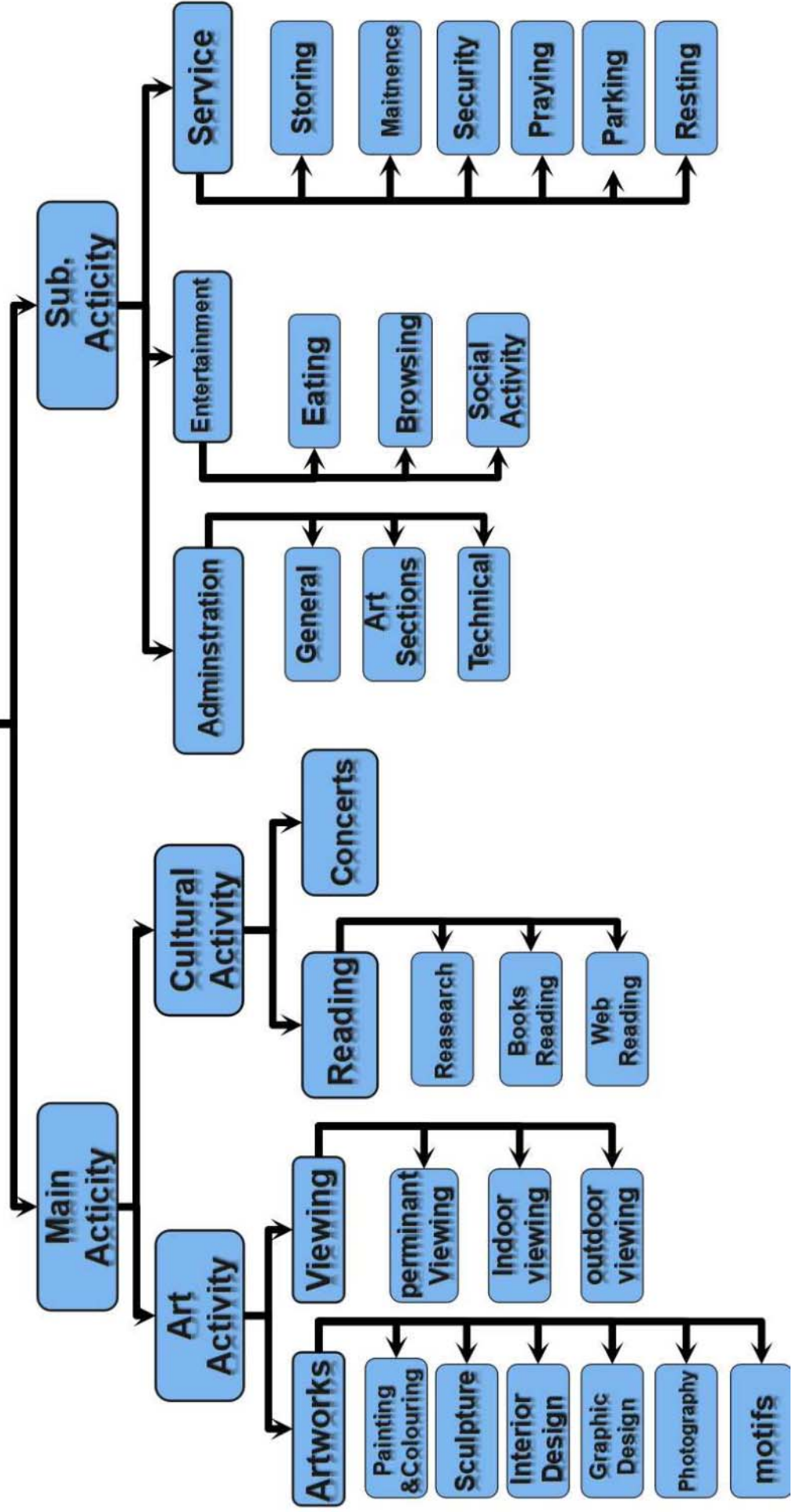


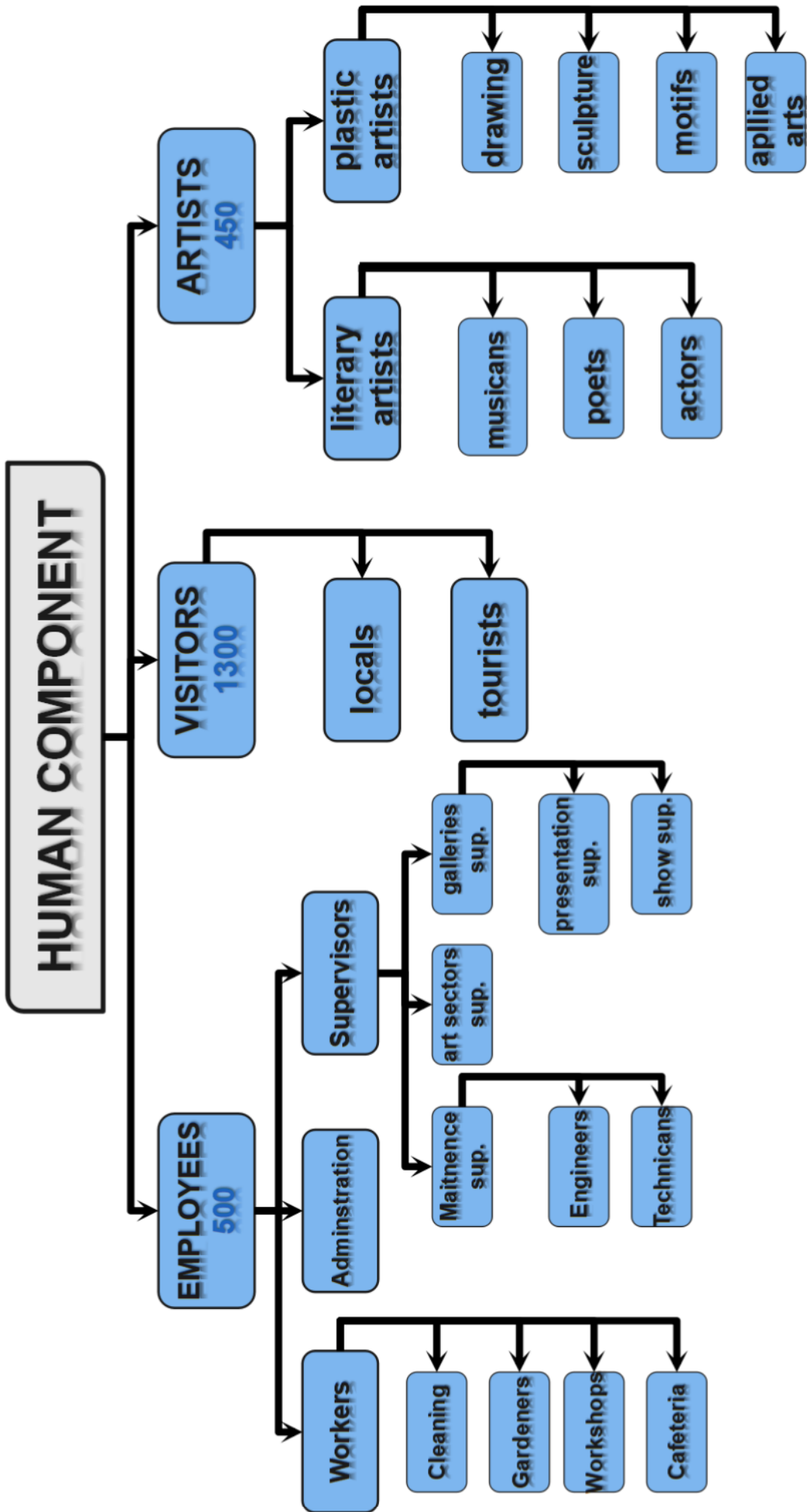
**CHAPTER THREE (3)**  
**DATA ANALYSIS**

3-1 Functions Analysis:  
Components Analysis:  
Project's Components:



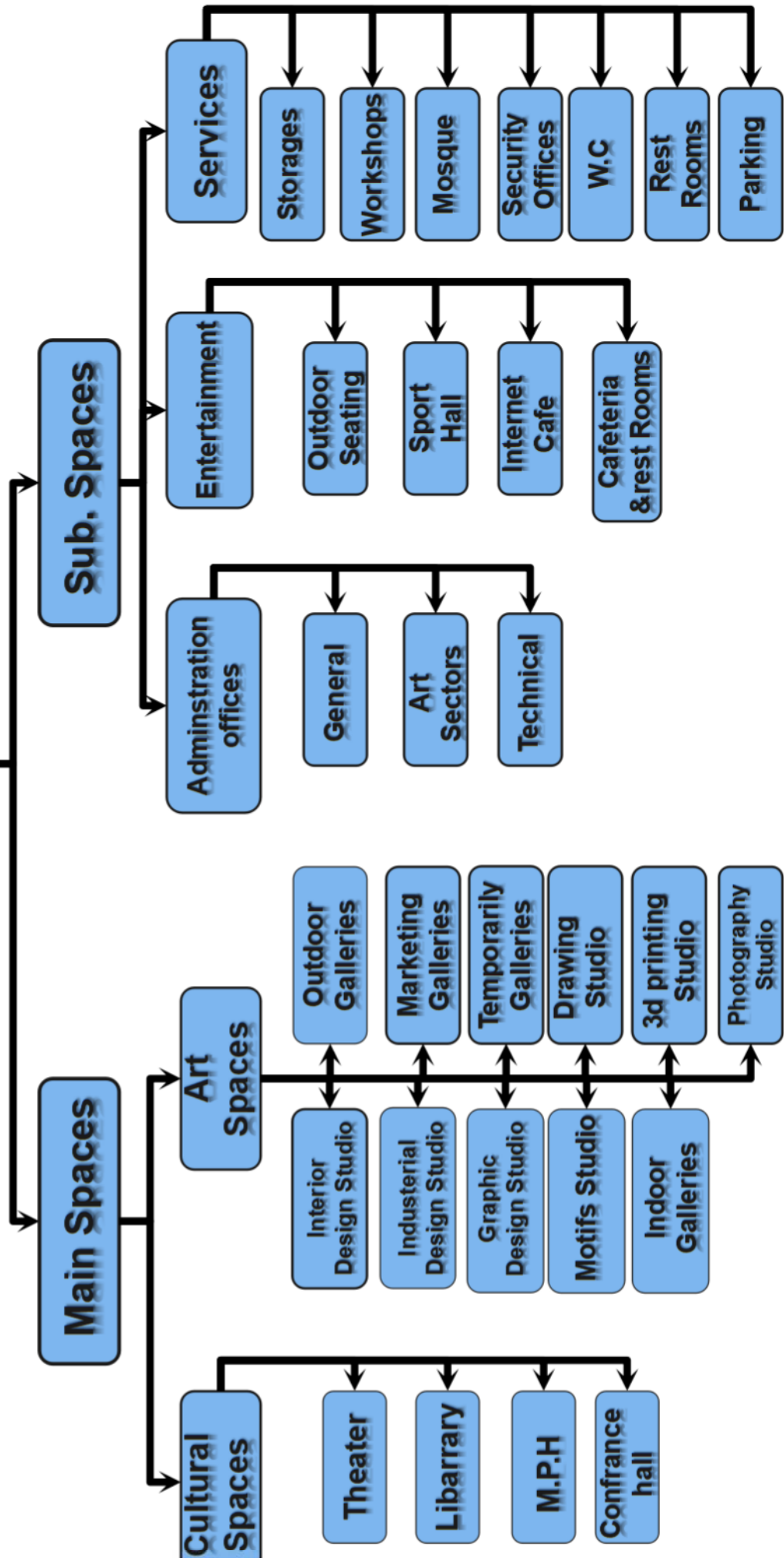
# ACTIVITY COMPONENT







# SPATIAL COMPONENT



## 3-2 SPACE STUDY:

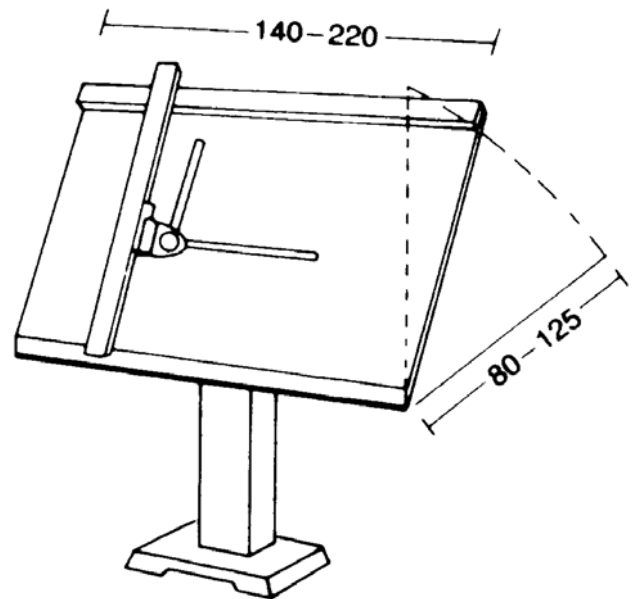
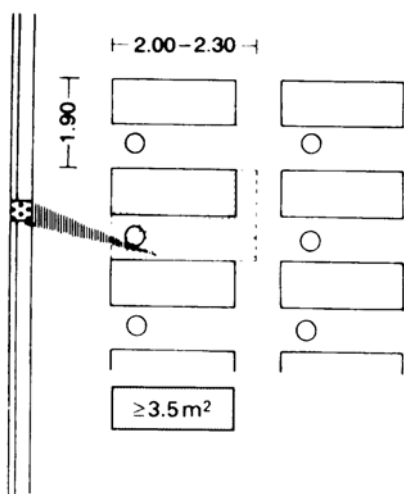
### **Drawing Studios:**

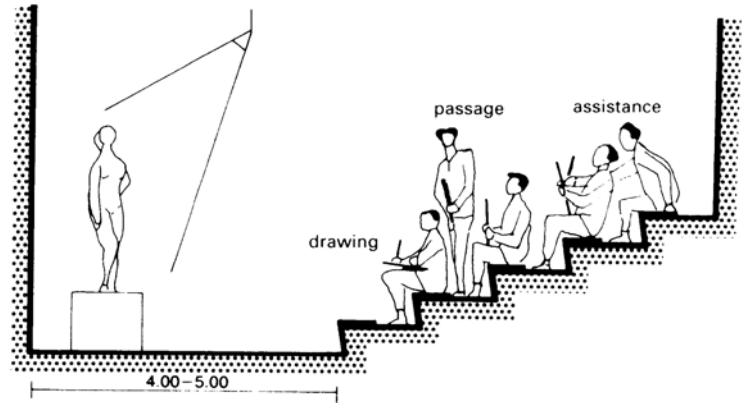
-In this space most ideas come to live, it's where students first ideas come to sketch, draft and draw their ideas.

- Working area for a single designer is 3.5-4.5 square meters.

- Circulation paths around the working area with a width of 1m.

- natural lighting is preferred, and artificial lightning should be at 500 lx.





### Live drawing studio:

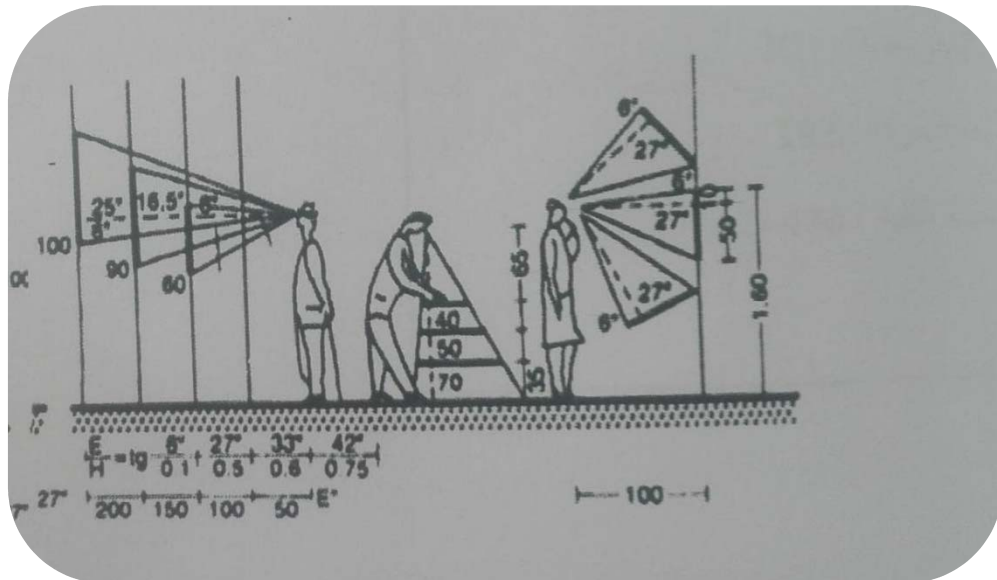
- this space is meant for life drawing, where a certain object is put and students try to imitate

it.

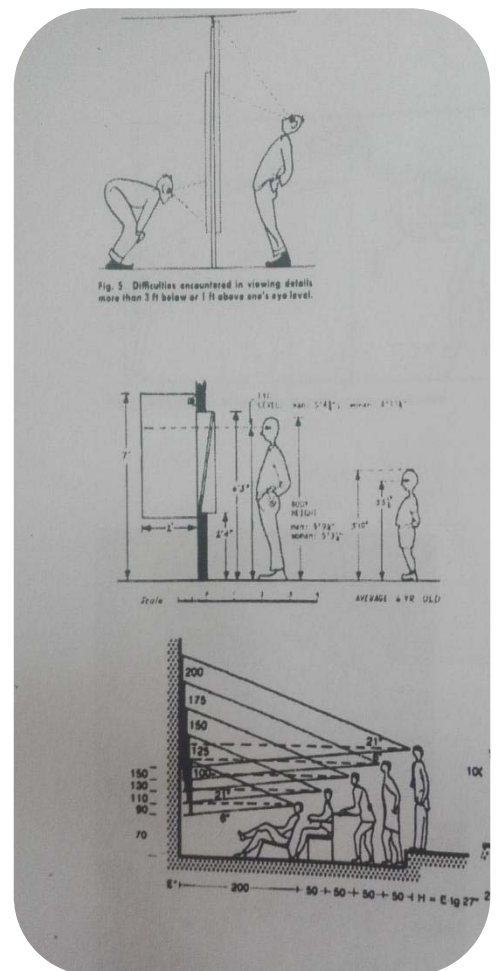
- natural lighting is preferred, and artificial lightning should be at 500 lx.

### **PAINTINGS GALLERIES :**

- Paintings must be placed by viewing level.
- Not lower then 90cm from sight level & not more than 30cm higher.

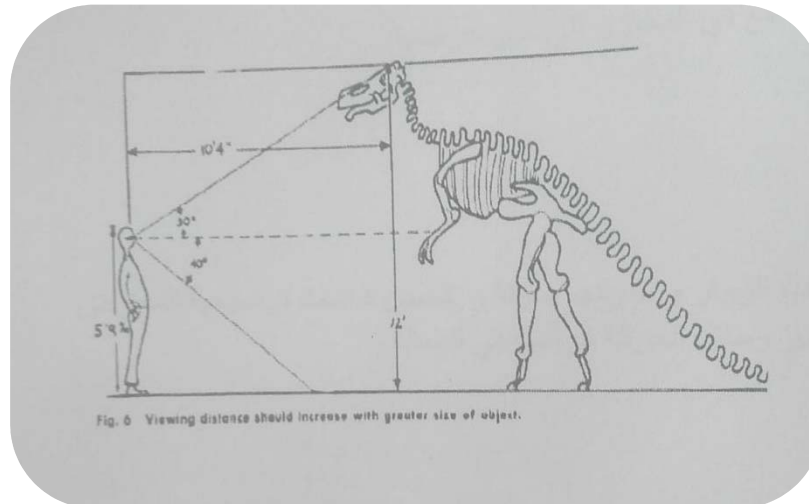


	<u>Small</u> <u>Painting</u>	<u>Larg</u> <u>Painting</u>
Distance from floor	0.9 m	1.2 m
Maximum Hight	2	2.6
Painting Area	3 m <sup>2</sup>	5 m <sup>2</sup>
View Area	4 m <sup>2</sup>	6 m <sup>2</sup>
Painting count	25 m <sup>2</sup>	5 m <sup>2</sup>
Movement Area	7 m <sup>2</sup>	12.5 m <sup>2</sup>
<b><u>Total Area</u></b>	<b><u>350 m<sup>2</sup></u></b>	<b><u>117.5 m<sup>2</sup></u></b>



## SCULPTURES GALLERIES :

- Required distance for seeing must not be less than 3.12 m.
- Required view angle is 30 degrees.
- Space required for each sculpture (6 - 10 m<sup>2</sup>).
- Sculpture count for each gallery (8 - 20).
- Movement space 44 m<sup>2</sup> for each gallery.
- Total space 432 m<sup>2</sup>.



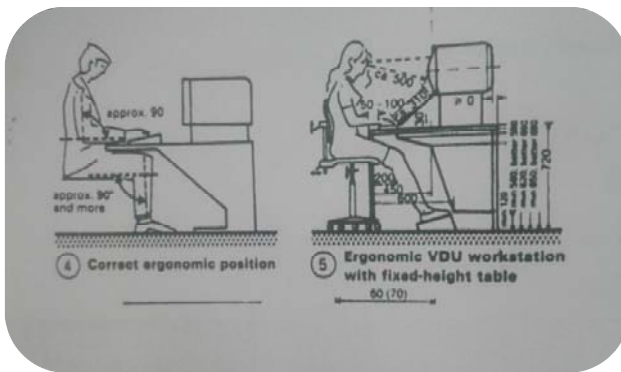
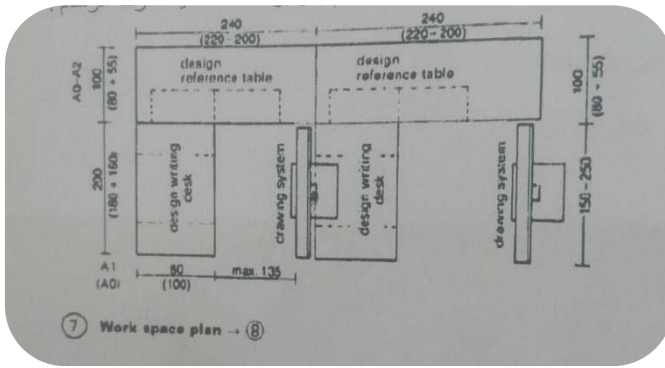
## **\*SCULPTURES ON STANDS:**

- Stand Area (1 - 4 m<sup>2</sup>).
- Stand height (1 - 2.5 m).
- Stands count (20 per gallery).
- Movement space 19.5 m<sup>2</sup>.
- Total area 470 m<sup>2</sup>.

## STUDIOS :

### **\*PAINTING STUDIO:**

- Movement Area:  $3.5 \times 2.4 = 8.4$  m<sup>2</sup>.
- Students count 20 per studio.
- Paths movement area 1.4 m<sup>2</sup>.
- Total area 169 m<sup>2</sup>.



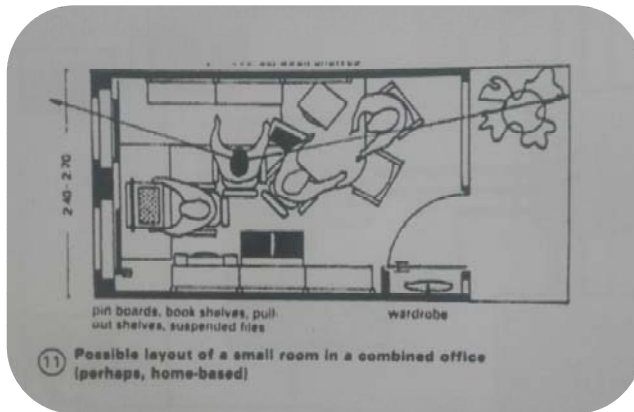
### \*PHOTOGRAPHY STUDIO:

- Work area per artist  $1.5 \times 1.56 = 2.5 \text{ m}^2$ .
- Storag area per artist  $0.5 \text{ m}^2$ .
- Artists count 15 per studio.
- Printers space  $2.1 \text{ m}^2$ .
- Movement area 10%.
- Total studio area  $51.80 \text{ m}^2$

### ADMINISTRATION :

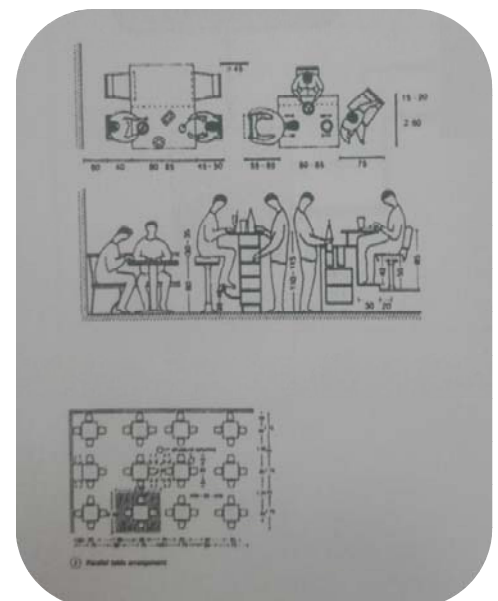
- Manager office + meeting table  $60 \text{ m}^2$ .
- Secretary office  $16 \text{ m}^2$ .
- Section manager office  $25 \text{ m}^2$ .
- V.manager office  $25 \text{ m}^2$ .
- Open offices  $80 \text{ m}^2$ .
- Security office  $24 \text{ m}^2$ .

- W.C 24 m<sup>2</sup>.
- Total Administration Area: 380 m<sup>2</sup>.



## RESTRANT :

- Capacity 300 person.
- Person space 2 m<sup>2</sup>.
- W.C space 8 m<sup>2</sup>.
- Movement area 40%.
- Kitchen +preparing room +Freezing room +laundry =80+80+100+30= 190 m<sup>2</sup>.
- Total area 557.2 m<sup>2</sup>.



### 3-3 SPACES TABLE: Presentation

<u>Activity</u>	<u>Space Name</u>	<u>Number</u>	<u>Time of Use</u>	<u>Functional Requirements</u>	<u>Environmental Requirements</u>	<u>Space of Unit</u>	<u>Number</u>	<u>Total Area</u>
<b>Presentation</b>	Painting Gallery	300	9 am - 4 pm	Viewing tables & cabins - Partitions	Natural-artificial lighting+ Natural & artificial ventilation	1200 m2	1	1200 m2
	Sculpture Gallery	300	9 am - 4 pm	Viewing tables & cabins - Partitions - Stands for sculptures	Natural-artificial lighting+ Natural & artificial ventilation	632 m2	1	632 m2
	Motifs Gallery	150	9 am - 4 pm	Viewing tables & cabins - Partitions	Natural-artificial lighting+ Natural & artificial ventilation	2550 m2	1	2550 m2
	Photography Gallery	400	9 am - 4 pm	Viewing tables & cabins - Partitions	Natural-artificial lighting+ Natural & artificial ventilation	1200 m2	3	3600 m2
	Marketing Gallery	400	9 am - 8 pm	Viewing tables & cabins - Partitions	Natural-artificial lighting+ Natural & artificial ventilation	1200 m2	3	3600 m2
	Outdoor Gallery	400	9 am - 4 pm	Viewing tables & cabins - Partitions	Natural-artificial lighting+ Natural & artificial ventilation	1200 m2	3	3600 m2
	Industrial Design Gallery	400	9 am - 4 pm	Viewing tables & cabins - Partitions	Natural-artificial lighting+ Natural & artificial ventilation	1200 m2	1	1200 m2
	Galleries Services	12	9 am - 4 pm	Viewing tables & cabins - Partitions	Natural-artificial lighting+ Natural & artificial ventilation	360 m2	1	360 m2
								<b>Total Area</b> <b>16742</b> <b>m2</b>



## Artworks:

<u>Activity</u>	<u>Space Name</u>	<u>Users</u>	<u>Number Of Users</u>	<u>Time of Use</u>	<u>Functional Requirements</u>	<u>Enviro. Requirements</u>	<u>Space of Unit</u>	<u>Num of Units</u>	<u>Total Area</u>
<b><u>Artworks</u></b>	Painting Studio	Artists & art students	25	9 am - 5 pm	tables-seats-boards-cabins	Natural &artificial light + natural &artificial ventelation	200 m2	1	200 m2
	Sculptring Studio	Artists & art students	20	9 am - 5 pm	tables-seats-boards-cabins	Natural &artificial light + natural &artificial ventelation	386 m2	1	386 m2
	Motifs Studio	Artists & art students	25	9 am - 5 pm	tables-seats-boards-cabins	Natural &artificial light + natural &artificial ventelation	200 m2	1	200 m2
	Photography studio	Artists & art students	30	9 am - 5 pm	tables-seats-boards-cabins	Natural &artificial light + natural &artificial ventelation	200 m2	1	200 m2
	Graphic design studio	Artists & art students	30	9 am - 5 pm	tables-seats-boards-cabins-computers	Natural &artificial light + natural &artificial ventelation	472 m2	1	472 m2
	Industerial design studio	Artists & art students	20	9 am - 5 pm	tables-seats-boards-cabins	Natural &artificial light + natural &artificial ventelation	200 m2	1	200 m2
	Printing Studio	Artists & art students	25	9 am - 5 pm	tables-seats-boards-cabins-computers	Natural &artificial light + natural &artificial ventelation	200 m2	1	200 m2
	Studios Services	Workers	12	9 am - 5 pm	Cabins-firs aid kits-cleaning equipments	Natural &artificial light + natural &artificial ventelation	360 m2	2	720 m2
									<b><u>Total Area</u></b> <b><u>2578 m2</u></b>

## Cultural:

<u>Activity</u>	<u>Space Name</u>	<u>Users</u>	<u>Number Of Users</u>	<u>Time of Use</u>	<u>Functional Requirements</u>	<u>Enviro. Requirements</u>	<u>Space of Unit</u>	<u>Num of Units</u>	<u>Total Area</u>
<b><u>Cultural</u></b>	Indoor Theater	visitors-artists	640	9 am - 4 pm	Seating-stage-screen display	natural &artifical light & ventelation - sound control/isolaion	850 m2	2	1700 m2
	Outdoor theater	visitors-artists	1000	9 am - 4 pm	Seating-stage-screen display	natural &artifical light & ventelation - sound control/isolaion	1200 m2	1	1200 m2
	Libarary	visitors-artists	200	9 am - 4 pm	Seating-book shelves-screen display	natural &artifical light & ventelation - sound control/isolaion	400 m2	1	400 m2
	M.P.H	visitors-artists	300	9 am - 4 pm	Seating-stage-screen display	natural &artifical light & ventelation - sound control/isolaion	500 m2	1	500 m2
	Confrance hall	visitors-artists	300	9 am - 4 pm	Seating-stage-screen display	natural &artifical light & ventelation - sound control/isolaion	650 M2	1	650 m2
									<b><u>Total Area</u></b> <b><u>4450 m2</u></b>

## Entertainment:

<u>Activity</u>	<u>Space Name</u>	<u>Users</u>	<u>Num. Of Users</u>	<u>Time of Use</u>	<u>Functional Requirements</u>	<u>Enviro. Requirements</u>	<u>Space of Unit</u>	<u>Num of Units</u>	<u>Total Area</u>
<u>Entertainment</u>	Sports hall	visitors-employees	70	9 am - 11 pm	Sport mach.-seats-cabins-tables-lockers	natural &artificial lighting &ventelation	300 m2	2	600 m2
	Restrant	visitors-employees	50	9 am - 11 pm	Tables-seats	natural &artificial lighting &ventelation	250 m2	5	1000 m2
	Rest Rooms	visitors-employees	35	9 am - 11 pm	Tables-seats-beds-sofas	natural &artificial lighting &ventelation	65 m2	3	195 m2
	Internet Cafe	visitors-employees	30	9 am - 11 pm	Tables-seats-computers	natural &artificial lighting &ventelation	75 m2	2	150 m2
									<b>Total Area 1945 m2</b>

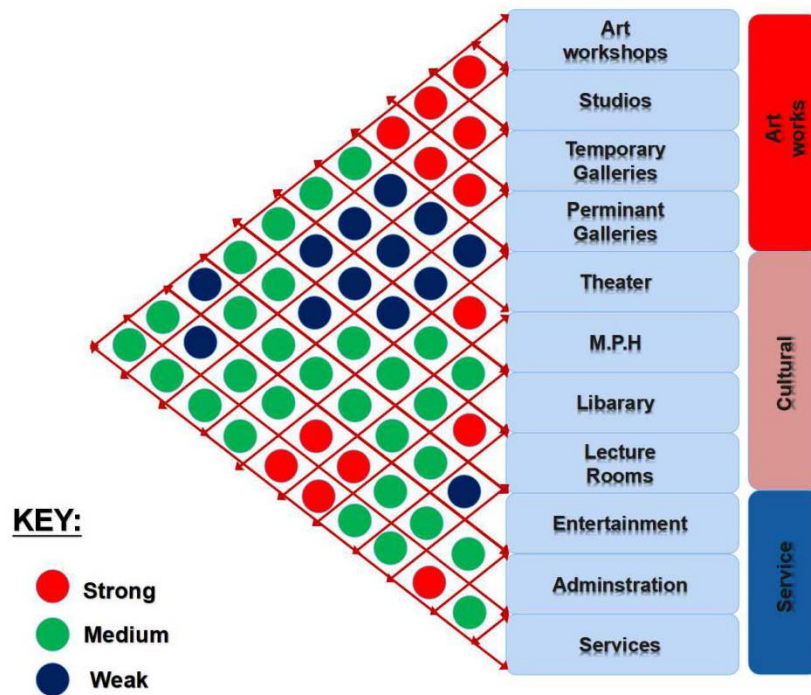
## Administration:

<u>Activity</u>	<u>Space Name</u>	<u>Users</u>	<u>Num. Of Users</u>	<u>Time of Use</u>	<u>Functional Requirements</u>	<u>Enviro. Requirements</u>	<u>Space of Unit</u>	<u>Num of Units</u>	<u>Total Area</u>
<b><u>Adminstr</u></b> <b><u>ation</u></b>	Manager office	manager	1	9 am- 4 pm	Seat-table- cabin	natural &artifical lighting &vntelation	48 m2	1	48 m2
	Secretary office	secretary	1	9 am- 4 pm	Seat-table- cabin	natural &artifical lighting &vntelation	25 m2	3	75 m2
	v.manager office	v.manager	1	9 am- 4 pm	Seat-table- cabin	natural &artifical lighting &vntelation	48 m2	1	48 m2
	Open offices	employee s	24	9 am- 4 pm	Seat-table- cabin	natural &artifical lighting &vntelation	50 m2	3	150 m2
	Art manager office	art manager	1	9 am- 4 pm	Seat-table- cabin	natural &artifical lighting &vntelation	48 m2	1	48 m2
	Meeting Hall	employee s	8	9 am- 4 pm	Seat-table- cabin	natural &artifical lighting &vntelation	60 m2	2	120 m2
	Security Office	security employee s	4	9 am- 4 pm	Seat-table- cabin	natural &artifical lighting &vntelation	25 m2	2	50 m2
									<b><u>Total Area</u></b> <b><u>539 m2</u></b>

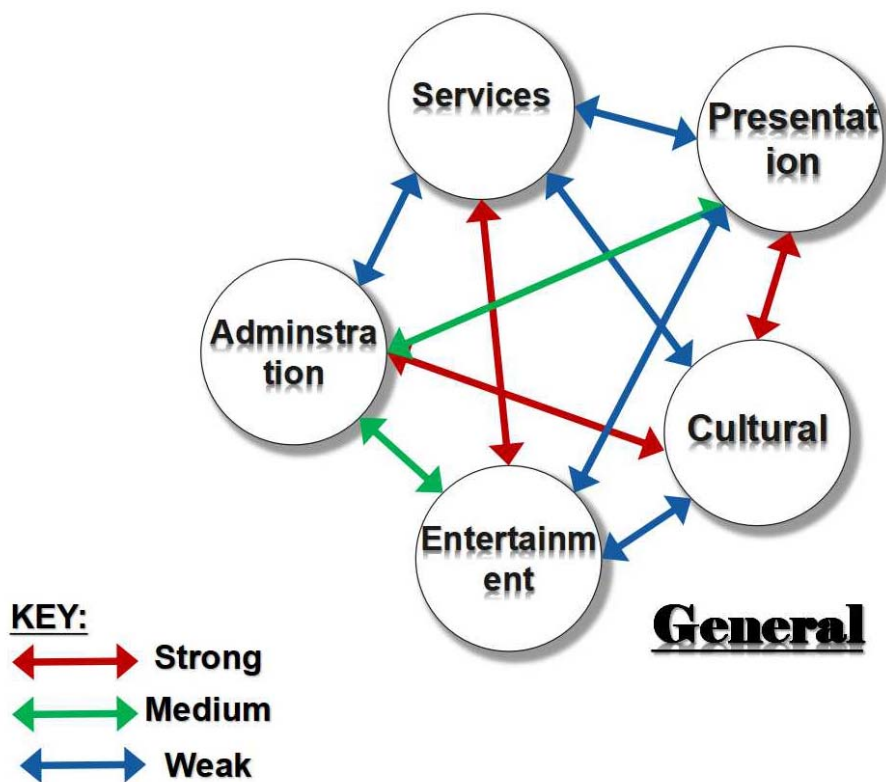
## Services:

<u>Activity</u>	<u>Space Name</u>	<u>Users</u>	<u>Num. Of Users</u>	<u>Time of Use</u>	<u>Functional Requirements</u>	<u>Enviro. Requirements</u>	<u>Space of Unit</u>	<u>Num of Units</u>	<u>Total Area</u>
<u>Service</u>	Storage	workers	15	9 am - 5 pm	Cabins	natural &artific light &ventelation	40 m2	2	80 m2
	Workshop	workers	20	9 am - 5 pm	tables-cabins-equipment	natural &artific light &ventelation	250 m2	3	750 m2
	Clinic	visitors-doctors	70	9 am - 5 pm	bed-table-seats-equipment	artific light &ventelation	80 m2	1	80 m2
	Mosque	visitors-employees	70	9 am - 5 pm	carpet-seats	natural &artific light &ventelation	80 m2	2	160 m2
	Cafeteria	visitors-employees	300	9 am - 5 pm	tables-seats-vases	natural &artific light &ventelation	120 m2	2	240 m2
	W.C	visitors-employees	300	9 am - 5 pm	w.c equipment	artific light &ventelation	42 m2	3	126 m2
	Gift shop	visitors-employees	250	9 am - 5 pm	table-seats-cabins-shelvs	natural &artific light &ventelation	30 m2	1	30 m2
	Outdoor Seating	visitors-employees	300	9 am - 5 pm	talbes-seats-vases	artific light	-	-	-
<u>Total Area</u> <u>6216 m2</u>	Parking	visitors-employees	-	9 am - 5 pm	-	artific light	19 m2	250	4750 m2

**3-4 FUNCTIONAL RELATIONSHIPS:  
MATRIX DIGRAM:**

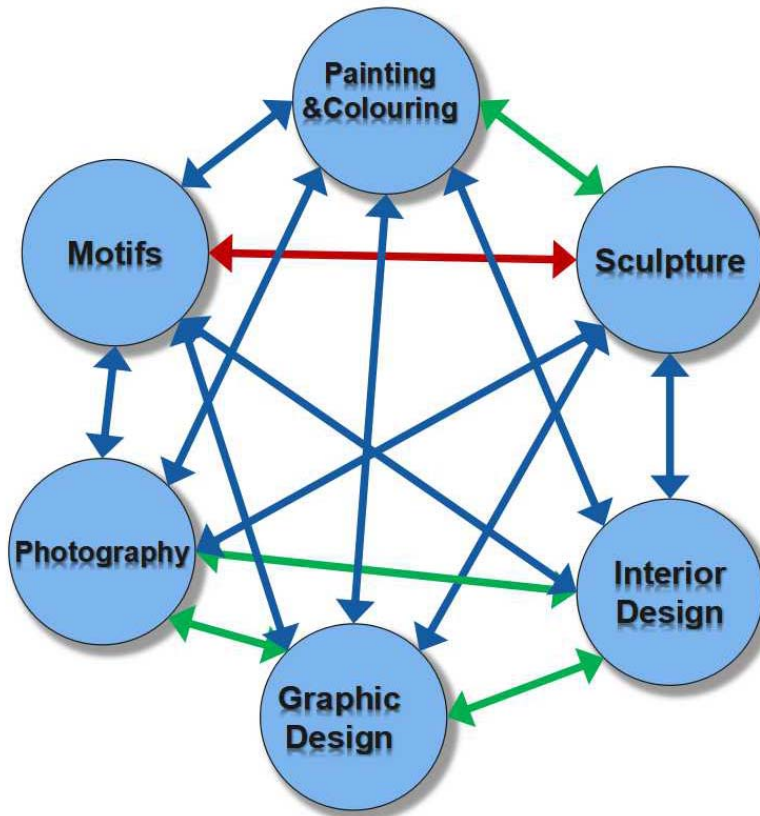


**BUBBLE DIAGRAM:  
General:**



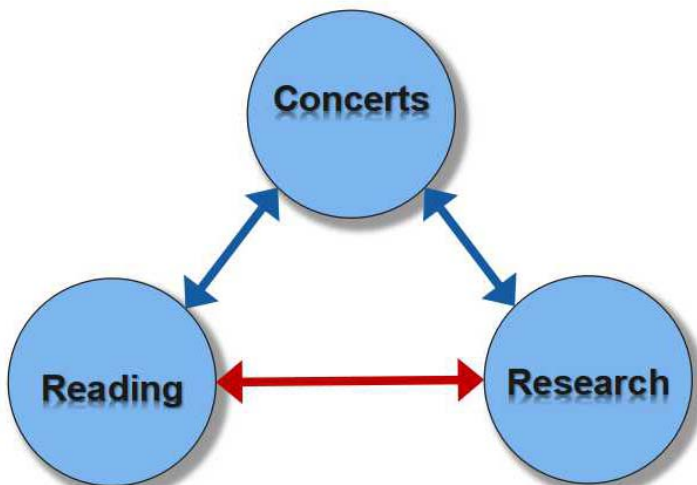


Artworks bubble diagram:



**KEY:**  
↔ Strong  
↔ Medium  
↔ Weak

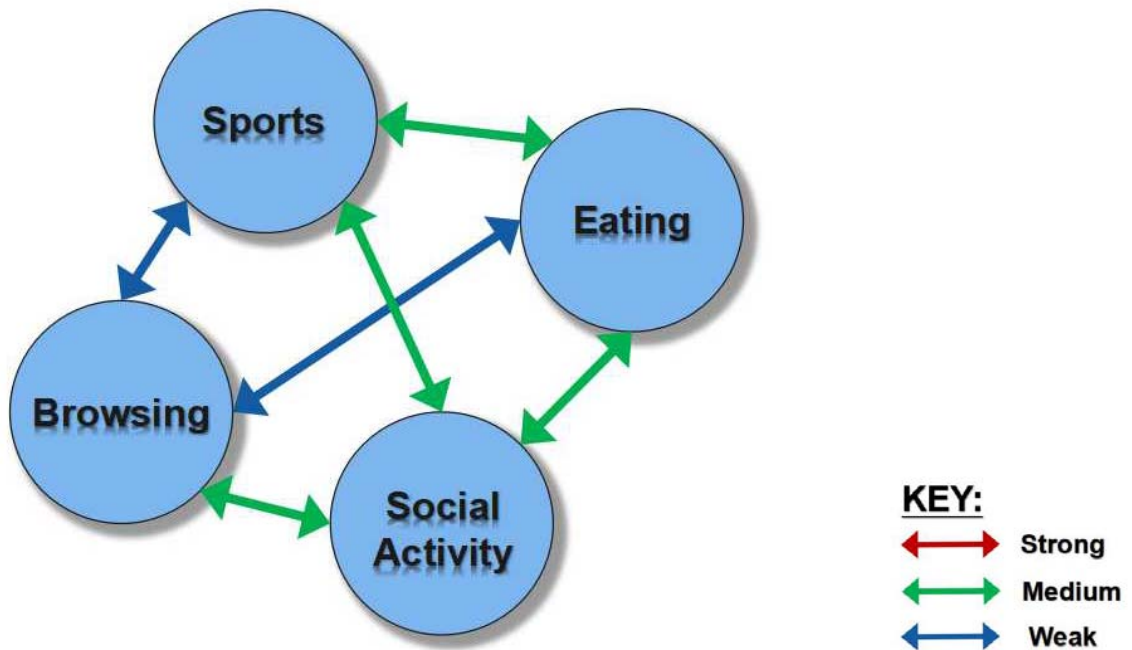
Cultural bubble diagram:



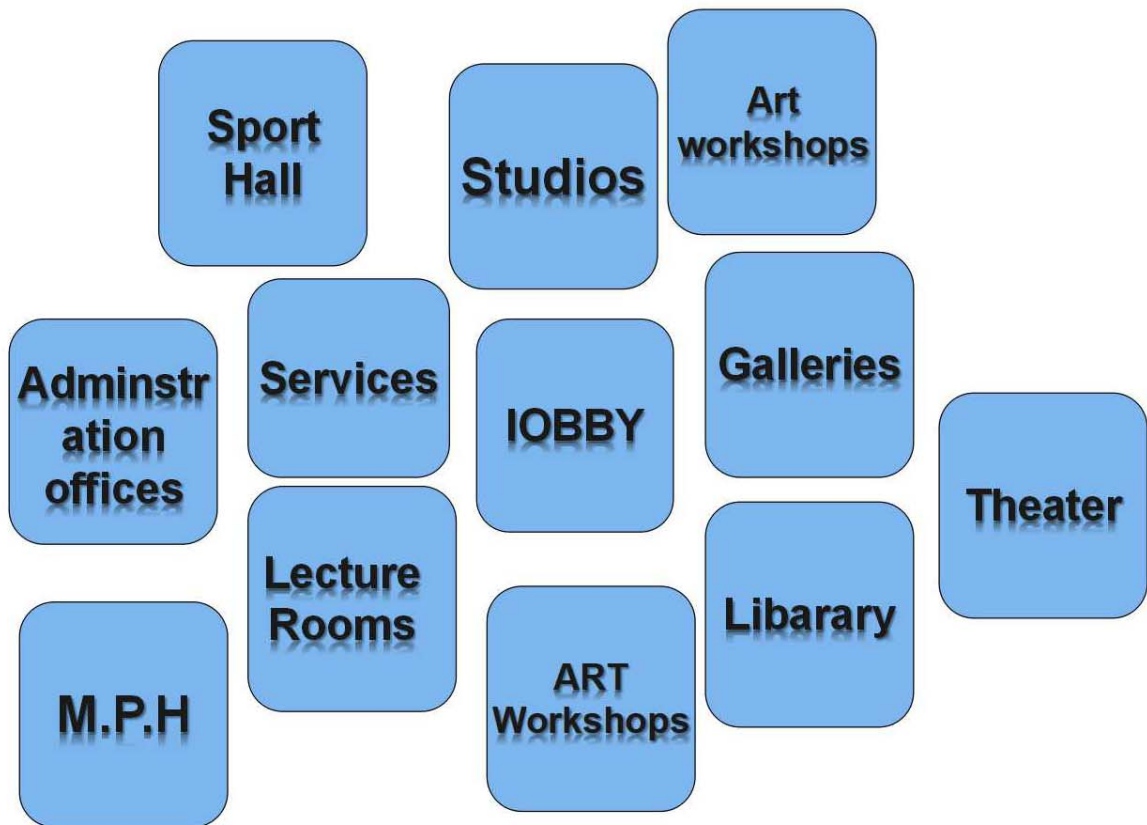
**KEY:**  
↔ Strong  
↔ Medium  
↔ Weak



Entertainment bubble diagram:

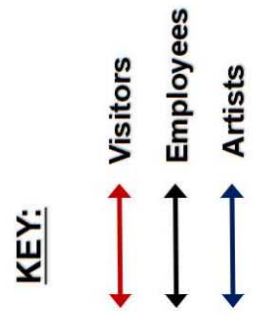
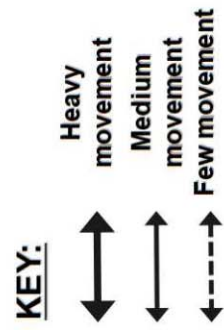
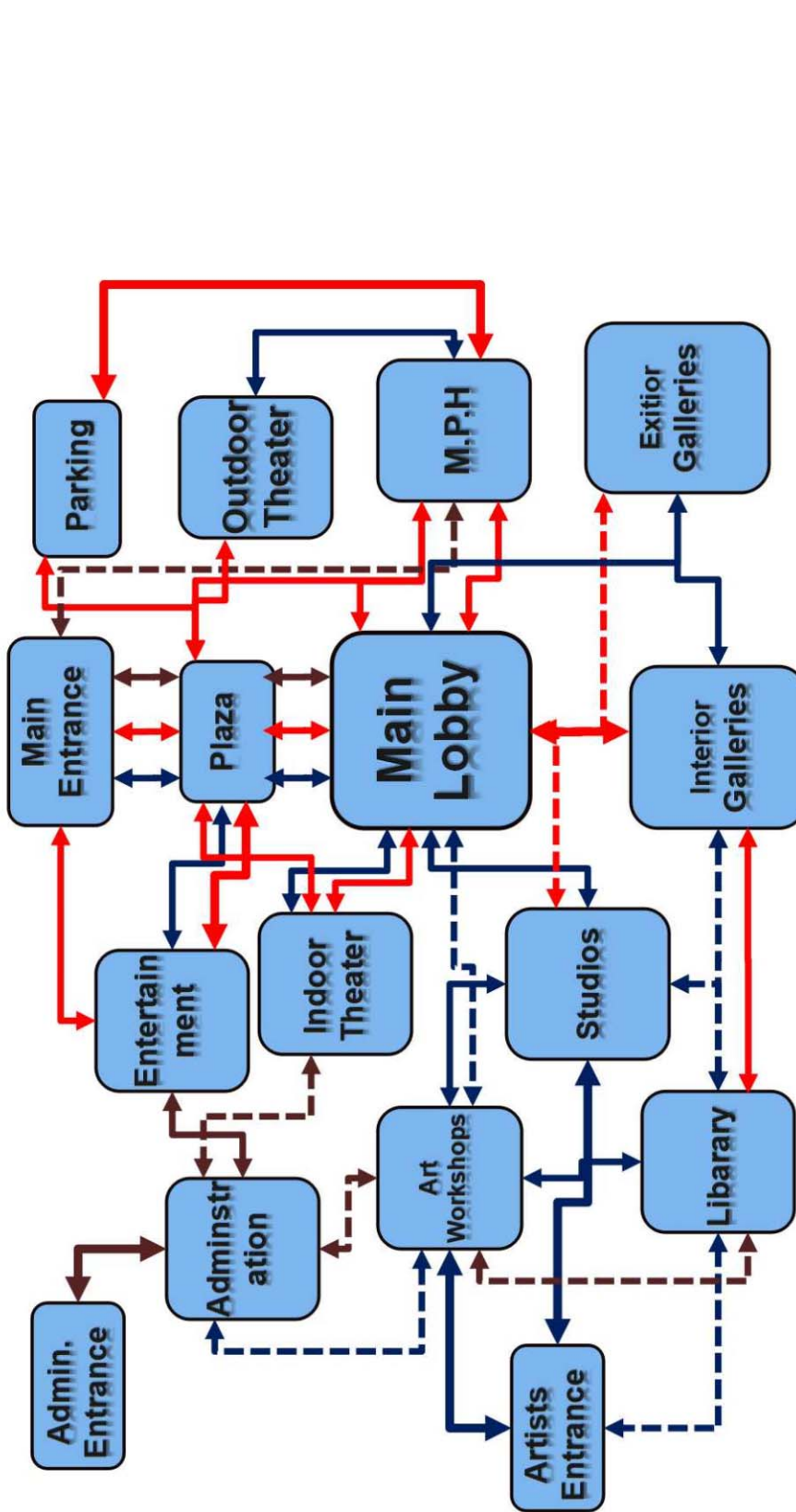


ADJACENCY DIGRAM:

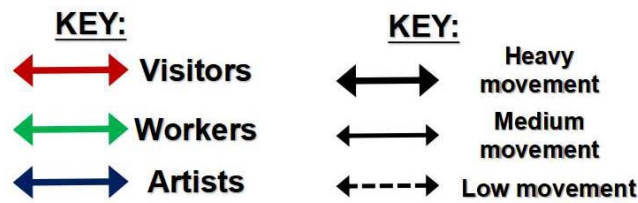
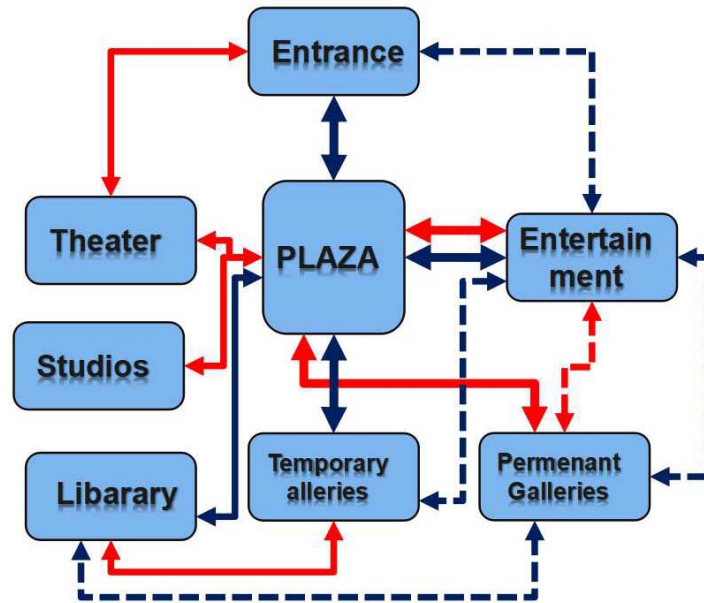


CIRCULATION DIAGRAMS:

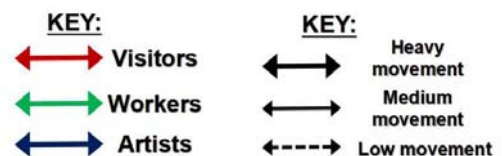
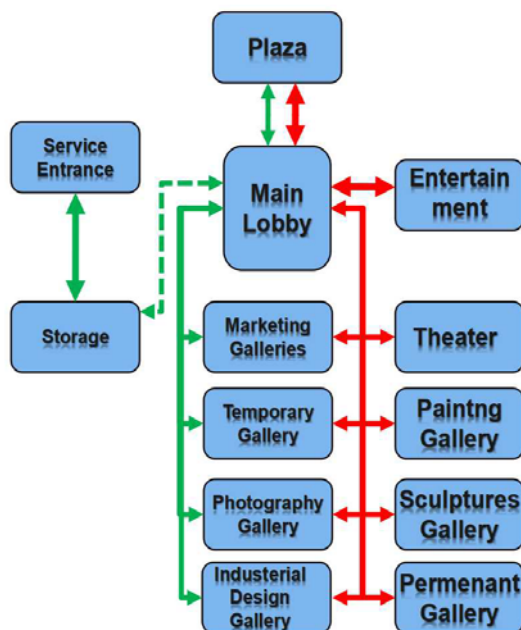
# GENERAL CIRCULATION DIAGRAM:



## CULTURAL SECTOR CIRCULATION DIAGRAM:



## GALLERIES CIRCULATION DIAGRAM:

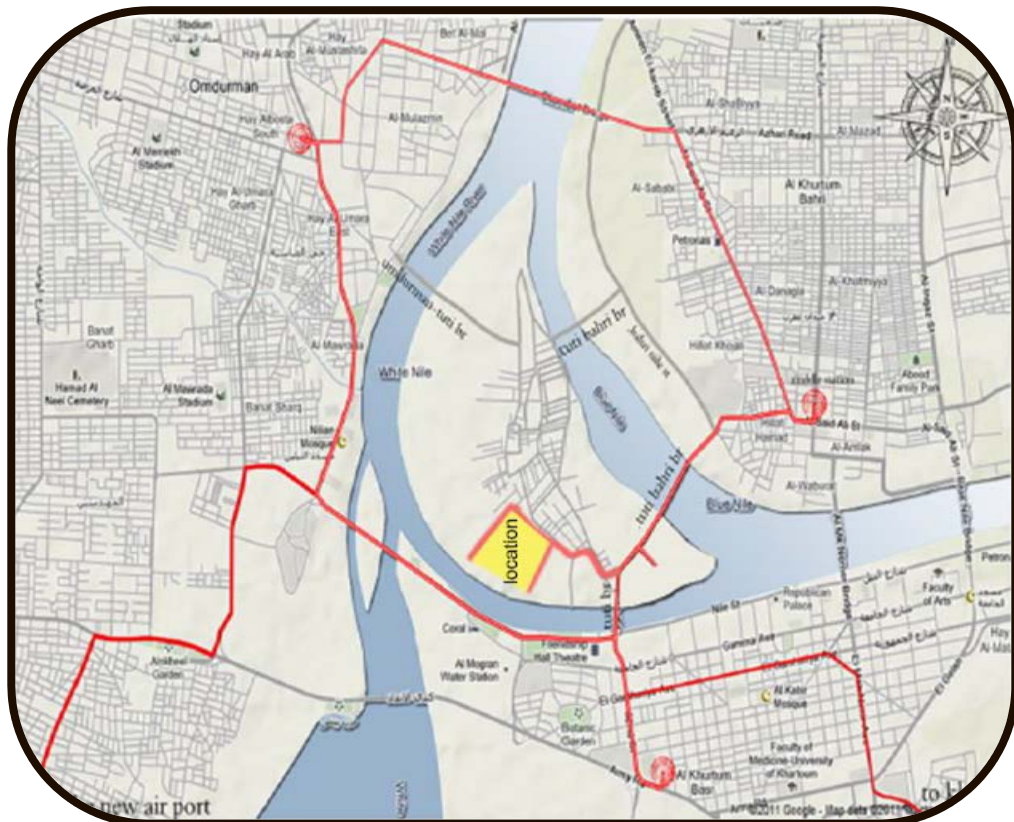


## PROPOSED SITES :

### **SITE (1) :**

- Area 7.1 hectares.
- location: Khartoum state- south west of toti island.
- Dimensions 247\*284 m.

North	East	West	South
Residential	Proposed Investment site	Proposed Investment site	White Nile River
Neighbour			



### **Advantages:**

### **Disadvantages:**

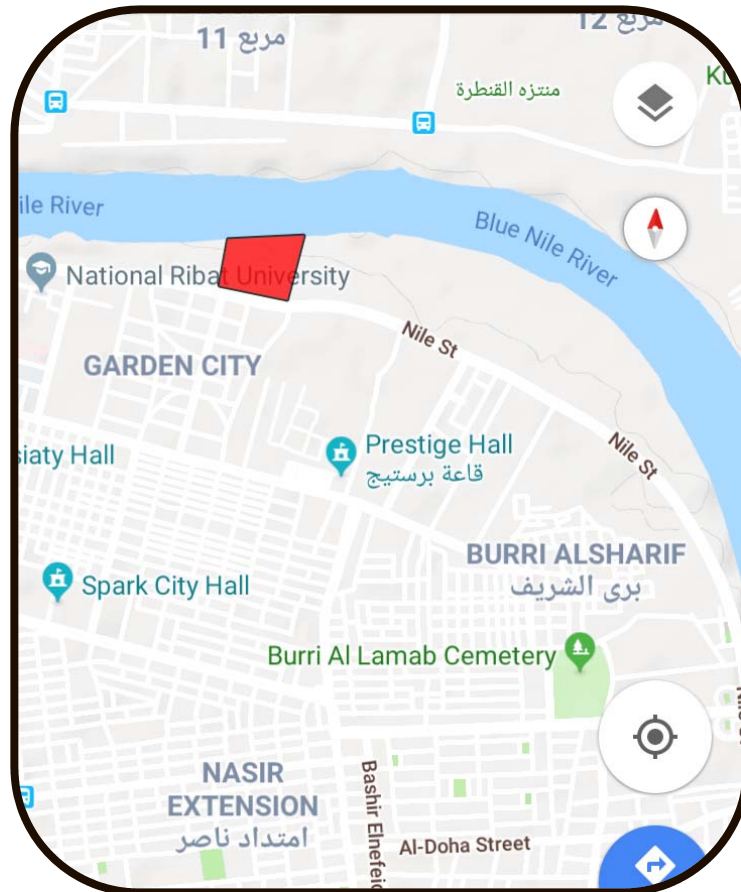
- Services efficiency.
  - Ease of transport.
  - Quiet area.
- 1- High humidity.
  - 2-Sea soil.
  - 3- access difficulty.

## SITE (2) :

-Area: 5.9 hectares.

-location: Khartoum state- Nile street-north of garden city university.

-Dimensions 219\*270 m.



North	East	West	South
Blue Nile River	Proposed Investment site	Proposed Investment site	Residential Area

### **Advantages:**

- 1- Services are efficient.
- 2- Nile view.
- 3- Investment Area.

### **Disadvantages:**

- 1-High Humidity.
- 2- Sea soil.
- 3- Difficulty of access from public transport.

## SITE (3) :

-Area: 3.9 hectares.

-location: Center of Port Sudan city -on the flamingo bay area.

-Dimensions: 255\*216\*200m.



North	East	West	South
Flamingo Bay	Proposed Investment site	Proposed Investment site	Proposed Investment site

### Advantages:

- 1- Services are efficient.
- 2- No pollution.
- 3- Water view.
- 4- Close to the city center
- 5- Quite area.
- 6- Future Expansion possibility.
- 7- Ease of access.
- 8- The linear shape.

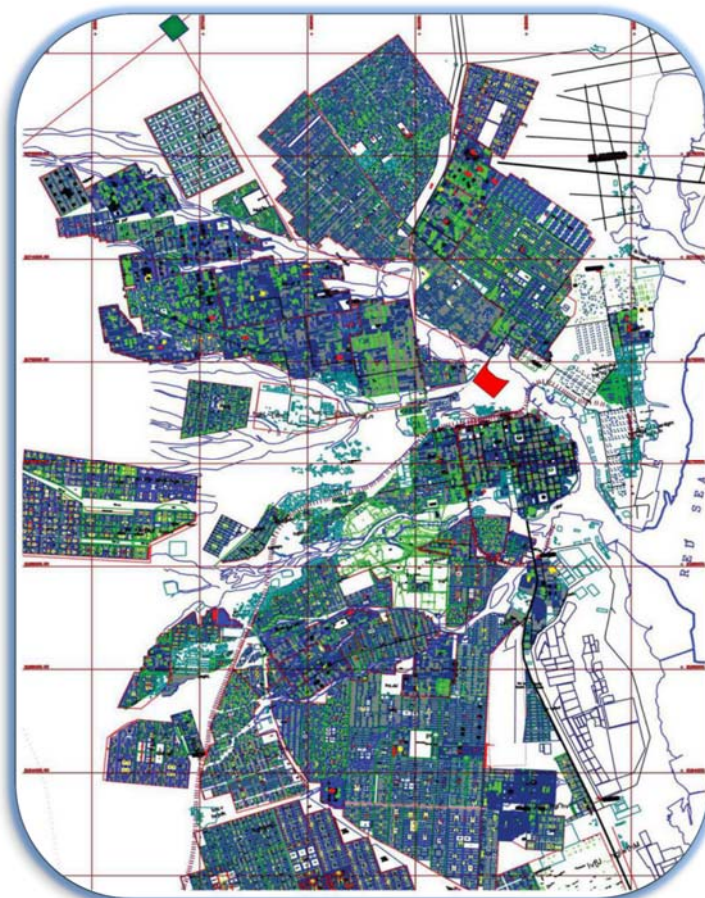
### Disadvantages:

- 1-High Humidity.
- 2-Sea soil.
- 3- Far from the airport .
- 4- Noise pollution from ships movement.

## SITES COMPARISON :

- Comparing the proposed sites to choose the best site.
- The comparison points are: Accessibility, services, local monuments, & the distance from the city.
- After comparison, the best site is the center of port Sudan SITE (3).

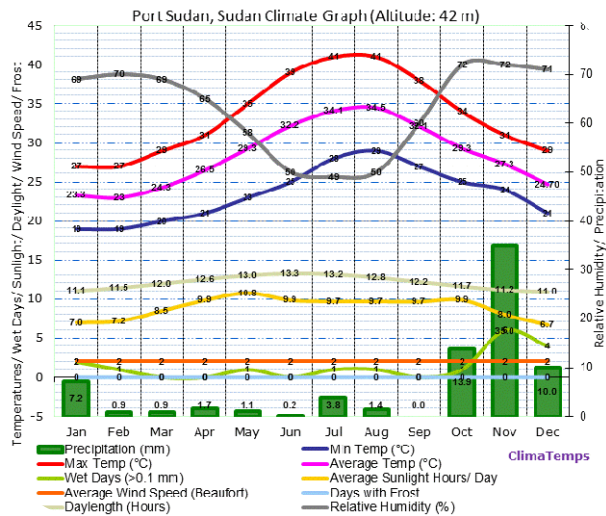
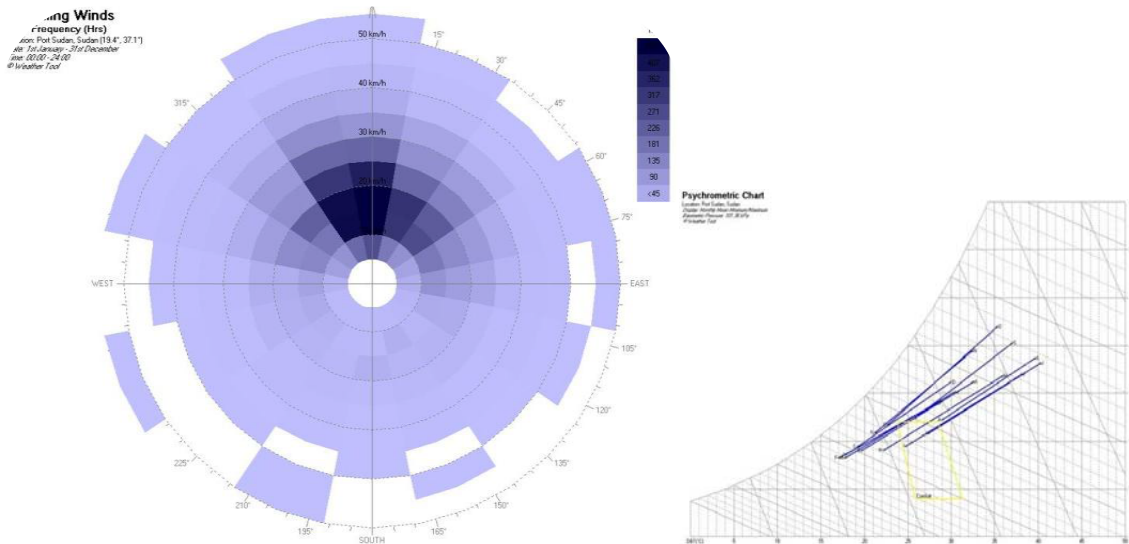
	<u>ACCESSABILITY</u>	<u>SERVICES</u>	<u>TOURISM MONUMENT</u>	<u>DISTANCE FROM CITY CENTER</u>	<u>VIEW</u>	<u>TOTAL</u>
<b><u>SITE (1)</u></b>	8/10	5/10	7/10	8/10	8/10	3
<b><u>SITE (2)</u></b>	4/10	6/10	2/10	6/10	7/10	2
<b><u>SITE (3)</u></b>	7/10	9/10	9/10	8/10	8/10	4



# 3-5 Environmental analysis:

## Climate:

- average temperature is between (15 - 47 dc).
- The state is in the effect of northern eastern wind in winter which speed is (30 - 40 km/h).
- In summer it has the northern western wind.
- The red sea state is in the winter rain domain & the annual average is not more than 101mm.
- Relative humidity (RH) is between (42-70) & increasing as we go south.





## SITE GEOLOGY:

- The site is slightly descending as we go east. as the highest point is the link between the site & the bay bridge (6m from sea level).
- The lowest spot of the site is the shore which is 3m above sea level.
- water depth in the bay area is very deep (between 40-50m).
- Water height increases in autumn by 1.6m max.
- The site slob is ineffective in construction because its slight. therefore it wont need much cut & fill. But its efficient in water drainage & waste clearance.



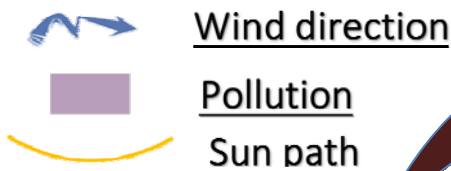
## **DESIGN INDICATORS :**

- Spaces positioning will be (North east-south west) to ensure natural ventilation.
- Using green belt on the west area to reduce noise pollution.
- High humidity in the area requires good ventilation and air renewing.
- Shading required for high summer temperature & landscape cooling.
- Making use of the sea view in the cultural spaces such as the outdoor theater & galleries.
- The main entrance would be in the south of the site, while the
- administration entrance on west of the site on the main st.

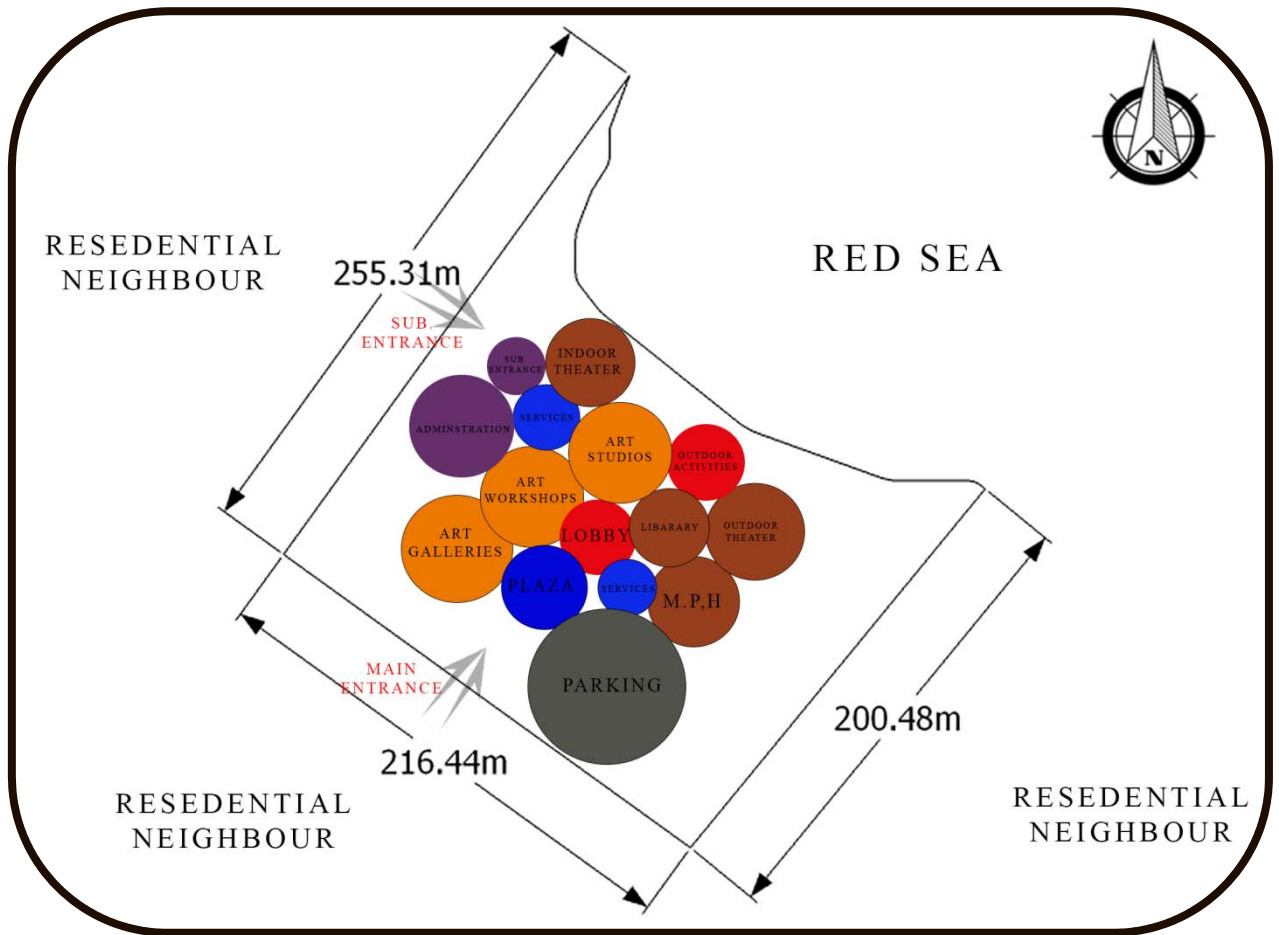
## SITE ENVIROMENTAL ANALYSIS :

- The main noise source is the bridge south of the site and the ships movement on the bay.
- The site is angled by 50 degrees which provides perfect natural ventilation.
- The site surface descends as we go in direction of the bay which makes great view access.
- The soil in site has less salts which makes it easier for construction & wont need Treatment.
- The area climate is wet dry which makes use of green areas.

### KEY:



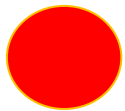
# 3-6 ZONING:



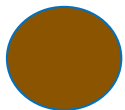
## KEY :



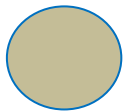
ART ZONES



ENTERTAINMENT



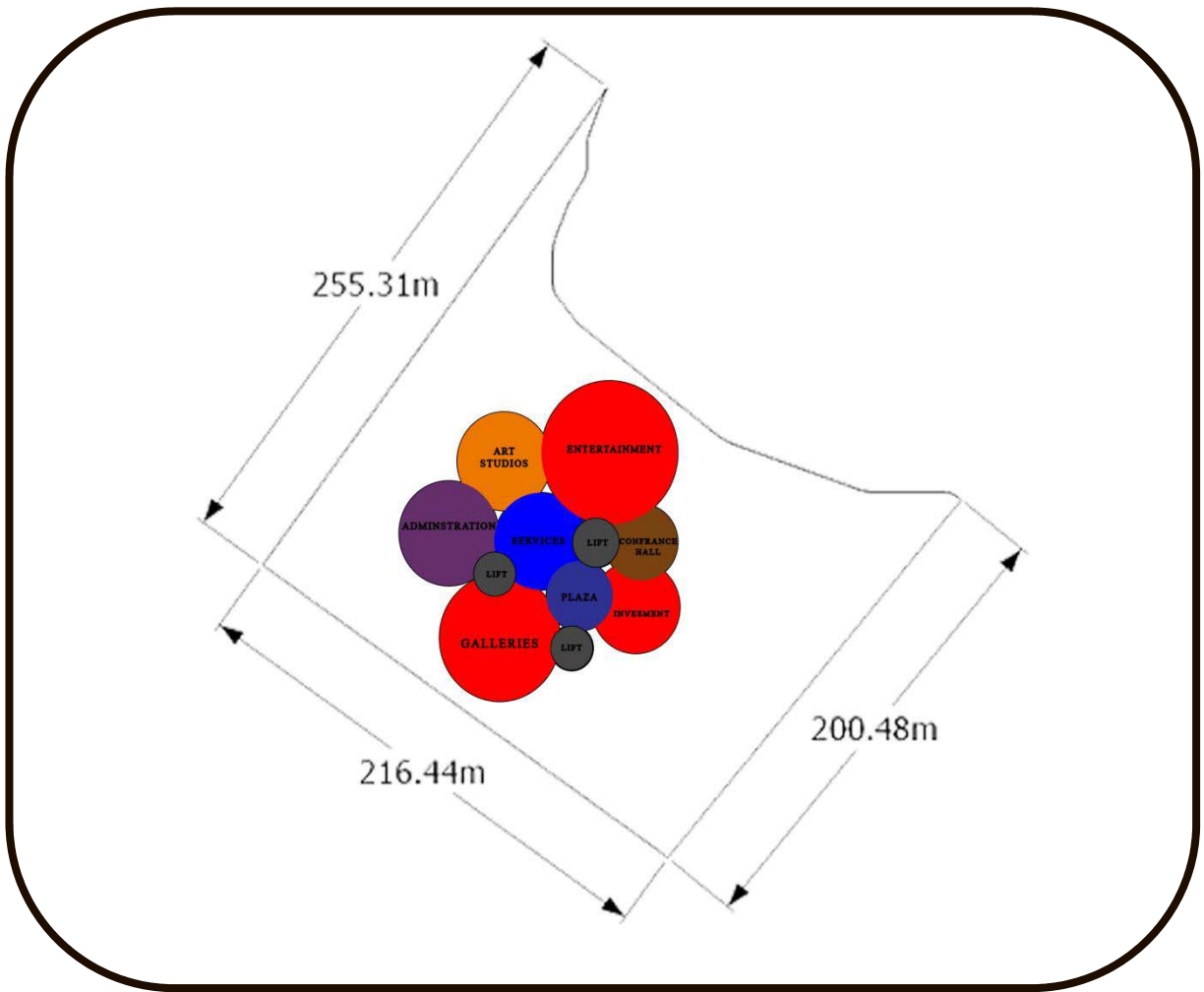
CULTURAL



PARKING





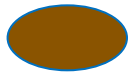


SERVICES



**VERTICAL :**

- The floors contain main administration as well as entertainment, galleries, & conference hall.
- The lifts are formed in triangle shape to provide efficiency for all building sections.

**KEY**

-  **ART ZONES**
-  **ENTERTAINMENT**
-  **CULTURAL**
-  **PARKIN**
-  **SERVICES**

**CHAPTER FOUR (4)**  
**ARCHITECTURAL DESIGN**

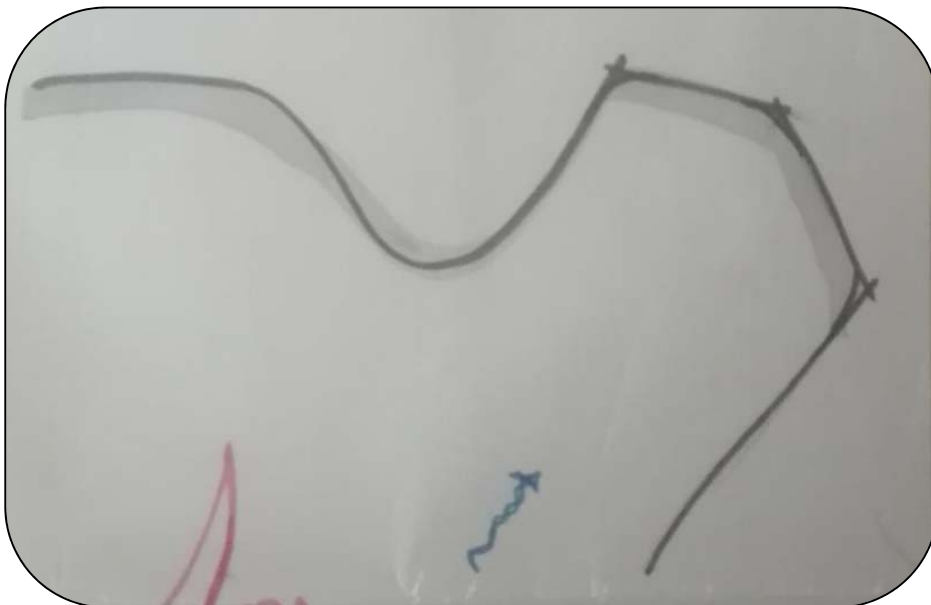
## DESIGN PHILOSOPHY:

### PRIMARY DESIGN:

- The main formation is inspired by the curved smooth shapes (eyesight comfort) that expresses the art creativity.



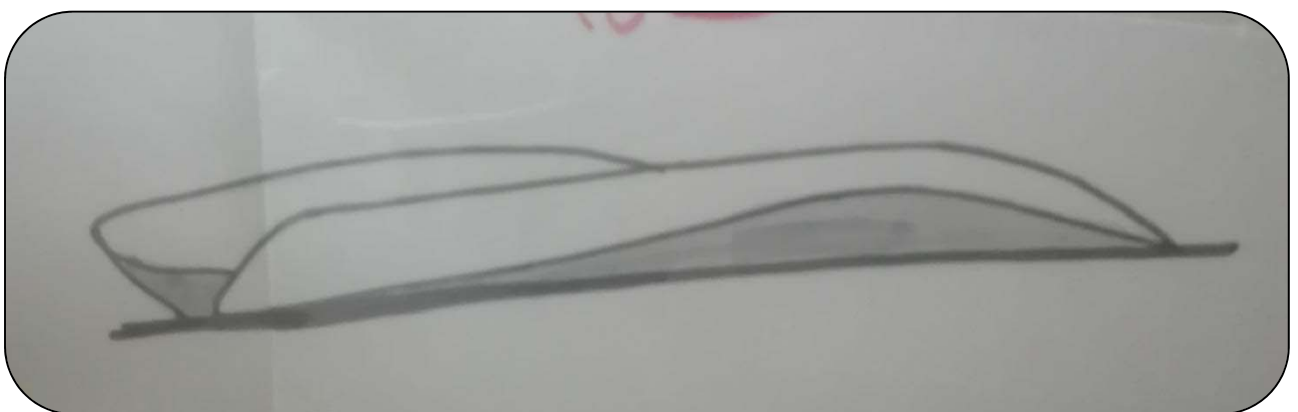
- Using the main access as a distribution method that gives the long walks required in gallery buildings and bending the entrance mass to give a welcoming shape.



-Used a sea (shell) element in formation on account that the site is located on sea shore and gives the mass a step like view.

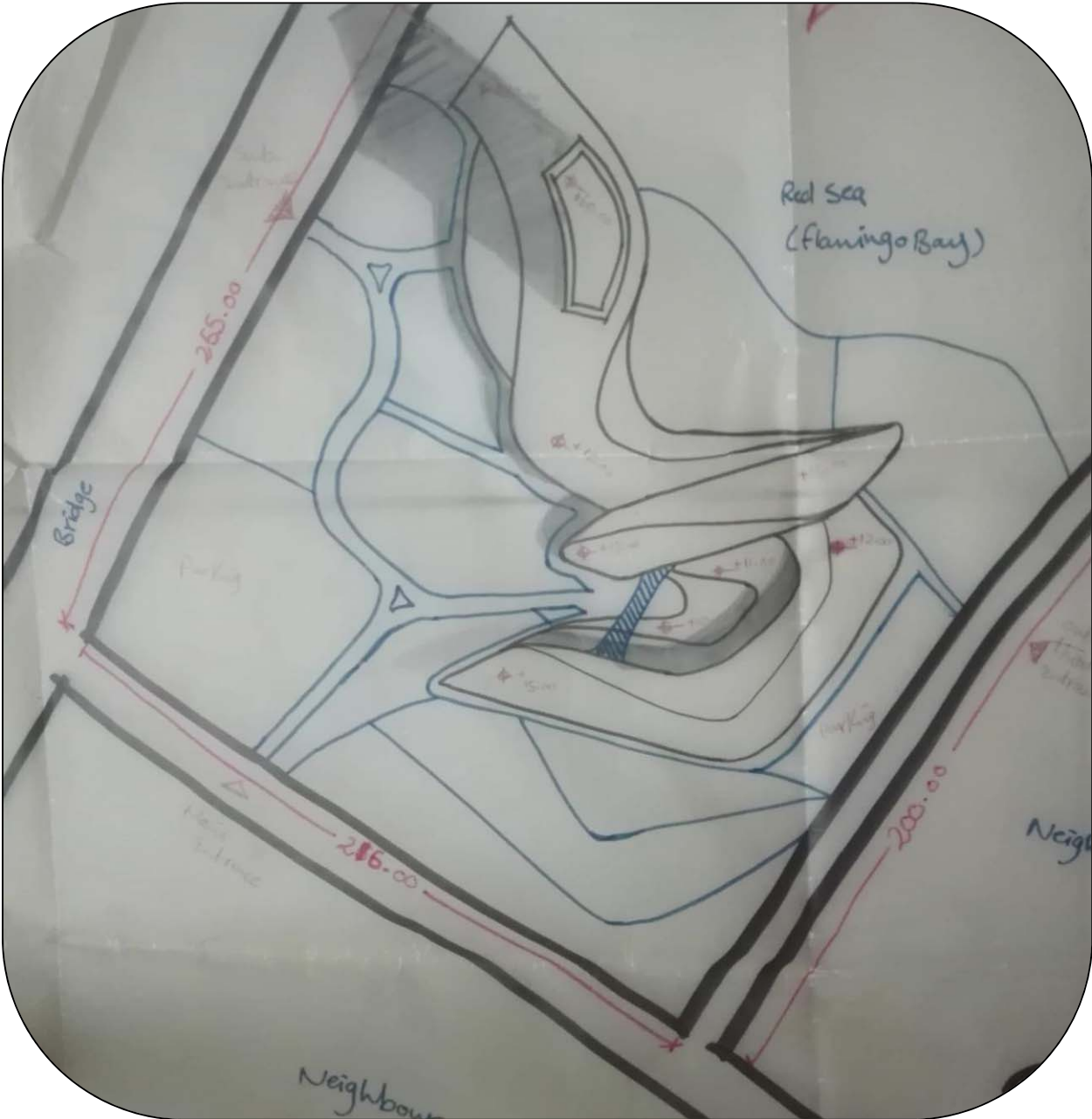


- the elevation expresses the smooth long curved shapes which by crossing masses is inspired by the shape of waves.





PRIMARY DESIGN:



## DESIGN DEVELOPMENT:

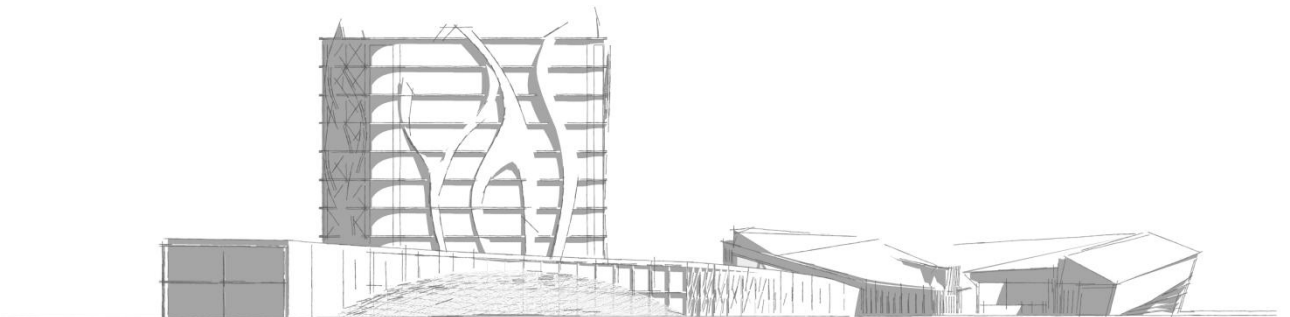
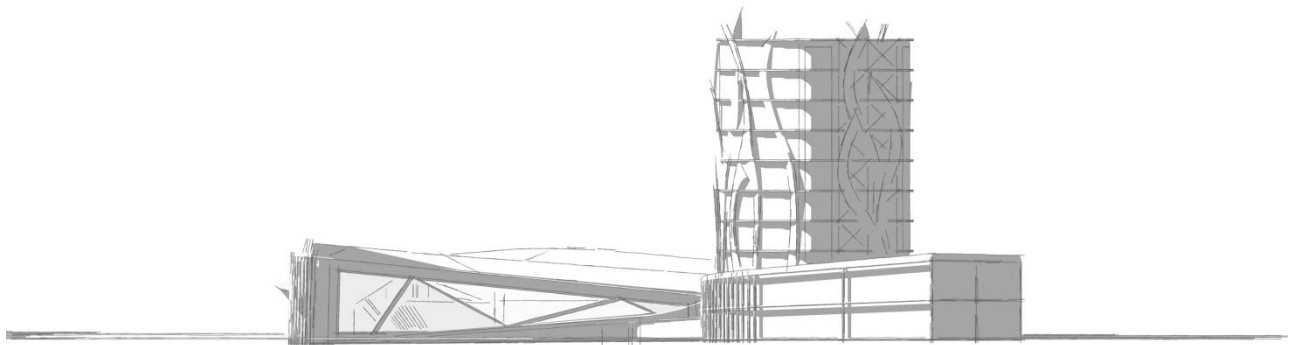
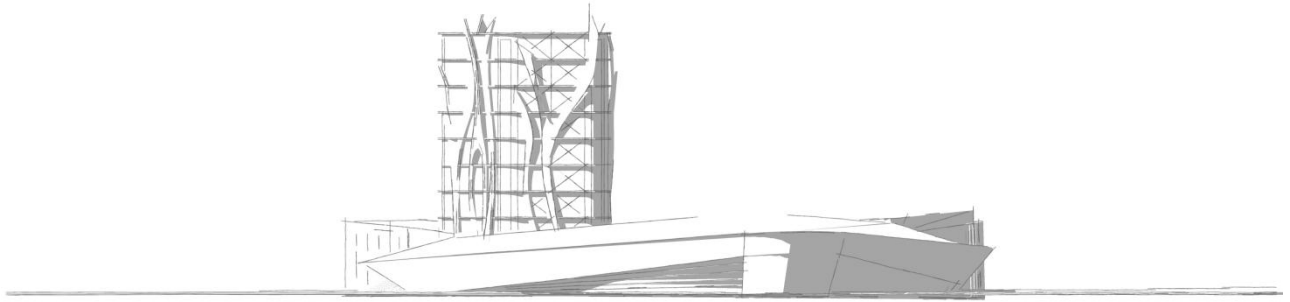
- The Main problem was the long passages from the site entrance to the building solved by making 2 entrances one for galleries and one for the training institute and administration.



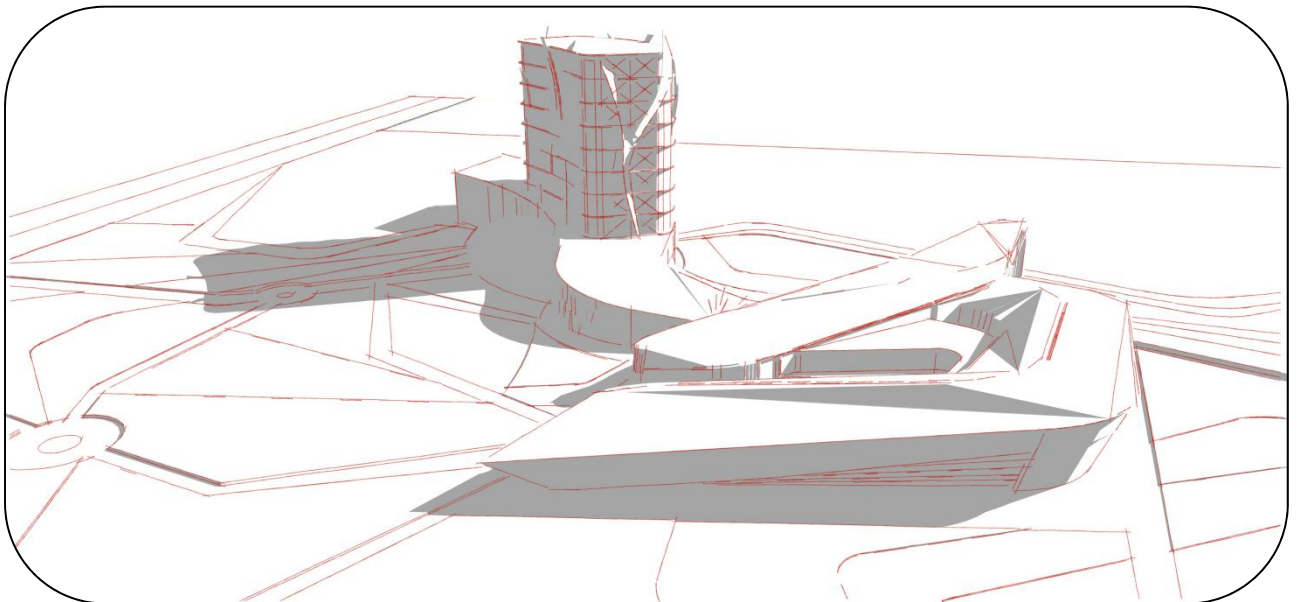
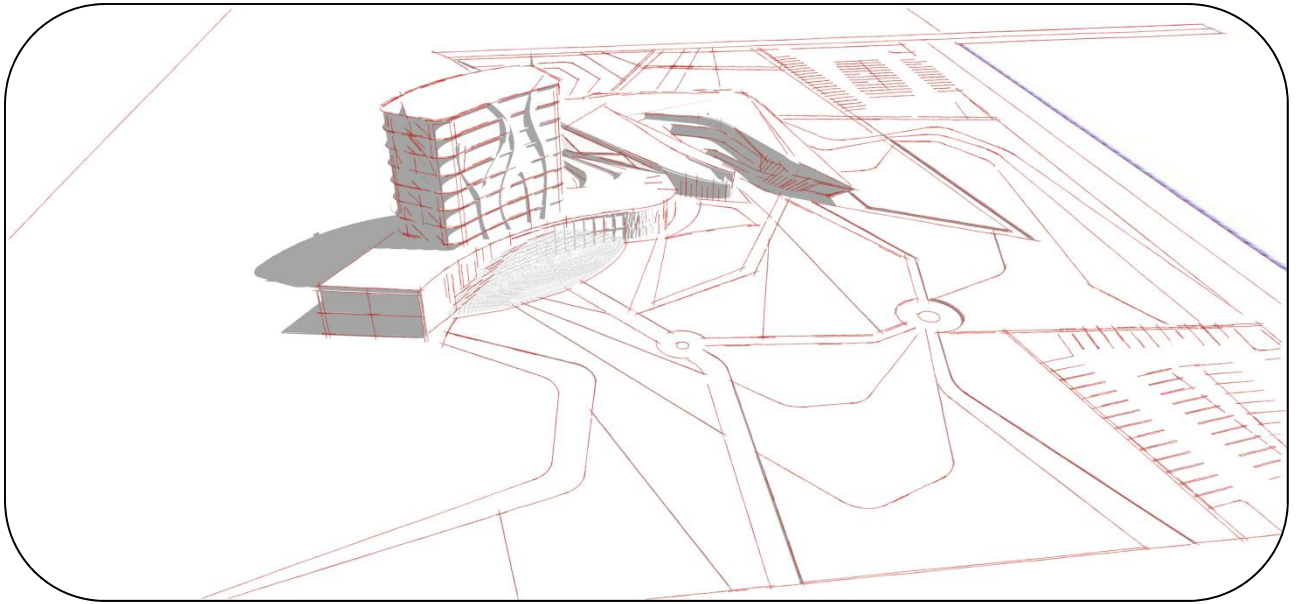
- The plan distribution relied on function only which created a problem with the long walk paths.



- The elevations lost the curved smooth shape due to the tower misplacement (removed in development).

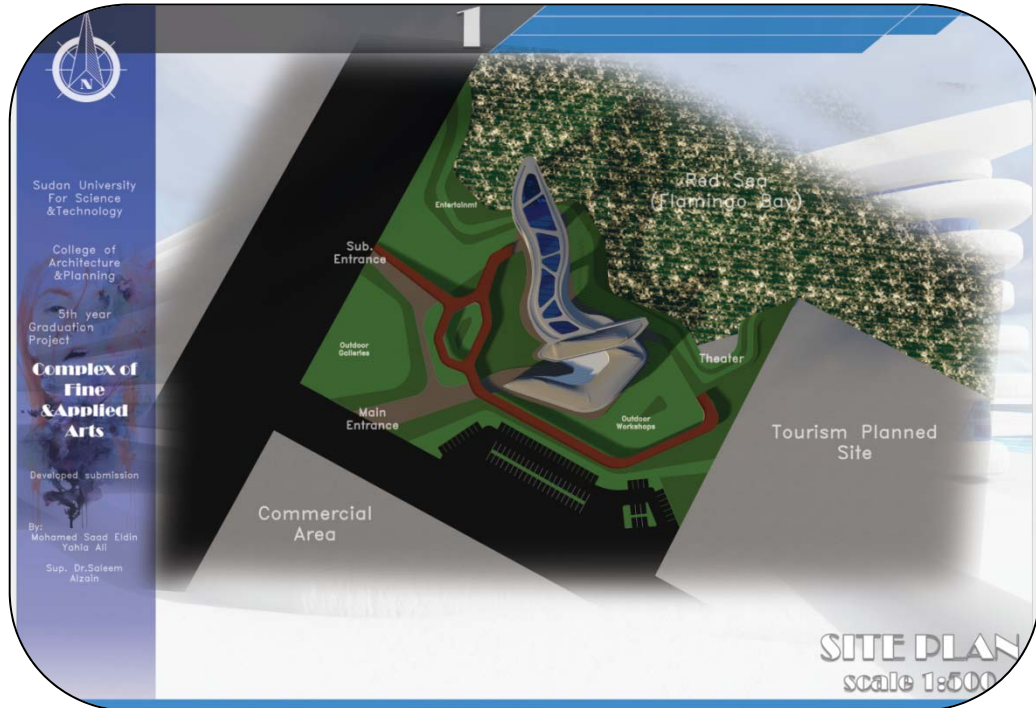


**VIEWS:**

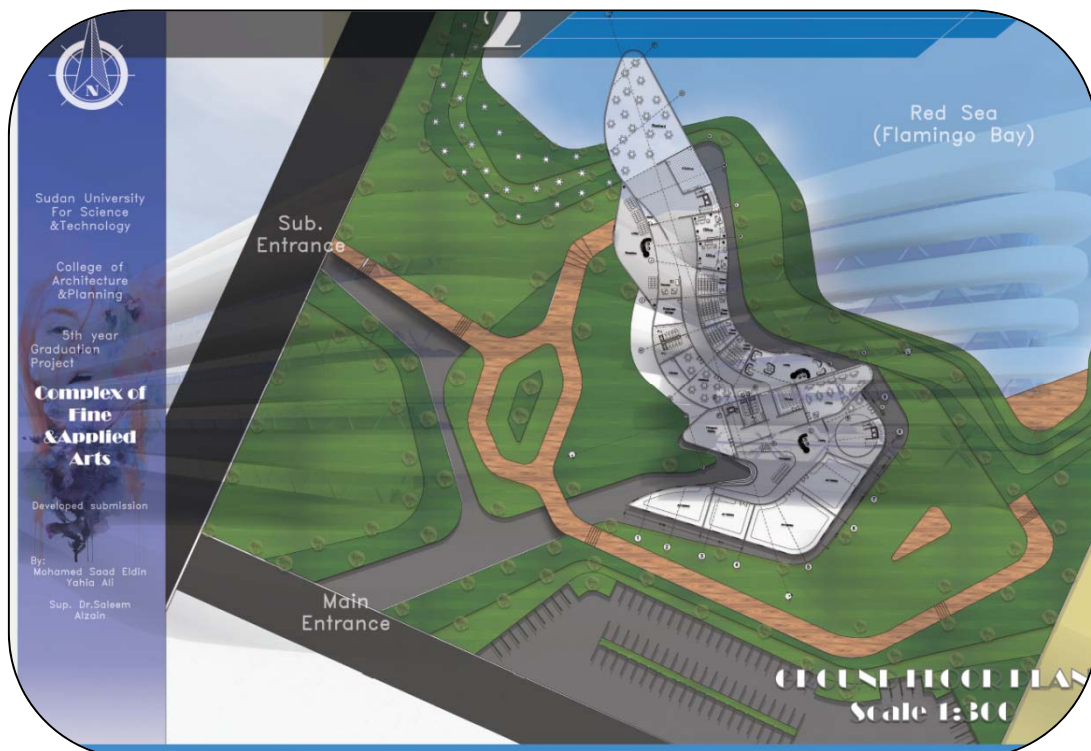


## DEVELOPMENT STAGE:

- Redistributed the landscape that links the outdoor activity with the indoor and solved the long passage problem with a floating bridge.

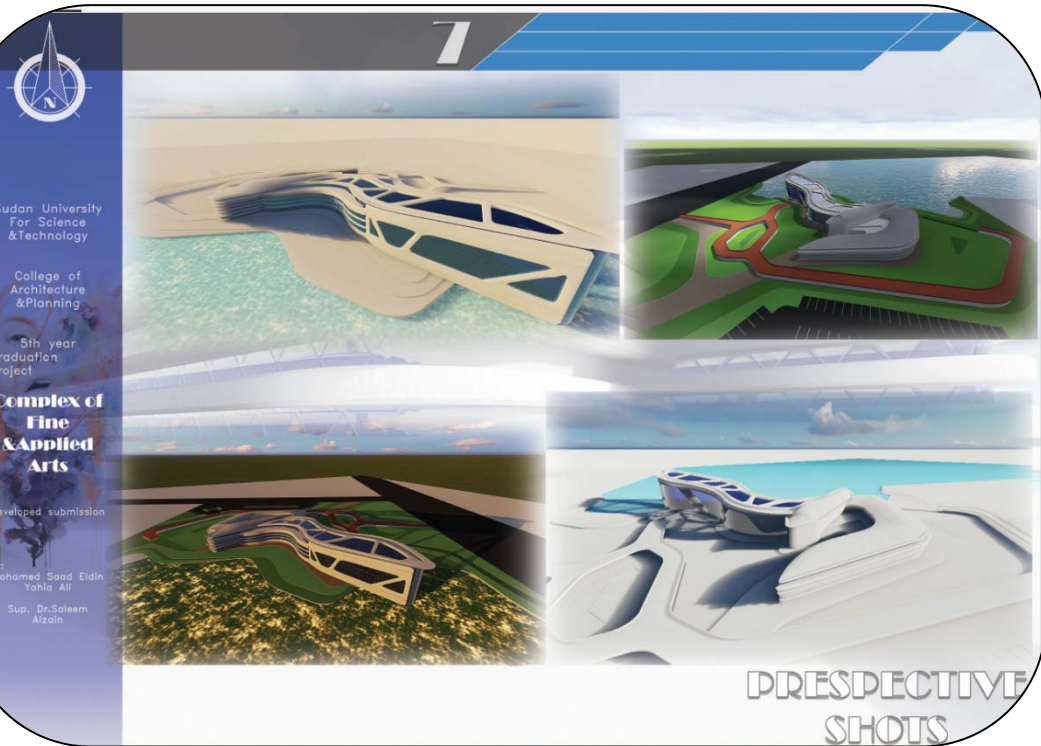
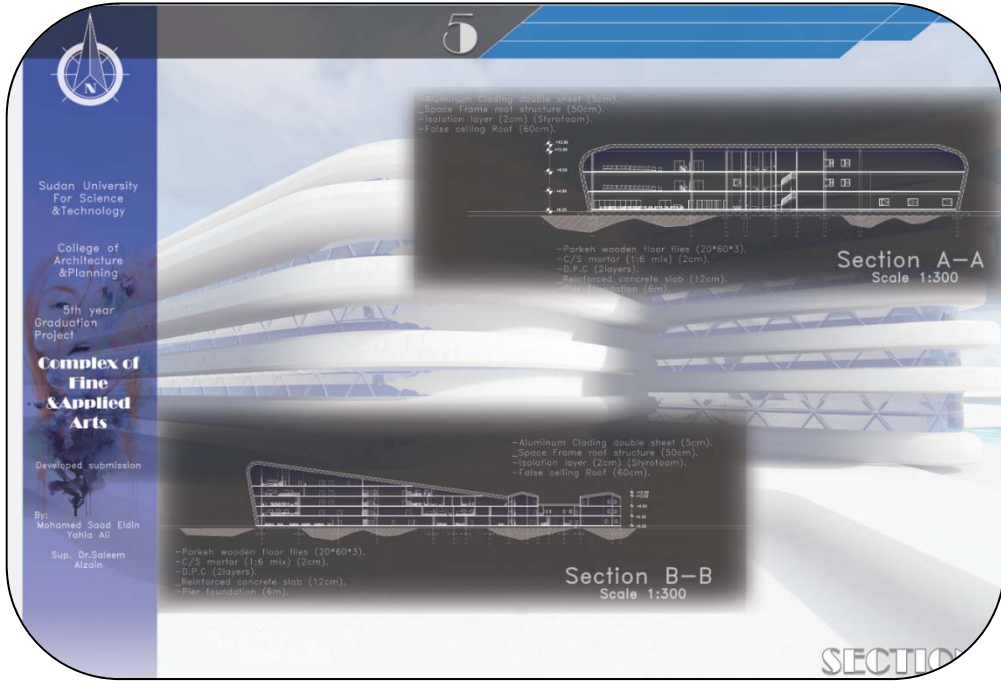


- The plan distribution was modified to accommodate the students activities.



- The building took a white colour to maximize the contrast of the mass and glass.





CHAPTER FIVE (5)  
TECHNICAL SOLUTIONS



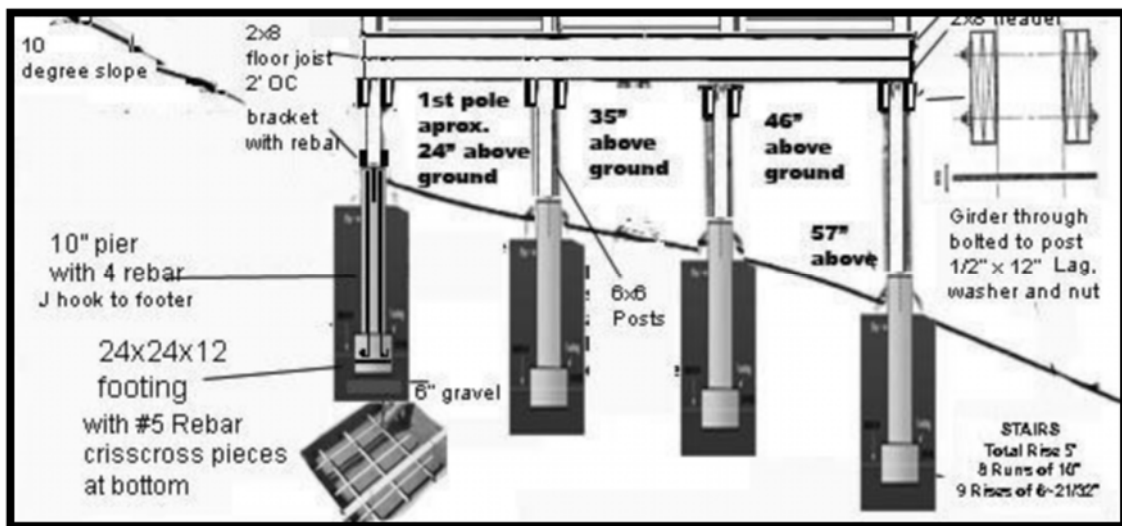
## 5-1 Structural System:

- The building structure is steel, looking at the non-usual volumes and masses from large interior spans & unusual roof shapes.

### Foundations:

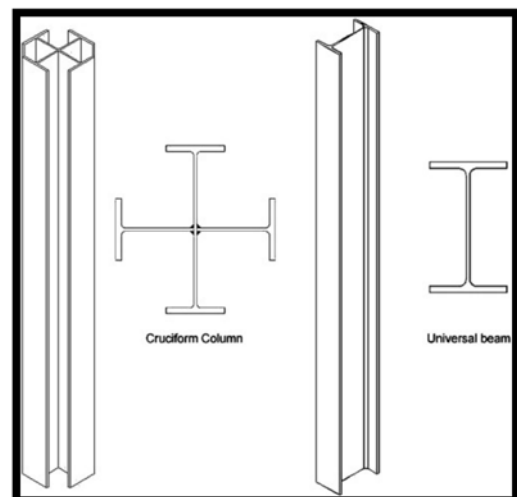
- The pier and beam foundation is the most suitable to use looking at the location of the site property near the White Nile Bank and the clay soil properties which makes the ground unstable to use raft foundation.

- The foundation must be isolated so any water or so do not affect it.



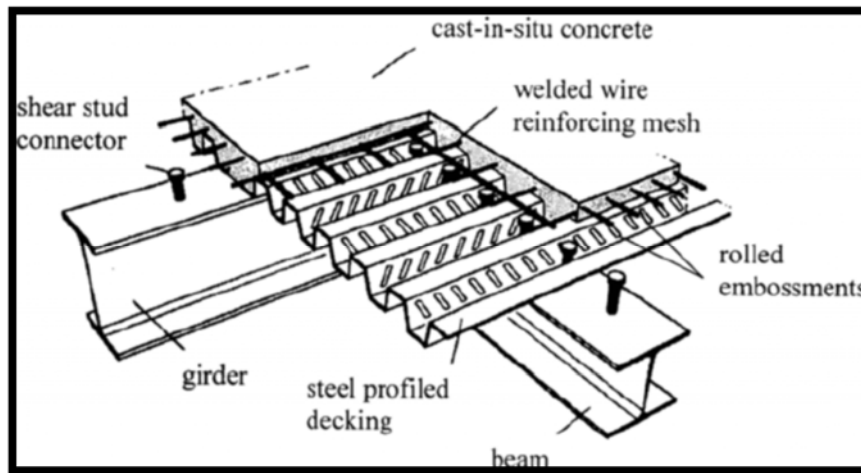
### Columns:

- The structural columns are the steel universal I section columns, for its ability to handle large long spans, which are considered and used in this type of buildings (exhibition & Galleries). Moreover, they are easier to connect to the steel flooring.



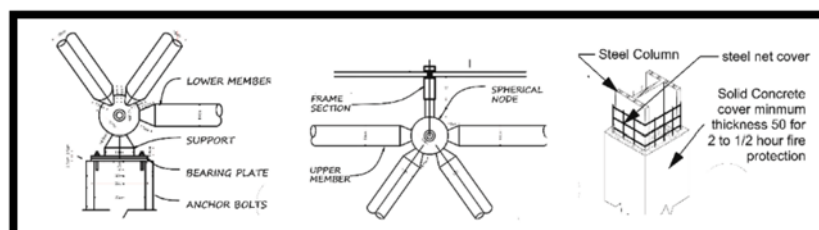
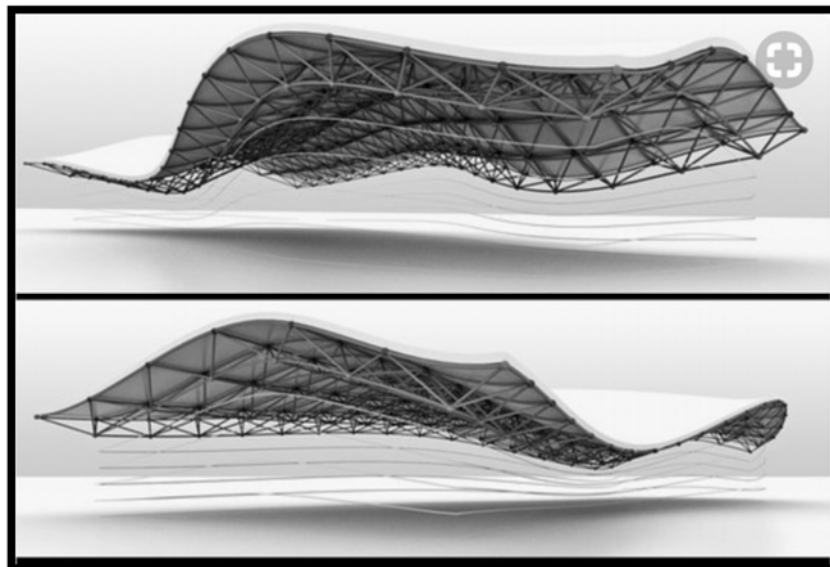
## Floors:

-The Floor deck uses the ribbed steel decking that reduces the overall depth and gives lighter weight.



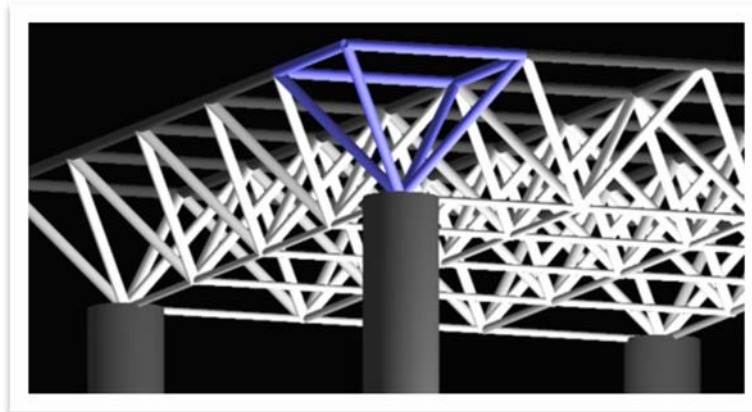
## Roofs:

The main exterior roof structure is a complex form of space frame, which now, is commonly used in modern organic and deconstruction architecture. In addition, it is preferred in this project looking at the concept design of the volumes.



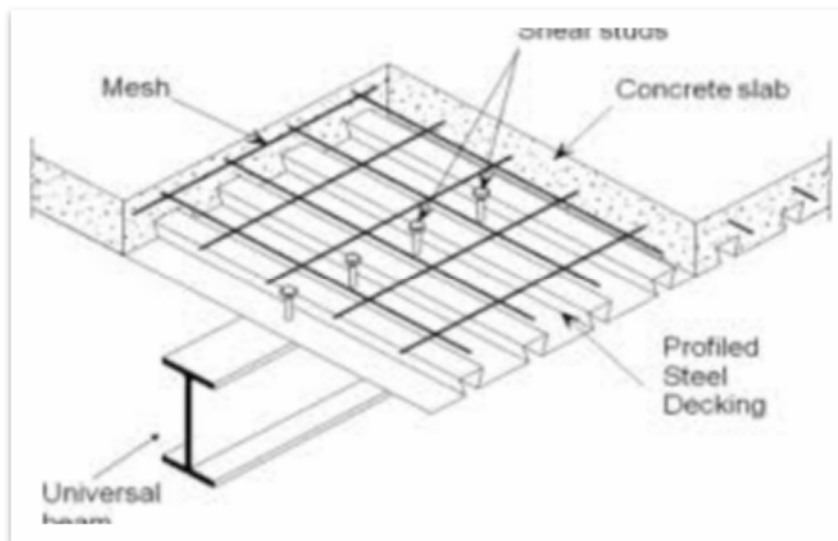
## Reasons why choosing those two systems together:

- To achieve the free form of the building specially the ceiling.
- The presence of large spans.



## Joints:

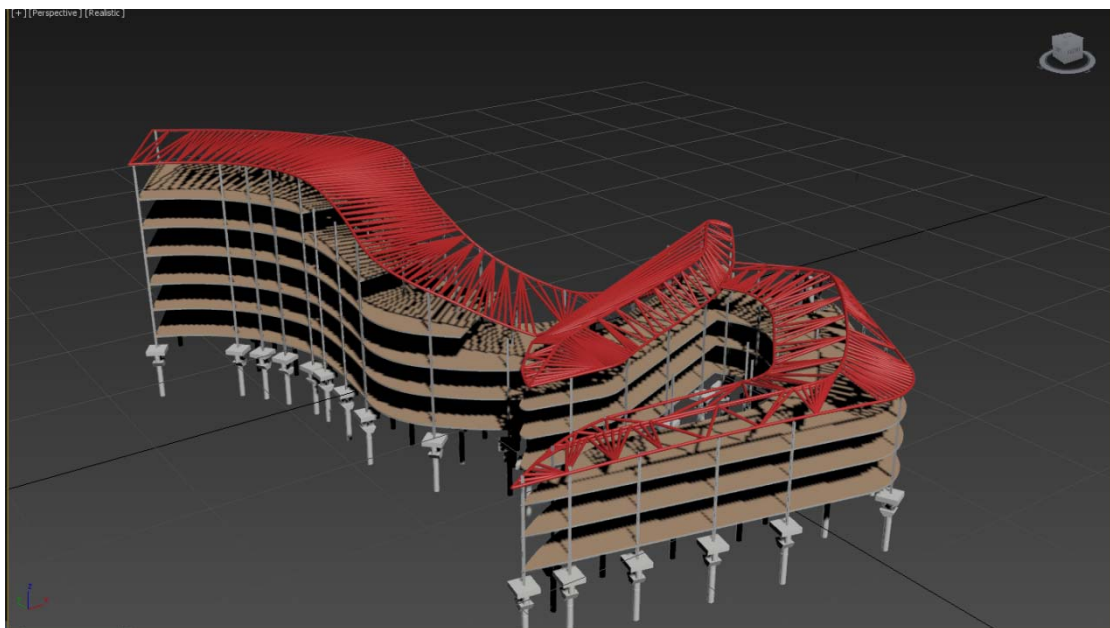
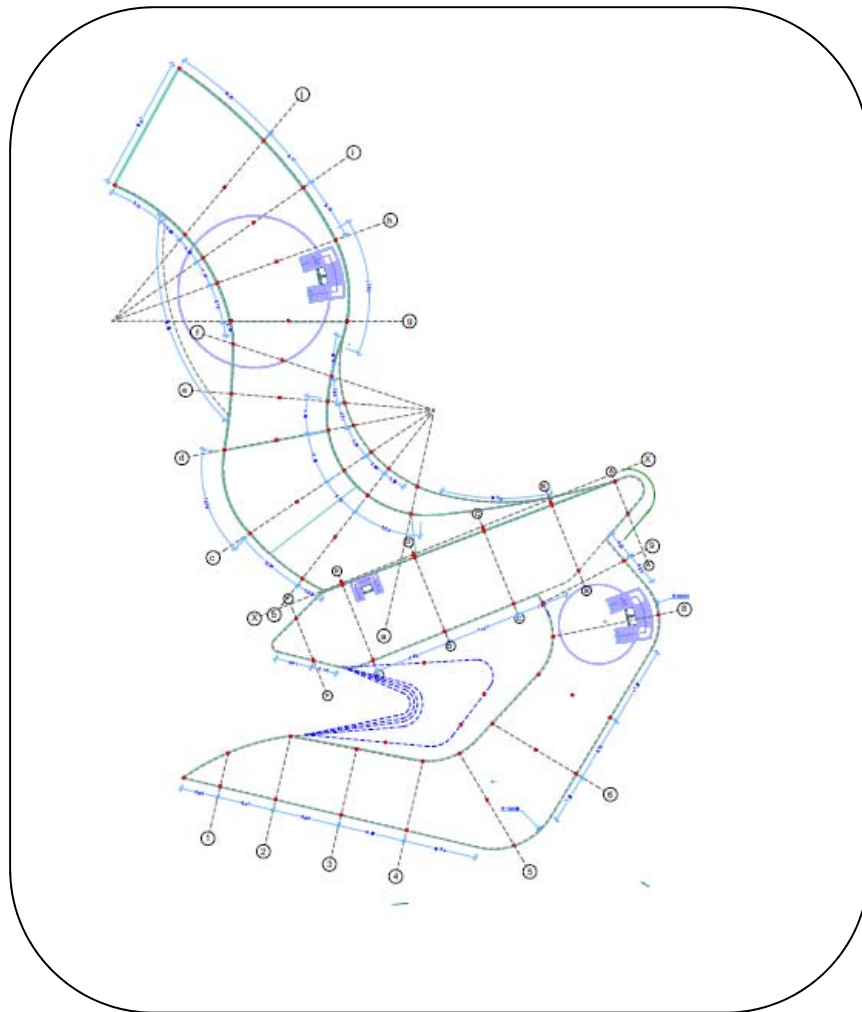
the columns are connected with the space frame with steel joints.



steel joints



## Structure plan:

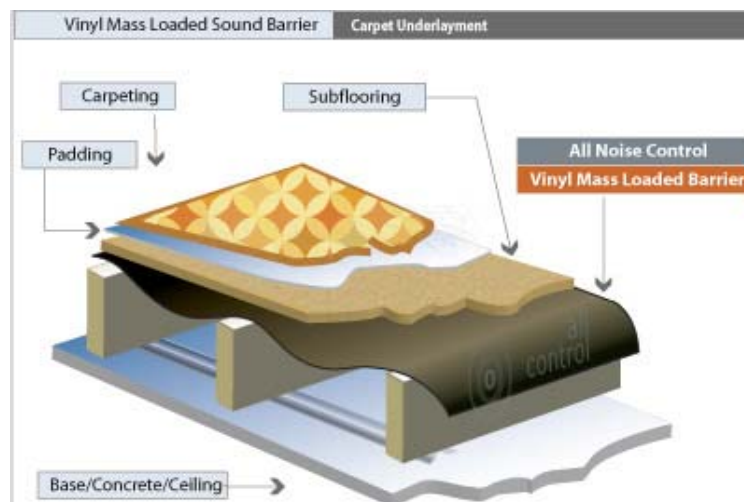


## Structure perspective

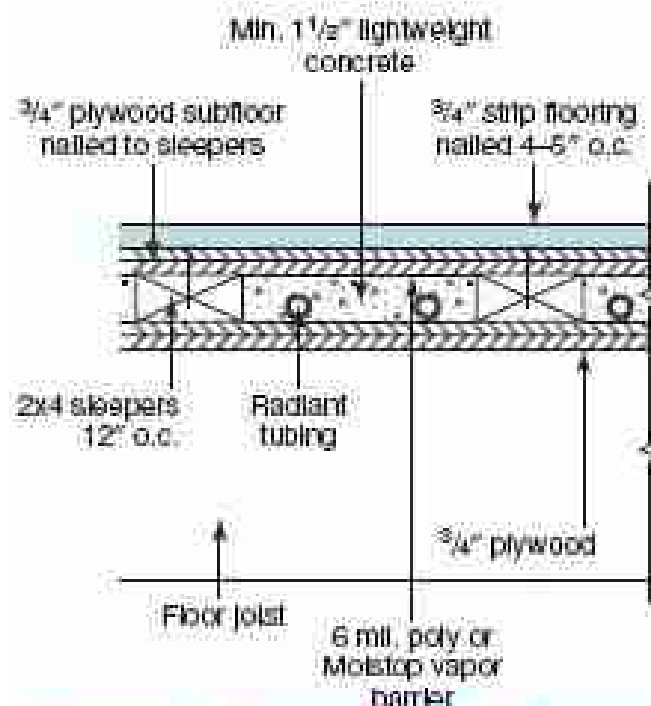
## Interior finishing:

### Floors:

- Porcelain tiles 90cmx90cm in the main corridors and in the lobbies **and** offices.
- Carpet floor in the lecture hall and life drawing studio.
- Wooden floors in the studios.



Subfloor Over Thin Slab

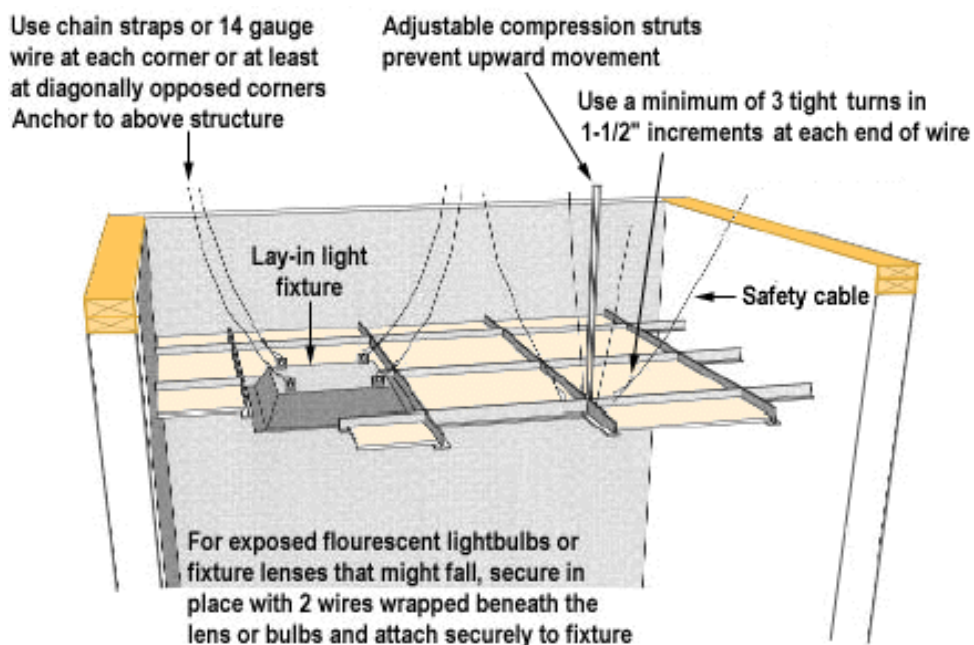


## Walls:

- White paint with some stripes of other colors to the offices and corridors and lobbies.
- \* Wooden walls for the studios.

## Ceilings:

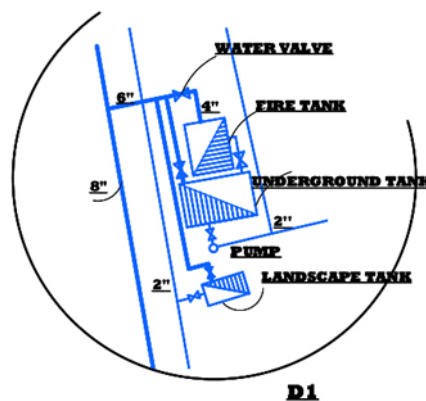
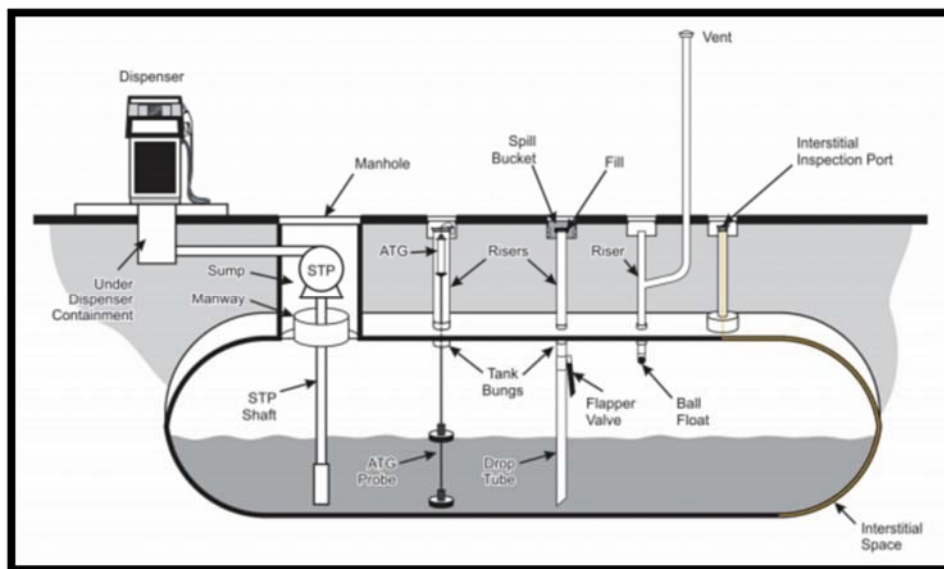
- Gibson board false ceiling 60cmx60cm.
- \* Wooden board false ceiling 60cmx60cm.
- White paint with some colored stripes.



## 5-2 SERVICES

### 1. WATER SUPPLY SYSTEM:

- The system used for water supply is the tank system due to lack of water pressure in the public network which used underground & elevated tanks.
- The main road West of the site has a supply pipe (8 in) that is connected to the main city supply network.
- The site feeder (6 in) enters the site from the west main supply line & takes the **(Ring supply system)** to supply the entire site starting with (2) underground tanks with (4 in) pipe.
- One tank feeds the elevated tanks for building water supply & the other feeds the landscaping of the whole site.



## 2. ELECTRICITY SUPPLY:

-the main electricity line is west of the site.

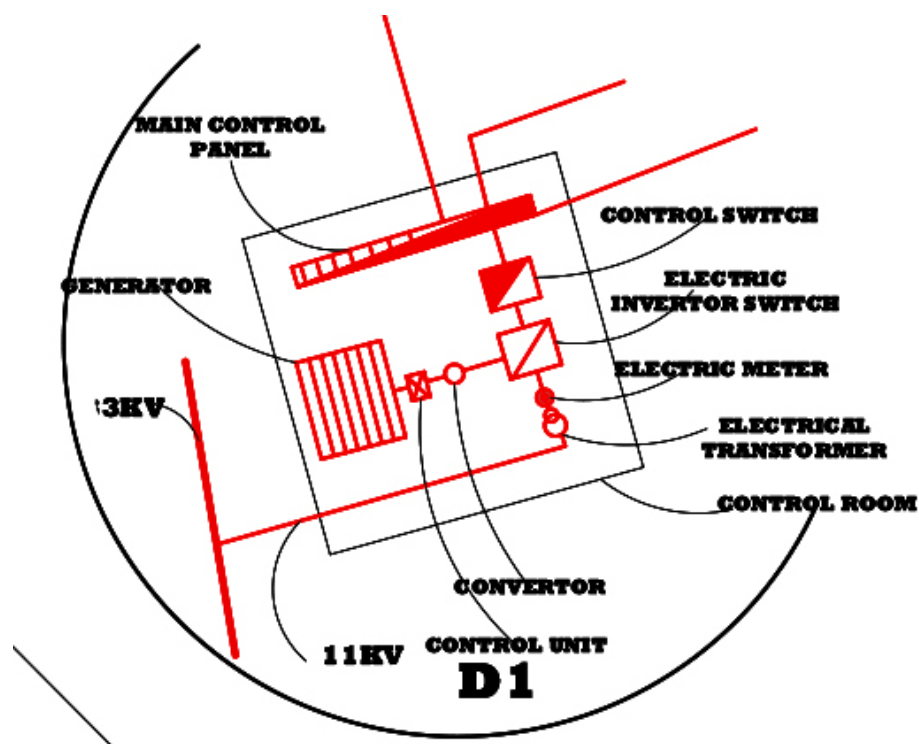
-it enters as a 11kv .

-then it is transformed into 415v.

-and then it is distributed through the main control panel.

-there's also a generator that's connected to the inverter switch to ensure an electrical supply to the site in case of shutdowns.

-site lamps are supplied through solar power panels on each one, and contains battery to save power, it is also connected to the public web in case there are outside factors that weakens the solar power to work properly.





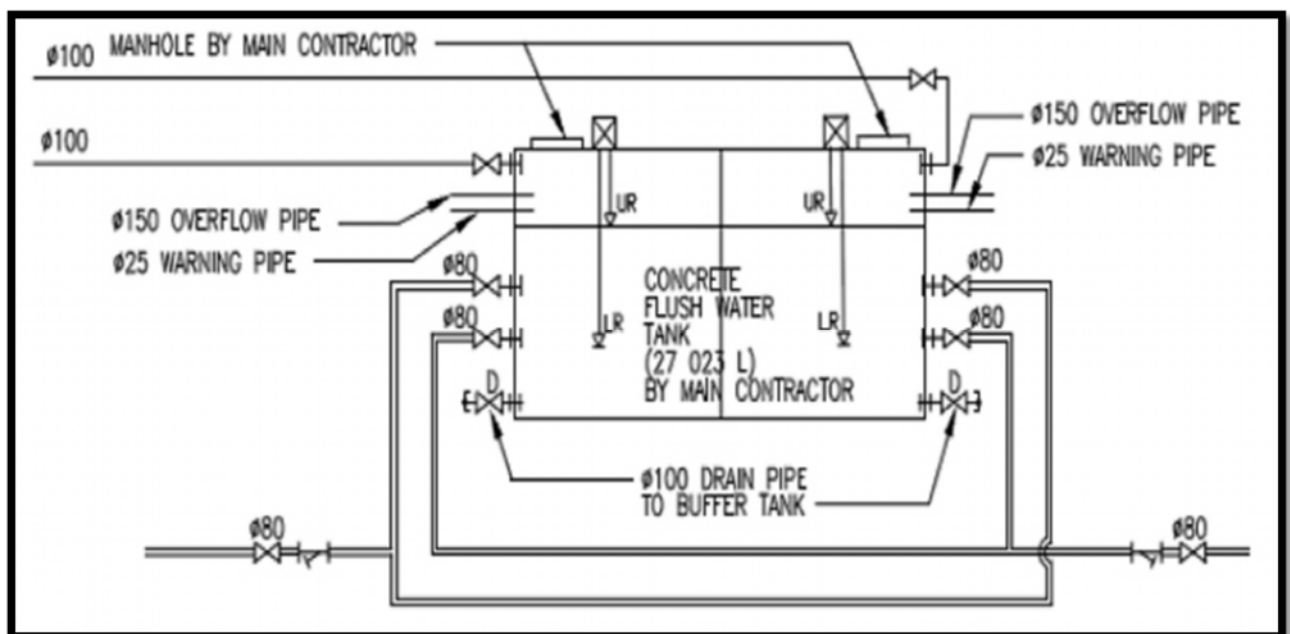
## 2. SEWAGE & DRAINAGE SYSTEM

### 1. Sewage System:

- The site has a surrounding sewer pipeline that links it to the main city sewage network system.
- Inspection chambers (manholes) depths are as follows:

### 2. Drainage:

- all the buildings' slope is 1:200.
- all the floors' slope is 1:100.
- down pipes were put on the ceiling to ensure the flowing of water.
- then all the excess water is drained to the tranche line.
- all the surface water then is contained on the surface water station which can be used for the green spaces instead of the public net.
- the surface water station is connected to the green spaces tank.



Inspection Chamber

### 5-3 AIR CONDITIONG SYSTEM:

-The system used in the complex is the VRV system.

#### Reasons of choosing this system:

- High efficiency of cooling.
- Free control of temperature in different spaces at the same time.
- High control of air sterilization.
- Availability of working under nature lighting circumstances in the galleries.

### 5-4 FIRE FIGHTING:

Fire Fighting can be accomplished through two stages:

Number one: detecting the fire:

which can be done:

\*Automatically:

-this can be done through fire detectors according to the space level of danger and use, and it's either smoke or heat detector, and in this project HEAT DETECTORS were used because:

-all materials and furniture are carbon based

-it detects heat from around 57-92 centigrade.

And those detectors are connected to the main control panel which in case of fire immediately sets off the alarm and the sirens and lights for the emergency exits.

**\*Manually:**

through the manual alarm buttons that works when it is pressed manually.

Number two: putting out the fire:

which can be done:

\* Manually : using:

- hoses: distribute boxes with hoses with a diameter up to 30m.
- Fire extinguishers: that are distributed in each space close to the door, and near the exits.

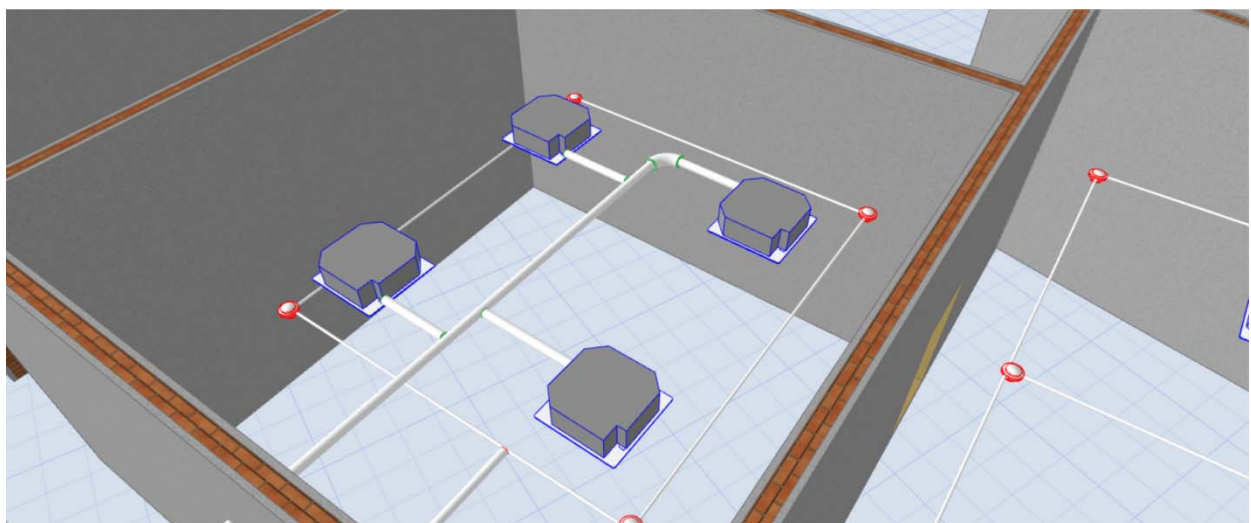
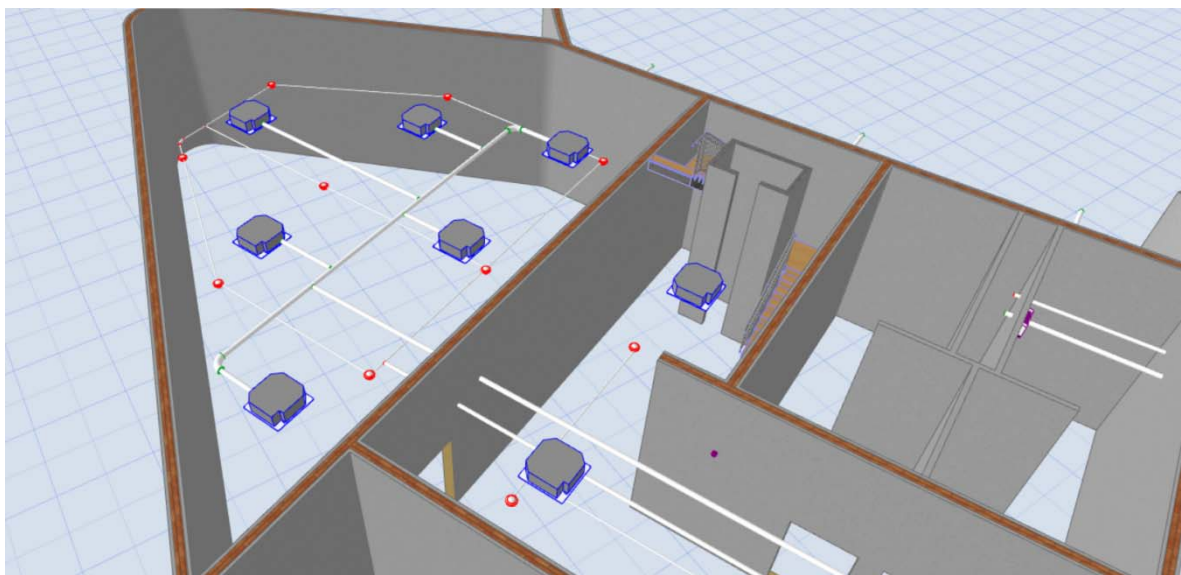
**\*automatically:**

using the sprinklers system.

reasons:

- the building's space is over 465m<sup>2</sup>.
- the building's users are over 300 person.

The sprinklers are installed in the ceiling through a water net supplied by a main water pipe. And the sprinklers cover the spaces of 8,12,15m<sup>2</sup>



## REFRANCES:

- Wikipedia.
- Google."by search"
- Google Maps.
- Archdaily.com.
- Architizer
- Time saver for building types 2nd edition by Joseph De Chiara & John Calender.
- Neufert Ernst and Peter – Architecture Data 3rd edition.
- Ministry of National Planning in Khartoum.
- Magazine of construction & architecture - fifth edition.
- Graphic Standers.