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FIFTH YEAR BACHELOR



FINR ART COMPLEX IN TUTI

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ABSTRACT:

Fine art complex is an integrated complex project that introduces the different types of fine art and aims to provide a variety of open and closed exhibitions, public bazaars and art shops which help promote and sale local art, an investment venue where international and local events are held, educational design studios and workshops serving the youth.

The project aims to achieve cultural yields and the development of the art side by offering local and global products, the achievement of local jobs in the aspect due the weakness domestically in the Arab world and to be an international stage.

This research deals with the study of fine complex project, in five chapters; the first chapter is a general introduction to the project which breaks into the definition, the objectives, and the aspects the and the causes of choice. The second chapter which consist of the data and information collected and a brief history and the study of the architectural examples. The third chapter contains in its first section the project components and charts, in the second section there is the causes of the site selection and the analysis of the site down to the indicators and guide lines to find the best zoning based on previous studies. Chapter four includes the whole architecture designing process which contains the design philosophy (concept) and how the beginning of the architectural form and the idea of the design came from the project himself and then to modify the design and problems which existed and the ideas for solving it down till reaching the final design. Chapter five deals with the technical solutions for the project in terms of the method of selecting appropriate structure for the project and which achieves requirements and treatments for the project plus the services and the method of prevision and distribution, and in the end there is the references.

the main result of this project is to be able to study and design a complex which has all of the needed spaces for the project, functional ,simple in circulation, structurally stable, appealing to the eye and finally able to profit the artists, the owners and finally the county as a whole.

Abstract (Arabic):

مجمع الفنون التشكيلية عبارة عن مجمع يتم فيه انتاج وعرض جميع انواع الفنون الجميلة كما يهدف لتحقيق تنوع في عرض الاعمال الفنية من معارض مغلقة ومفتوحة وبازارات عامة ومتاجر الاعمال الفنية التي تساعد على عرض هذه الأعمال وبيعها, وتوفير مساحات استثمارية لاقامة الاحداث العالمية والمحلية المختلفة, كما يوفر ورش وستوديوهات للهواة والفنانين.

ويهدف المشروع الى: تحقيق مردود ثقافي وتطوير الجانب الفني عن طريق عرض الاعمال الفنية المحلية والعالمية وتحقيق فرص عمل محلية في هذا الجانب نظرا لضعفه محليا في الوطن العربي والنهضة به عالميا.

ويتناول هذا البحث دراسة لمشروع مجمع الفنون التشكيلية وذلك في خمس أبواب, الباب الأول به مقدمة عامة عن تعريف المشروع وأهدافه وأبعاده وأسباب الاختيار ثم مرورا بالباب الثاني الذي به جمع المعلومات من نبذة تاريخية ودراسة النماذج , وفي الباب الثالث تناول في فصله الأول مكونات المشروع والمخططات وفي فصله الثاني تناول أسباب اختيار الموقع وتحليل الموقع وصولا الى المؤشرات والموجهات وبالتالي التنطيق الأمثل للمشروع بناء على الدراسات السابقة, الباب الرابع اشتمل على التصميم من فلسفة تصميمية وكيفية بداية التشكيل المعماري وان الفكرة التصميمية منطلقة من المشروع نفسه وصولا الى تعديل التصميم والمشاكل الموجودة والطرق المتبعة في حلها وصولا الى التصميم النهائي, الباب الخامس يتناول الحلول التقنية للمشروع من حيث طريقة اختيار النظام المناسب للمشروع والذي يحقق المتطلبات مرورا بالمعالجات الخاصة بالمشروع نهاية بالخدمات وطريقة توفيرها وتوزيعها, وفي الختام استعراض المراجع.

والنتيجة الرئيسية لهذا المشروع هو القدرة على دراسة وتصميم مجمع الفنون التشكيلية الذي يحتوي كل المساحات اللازمة للمشروع, كما يكون متكامل وظيفيا, بسيط في الحركة والتنقل, مستقر من ناحية الهيكل اللانشائي, , واخيرا يحقق الاستفادة للفنانين والمصممين والماكين ككل.

Dedication:

I dedicate this humble project of mine to my father may his soul rest in peace. The wave breaks and I'm carried into it. This is hell, yet my father laughs, chest-deep, proving I'm wrong we're safely rooted, rocked on his toes. Nothing irked him more than asking, "What is there beyond death?" his theory was that love greets you, and the loveless don't know what to say.

I also dedicate this for my mother for nursing me with affection and love and her dedicated partnership for success in my life. To my bundle of joy my sister and brothers for making the roughest of times go away.

To my friends who once stood by my side and protected me from all sort of harm.

"Dad, your guiding hand on my shoulder will remain with me forever" ..

Acknowledgment:

First and foremost I would like to thank God the blessing me with the knowledge needed to work on this project.

I present my humble thanks and appreciation to my supervisor Dr.Awad Saad for all of the help he provided and for guiding me throughout the project, all of the teachers in the college of architecture and planning and the ones associated with it providing us with the needed information and experience through the years.

Lastly I'm offering my sincere gratitude and thanks to my parents and my siblings for everything they have done in my life and picking me up when I was at my lowest and giving me the strength to move on and reach this chapter in my life, my dear friends for being my second family and my spine and my source of happiness and joy.

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CHAPTER ONE (INTRODUCTION):

Contents:

1-1 Project Definition.

1-2 Project Purpose.

1-3 Project Objectives.

1-4 Reasons behind the Selection of the Project.

1-5 The different aspects of the project.

1- Project introduction:

1-1 Definition of fine art complex:

An art complex is a functional community center with a specific remit to encourage arts practice and to provide facilities such as galleries , educational facilities “institutes “ , workshop areas , theaters , venues for musical performance .

1-2 Project's purpose:

The fine art complex is will provide trainees the ability to grow in different aspects , and share other people opinions causing a more interacting environment and social interaction among people with different background and different interests .

This project also aims to provide:

- A variety of open and closed galleries.
- Public bazaars and art shops which help promote and sale local arts.
- An investment venue where international and local events are held.
- Educational studios, classrooms and workshops.

1-3 Project objectives:

- Promoting art for what it is worth.
- Enhancing the artistic aspect of our region.
- Showcasing the talents held by young Sudanese underdogs.
- Capturing the eyes of the collectors, investors and art lovers.
- Reflecting the rich minds of our society.
- Helps rise the innovative level here in Sudan.
- Foster opportunities innovation, diversity and economic inclusion.
- Providing the necessary channels for young people to be connected and participate in community life.

1-4 Reasons behind the selection of this project:

- For the international community: this complex is a dialogue platform and cooperation.
- For the general public: it is an educating and entertaining experience.
- For the host country: it's a tool for nation branding and development.
- For the participants: it allows international outreach and economic opportunities.

1-5 The different aspects of the project:

➤ *Functional aspects:*

- Designing a place suitable for the trainees to help them develop and be more creative and help them interact with other people and socialize.
- A building that is safe and comfortable and creating a link between indoor and outdoor activities.
- Designing accessible movement, escape and exit routes.
- Accomplishing both, form and function requirements.
- Using modern architectural methods.

➤ *Structural aspects:*

- Choosing the right structural solutions that are able to tolerate long span units.
- Using a structural system that can solve all structural problems and also give an appealing look to the building over all façade.
- Focusing on the occupation, construction and maintenance of the project.

➤ *Economical aspects:*

- Coming up with a highly sophisticated project with minimum time and expenses not neglecting a high performance and technological matter.

➤ *Aesthetics and cultural aspects:*

- Translating art into the building's concept.
- Using eco-friendly, blissful materials and abstracted futuristic elevations.
- Showcasing the region's artistic talent.
- Exchanging a variety of cultural behaviors.
- Highlighting the different brain sets in our society

CHAPTER TWO: (DATA COLLECTION)

Contents:

2-1 The definition of Art.

2-2 Case studies.



2- Data collection:

2-1 The definition of art:

Art is a diverse range of human activities in creating visual, auditory or performing artifacts (artworks), expressing the author's imaginative or technical skill, intended to be appreciated for their beauty or emotional power. In their most general form these activities include the production of works of art, the criticism of art, the study of the history of art, and the aesthetic dissemination of art.

The oldest documented forms of art are visual arts, which include creation of images or objects in fields including painting, sculpture, printmaking, photography, and other visual media. Architecture is often included as one of the visual arts; however, like the decorative arts, or advertising, it involves the creation of objects where the practical considerations of use are essential—in a way that they usually are not in a painting, for example. Music, theatre, film, dance, and other performing arts, as well as literature and other media such as interactive media, are included in a broader definition of art or the arts. Until the 17th century, art referred to any skill or mastery and was not differentiated from crafts or sciences. In modern usage after the 17th century, where aesthetic considerations are paramount, the fine arts are separated and distinguished from acquired skills in general, such as the decorative or applied arts.



2-1-1 Classification of art:

Fine arts, visual arts, plastic arts, performance arts, applied arts and decorative arts are the major classifications of the arts. Several of these classifications have Sub-classifications associated with them.

2-1-2 The definition of fine art:

Fine art is art developed primarily for aesthetics or beauty, distinguishing it from applied art that also has to serve some practical function.

Historically, the five main fine arts were painting, sculpture, architecture, music and poetry, with performing arts including theatre and dance. Today, the fine arts commonly include additional forms, such as film, photography, video production/editing, design, sequential art, conceptual art, and printmaking. However, in some institutes of learning or in museums, fine art and frequently the term fine arts (pl.) as well, are associated exclusively with visual art forms.

One definition of fine art is “a visual art considered to have been created primarily for aesthetic and intellectual purposes and judged for its beauty and meaningfulness, specifically, painting, sculpture, drawing, watercolor, graphics, and architecture. In that sense, there are conceptual differences between the fine arts and the applied arts. As originally conceived, and as understood for much of the modern era, the perception of aesthetic qualities required a refined judgment usually referred to as having good taste, which differentiated fine art from popular art and entertainment.

The word “fine” does not so much denote the quality of the artwork in question, but the purity of the discipline according to traditional Western European canons. This definition originally excluded the applied or decorative arts, and the products of what were regarded as crafts. In contemporary practice these distinctions and restrictions have become essentially meaningless, as the concept or intention of the artist is given primacy, regardless of the means through which this is expressed.



2-1-3 History of Fine Art:

According to some writers the concept of a distinct category of fine art is an invention of the early modern period in the West. Larry Shiner in his *The Invention of Art: A Cultural History* (2003) locates the invention in the 18th century: "There was a traditional "system of the arts" in the West before the eighteenth century. (Other traditional cultures still have a similar system.) In that system, an artist or artisan was a skilled maker or practitioner, a work of art was the useful product of skilled work, and the appreciation of the arts was integrally connected with their role in the rest of life. "Art," in other words, meant approximately the same thing as the Greek word *techno*, or in English "skill", a sense that has survived in phrases like "the art of war," "the art of love," and "the art of medicine." Similar ideas have been expressed by Paul Oskar Kristeller, Pierre Bourdieu, and Terry Eagleton (e.g. *The Ideology of the Aesthetic*), though the point of invention is often placed earlier, in the Italian Renaissance.



Claude Monet, *Haystacks*, late 19th century. In this example of an oil painting, Monet was using simple forms to explore light and shadow. Monet painting of haystacks.

2-1-4 Types of Fine Art:

Now that we've covered the definition, let's explore some types of fine art.

Some fine art is two-dimensional. The most basic is drawing, or the idea of using a tool like a pencil, pen, or charcoal to create an image using line and shadow. A drawing can be fine art, and the practice of drawing is fundamental to many other kinds of fine art. Another type of two-dimensional fine art is painting. This includes mediums like watercolor, oil, and acrylics. A painting may be created on a wooden panel, a canvas, or almost any other surface.

Other types of fine art may involve processes that create more than one image. Printmaking uses etching, engraving, and screen-printing to transfer an image from one surface to another. When a print is fine art, there are usually a limited number of very high quality prints made.

2-1-4-1 Sculpture:

Sculpture is another of the 7 forms of fine art. The capacity to use this ability to create 3D shapes and forms has been recognized since ancient times, and today is still considered one of the primary forms of art.

Sculptures can be made out of any material, and can be created by carving, assembling, molding, casting...



2-1-4-2 Painting:

Amongst the 7 forms of fine art, painting is perhaps one of the most recognized disciplines. Since antiquity, people have used it as a form of expression and a mechanism to capture reality. Throughout history there have been hundreds of famous artists, so it is no wonder that today it remains one of the most popular and appreciated fine arts.

2-1-4-3 Photography:

Photography is making pictures by letting light through the lenses of a camera onto a film. In analogue photography light was recorded onto a film, which had to be chemically developed. Images could then be printed onto special paper.

Today most photography is digital. Cameras have no film; the images are recorded onto silicon chips.



2-1-4-4 Calligraphy:

Calligraphy is a type of visual art. It is often called the art of fancy lettering . A contemporary definition of calligraphic practice is "the art of giving form to signs in an expressive, harmonious and skillful manner".[5] Modern calligraphy ranges from functional hand-lettered inscriptions and designs to fine-art pieces where the abstract expression of the handwritten mark may or may not compromise the legibility of the letters Classical calligraphy differs from typography and non-classical hand-lettering, though a calligrapher may create all of these; characters are historically disciplined yet fluid and spontaneous, improvised at the moment of writing.



2-1-4-5 Mosaics:

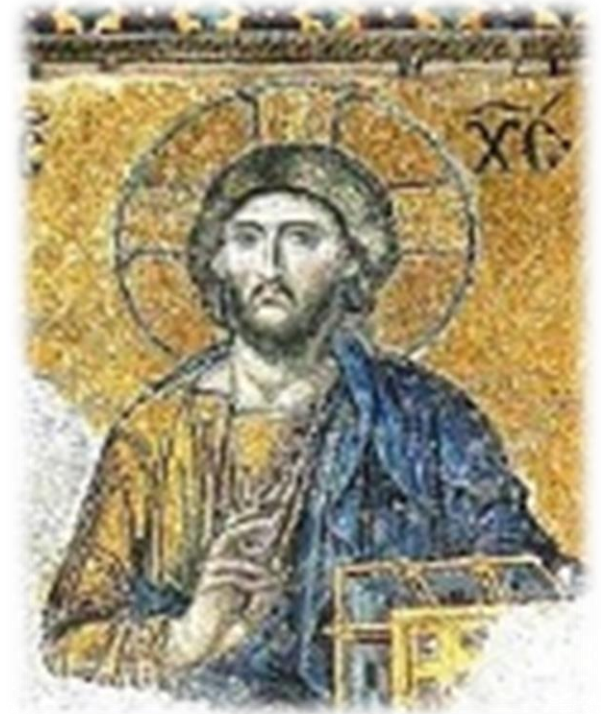
Mosaics are images formed with small pieces of stone or glass, called tesserae. They can be decorative or functional. An artist who designs and makes mosaics is called a mosaic artist or mosaics.

2-1-4-6 theater:

Modern Western theatre is dominated by realism, including drama and comedy. Another popular Western form is musical theatre. Classical forms of theatre, including Greek and Roman drama, classic English drama (Shakespeare and Marlowe comprised), and French theater (Molière included), are still performed today. In addition, performances of classic Eastern forms such as Noh and Kabuki can be found in the West, although with less frequency.

2-1-4-7 printmaking:

Printmaking is the process of making artworks by printing, normally on paper. Except in the case of monetizing, the process is capable of producing multiples of the same piece, which is called a print. Each print is considered an original, as opposed to a copy. The reasoning behind this is that the print is not a reproduction of another work of art in a different medium — for instance, a painting — but rather an image designed from inception as a print. An individual print is also referred to as an impression. Prints are created from a single original surface, known technically as a matrix. Common types of matrices include: plates of metal, usually copper or zinc for engraving or etching; stone, used for lithography; blocks of wood for woodcuts, linoleum for linocuts and fabric in the case of screen-printing. But there are many other kinds, discussed below. Multiple nearly identical prints can be called an edition. In modern times each print is often signed and numbered forming a "limited edition." Prints may also be published in book form, as artist's books. A single print could be the product of one or multiple techniques.

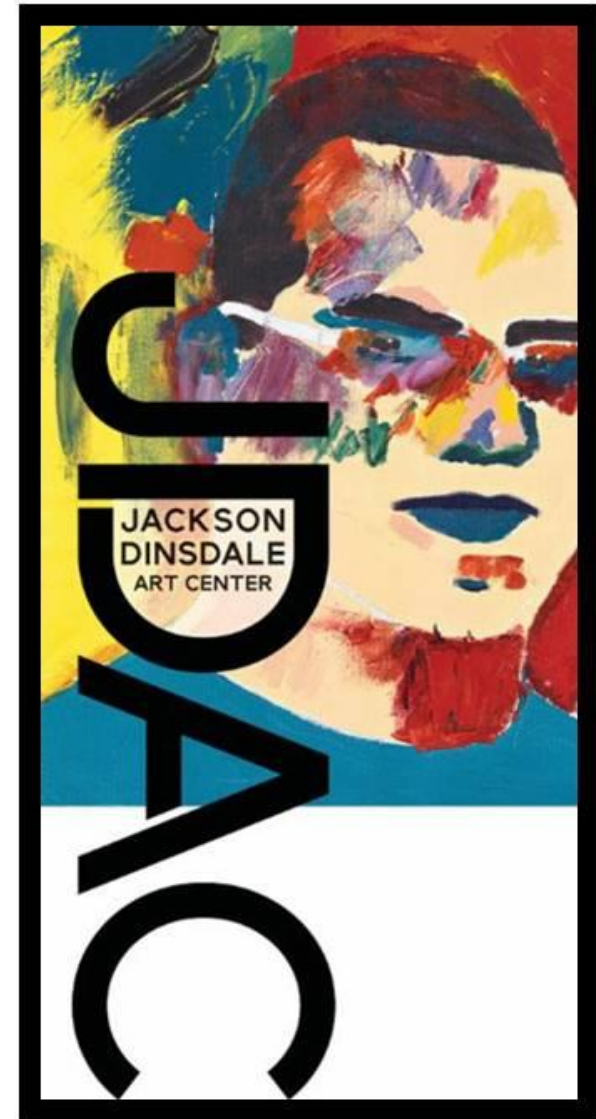


2-2 Case studies:

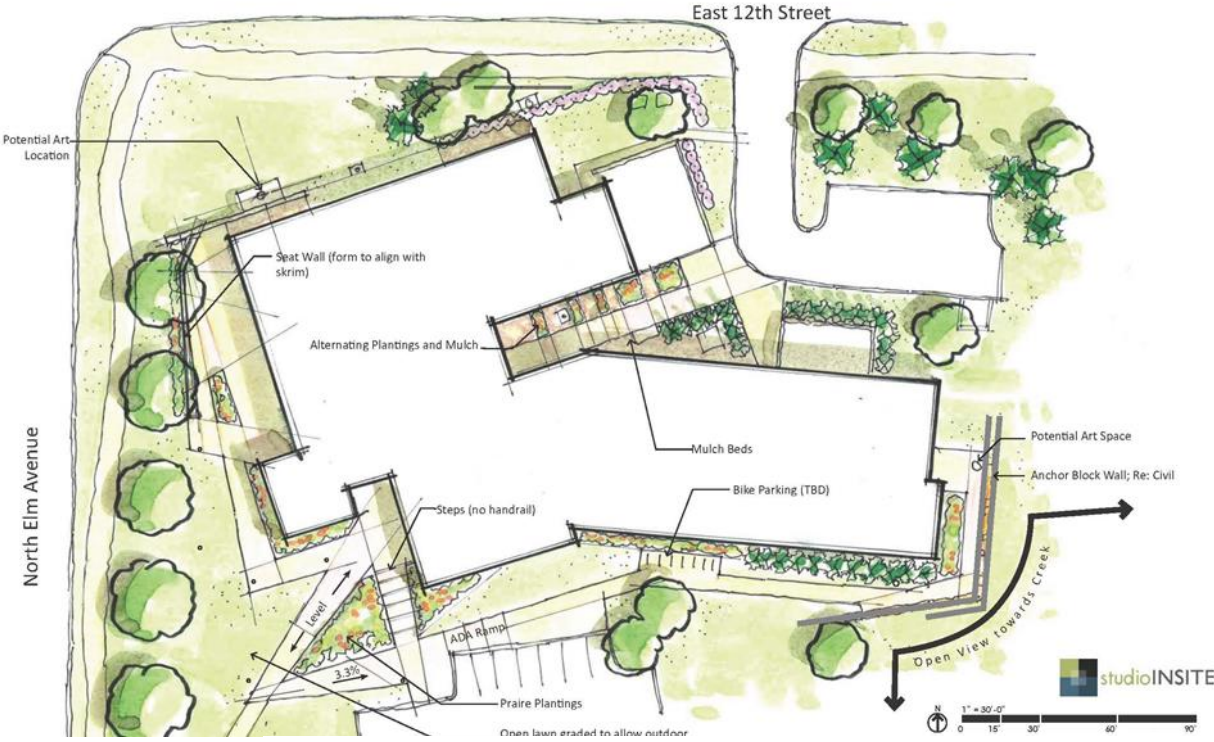
2-2-1 international project:

Project name:	Jackson Dinsdale Art Center
Location:	Hastings,Nebraska,USA
Area :	2322.576m2
Year :	2016

Primary spaces
Art gallery
3Class rooms
7Studios
5 offices



FINE ART CENTER



Site plan

Figure 1: site plan (international project)



FINE ART CENTER



Figure 2: Ground floor plan(international project1)

Ground floor plan

FINE ART CENTER

Table 1: spaces and area in the interntional project1

Space	Area
Art Gallery	335m2
Glass studio	1714m2
Sculpture studio	731m2
Painting studio	335m3
Drawing studio	365m2
Printmaking studio	259m2
Ceramic studio	541m2

Spaces table



pros:

Simple design and good study of movement

Having various types of studios for the many styles

The project has good orientation and simple site

The good orientation of the building caused natural ventilation and natural lighting

cons:

There isn't a space designed for public interaction



2-2-2 international project :

Project name:

Contemporary Arts Center “MAXXI”

Location :

Rome , Italy

Area :

29,000m2

Architect:

Zaha Hadid

Primary spaces

Auditorium

Library

Media center

exhibition

Administration

Restaurant



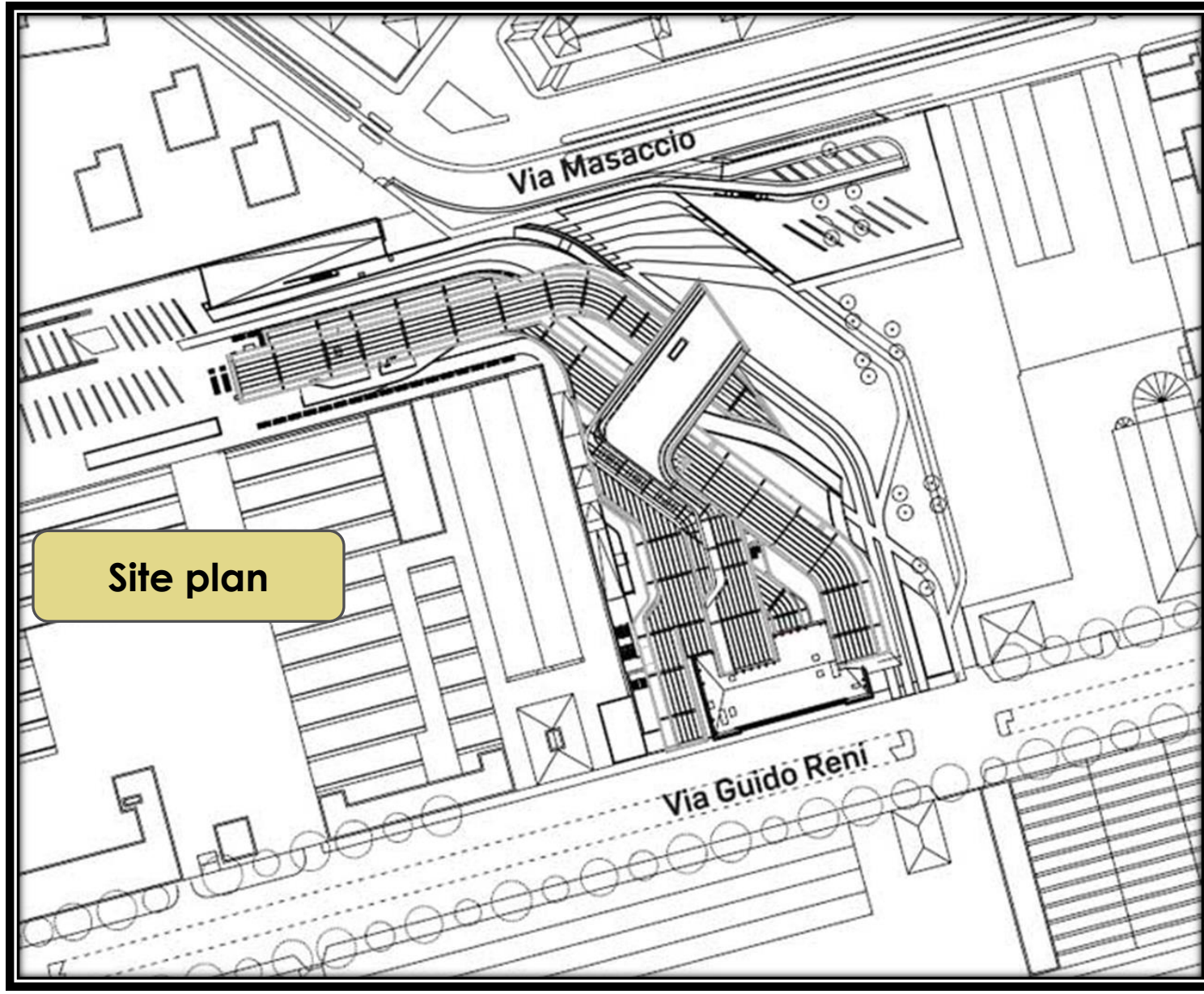


Figure 3: Site plan (international project2)

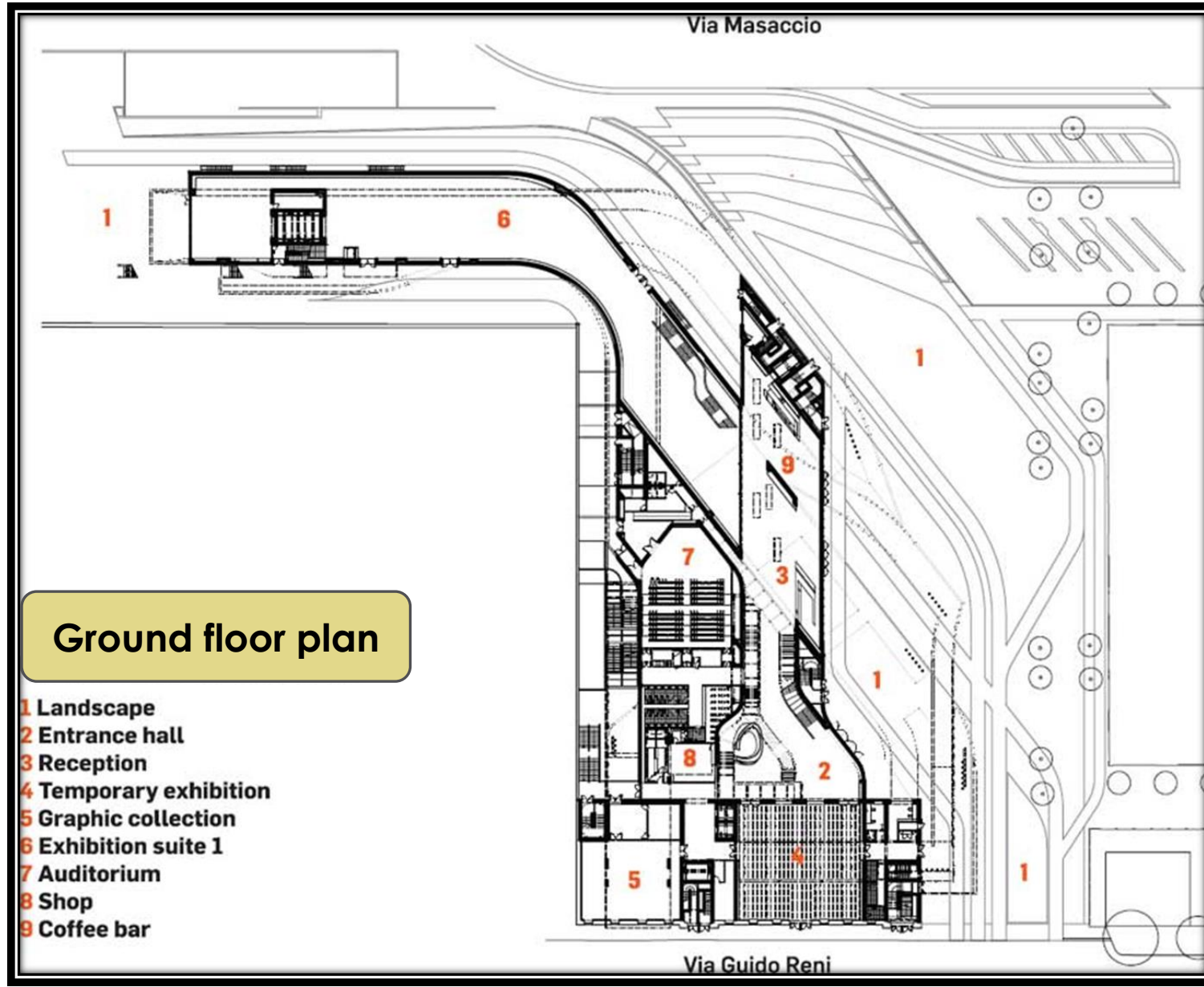


Figure 4: Ground floor plan (international project2)

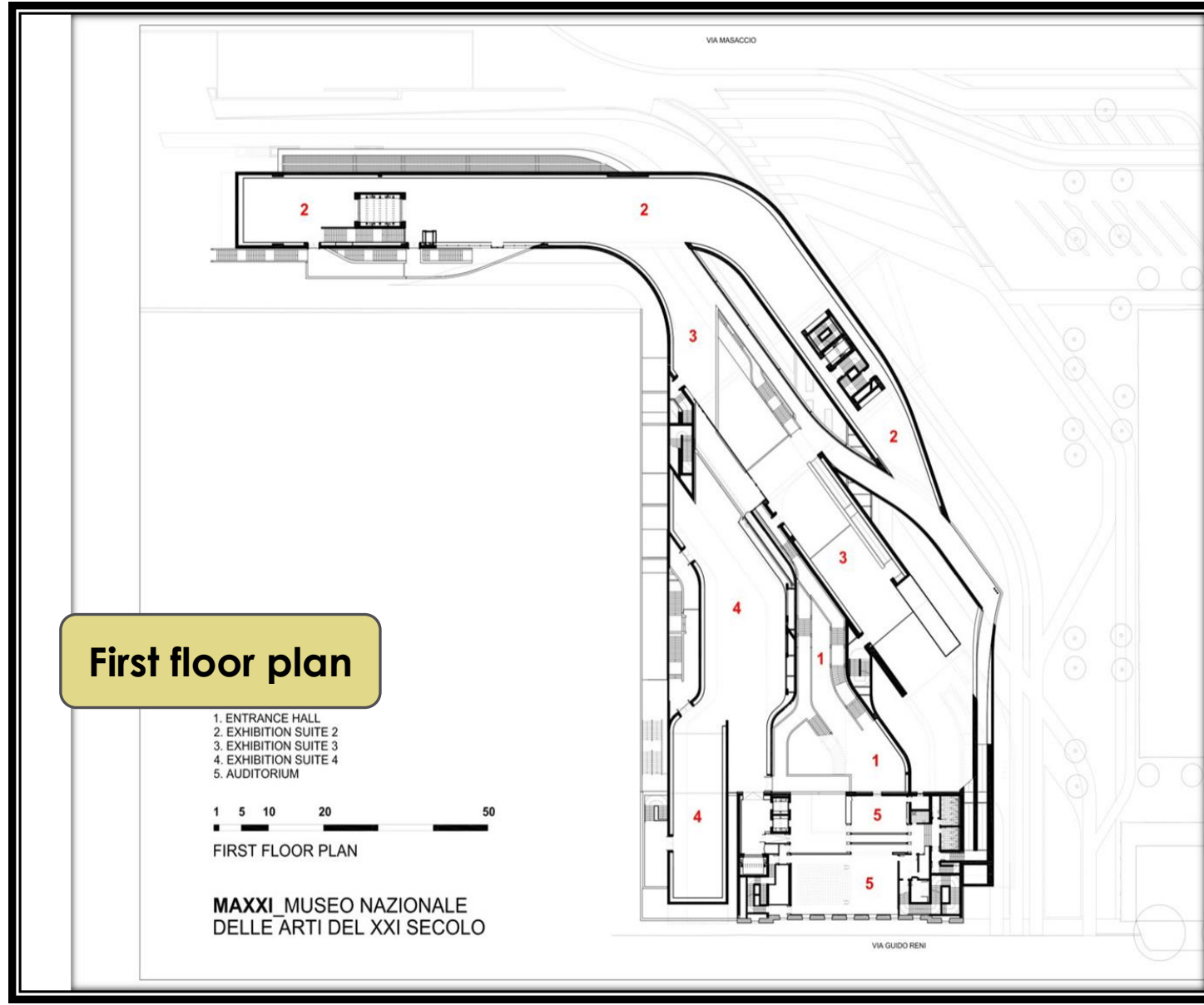


Figure 5: First floor plan(international project2)

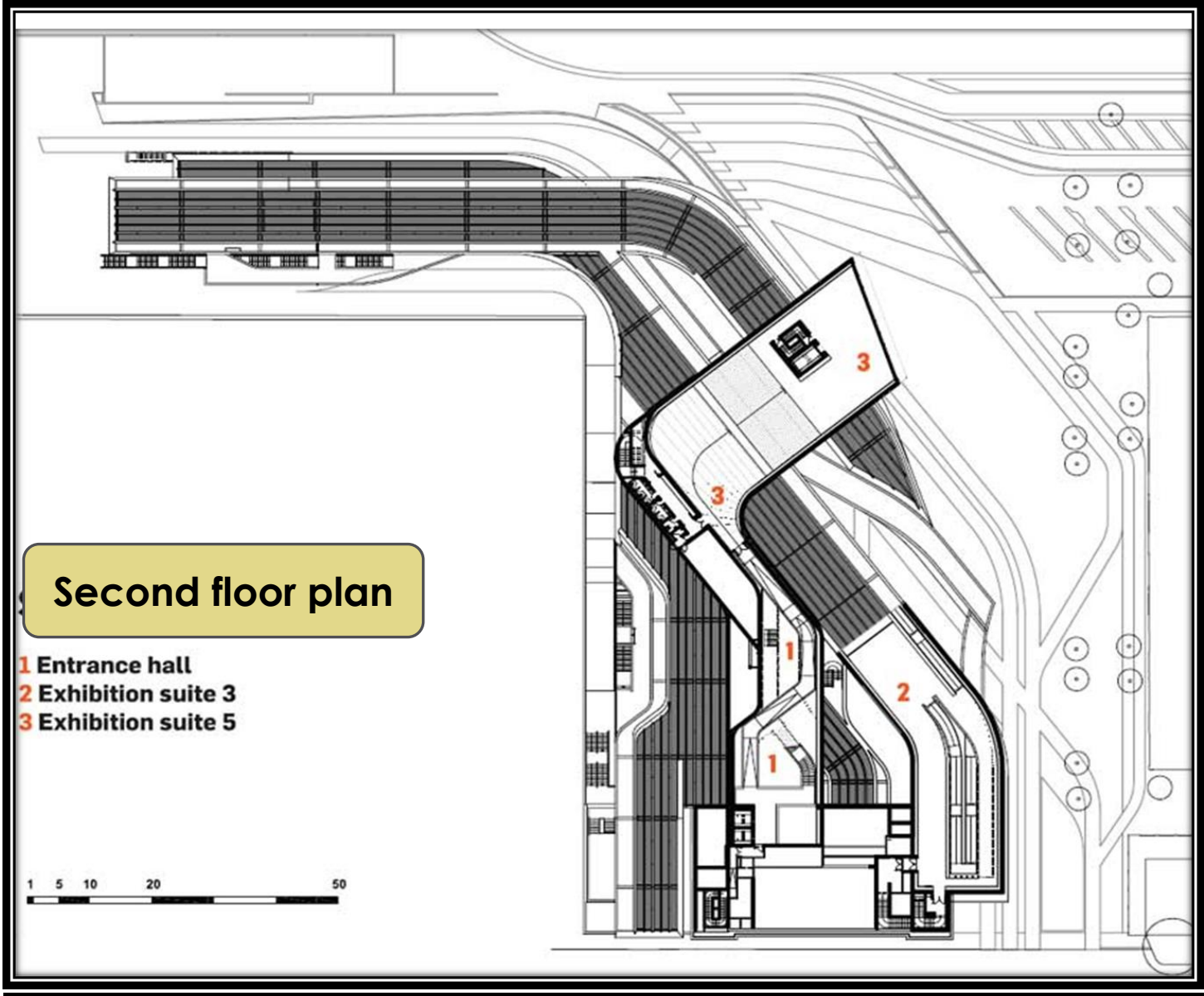


Figure 6: 2nd floor plan (international project2)

pros:

Having a void for good ventilation and good connection between indoor and outdoor activities

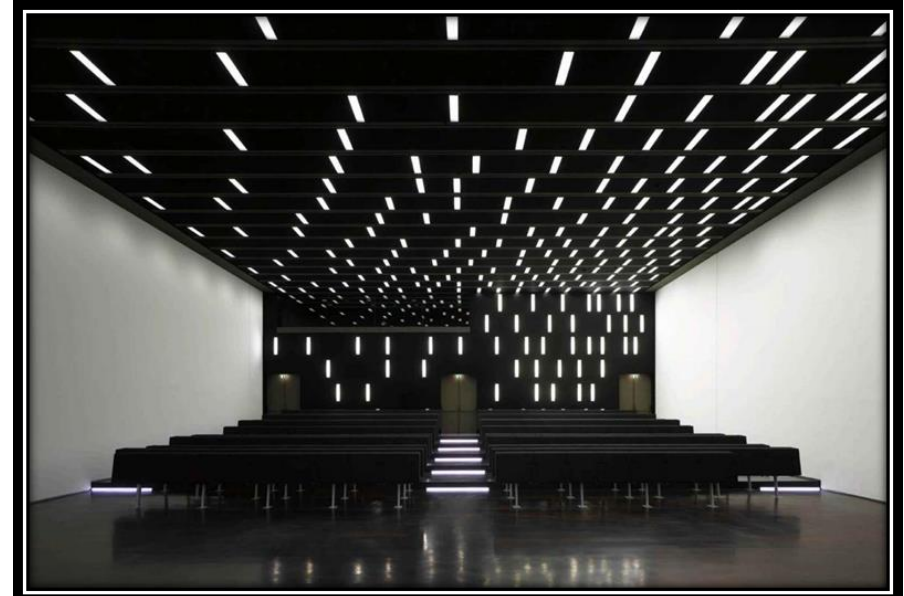
Good interior design that would stimulate the designers to bring out their best .

Simplicity in design but effected good in function and circulation between spaces

Good connection between spaces in horizontal and a vertical manner

cons:

There are unused spaces that can be used for the show



CHAPTER THREE: (DATA ANALYSIS)

Contents:

3-1 project components.

3-2 space study.

3-3 spaces table.

3-4 movement diagrams

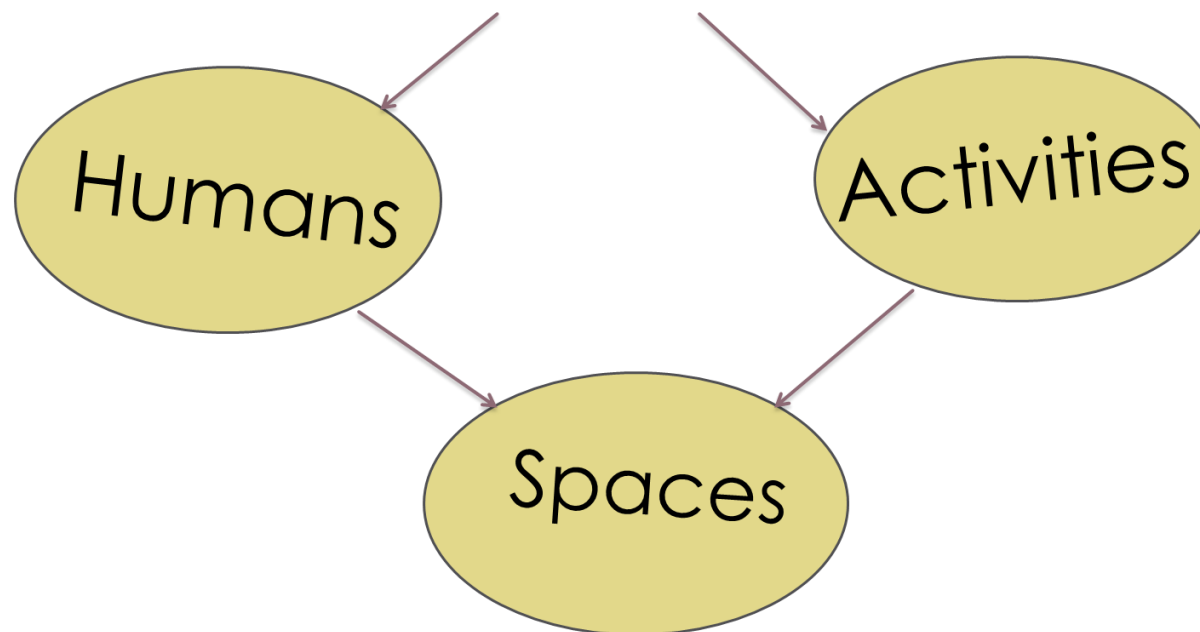
3-5 relations diagram.

3-6 pyramid diagram.

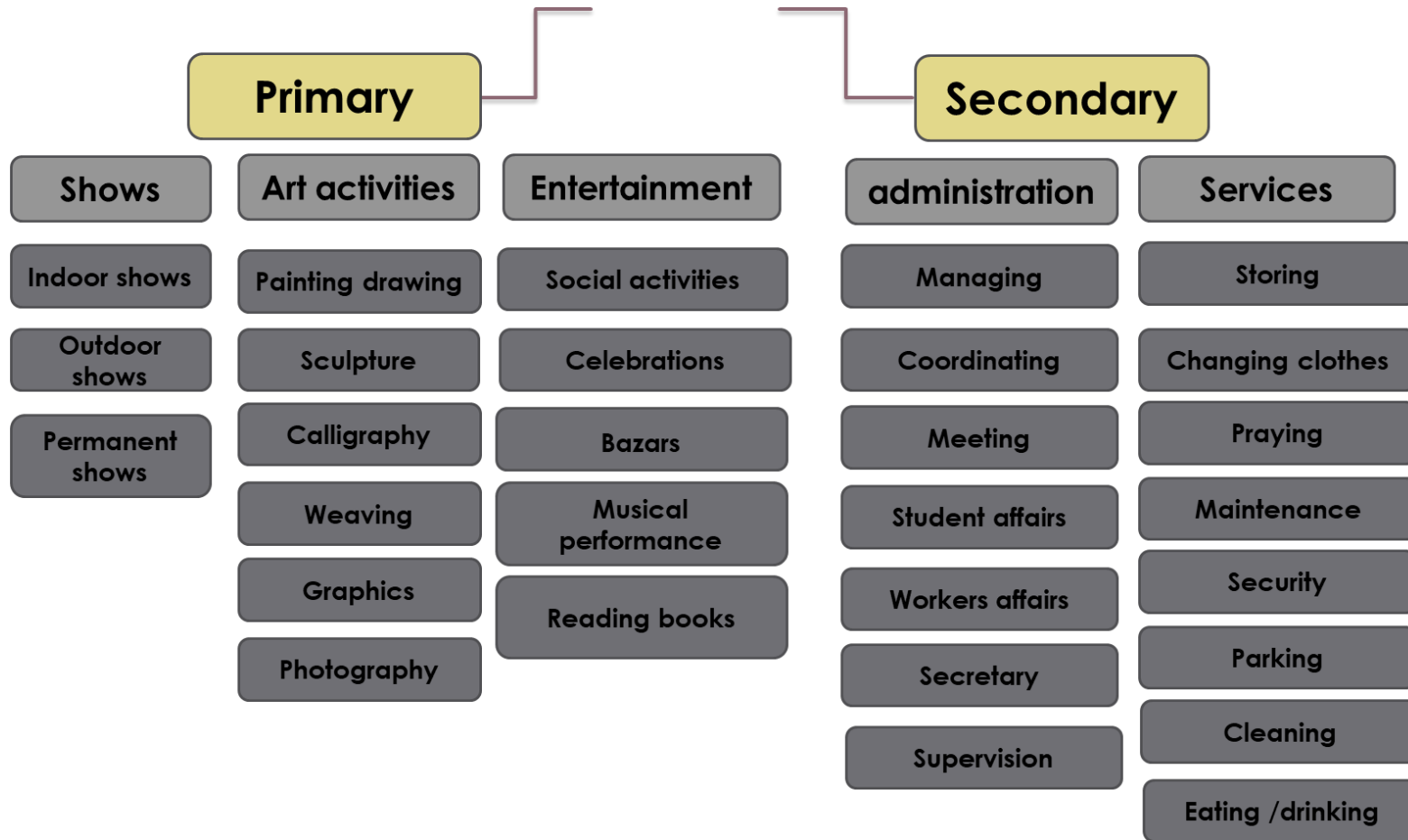
3-7 suggested sites and site analysis.

3- Data analysis:

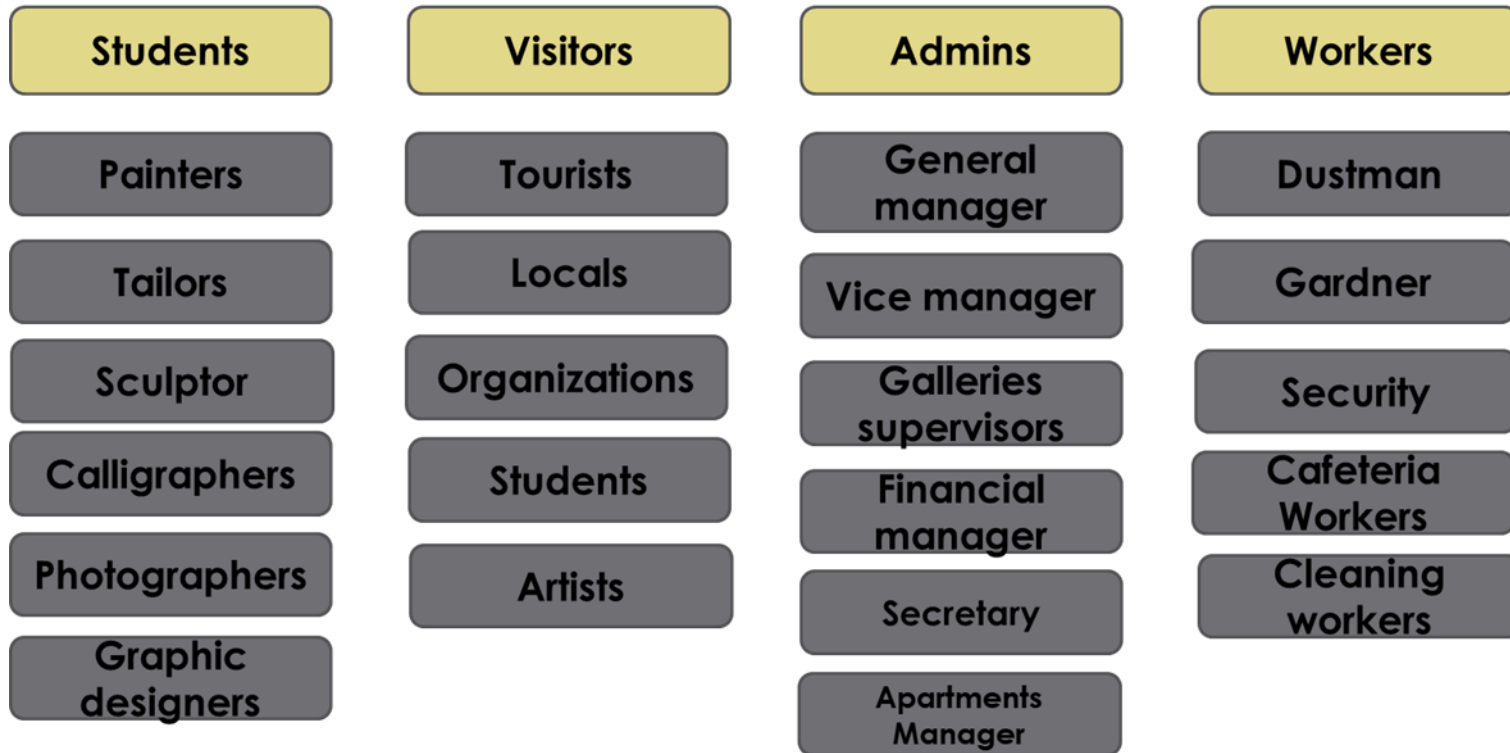
3-1 Project component:



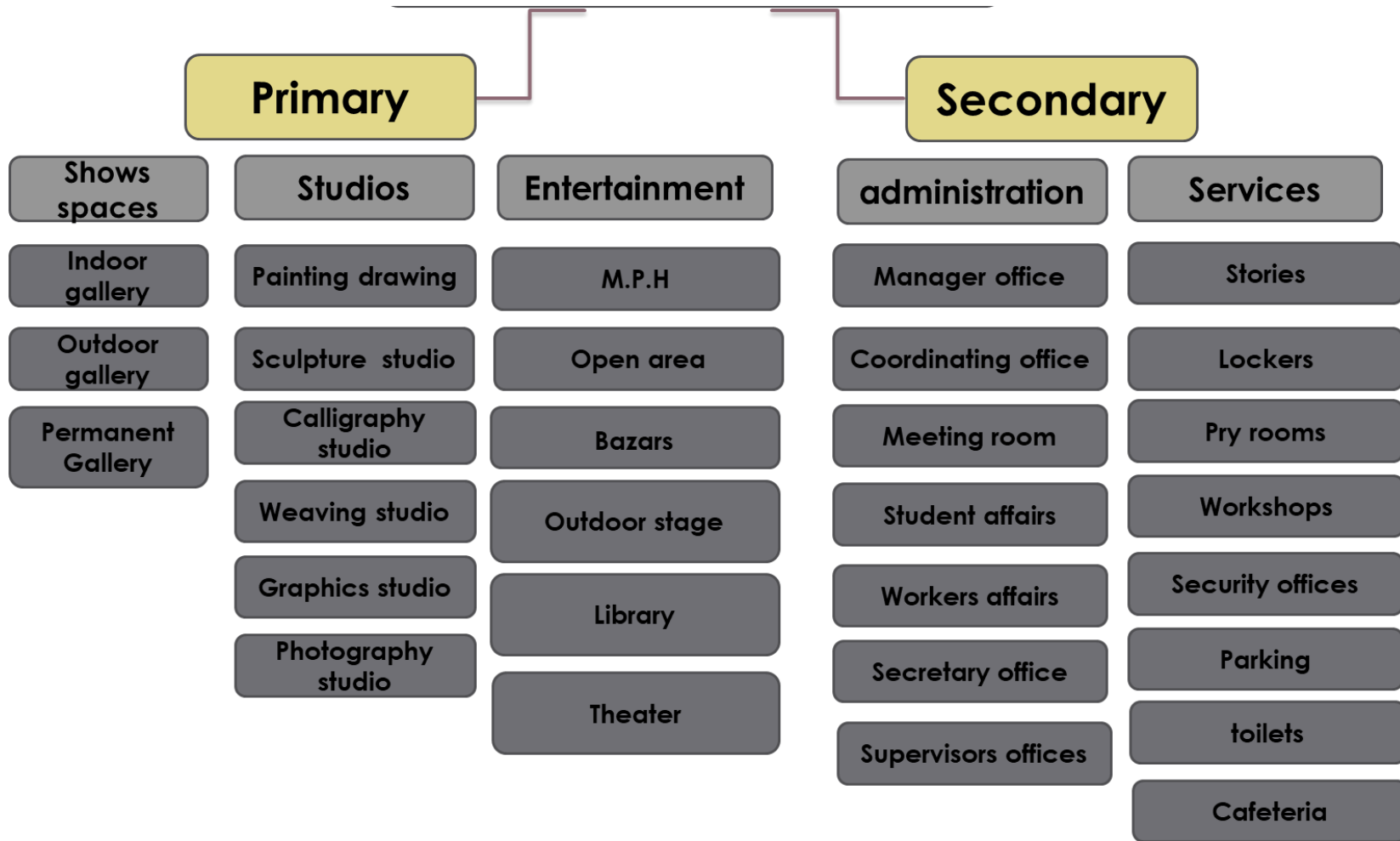
3-1-1 ACTIVITIES DIAGARAM



3-1-2 HUMANS DIAGRAM



3-1-3SPACES DIAGRAM



3-2 space study:

3-2-1 galleries:

THE GALLERY IS CONSIDERED THE PRIMARY space IN THE PROJECT, THE DESIGN OF THE GALLERY SHOULD BE FLEXIBLE TO INCLUDE ALL TYPES OF DISPLAY, HANGED PAINTINGS, SCULPTURES AND EVEN ANTIQUES AND ART WORKS .IT MUST TAKE INTO ACCOUNT THE MOVEMENT SPACES AND THE SPACES OF THE ART WORKS TO BE DISPLAYED. GALLERY SPACE BE DEPENDING ON THE SIZE OF EMPLOYED PERSONS AND DOSE NOT CONTAIN A FIXED FORM.THERE WILL BE A SPECIAL SUPPLEMENT TO THE GALLERY AND STORAGE SERVICES AND CONTROL ROOM LIGHTINING AND ELECTRONIC.

NUMBER OF
USERS: 600
AREA FOR
PERSON: 1.6M²
TOTAL AREA:
1200M²

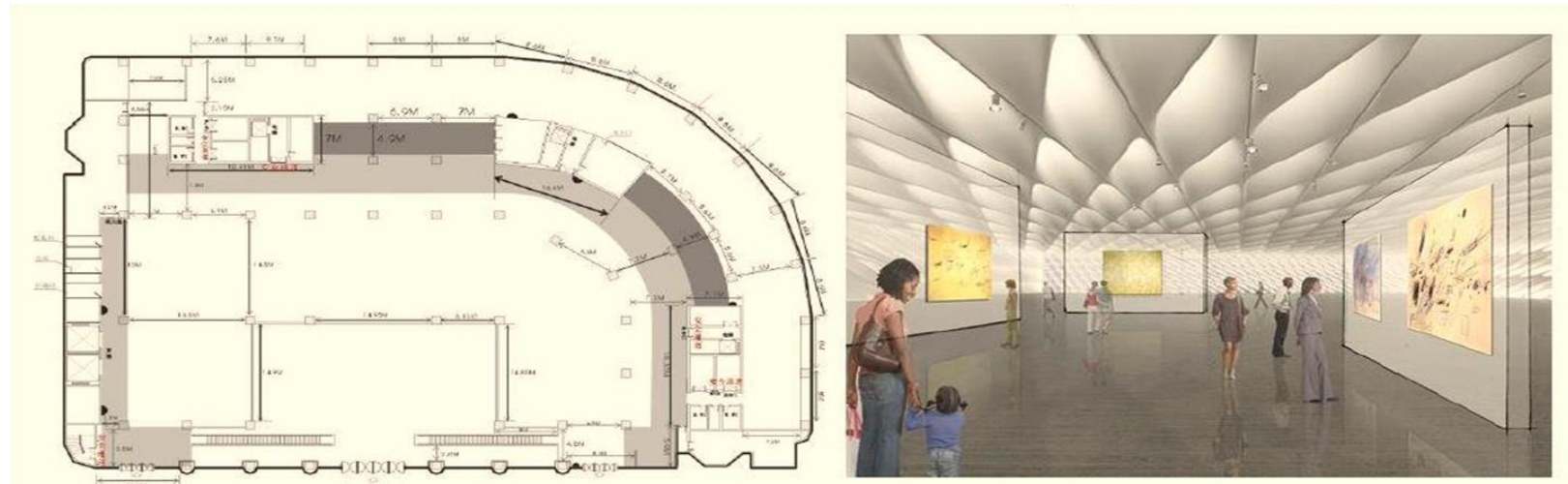


Figure 7: Gallery plan

3-2-2 Theater:

The theater also considered the primary space in project, including the stage that has the shows performed on it, backstage as well, control rooms, rest rooms for artists, sound systems, electronics and lighting rooms.

Number of users: 1200.

Area for person: 0.8m².

Total area: 1900m².

Backstage area: 200m².

Stage area: 80 m².

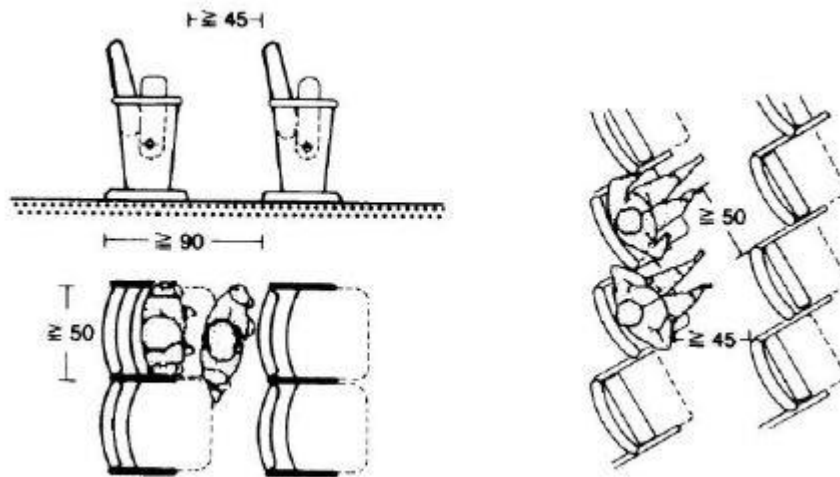
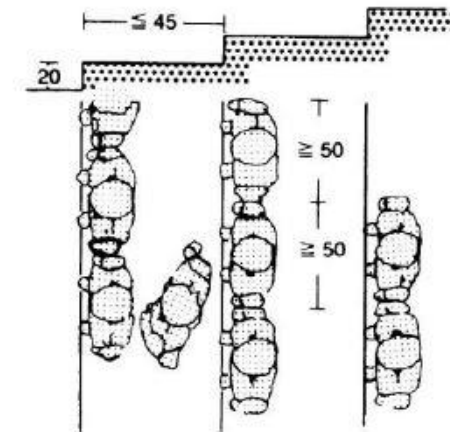


Figure 8: space between seating in theater



3-2-3 Library:

The public library of the art is also one of the primary spaces of the project. The library is bisected into three main sections: department of index, department of e-readers and department of reading books. It must be considered the design of the indexing department and storing books and calculates movement's corridors.

Number of users: 150.
Area of person: 2.5m².
Total area: 400m².

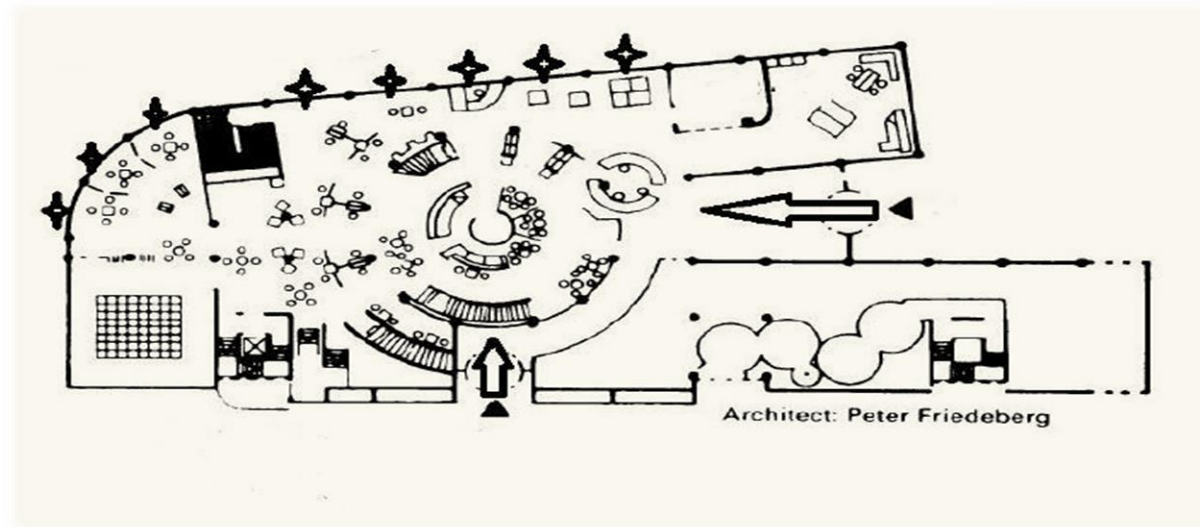
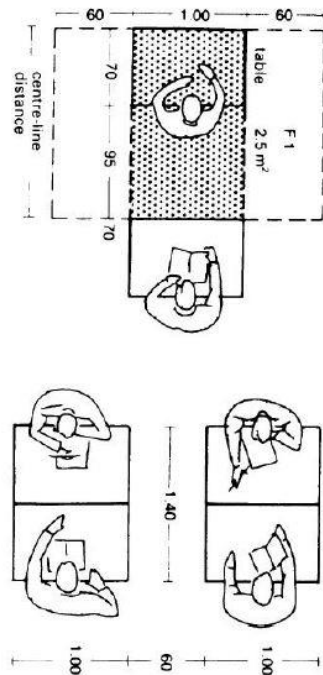


Figure 9: library plan

3-2-4 studios:

It must be considered movement and the spaces between the chairs and paint panels also the spaces between the users, tools. Considering tools storage and control.

Number of users: 100
 Area of person: 3m².
 Total area: 400m².
 Movement space: 10%.

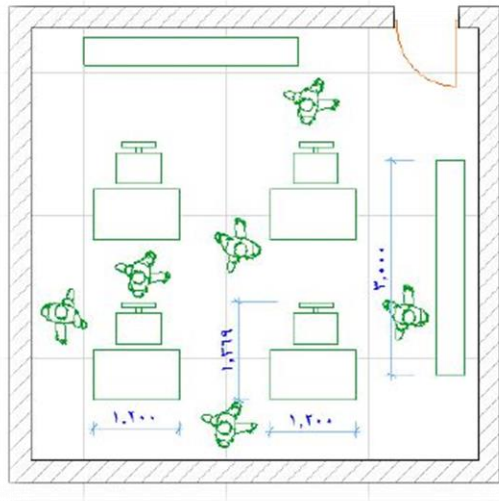


Figure 11: movement spaces in studios

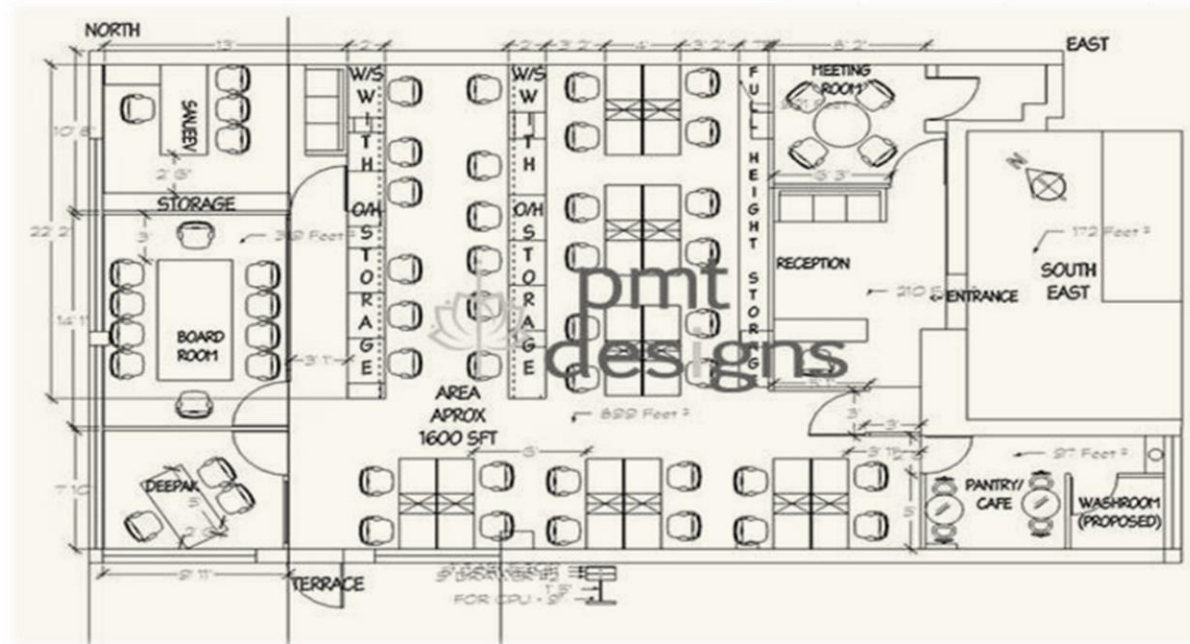


Figure 10: studio plan

3-2-5 Graphic studios:

It's the space that takes the characters drawings, backgrounds, fashion and events of the story. The space considered between 4 to 6 boards for drawing.

Number of users: 12.
 Area of person: 3m².
 Total area: 80m².
 Movement space: 10%

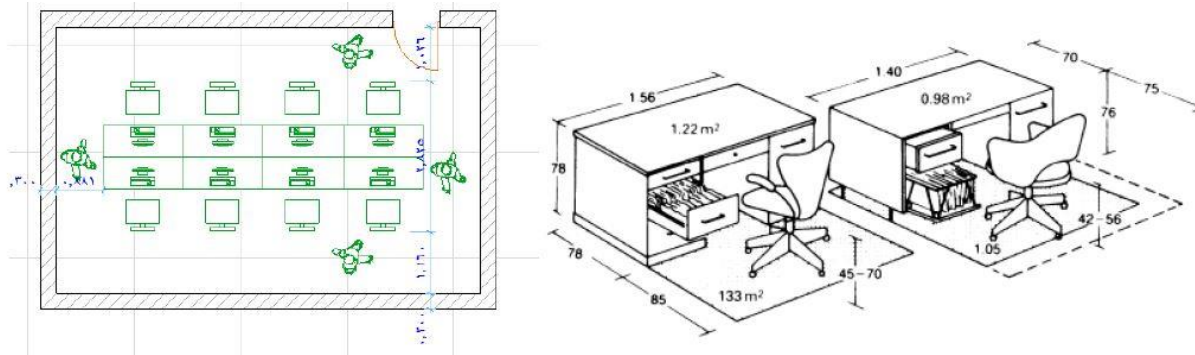


Figure 12: movement spaces in graphic studios



3-2-6 tourist's number:

According to the statics the expectations for the number of population in Khartoum for the year 2018 , the number of the local residents will be 8,700,000.

30% of the state's population visits cultural activities



2,610,000 p in year

Supposing the center is going to serve 15%



391,500p

The number of local visitors in the month



32,625 p.

The number of local visitors per day



1,088p.

3-2-6 Tourist's number:

According to the statics the expectations for the number of tourists in Sudan for 2020 was supposed to be 15,000,000 tourists. But due to the deterioration of the political situation and tourism , it has fallen to 2,000,000 tourists .

Khartoum state's share of tourists is 27%, thus they have



450,000 p in year

The population of tourists visiting the cultural activities is 32% of the total number of the tourists



172,000 visitors

The number of visitors per day from the tourists is



545 visitors

3-3 Spaces table:

3-3-1 shows:

Space name	Type of users	Number of users	Area of person	Time of Usage	Functional needs	Environmental needs	Space area	Number Of spaces	Total area
Permanent Galleries	visitors	600	3 m2	10am-2pm. 5pm-11pm	Tables for the models Partition	Natural and artificial Lighting Protection from the dust ventilation	1800m2	2	3600m2
Amateur Gallery	visitors	400	2 m2	10am-2pm. 5pm-11pm	//	//	800m2	1	800m2
Temporary gallery	visitors	400	2.5m2	//	//	//	1000	1	1000

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Space name	Type of users	Number of users	Area of person	Time of Usage	Functional needs	Environmental needs	Space area	Number Of spaces	Total area
Galleries services	Workers	-	-	-	-	-	480	2	960

Table 2: spaces table for shows

3-3-2 art activities:

Space name	Type of users	Number of users	Area of person	Time of Usage	Functional needs	Environmental needs	Space area	Number Of spaces	Total area
Painting and drawing studio	Artists And Students	100	3m2		Tables Chairs Panels shelves	Natural artificial Lighting Protection from dust ventilation	400m2	1	400m2
Sculpture studio	Artists And Students	40	15m2		Tables Chairs Ovens	//	460m2 Plus 20 m2 oven space	1	480m2
Calligraphy studio	//	60	5m2		//	//	420m2	1	420m2
Graphic studio	//	30	3m2		// Computers screens	2,3	120	1	120

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Space name	Type of users	Number of users	Area of person	Time of Usage	Functional needs	Environmental needs	Space area	Number Of spaces	Total area
Amateur studios	amateur	40	9m ²		Chairs Panels holders	//	400m ²	1	400m ²
Weaves studios	Artists And students	40	4m ²		Tables Chairs Printers Sewing Machines	//	500m ²	1	500m ²

Table 3: spaces table for the art activities

3-3-3 entertainment:

Space name	Type of users	Number of users	Area of person	Time of Usage	Functional needs	Environmental needs	Space area	Number Of spaces	Total area
Library	Visitors And students	150	2.5m ²		Shelves Tables Chairs	//	400m ²	1	400m ²
Theater	Artists And Audiences	1600	0.8 m ²	5pm - 11pm	Chairs for Audiences	// Fire Protection	1600 M ² ± 10% Movements area	1	1900 m ²
Stage	Artists		//	****	//	//	80m ²	1	80 m ²

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Space name	Type of users	Number of users	Area of person	Time of Usage	Functional needs	Environmental needs	Space area	Number Of spaces	Total area
Rehearsals Room	Artists	15	5m2	//	-	//	90m2	1	90m2
Rest rooms	Artists	4	3m2		Chairs Mirrors Tables Shelves	//	40	3	120m2
Closets	2	-	//		Wardrobe	-	20m2	2	40m2

Table 4: spaces table for the entertainment activities

3-3-4 Administration:

Space name	Type of users	Number of users	Area of person	Time of Usage	Functional needs	Environmental needs	Space area	Number Of spaces	Total area
general Manager's office	admins	1	-	9am-2pm 5pm-11pm	Chairs Tables shelves	//	40m2	1	40m2
Vice office	//	1	//	//	//	//	36m2	1	36m2
Department manager	//	4	//	//	//	//	24m2	4	96m2
Secretarial offices	//	2	//	//	//	//	20m2	2	40m2
Employees offices	//	4	//	//	//	//	24m2	4	96m2

Table 5: spaces table for the administration

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3-3-5 services:

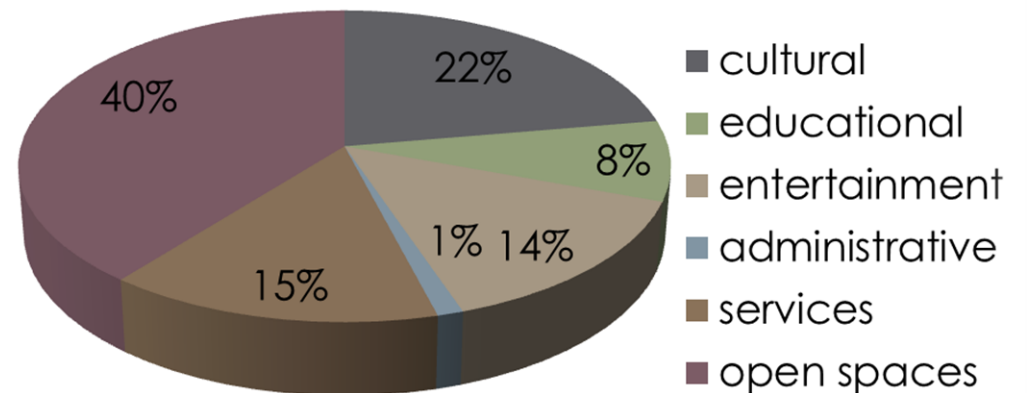
Space name	Type of users	Number of users	Area of person	Time of Usage	Functional needs	Environmental needs	Space area	Number Of spaces	Total area
Security office	admins	3	-	-	//	//	20m2	2	40M2
Store	workers	-	-	-	//	//	180m2	4	720m2
workshops	workers	-	-	-	//	//	80m2	2	160m2
toilets	men	5(300)	1/20 person	-	-	//	1.5		260m2
toilets	women	5(300)	//	-	//	//	1.5		260m2
Pray room	men	200	0.8	-	-	//	160m2	1	
Pray room	women	80	0.8	-	-	//	84m2	1	
Rest room	men women	5/5	2.5m2		Shelvs shower	//	16.5/16.5	1/3	50m2
parking	-	150	-	-	-	-	900	3	2720m2

Table 6:spaces table for services

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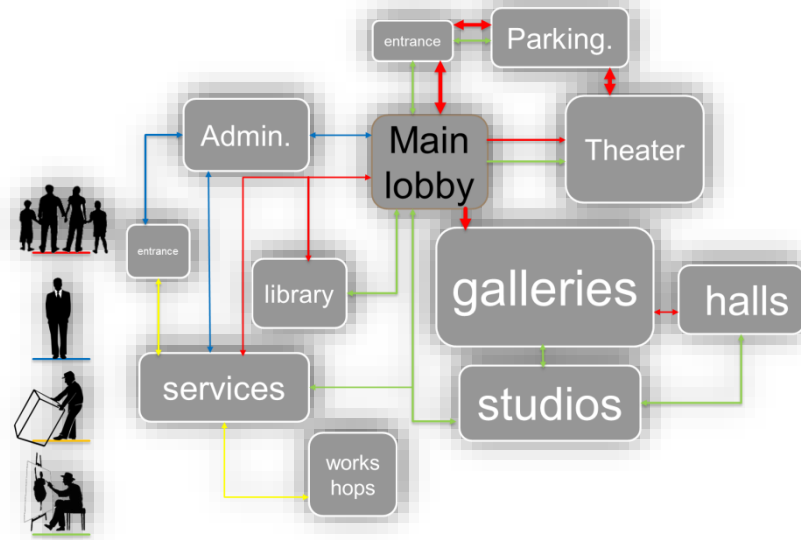
Total area of galleries	6560 m2
Total area of	2240m2
Total area of entertainment	3810m2
Total area of	308m2
Total area of services	3964m2
Total area	18,554m2

total area of the spaces:

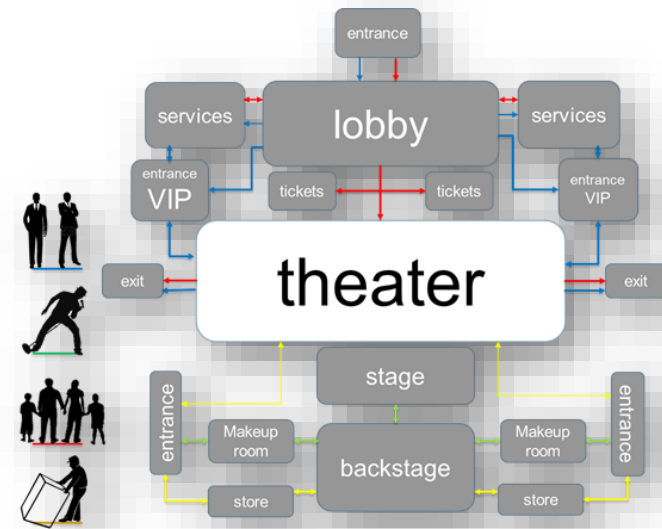


3-4 Movement diagrams:

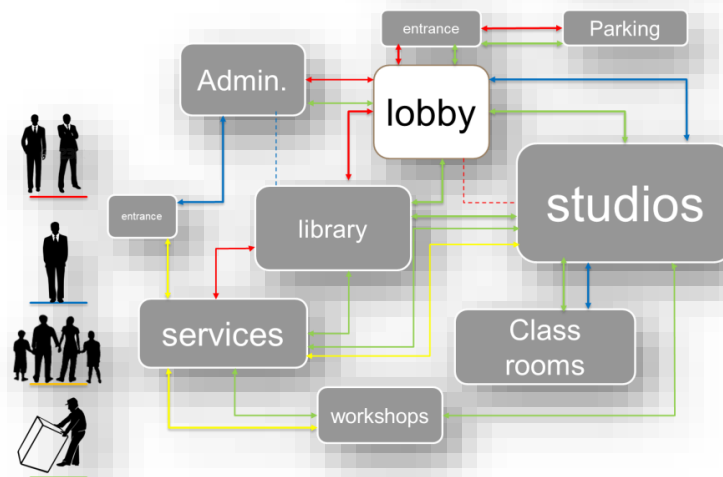
3-4-1 Main movement diagram:



3-4-2 Theater movement diagram:

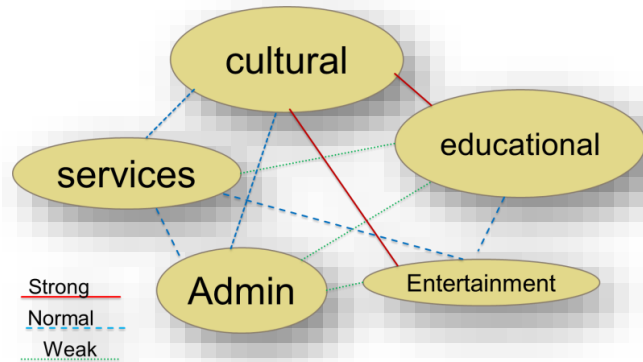


3-4-3 Institute movement diagram

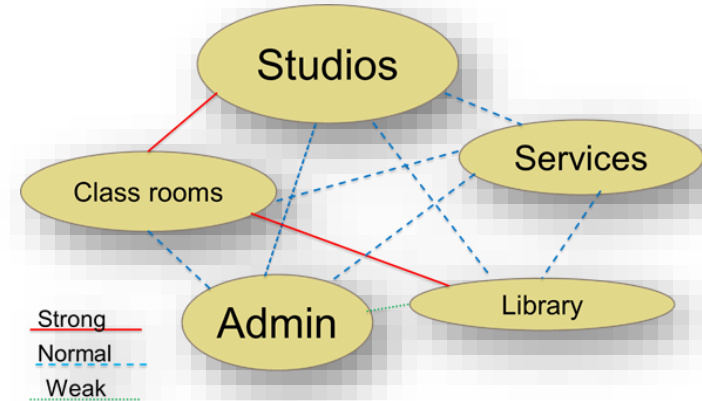


3-5 RELATIONS DIAGRAM:

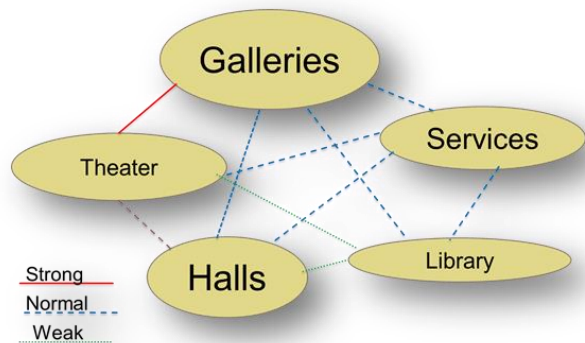
3-5-1 General relations diagram



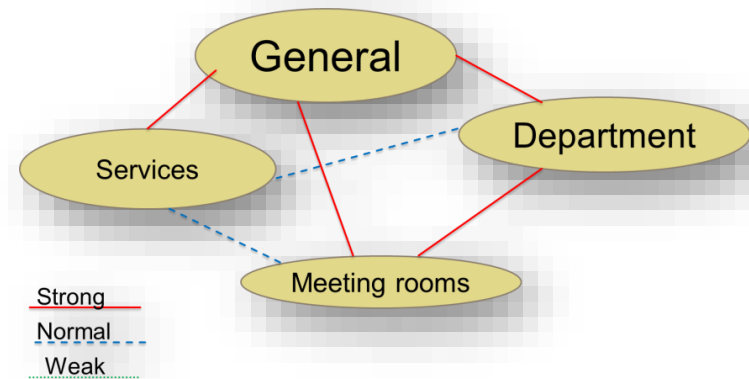
3-5-2 Educational relations diagram:



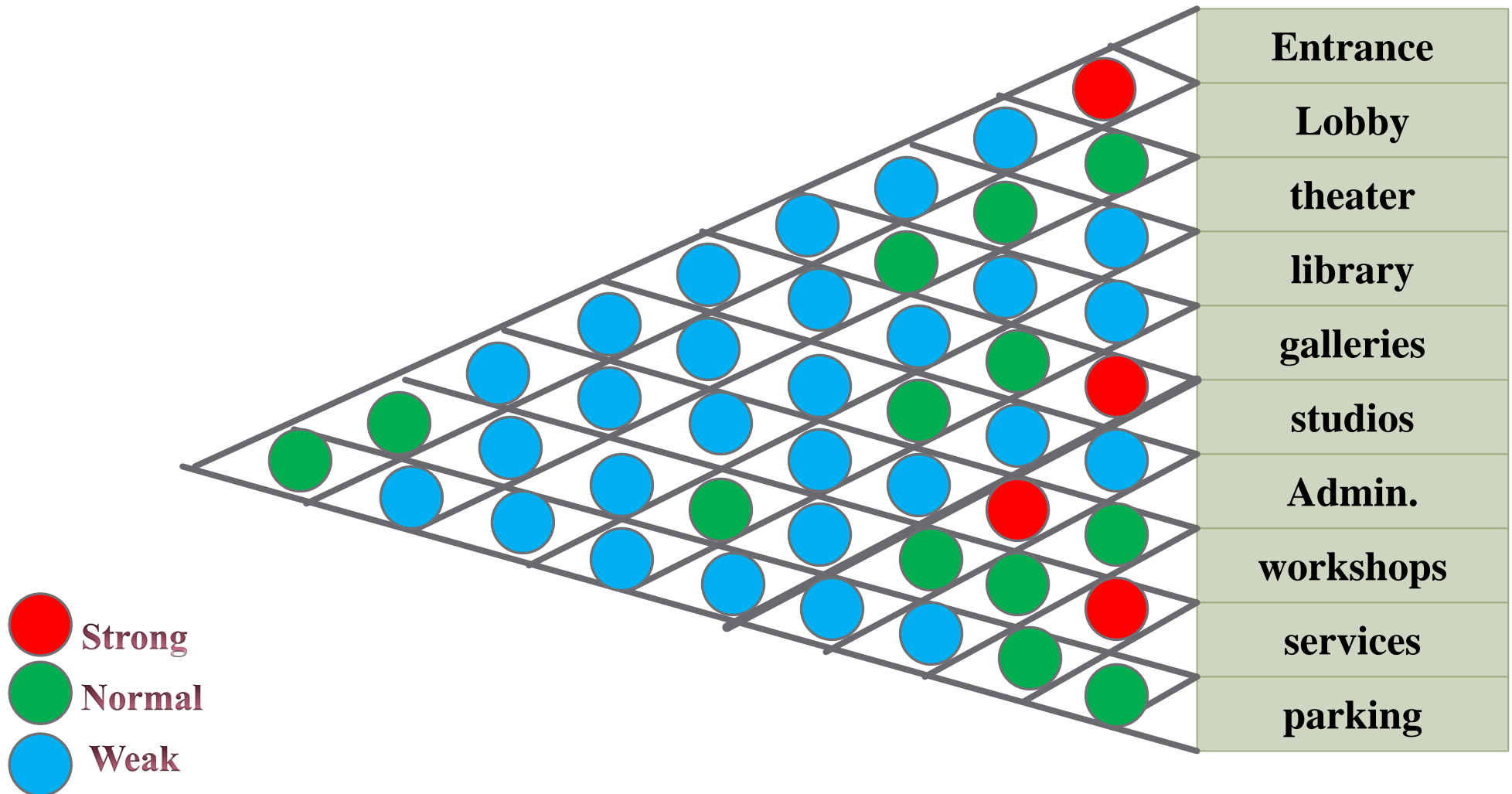
3-5-3 Cultural relations diagram:



3-5-4 Administration relation diagram:



3-6 PYRAMID MATRIX DIAGRAM:



3-7 SUGGESTED SITES:



All Suggested Sites Locations map



Image © 2014 DigitalGlobe

site1:



Location :

South of Nile street and Hilton street north of victory bridge. And west of the Petrodar tower and PDOC headquarters.

Area:

7.5 hectares .

site2:



Location :

- SITE : Khartoum.
- LOCAL : Toffy island.
- OWNER : Sudanese government.

Area:

5 hectares .

site3:



Location :

- LOCAL : Khartoum.
- OWNER : Sudanese government

Area:

3.4 hectares .

3-7-2 Compression table:



Site	View	Accessibility	Neighbors	streets	Site Treatments	Future extend	Total
SITE 1	8.5	9	10	9	10	7	53.5
SITE 2	10	8.5	9	10	9	10	56.5 ✓
SITE 3	5	8	8	9	10	3.5	34.5

Table 7: compression table

3-7-3 site analysis:

3-7-3-1 General location:

*The site is located in Khartoum ,in the southern -west Of Toti island .
Sire can be reached by public transportation from al souq al arabi station .
According to the future planning for toti island the site can be reached by bahri bridge , Omdurman bridge
-AREA: 7.1 hectares 284m*247m*

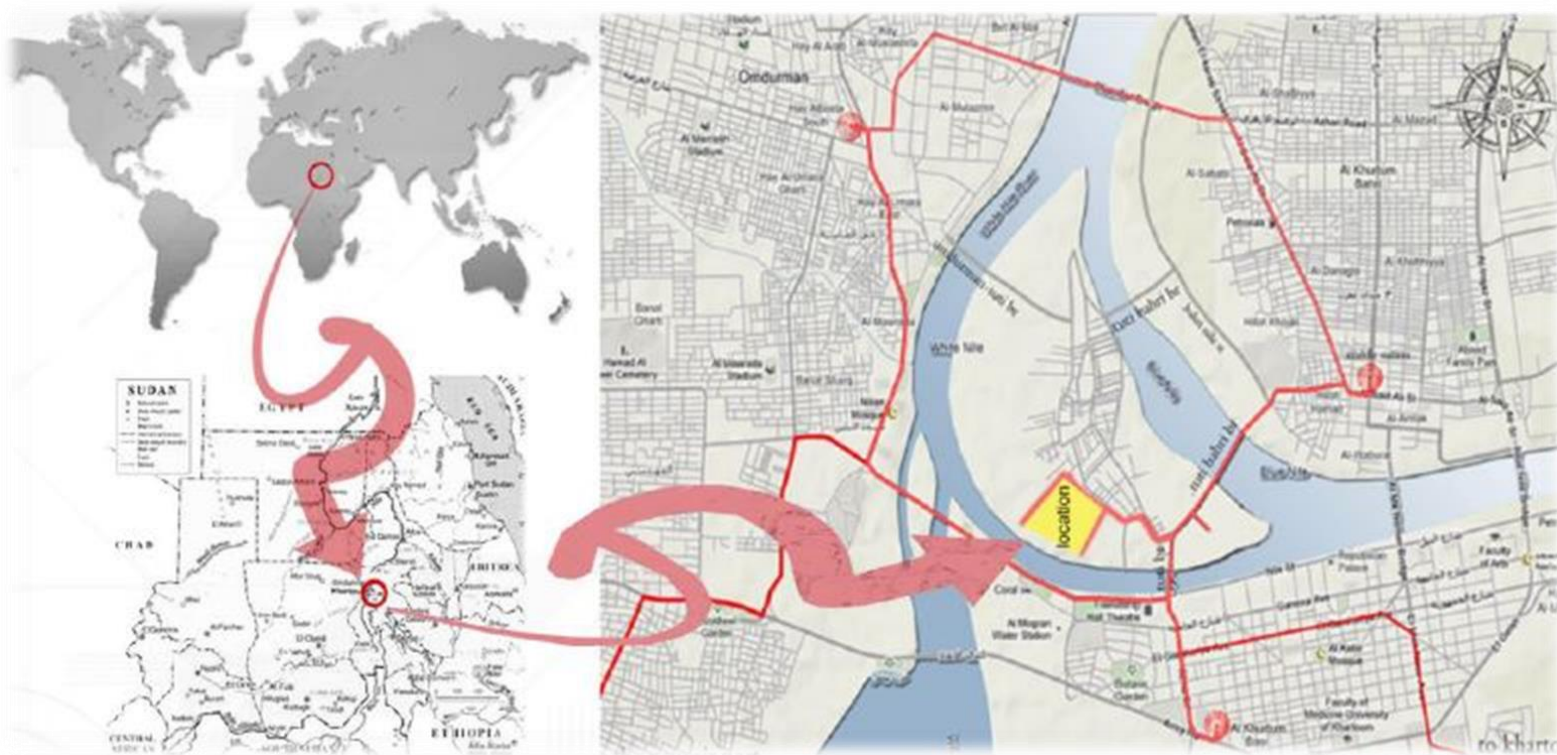


Figure 13:general location

3-7-3-2 Accessibility:

Site refers easily accessible from transportation centers in the capital and can be reached in:

- about 15km by vehicles from and to souq Omdurman.
- 10km from and to alwosta station
- 3km from an to al souq alarabi.

3-7-3-3 Electricity and water supply:

Electricity extended from al mugran station from the eastern road , 3 kilo watt .

Water supplement also from al mugran station or from tuti station . from the eastern road .

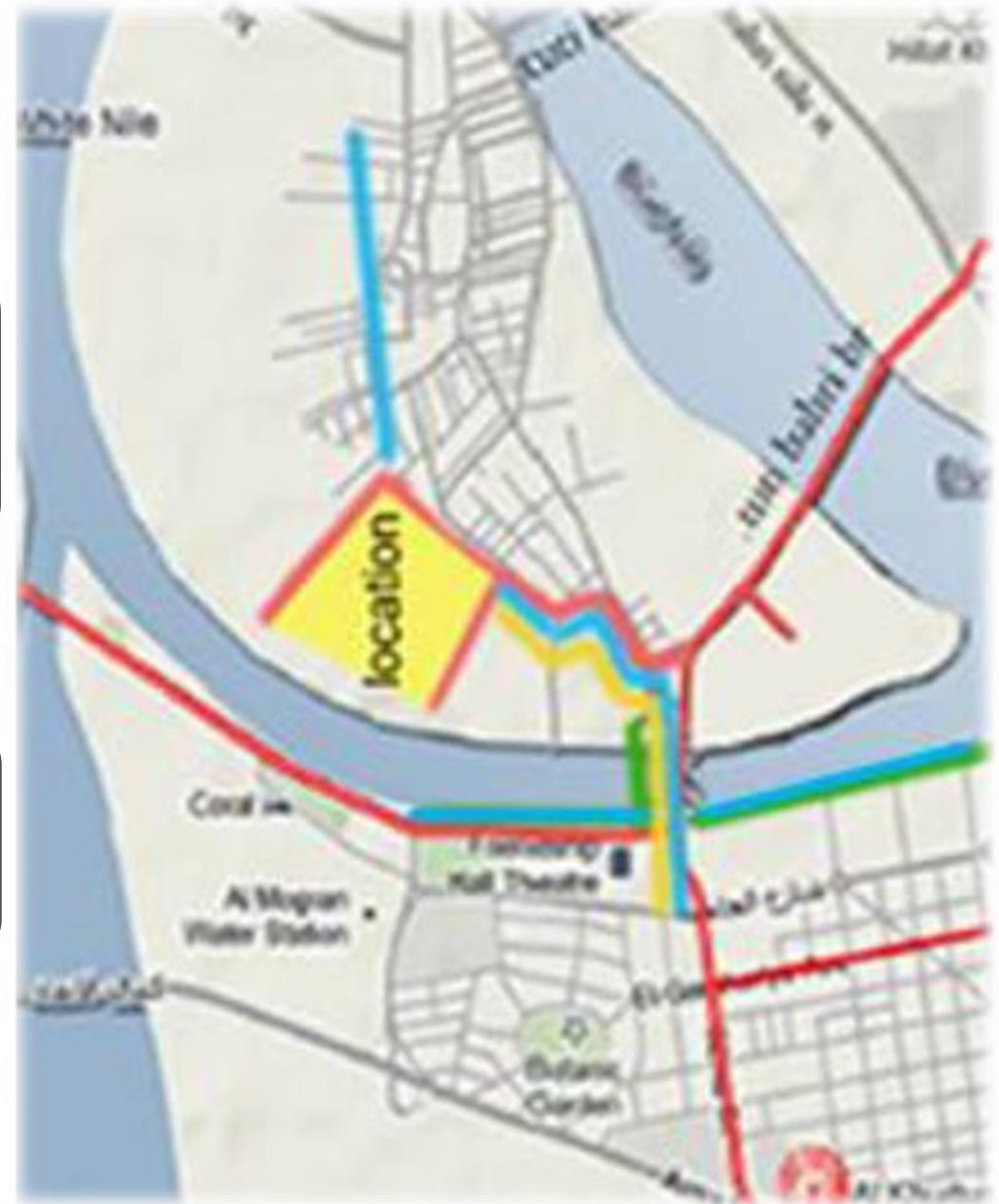


Figure 14: accessibility

3-7-3-3 Environmental analysis:

3-7-3-3-1 terrain and topography:

The site is pre planned by the ministry of planning and so it is now flat without any terrains in it. The land slopes toward the Nile

3-7-3-3-2 humidity:

The highest humidity ratio is in august where it reaches 51% .
The lowest humidity ratio is in April where it reaches 13.3%.

3-7-3-3-3 air pollution:

Air pollution effects the site from western and eastern side “ low effect”

3-7-3-3-4 noise pollution:

Noise pollution is low from the north side because of the residential area and medium from the west and east because of the cars .

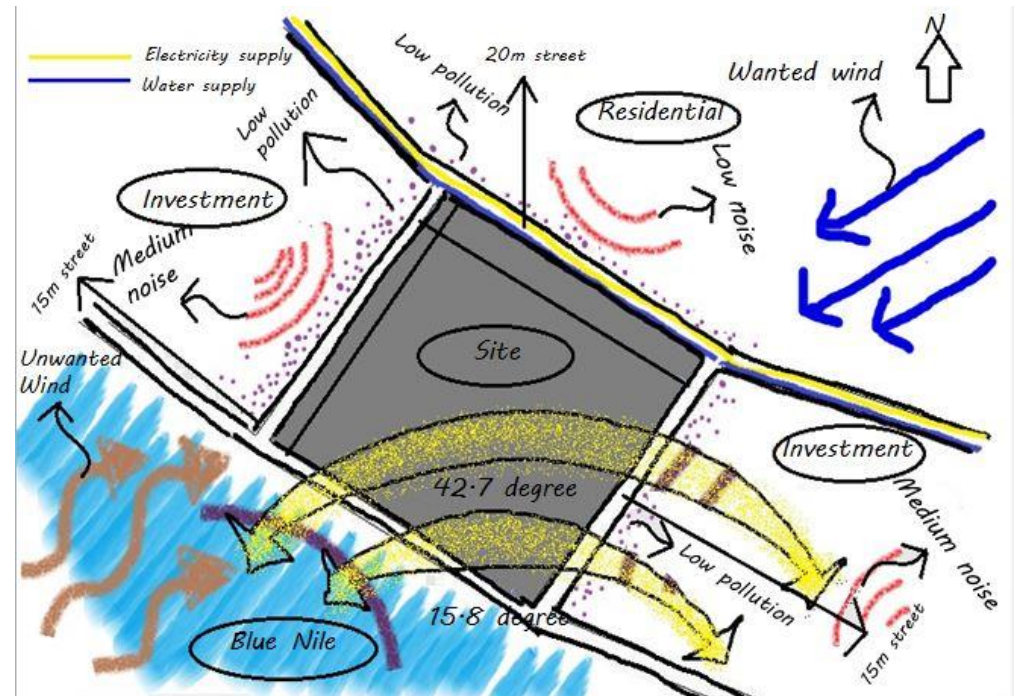


Figure 15: environmental analysis

3-7-3-4 environmental analysis:

3-7-3-4-1 wind:

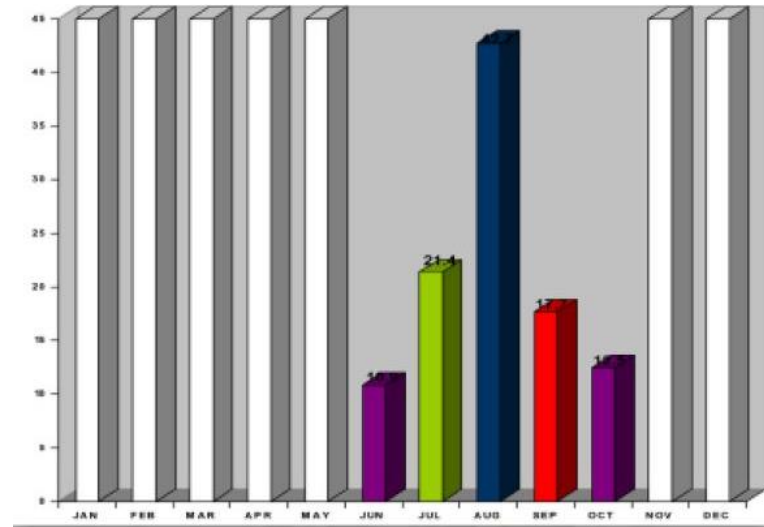
the dominate winds are north-eastern winds and south -western .
The wind with highest speed is in the months of April and February and the wind with lowest speed is in June .

3-7-3-4-2 Rain:

The highest amount of the rain is in august ,as it reaches 42.7mm
The lowest amount of the rain are in January, February ,March,May,November,December.

3-7-3-4-3 TEMPRATURE:

The highest temperature degrees are in may, where it reaches 42.7 degree .
The lowest temperature degree are in January ,where it reaches 15 degree.



Conclusion

Use building materials with high thermal content with the use of thermal insulation.
Use horizontal and vertical sun breakers ,to minimize the damage caused by unwanted sun radiation

The increased noise and air pollution from north eastern and north of the site,
And thus facilitates the utilization of Nile views that should be exploited to the fullest.

The site is located near by the Nile , deep foundations must be used . The slope in the site can be useful for deranae system.

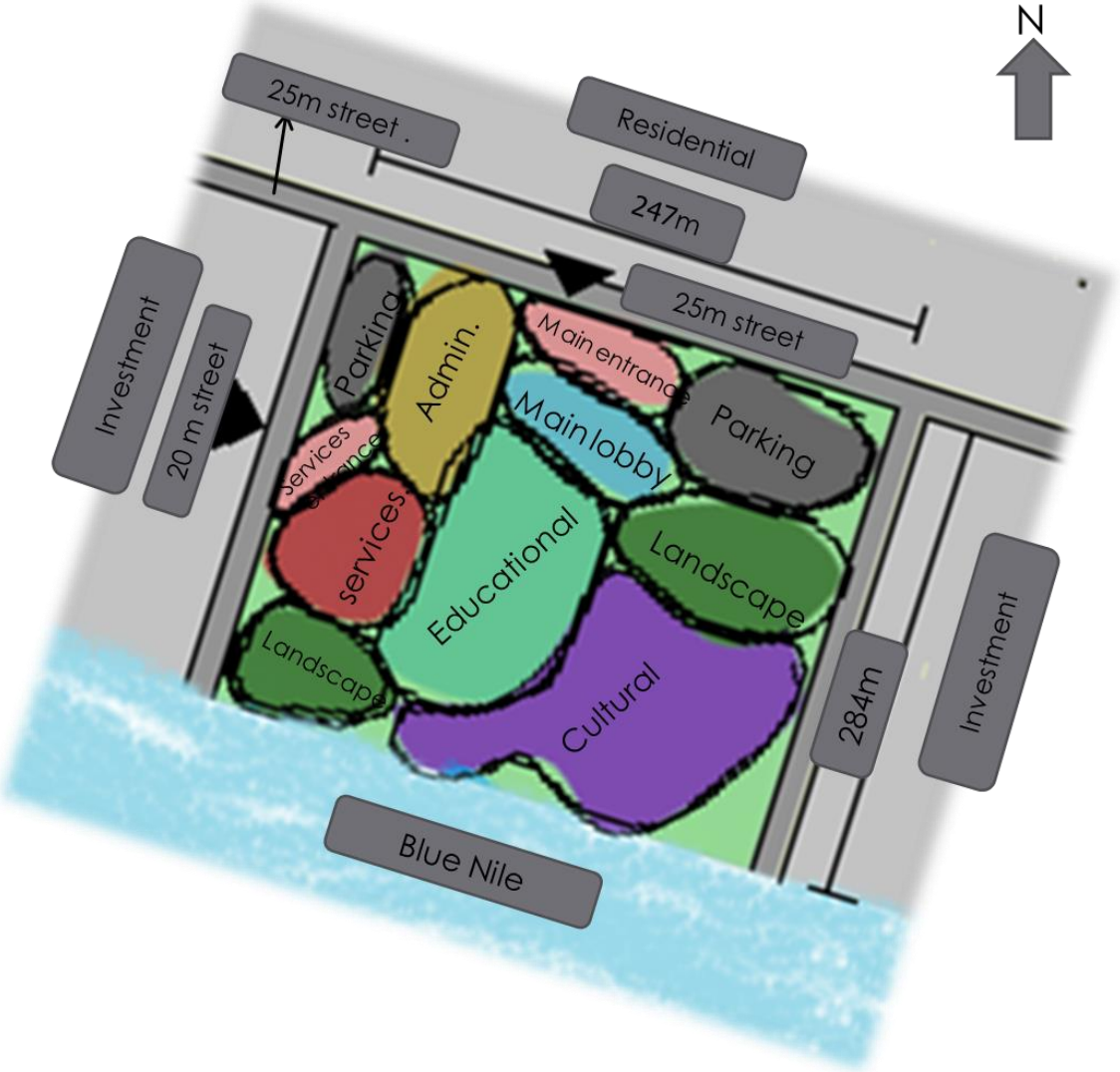
3-7-4 Indicators and Guidelines:

Indicators	Guidelines
The Nile view is in the southern side of the site	Take advantage of it to give an attractive look as well as restaurant and social event .
Clay soil and the high level of the Nile	Use deep foundation to carry the loads of the building .
Winds carrying dust from the western south side of the site	Putting the library in the quiet side and providing natural lighting for it
The existence of the main street is in the northern side	Take advantages of the situation in north entrance as well as the main façade of the building
The presence of a side street from the eastern side	The services entrance must be in eastern side .
The site could be exposed to corrosion by the flood	Use cement barriers.
The land slope toward the Nile direction.	The slope in the site can be used in drainage system.
The southern-west side of the site is quite sort of.	Southern west side of the site appropriate for library and classrooms.

Table 8: indicators and guidelines

3-7-5 ZONING:

	Parking
	Landscape
	Educational
	Administration
	Entrances
	Services
	Cultural



CHAPTER FOUR: (DESIGN PROCESS)

Contents:

4-1 Design concept.

4-2 Design process and development.

4-3 Final design.

4-1 Design concept:

4-1-1 form inspiration:

Strong and unique forms are perfectly used when designing these types of projects.

It's because this type of projects may be considered As seasonally: therefore in order to capture the eye of the visitor, and effort should be made by amusing both the Visual and senses of whomever the design.



4-1-2 form philosophy:

Form abstraction was one of the many stages through the design process. After abstracting the lines depending on the users behavior, circulation and zoning, the form construction was the next step into modeling the two –dimensional shape of the design.

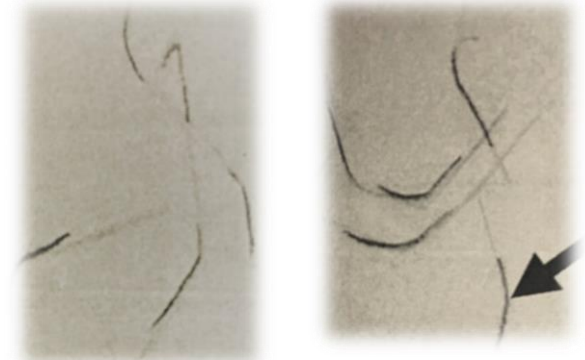
Starting from the smooth lines makes the circulation lines visible.

4-1-3 circulation philosophy:

From the zoning and the form philosophy it had to start with circulation axes that reflect the formation and serving the project's zones.

The main challenge in project that it's a complex consists of many different activities and they must be linked.

The main concept is having two axes branching into other axes.



Consider the following in these axes:

- The visual connection: by giving sense of continuity.
- Ending axes of movement in functionally important areas.

4-2 design process and development::

From the philosophy of formation in terms of giving forms that give a sense of movement in plans, elevations, and movement philosophy from the visual connection. The idea was formed on this basis.

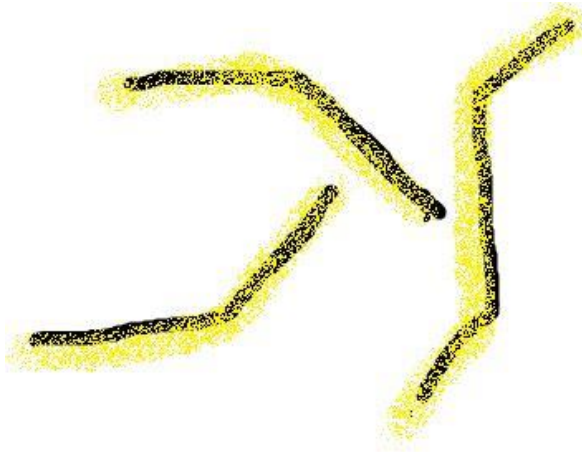


Figure 18: beginning of configuration concept

Fg.16 The beginning of configuration of the use of flow forms and the irregular shapes were used.

Fg.17 The primary concept: formation around axes of movement

Fg.18 The primary concept development: where the circulation axes were connected

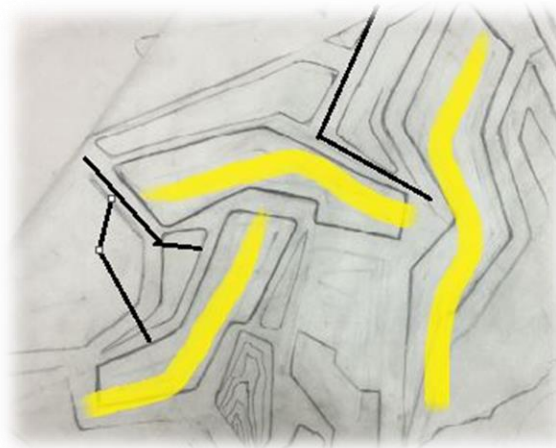


Figure 17:primary concept

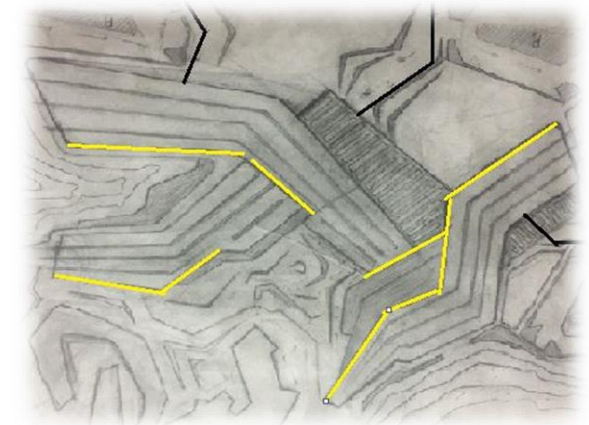


Figure 16: concept development

After further design the initial formation phases

Several adjustments:

- Due the simplicity of the first design.
- It didn't accomplish the designs functional purpose.
- Further spaces were added along the development process.
- It didn't achieve the satisfaction of the designs elevation.



Figure 19: ground floor plan in development stage

4-3 final design:

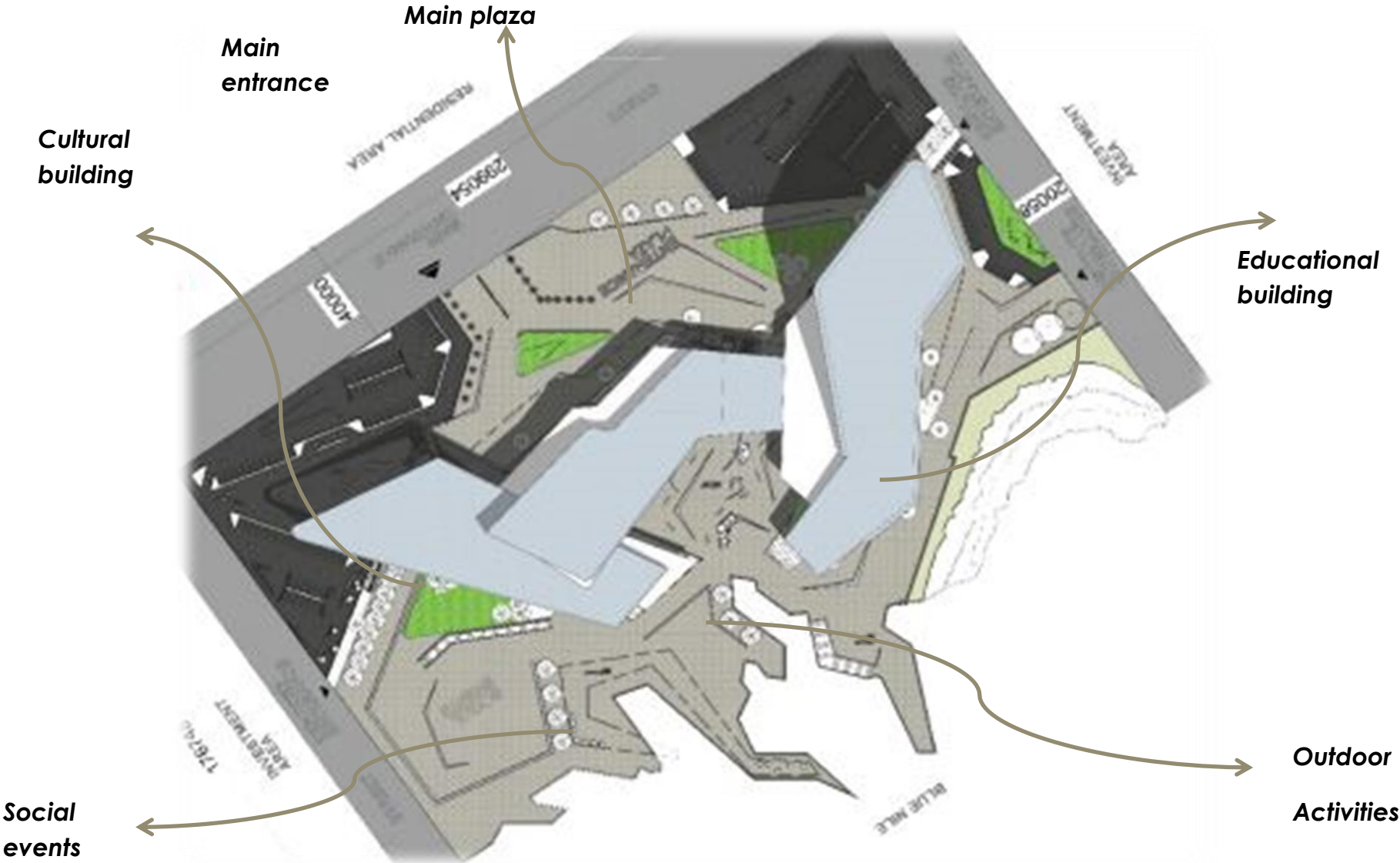


Figure 20: Site plan (final stage)

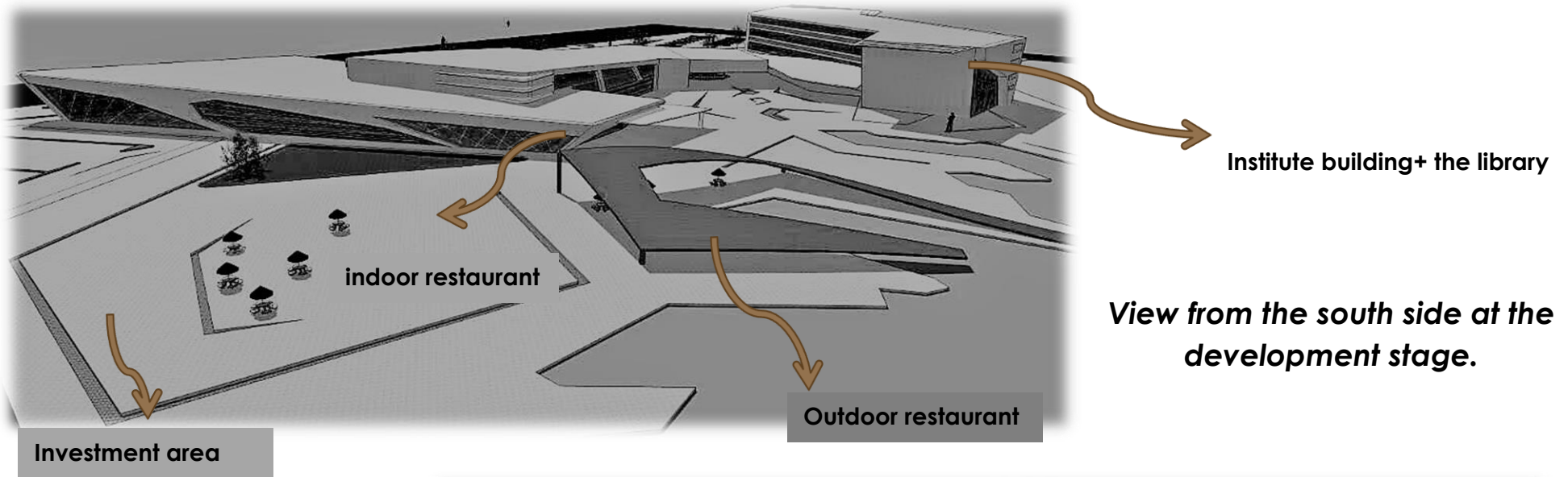
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Figure 21: Ground floor plan (final stage)

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Figure 22: perspective 1



View from the south side at the development stage.

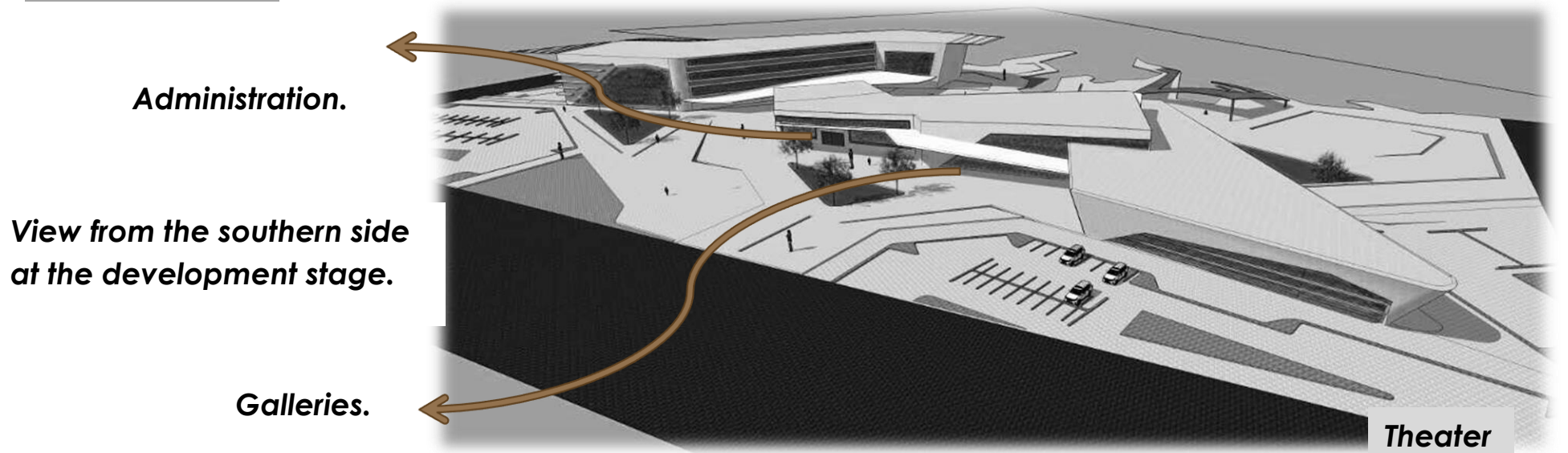


Figure 23: perspective 2

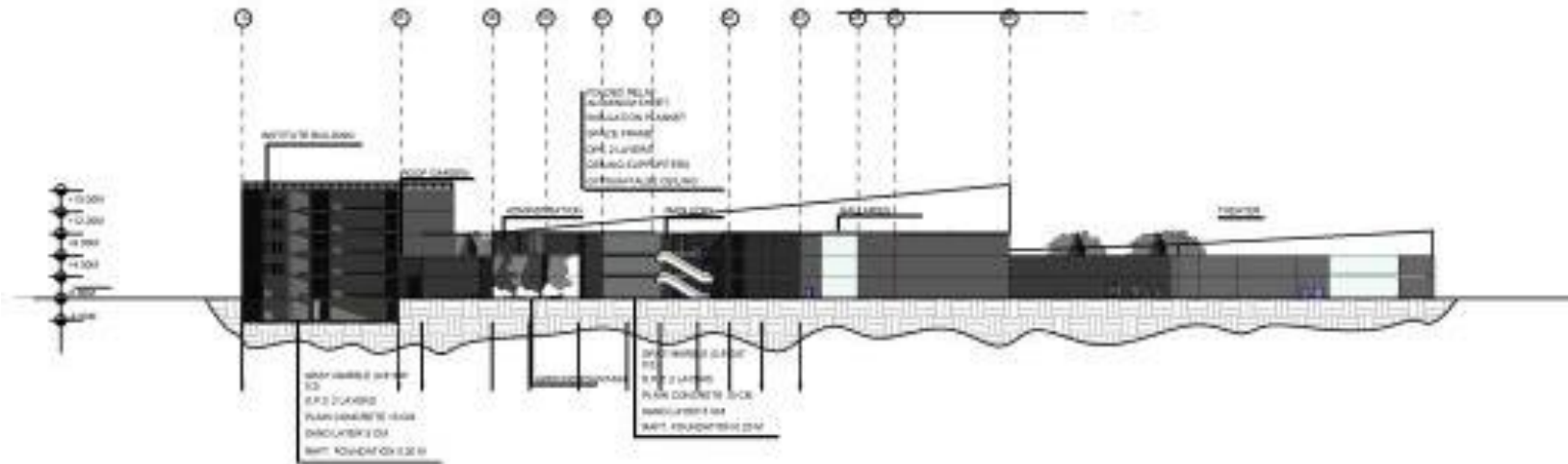
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Main entrance.

Figure 24:south elevation

Restaurant .



CHAPTER FIVE: (TECHNICAL SOLUTIONS)

Contents:

3-1 Structural solutions.

3-2 Finishing solutions.

3-3 Electrical solutions.

3-4 Water supply, drainage and sewage solutions.

3-5 HVAC and firefighting system.

5- Technical solutions:

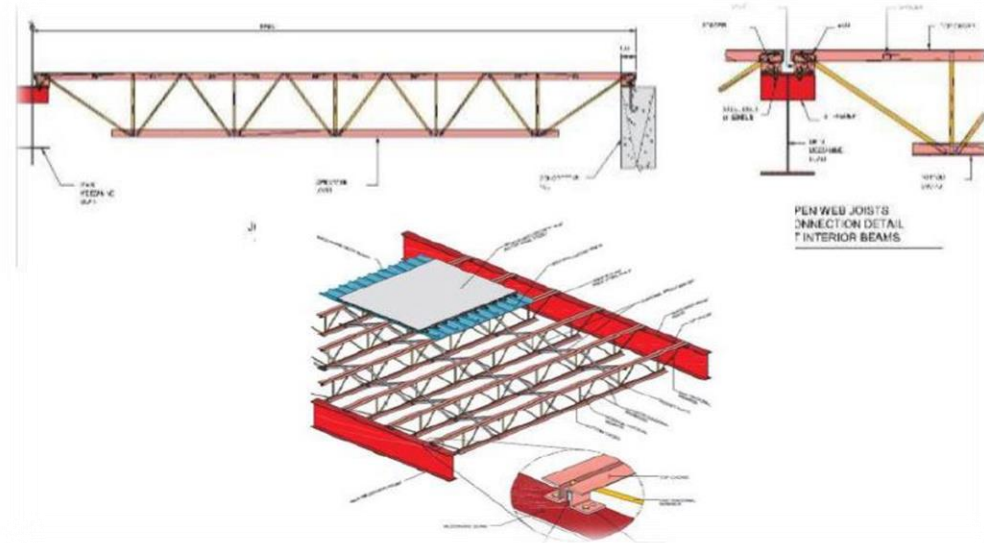
5-1 structural solutions:

5-1-1 The types of structural systems used in this project:

Steel frames (column and beam): The choice of steel frames instead of concrete is due to the large spans of the building.



Figure 25: steel frame



5-1-2 Reasons behind choosing the structural system :

- The need of long spans in the project without any columns in the middle.
- Flexibility in design.
- Ease of constructing.

5-1-3 The system is consist of:

5-1-3-1 Foundations:

Deep piles foundation because the project is located in a place where the ground is muddy at the top, so deep foundation are required to be able to reach the solid grounds plus the deep piles foundations are needed to support the height of the projects in the building.

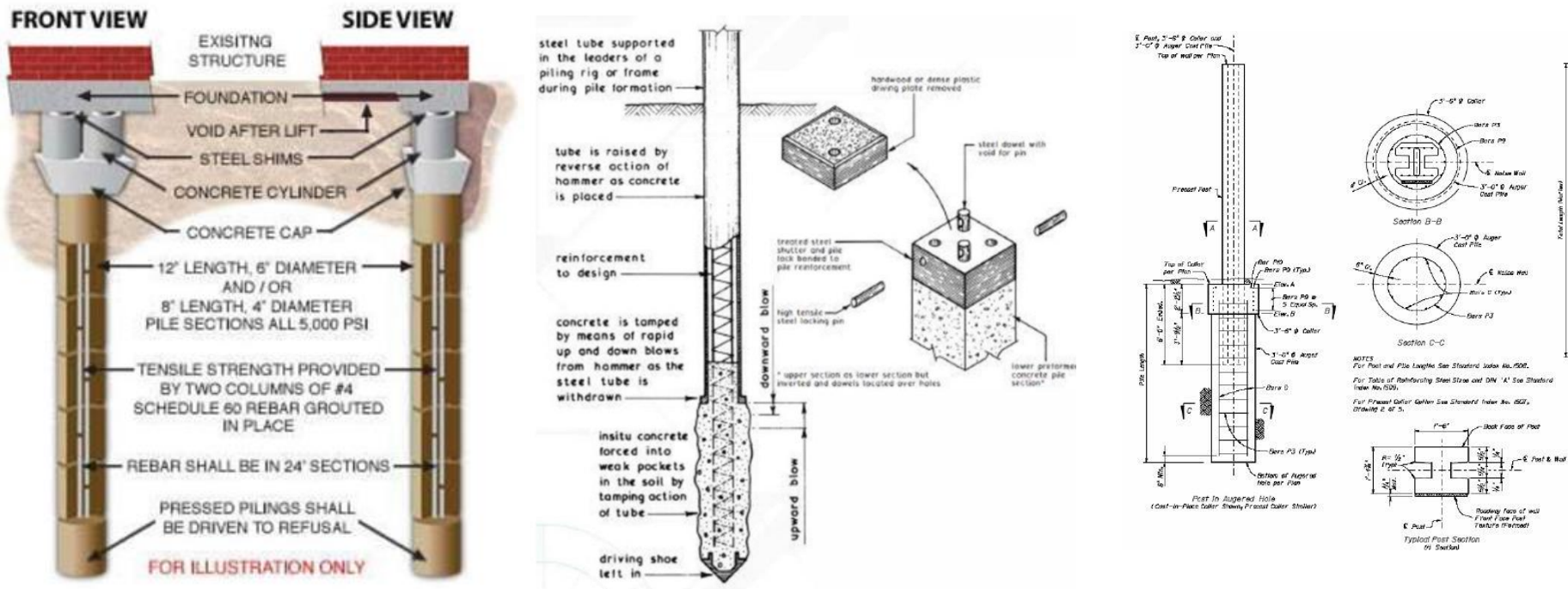


Figure 26: foundations

5-1-3-2 columns:

The columns in the project are all I-section universal steel columns covered by concrete to insulate the steel and give it more strength to resist fire , the columns are covered by marble to give the luxurious look that represent the project.

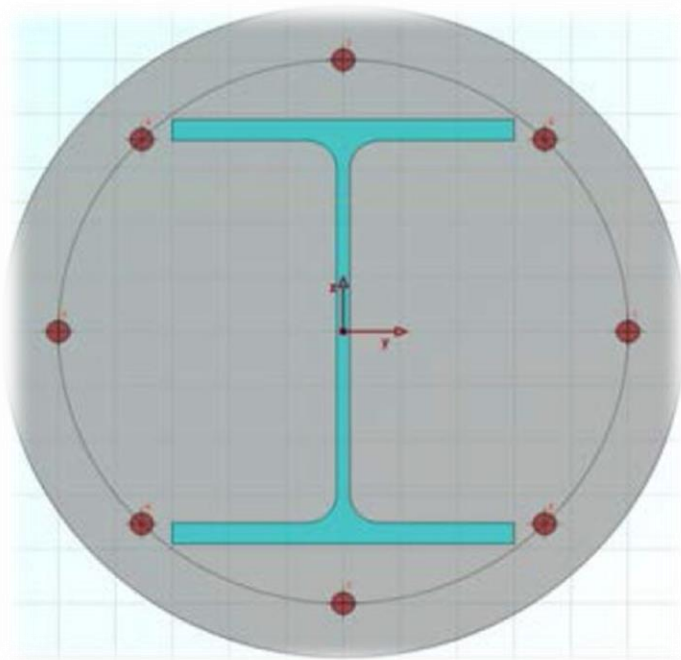


Figure 27: column to beam detail

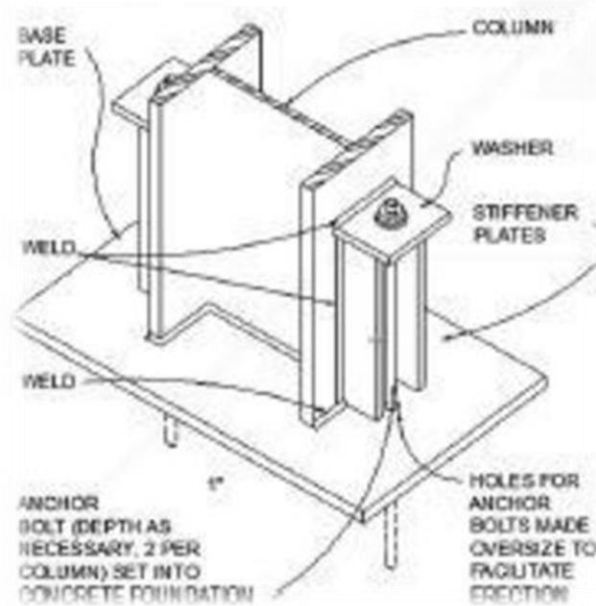


Figure 28: i-section column

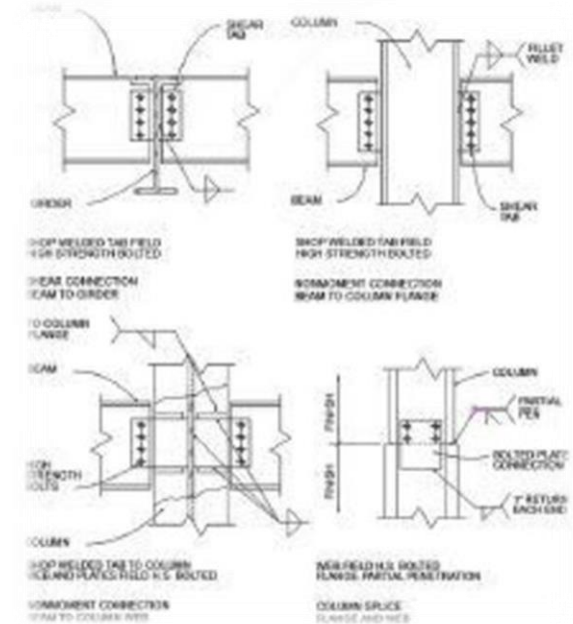


Figure 29: column to foundation detail

5-1-3-3 Beams :

the project has steel I-section universal beams that connect the columns together to achieve more stability.

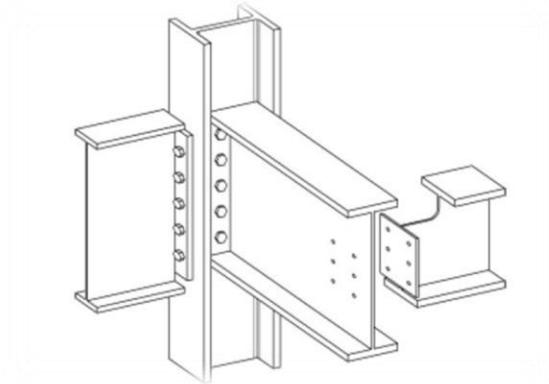


Figure 31:Detail that shows beam connected to column

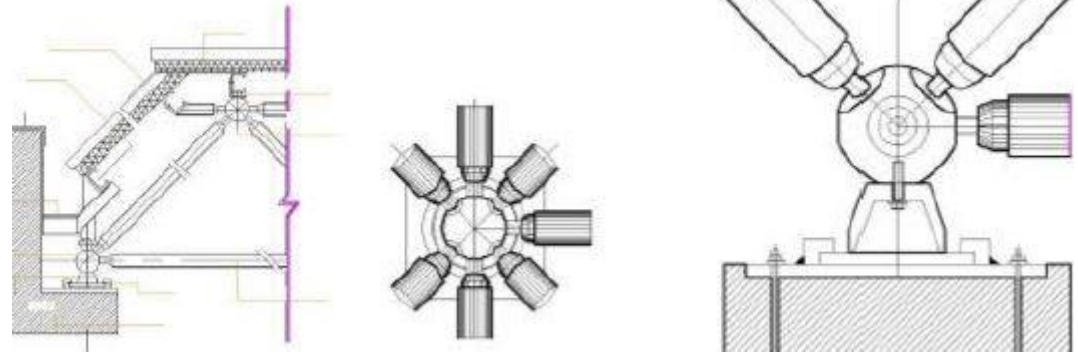
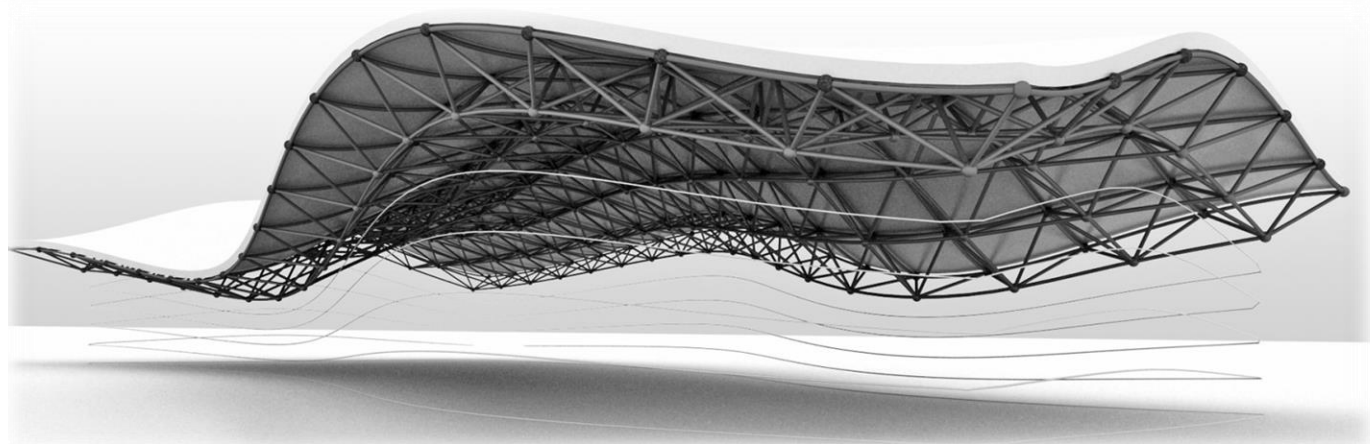


Figure 30:space frame details

5-1-3-4 roofs and slabs:

This type of roofs are used for the spaces that needs long spans like theaters and galleries, also it's a type of structure allows you to create a different and fixable shapes and masses.



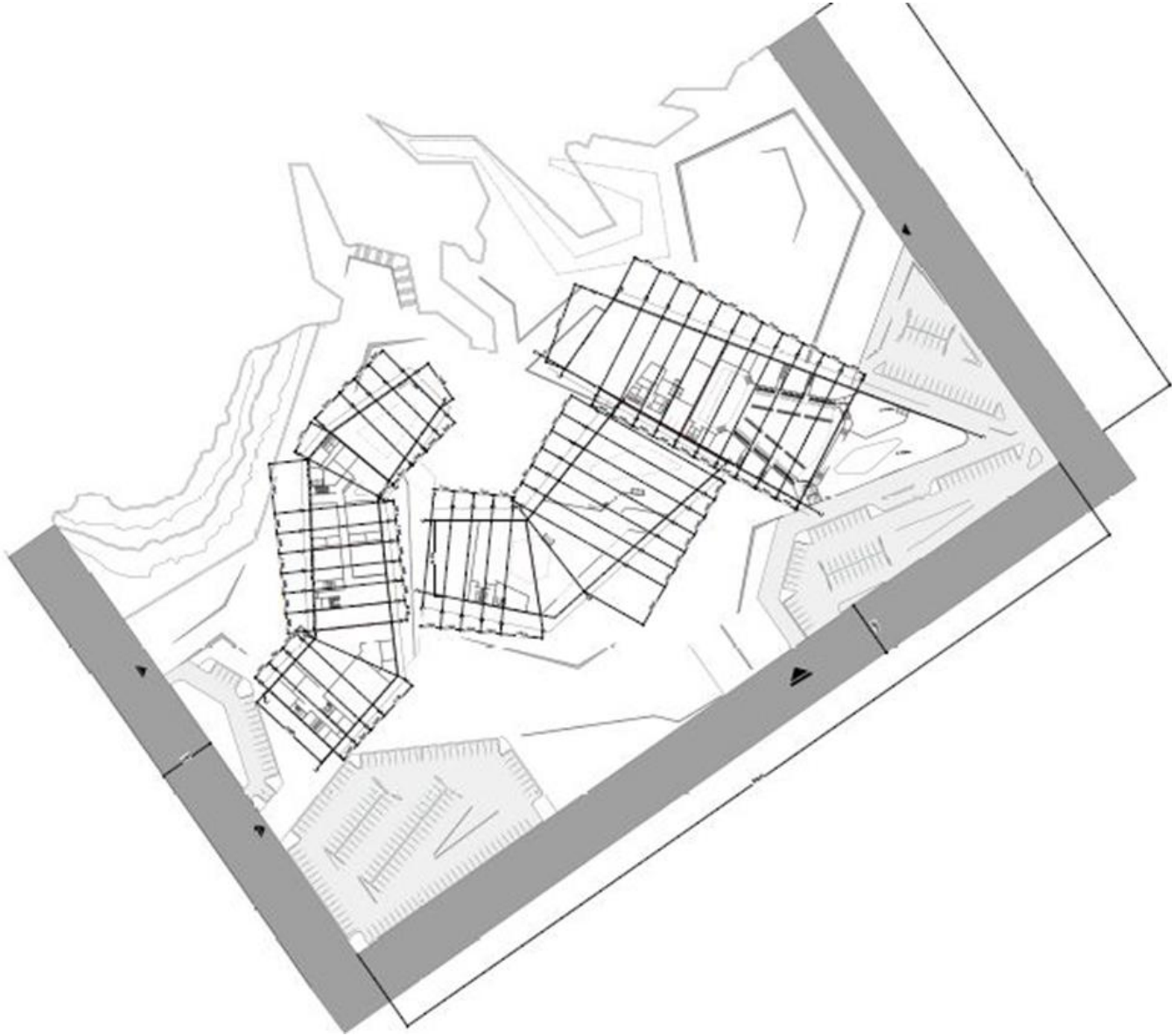
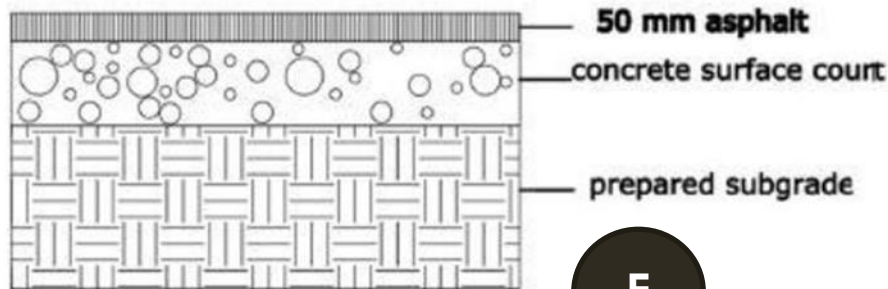


Figure 32: structural system plan

5-2 Finishing's solutions:

5-2-1 site finishing and treatment:

5-2-1-1 Asphalt for the parking:

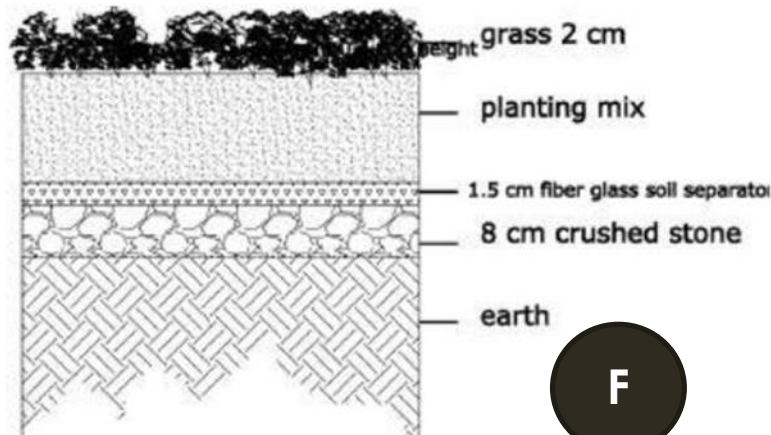


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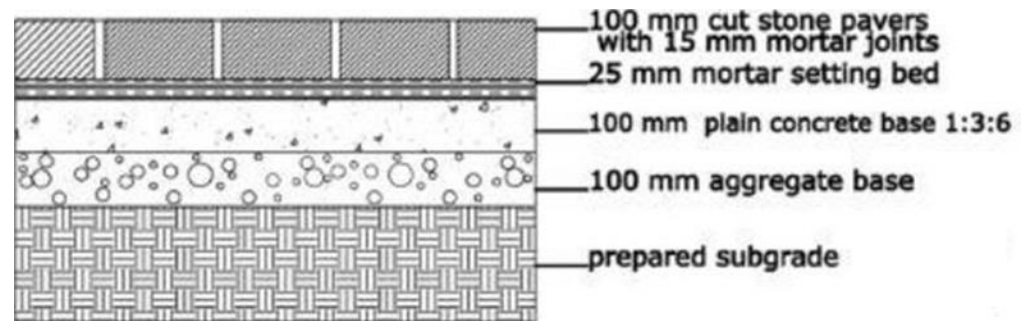
5-2-1-3 Brick pavement in the pathways and corridors.

Brick was chosen because it can handle the different weather elements and the friction caused by the high number of users in the project.

5-2-1-2 Green Areas:



F



5-2-1-4 Ceramic tiles:
In the slab around the
buildings.

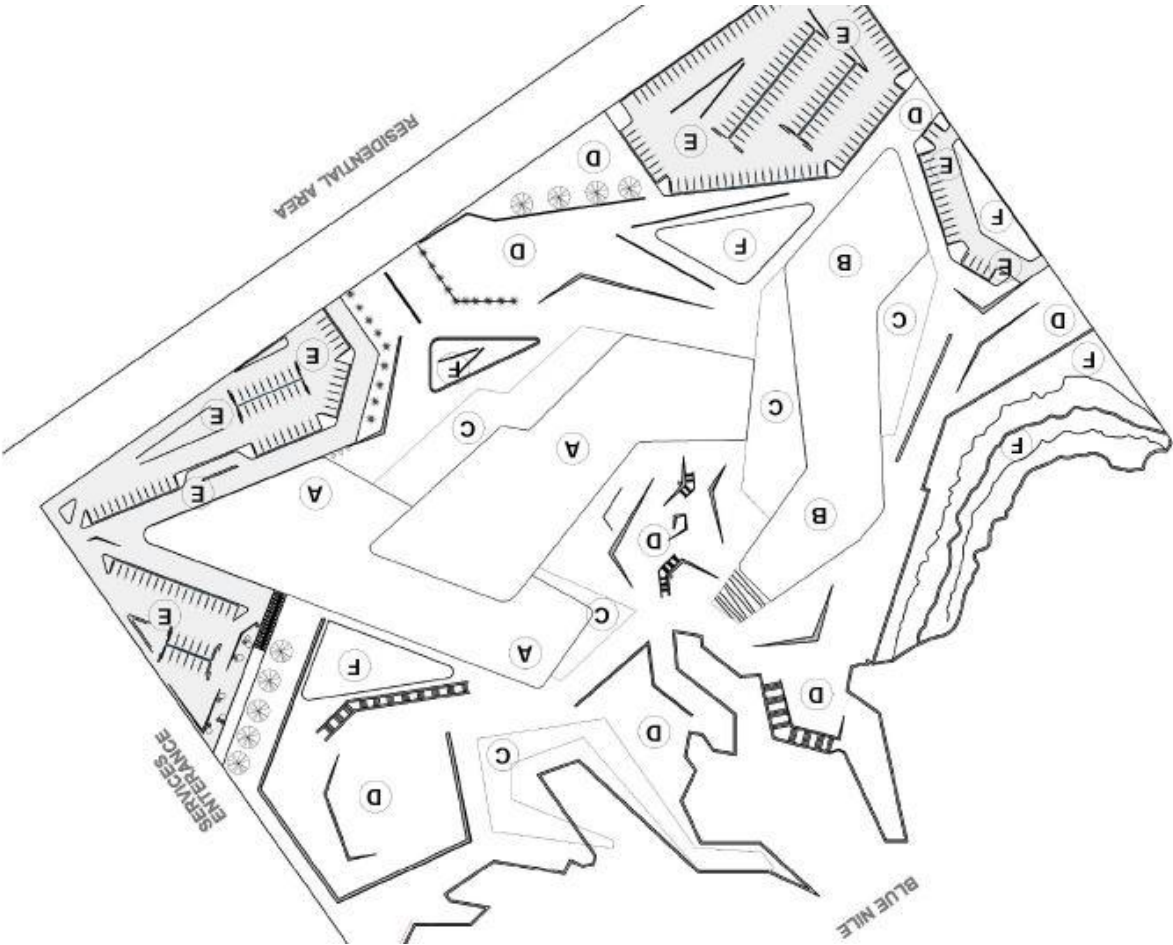
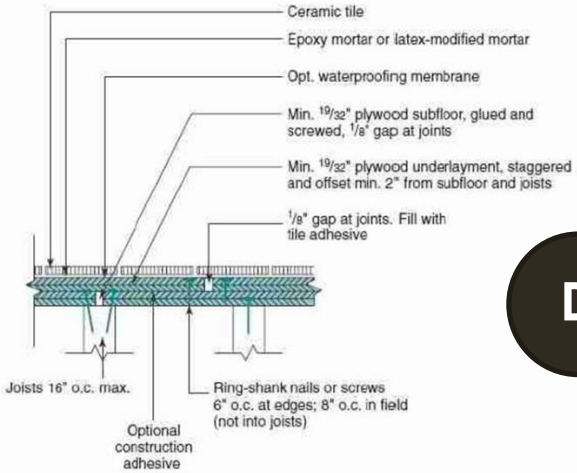
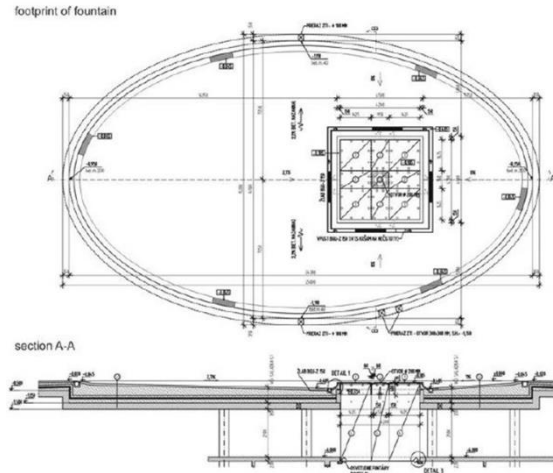


Figure 33: finishing site plan

5-2-1-5 fountains and water elements:



5-2-1 composite slabs:

In the institute building which consist of:

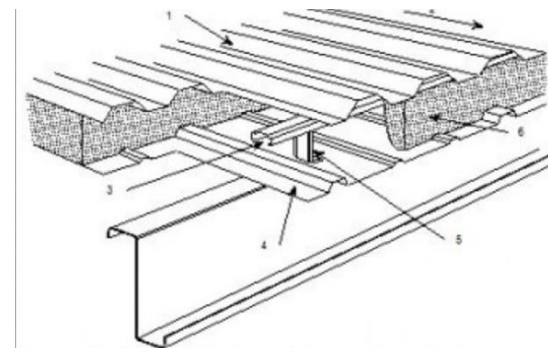
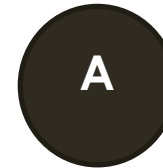
- White concrete layer.
- Mortar
- 3 insulations layer of DPC
- Zink sheets
- Steel beams



5-2-1-7 Aluminum sheets:

In the cultural building which consists of:

- Insulation layer
- Air space
- Insulation layer
- Steel purlins
- Steel beams
- Steel purlins and beams
- Aluminum frame for the false ceiling
- False ceilings elements 60cm*60cm



1	Weather sheet	4	Liner sheet
2	Slope	5	Bracket
3	Bar	6	Insulation

5-2-2 Interior finishing:

5-2-2-1 floors:

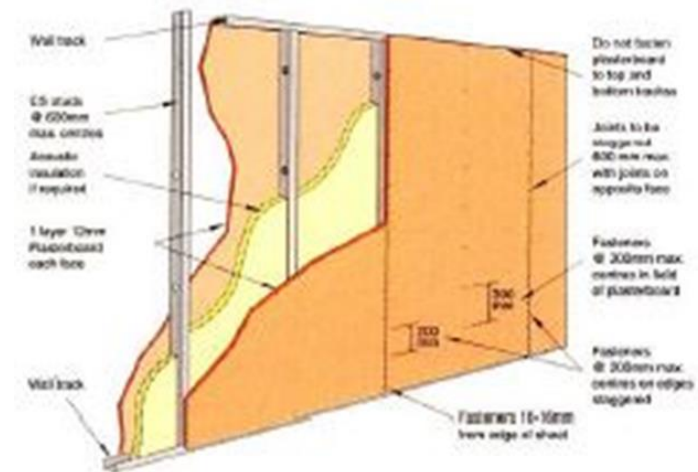
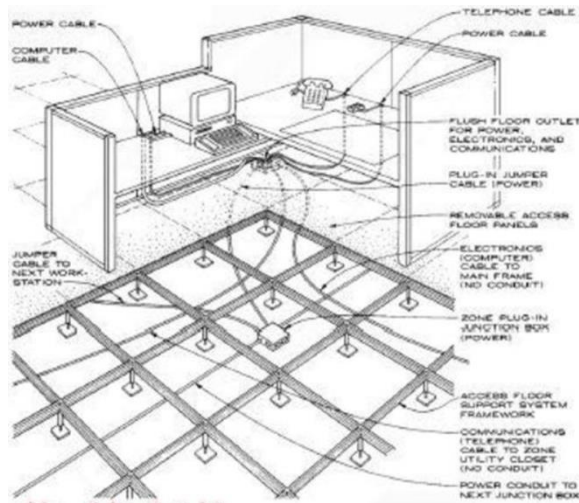
- Porcelain tiles 90cm*90cm in the main corridors and in the receptions.
- Carpet floor in the offices and theater to reduce the noise in these spaces.
- Wooden floors in the meeting rooms and the exhibitions.

5-2-2-2 ceilings:

- Gibson board false ceiling 60cm*60*cm.
- White paint with some colored stripes.

5-2-2-3 walls:

- White paint with some stripes of other colors to motivate the artists and inspire them more.



5-3 electrical solutions:

5-3-1 electricity supply

The main line that supply the electricity in the site is located in the southern-east side of the site “the main street “.

The electric current is 33 kilo volt the moment of entering the site.

The electric current exposed to lowering in the value to 11 kilo volt by the adapter.

And then to 415 volt, the electric current gets distributed to the main control panel.

There is a switch key that transfer the electric current from the generators when there is a blackout.








The exterior lightings are designed to work automatically by the solar panels.

Each building on the site has its own electric panel which is connected to the main panel.



5-3-1-1 Electricity supply Room:

The electricity room is located in the basement, the southern west side of the building.

	TRANSFORMER
	FLIPPING SWITCH
	ELEC METER
	MAIN PANEL
	SUB PANEL
	ELEC LINE
	GENERAITOR

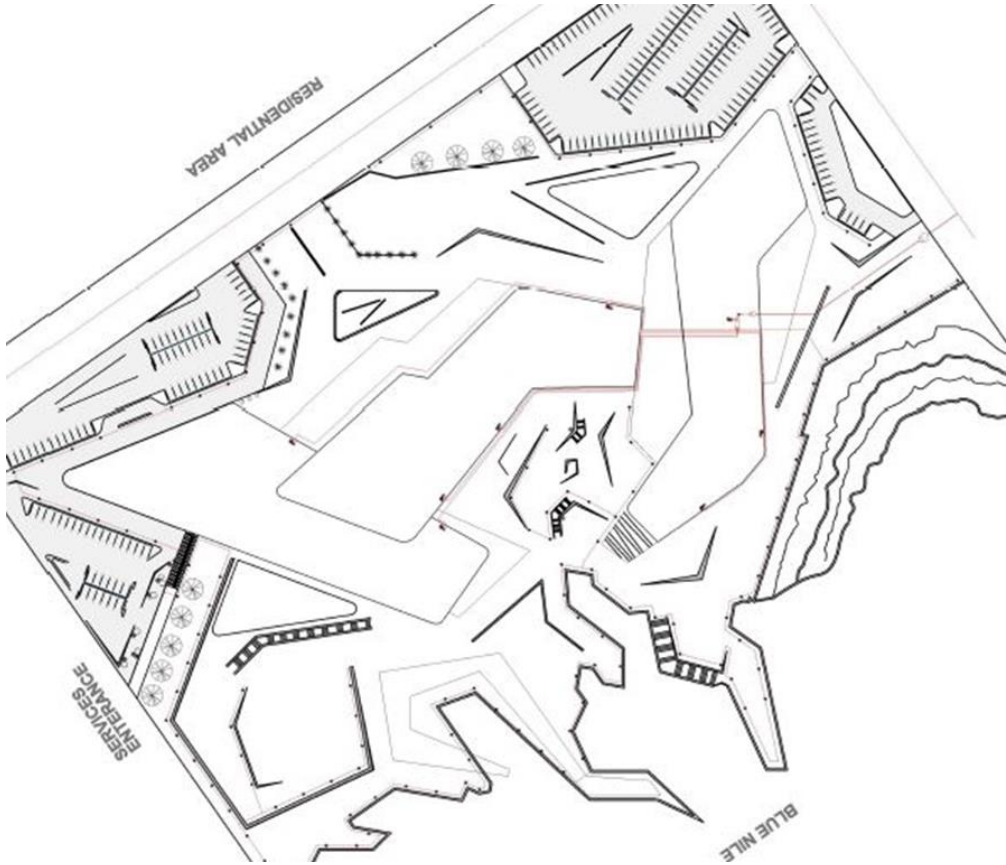


Figure 35: electricity site plan

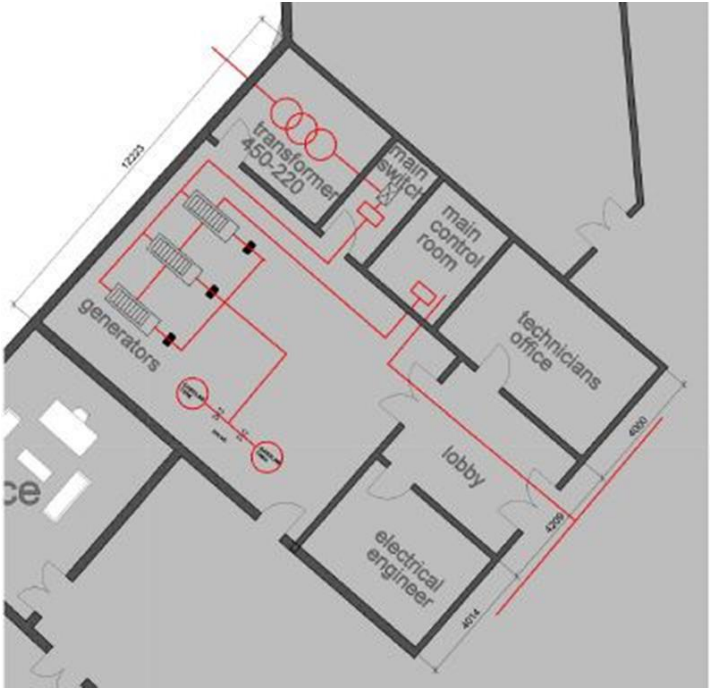


Figure 34: electricity room

5-3-1-2 Lighting solutions:

1-The exhibitions:

- Flood lights on the sides of the exhibition.
- Spot lights above the different types of the art works.
- Fluorescents lights in the offices and the colliders.

2-THEATER:

1-Fresnel : above the theater stage –it is a soft – edged spotlight that allows for a variable beam spread from spot to flood. Used to create large washes of light ,sometimes highly colored

2-Spotlights:

Are used above the seating and in the corridors between the steps ,as shown in the picture

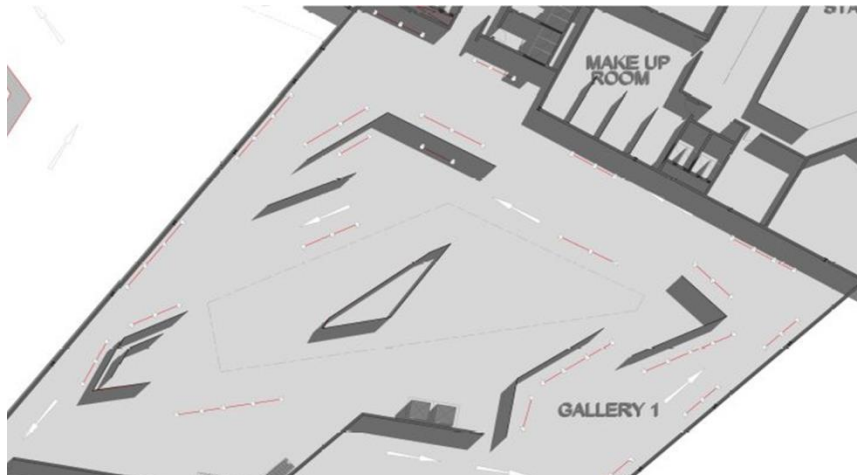


Figure 37: lighting system in exhibitions

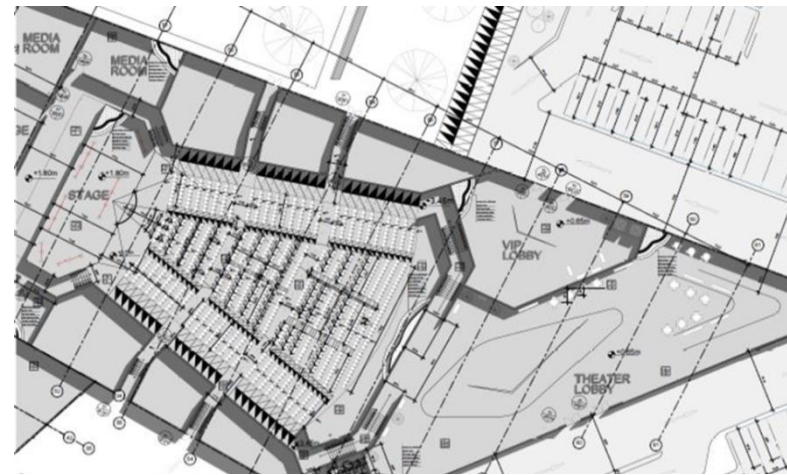


Figure 36: lighting system in theater

5-4 water supply, drainage and sewage solution:

5-4-1 water supply system.

- 5-4-1-1 Calculation of the amount of water=
- employees and administrators=600
- Daily usage water + firefighting water .
- Total daily consumption=
- Daily usage of water =personal usage +
- (6700*5)+(1650*15)+(600*5)=33500+24750+9000
- irrigation water
- =67250 gallons per day.
- From the daily usage of water
- 67250*4.4=295500 liter.
- Consumption of the exhibitions
- Garden irrigation:
- and galleries=5 gallons per day.
- Each square meter needs 5 liters daily .
- consumption of the institute users =15
- Total of green spaces= 12000 square meter.
- gallons per day.
- Consumption of irrigation= 12000*5=60000 liter per day.
- consumption of the employees and the
- Total consumption of the daily usage =
- administrators= 15 gallons per day.
- 295500+6000 =355500.
- total consumption= number of users*daily
- consumption.
- exhibitions and galleries users = 6700
- institute users = 1650

5-4-1-2 The system that used for water supply :

Water is supplied to the building with the use of a pump and an upper water tank to keep the water pressure stable for all the floors of the buildings, that with the help of another water tank that will be at the middle of each building to help supply the higher tank and the lower floors too. Two tanks are used to fix the issue of the water pressure of the farthest floors from the tank plus to keep the tanks full and make sure the water doesn't run out of the buildings. The water tanks will be located on the top of the bathrooms duct being the place needing most water supply .

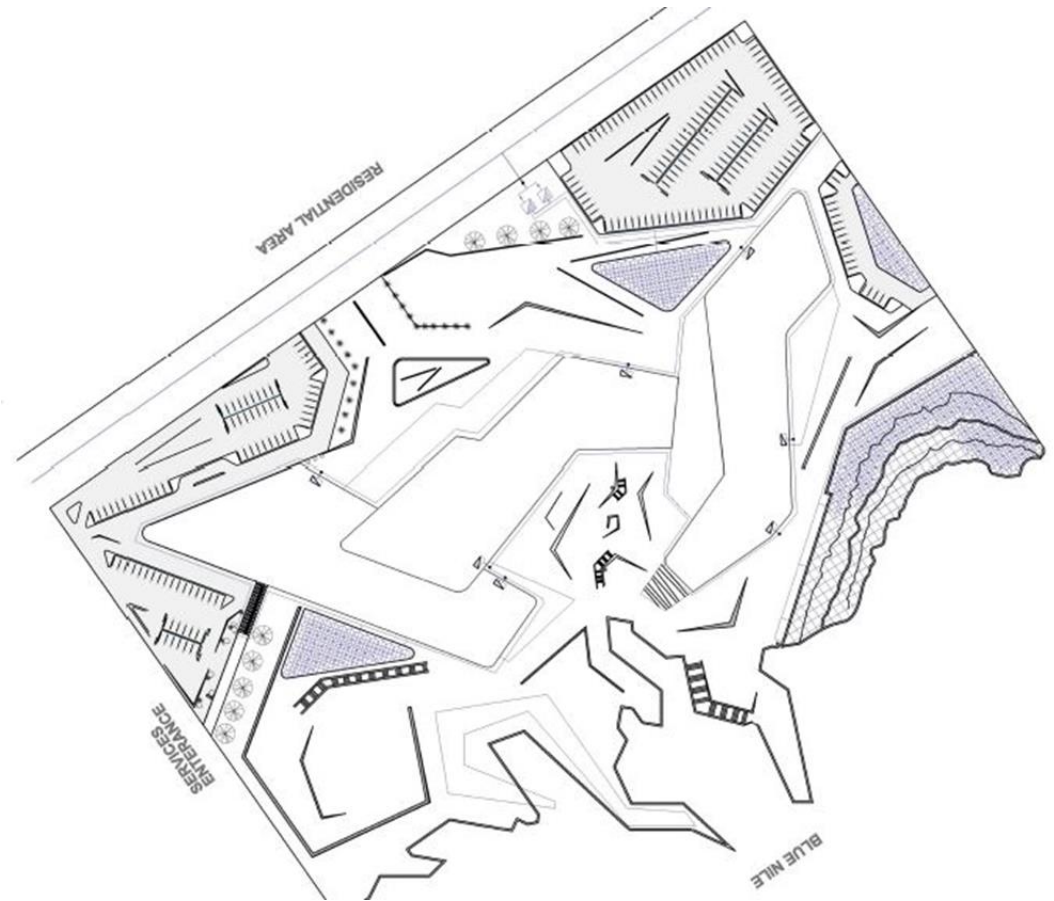


Figure 38: water supply site plan.



5-4-2 sewage system:

The two pipes system is used for the sewage of the bathrooms to get rid of the smell and to make sure that the pipes don't get close, by helping to maintain the air pressure inside of the pipes, then the waste is transferred into the lines where it goes through the manholes till it reaches the main sewage line that is surrounding the building.

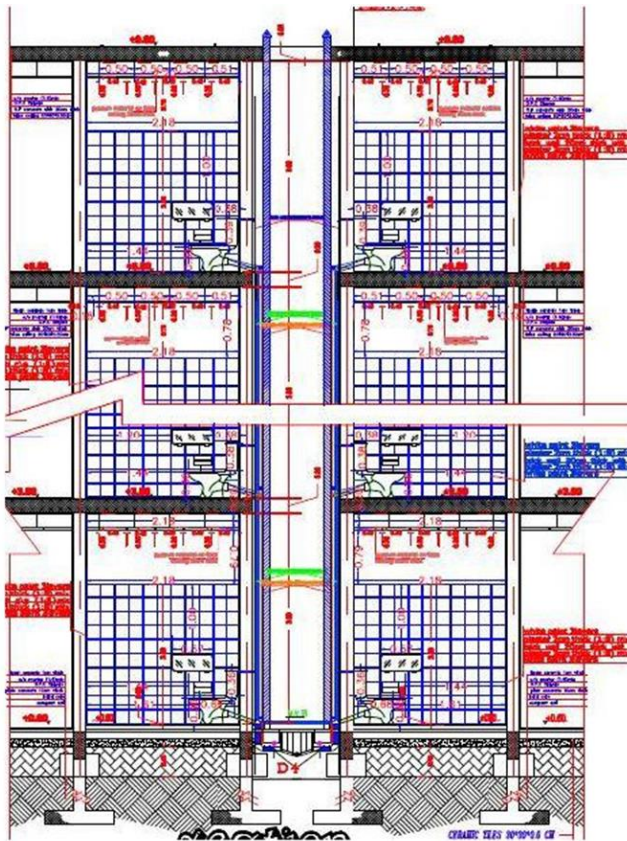


Figure 39: a section that shows the sewage system

5-4-3 Drainage system:

Draining the water from the roofs of the buildings from the rain is done by slope of 1:100 directing the water towards the down pipes placed inside the ducts of the buildings which will affect the elevations and so on. The water will then be drained towards the landscape of the project then the angle of the landscape will take it outside.

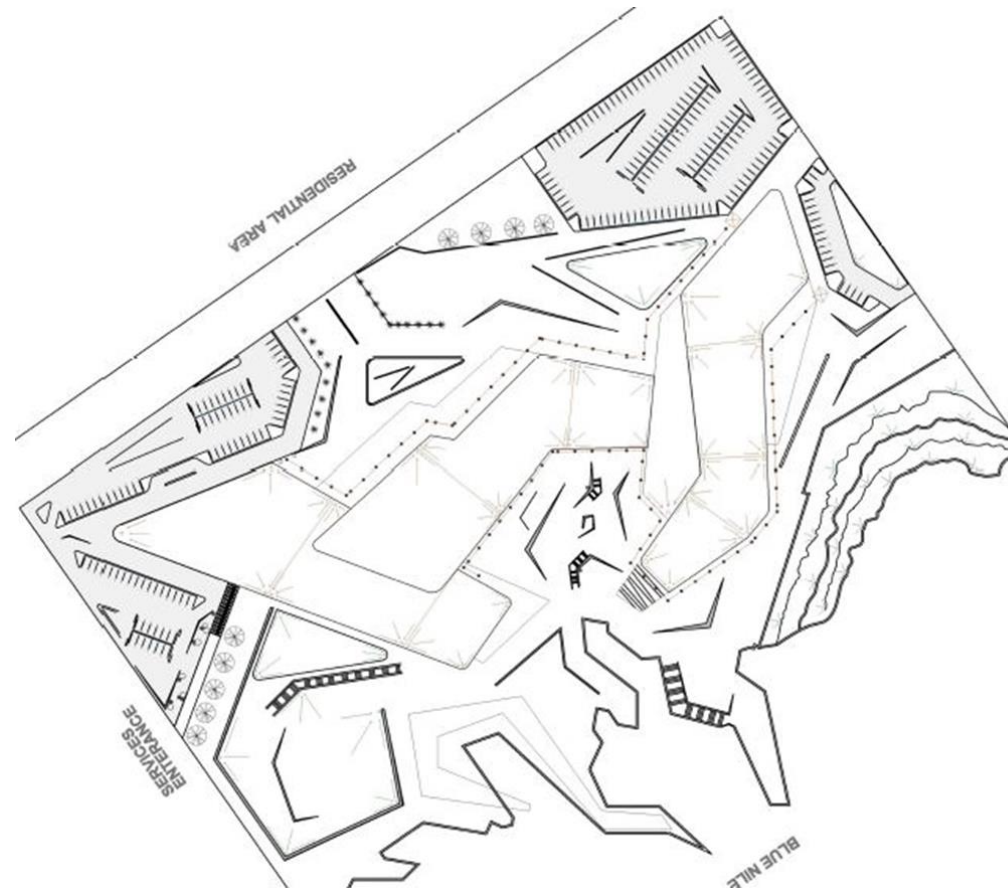


Figure 40 :drainage and sewage site plan

5-5 HAVC and Firefighting System:

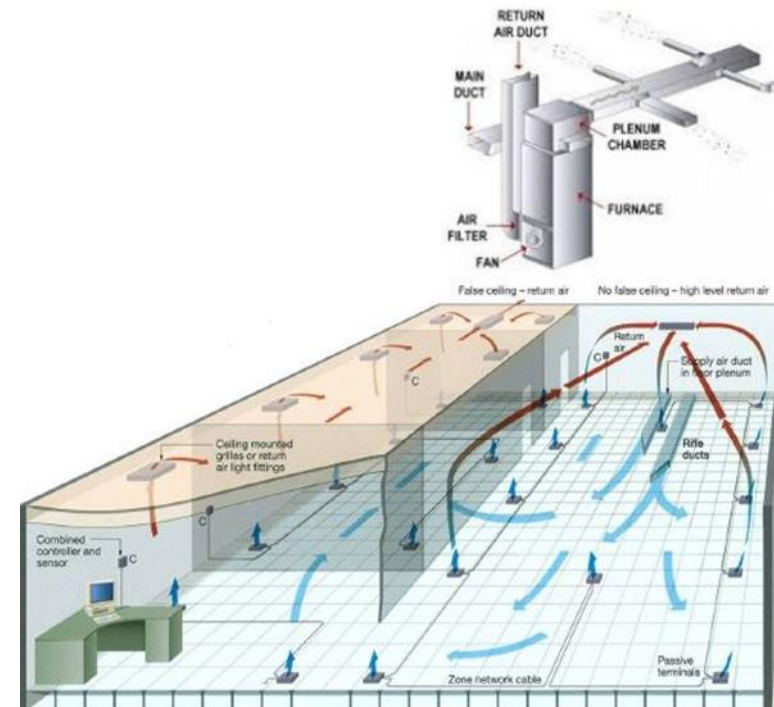
5-5-1 Air conditioning system:

Choosing the right HVAC system depends on many factors and major points which lead to choosing “ All Air System”.

The main factors are:

- the project consist of many spaces.
- the HVAC system needed for this project should be able heat or cool the spaces.
- the HVAC system should be controllable from all of the spaces.

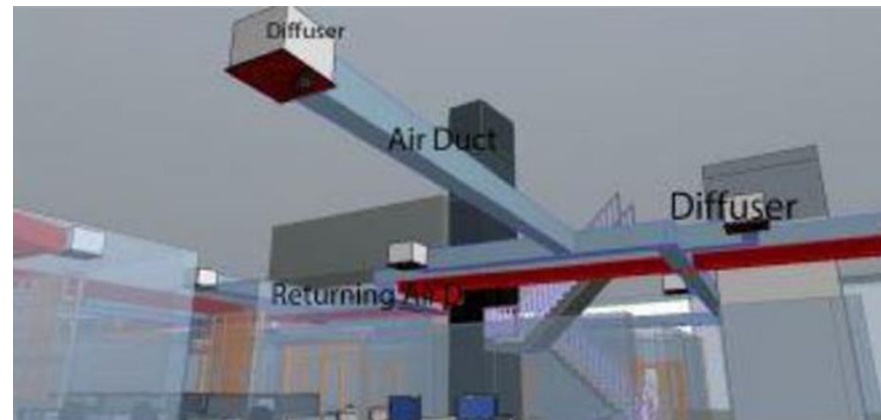
The above points were the reasons of choice of the “ all air system” because it supplies the needed things project.



for the

5-5-3 HVAC Operating:

All air system transfer cooled or heated air from a central plant via ducting. Distributing air through a series of grills or diffusers to the room or rooms being served. The system is consist of air supply duct and a return duct, the HVAC unit could be placed in the basement or on the top of the building. also it consists of a fan coil unit, chiller ,supply diffusers and return diffusers.



FINE ART CENTER

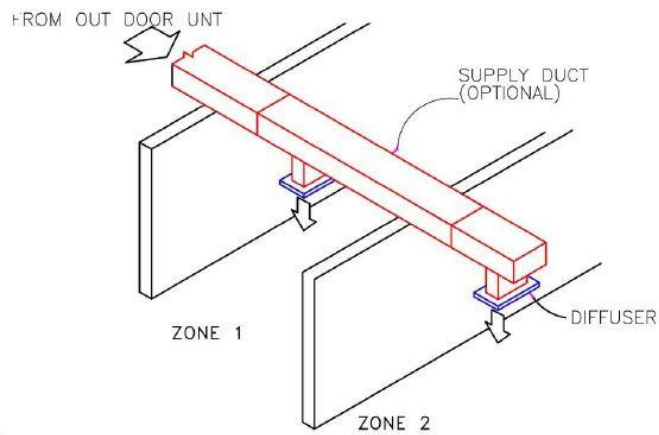
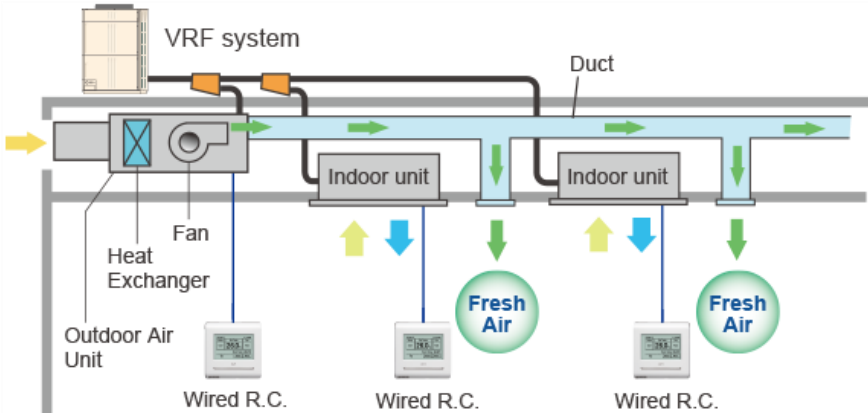


Figure 41: part plan that shows the AC system

5-5-3 Firefighting system:

Sprinklers system.(GAS AND WATER)

Reasons behind choosing this system:

- The project consists of main buildings with some scattered units.
- It has an ordinary level of hazard.
- Spaces are divided into: storage, offices, classrooms and galleries .
- In case a fire took place the materials that would catch fire are divided into: carbonic solid materials, electrical equipment, metals and chemicals.
- The building go higher than 5 floors

After keeping the above points in mind, the firefighting system should have the following stuff in it :

- having fire blankets in the workshops.
- using co2 and dry powder to put down the fire so it doesn't affect the electrical equipment.
- the use of sprinklers is a must because of the height of the building plus putting hand held fire extinguisher inside of the spaces too where they are put beside of the door of each space.
- each sprinkler will cover 8 square meters.
- for the fire detecting an ionic detector is put in the storage areas to detect the smallest sigh of fire in them.in the offices and classrooms a smoke detector is needed. And in the cultural building smoke detector are put there too.



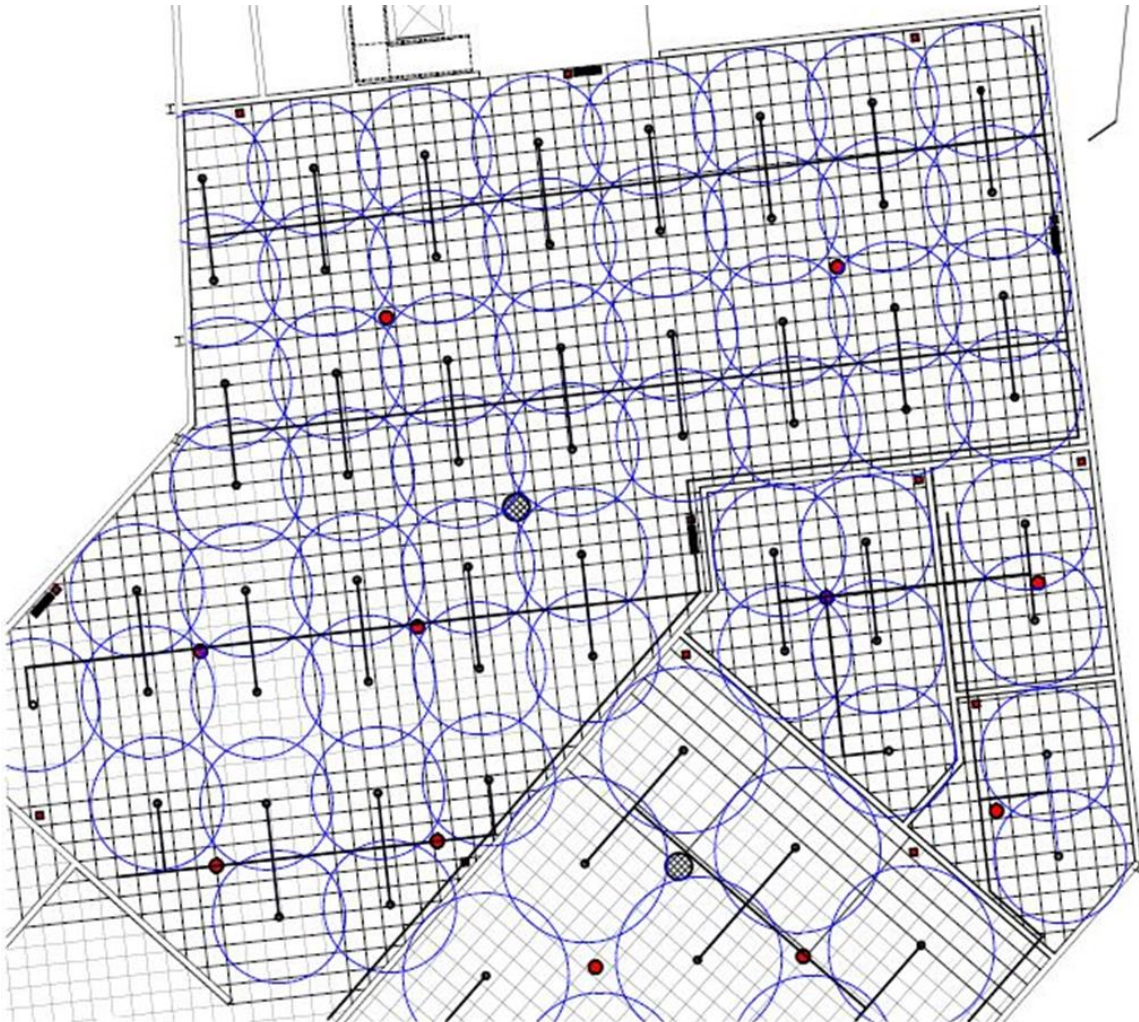


Figure 42: part plan that shows the firefighting system

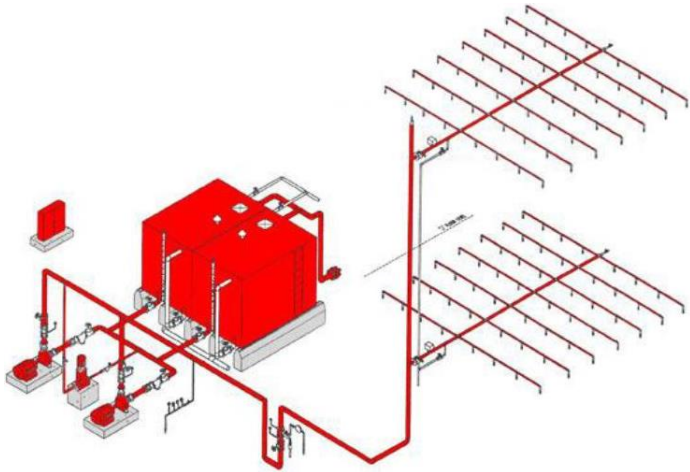


Figure 43:f gas firefighting system

	water line
	sprinklers
	smoke detector
	fire alarm
	hose rail
	extinguisher

References:

- **Wikipedia.**
- **Google**
- **Archdaily.com**
- **Architects handbook.**
- **Time saver for building 2nd edition joseph de Chiara & john calendar.**
- **Ministry of national planning in Khartoum.**