SUDAN UNIVERSITY OF SCIENCE AND TECHNOLOGY

COLLEGE OF ARCHITECTURE AND PLANNING

ARCHTECTURAL DESIGN DEPARTMENT

5TH GRADE BACHELOR DEGREE

GRADUATION PROJECT REPORT

COLLEGE OF MUSIC AND DRAMA

IN KHARTOUM CITY

PRESENTED BY :

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D. AWAD SAAD

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DEDICATION

To a truly extraordinary man who without him I would seize to exist .. my dear FATHER

To the soul dearest to mine , the reason for my smile in life , my best friend .. my MOTHER

To a man who always stood by my side in my time of need my dear brother … AMR

To my dear sister who always provided me of warmth whenever I needed it … ROAA

To my little brother who taught me the true meaning of kindness in life MEGDAD

To my cute little friend who adds joy and color to my days my sister RAGAD

To my life companions who decorated my childhood memories with their existence MAISAA & MALAZ

To my friends whom without I would have never been able to become the person I am today MARFAA , MARAM , ABEER , MAHIDA , SAMAH

To the man who entered my life and gave it all meaning ,the one whom I hope to share the rest of my days with

OMER

THANKS & GRATITUDE

Praise be to Allah for with his grace all good is done

I praise you Allah for what you have guided me

The prophet said "peace be upon him" : (who makes you a favor should be rewarded , and if you can't reward them , pray for them until enough to seem you have rewarded them)

Sincerely in a humble attempt of me to repay all the kindness of everyone who contributed on my learning process

I also thank all the teachers and instructors in the college of architecture and planning for their constant giving through the years

For the beautiful soul that was the reason I continued my path through this college , always encouraging with constant optimism .. Jasmine Osman

To a teacher who undeniably gave everything he could to give us the best learning experience T. Wleed Mansour

To every human being that took teaching as their life achievement to nurture seeking minds .. from the bottom of my heart I thank you

ABSTRACT :

This report contains a design a for the college of music and drama which is located in SUDAN , Khartoum with a total area of 2,82 hectare.

The college of music and drama is an institute specialized in the study , training and research of music and theatrical actions . It serves the high education in Sudan to graduate generations capable of using their talent in reflecting the effect of music and drama in people's lives.

This project can provide a solid base to the different kinds of talents in Sudan in safe academic environment and allow it to grow and present possible master pieces that can be remembered through generations to come.

the main concept of designing this college is the circulation axes and the connection between the different functions in the project . The college was designed in the objective of providing classrooms and studying halls with the appropriate standards for musical and theatrical actions without ignoring the importance of a relatively vast theater to present the students achievements . And as a college it contains a large area of greenery and natural views to inspire the students , without forgetting the services area which also serves as a relief area for its users.

ملخص التقرير:

هذا التقرير يحتوي على تصميم لكلية الموسيقى و الدراما المقترح تواجدها في ولابة الخرطوم و مدينة الخرطوم بمساحة 2,82 هكتار .

كلية الموسيقى و الدراما هي مؤسسة تعليمية مختصة في دراسة و البحث في الموسيقى و الاعمال المسرحية . هذه المؤسة تخدم التعليم العالي في السودان لتخريج اجيال قادرة على تسخير مواهبها لعكس تاثير الموسيقى و الدراما في حياة الناس .

هذا المشروع يمكن ان يوفر قاعدة صلبة لمختلف المواهب في السودان في بيئة اكاديمية امنة تسمح بتمنية لتلك المواهب بالنمو و تقديم ما من المحتمل ان يصبح قطعة فنية تتناقل عبر الاجيال .

المبدا الاساسي لتصميم المشروع يعتمد على محاور الحركة و الربط بين مختلف وظائف المشروع . تم تصميم الكلية بهدف امداد الطلاب بفراغات دراسية مصممة وفق المعايير الصحيحة للاستخدام في النشاطات الموسيقية و المسرحية , مع وجود مسرح ذو مساحة مناسبة نسبيا لتقديم انجازات الطلاب .

تحتوي الكلية ايضا على مساحات من الخضرة تساعد على الهام الطلاب في دراستهم كما تخدم كمتنفس للكلية .

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CHAPTER ONE

1. Chapter One

1.1 Introduction

Performing arts are a form of art in which the artists use their voices bodies or inanimate objects to convey an artistic expression. It is different from visual arts which is when artists use paint, canvas or various materials to create physical or static art objects.

Performing arts include a range of disciplines which are performed in front of a live audience. All these kinds of performances are present in all human cultures. The history of music and drama date returns to prehistoric times. Performances can be in purpose built buildings such as theaters and opera houses or on open air stages at festivals and such.

MUSIC is an art form which combines pitch, rhythm and dynamic in order to create sound. It can be performed using a variety of instruments and styles and as an art form music can occur on live or recorded formats and can be planned or improvised.

THEATER is the branch of performing arts concerned with acting out stories in front f an audience using a combination of speech, gesture, music, dance, sound and spectacle. Any one or more of these elements is performing arts.

1.2 Project name

COLLEGE OF MUSIC AND DRAMA

1.3 Project Definition

A music and drama college is an institute specialized in the study, training and research of music and theatrical actions.

1.4 Reasons to Choose the Projects

Introducing modern techniques of music and drama so as to improve the already existing arts. Spreading new types of music and acting other than the traditional ones. As important as art is to a nation the fundamentals of music and drama are properly oriented which is why it was important to set a base for it using this college.

1.5 The Need for the Project

- The lack of a college building with the required specifications.
- Developing the desire to learn the musical and theatrical arts thanks to availability of a suitable environment.
- Introducing different types of music and performing arts to the students and thus to the country.
- Building an integrated facility that provides all the needs of learners in this field, due to the current dispersion in the ways and places of learning.

1.6 Project Goals

- Developing the student's artistic talents.
- Providing the students with the proper environment.

- Reaching a design that serves all required functions without any complications while using reasonable expenses.
- Designing a building using advanced structural and architectural methods that keep up with the current and future development.

1.7 Project Challenges

- **FUNCTIONAL CHALLENGE:** Combining noise producing spaces with ones that need quite.
- **STRUCTURAL CHALLENGE:** Using multiple construction systems to suit the different activities in the project.
- **ECONOMICAL CHALLENGE:** Maintaining a reasonable economical cost
- **AESTHETIC CHALLENGE:** Reflecting what the college produces of audile and visual arts.

CHAPTRE TWO

2. Chapter Two

2.1 Introduction

Music and drama have many similarities and complement each other ,each of these arts create their own way in touching people's hearts , while music charms the hearing the acting charms the vision and together they form an integral piece of art.

2.2 Design considerations

2.2.1 For location

- The college should be easy to reach.
- The area must be compatible with all the activities in the building.
- Considering the nature of the earth and how to deal with it.
- The nature of the surroundings of the site.

2.2.2 For building

- Separating between noise producing activities from the quiet ones.
- Arranging between buildings with different activities so as to create. Minimal amount of intersections between different categories of users.
- The movement between the teacher’s offices and the classrooms should be easy while considering the teachers privacy.
- Visual isolation between theater users and the rest of the college departments.
- Placing the services in a central area that can be easily reached, while distributing separate units in the different parts of the building.

2.3 About music

2.3.1 History of music

Music is found in every known culture, past and present, varying widely between times and places. Since all people of the world, including the most isolated tribal groups, have a form of music, it may be concluded that music is likely to have been present in the ancestral population prior to the dispersal of humans around the world. Consequently, music may have been in existence for at least 55,000 years and the first music may have been invented in Africa and then evolved to become a fundamental constituent of human life

.

Figure 2.1

A culture's music is influenced by all other aspects of that culture, including social and economic organization and experience, climate, and access to technology. The emotions and ideas that music expresses, the situations in which music is played and listened to, and the attitudes toward players and composers all vary between regions and periods.

2.3.2 Sudanese music

South Sudan has rich folk music that reflects the diverse cultures of the region. For example; the folk music of the Dinka people include poetry, while the Azande are known - beside many other traditions and beliefs for story telling that feature a good wizard figure prominently.

Figure 2.2

Due to the many years of the civil war, the culture is heavily influenced by the countries neighboring South Sudan. Many South Sudanese fled to Ethiopia, Kenya and Uganda where they interacted with the nationals and learnt their languages and culture. For most of those who remained in the country, or went north to Sudan and Egypt, they greatly assimilated Arabic culture.

Figure 2.3

Since Sudan lives in it all these groups have artistic output the music is varied and multi-musical. A brief summary can be given as follows:

Northern Sudan: The region is dominated by turbines, drums.

West Sudan: They use the drums of the press, Al-Rababah, Um Berri. Etc.

Eastern Sudan: Region it's famous for Al-Rababa, which is called Pasnkop or Messenger.

South Nile: Their environment is dominated by Al-Rababah, which they call Abanqrang, Balochoro, Blongroo and others.

2.3.3 Classical music

The major time divisions of classical music up to 1900 are the early music period, which includes Medieval (500–1400) and Renaissance (1400–1600) eras, and the Common practice period, which includes the Baroque (1600–1750), Classical (1750–1820) and Romantic (1810–1910) eras. Since 1900, classical periods have been reckoned more by calendar century than by particular stylistic movements that have become fragmented and difficult to define.[citation needed] The 20th century calendar period (1901–2000) includes most of the early modern musical era (1890–1930), the entire high modern (mid 20th-century), and the first 25 years of the contemporary (1945 or 1975–current) or postmodern musical era (1930–current). The 21st century has so far been characterized by a continuation of the contemporary/postmodern musical era.

2.3.3.1 Instruments

The standard instrumental groups of Western chamber music include the string quartet (two violins, viola, and violoncello), the woodwind quintet (flute, oboe, clarinet, horn, and bassoon), the combinations employed in sonatas (one wind or stringed instrument with piano), and the brass quintet (frequently two trumpets, horn, trombone, and tuba). In addition to these standard groups there are, however, hundreds of other possible combinations.

Figure 2.4

2.4 About drama

2.4.1 History of acting

- As we talk about acting history, the art of acting has evolved in many ways over its lifetime and continues to evolve to this day. Acting first originated in Greece in the 6th century BC with the Greek tragic actor Thespis being widely regarded as the founder of the profession. This is why, to this day, actors are often referred to as thespians.

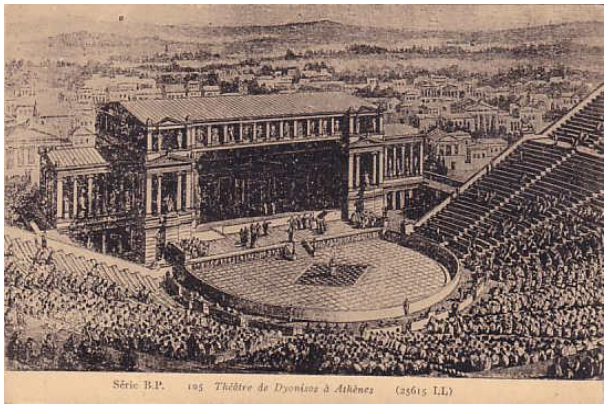


Figure 2.5 Middle Ages Theater

- Aristotle, the Greek philosopher, defined acting as 'the right management of the voice to express various emotions ' and declared it to be a natural talent that was innate and could not be taught.
- There are a few ancient Greek plays by Aeschylus, Euripides and Sophocles that survived all acting history and are still performed in the theatres.

2.4.2 Sudanese theater

Sudan known abroad more for decades of violent conflict and a brutal counter has a long history of theater that ranges from ancient folk drama to contemporary plays that delve into politics and comedy.

Figure 1 Sudanese Theater

2.5 College departments

2.5.1 Theoretical department

Arabic Language , English Language , History of Sudanese Music , History of Arabic Music , Music of Arab heritage , Analysis and criticism of music , Science of tools , watching and listening , Chorus , History of music , Principles of analysis and criticism , Contradiction of phonetics , Theories of Arabic Music , Art Aesthetics , Harmony , Singing , International Music Theories , Music psychology , History of International Music , Basics of acting , Acting techniques , Linguistics , Script analysis , Design and technical theater, Technical production , Technical Distribution .

2.5.2 Practical department

- Training of solo playing instruments: drums, drums, keyboards, inflatable machines.
- Training for group playing instruments: band playing - playing the orchestra.
- Solo acting training: solo performances.
- Group acting training.
- Solo Singing Training: Solo - Singing Theater.
- Group singing training: band – choir.
- Technical production.
- Technical Distribution.

2.6 Similar projects

2.6.1 Local Project

- **COLLEGE OF MUSIC AND DRAMA , SUDAN UNIVERSITY**
- Location : Alhila aljdeda , Khartoum , Sudan
- AREA : 15,200 m2
- It’s the first colleges in the field of music and drama art in Sudan and its one of the leading colleges in the field at the Arabian and African level.

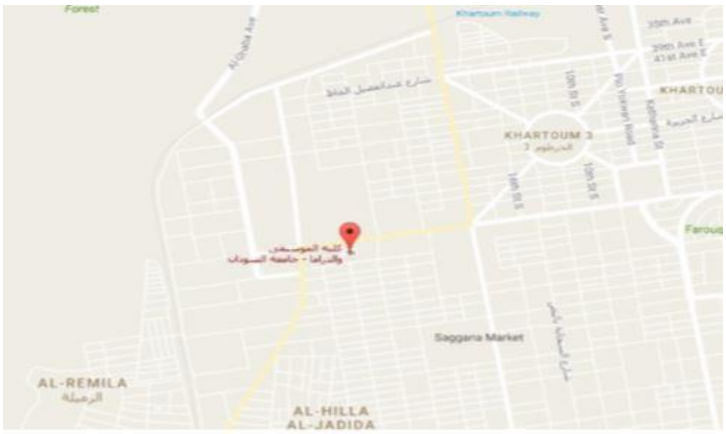


Figure 2.7 College Location

Figure 2.8 College Site

- College buildings :
  - Management building: a two story building containing offices and a 35 seats conference hall.
  - College Theater: it's where the students theatrical and musical works are presented, it contains 700 seats.

Figure 2.9

- Class rooms: there are two rows with total of seven classrooms which are used in both theoretical and practical classes by gathering the furniture in a corner of the classroom.
- Solo practice room : 3*5 m^2 with a piano for each room , there are 7 rooms
- Corral room :4*5 m^2
- Services: bathrooms, resting area, prayer.
  - One story rectangular buildings which are randomly distributed including: Sudanese music hall, reading library, acoustic library, computer laboratory, radio & television studio, conference hall and theater technical workshop.

Figure 2.10 College Theater

- teaching system :
  - Theoretical subjects: Arabic, English, History, Philosophy, Islamic culture.
  - Practical subjects: through the interviews held at the beginning the students are classified to: Acting, instruments, singing.
- Number of students :
  - Music department : 25 student per a class.
  - Drama department : 45 student per a class .

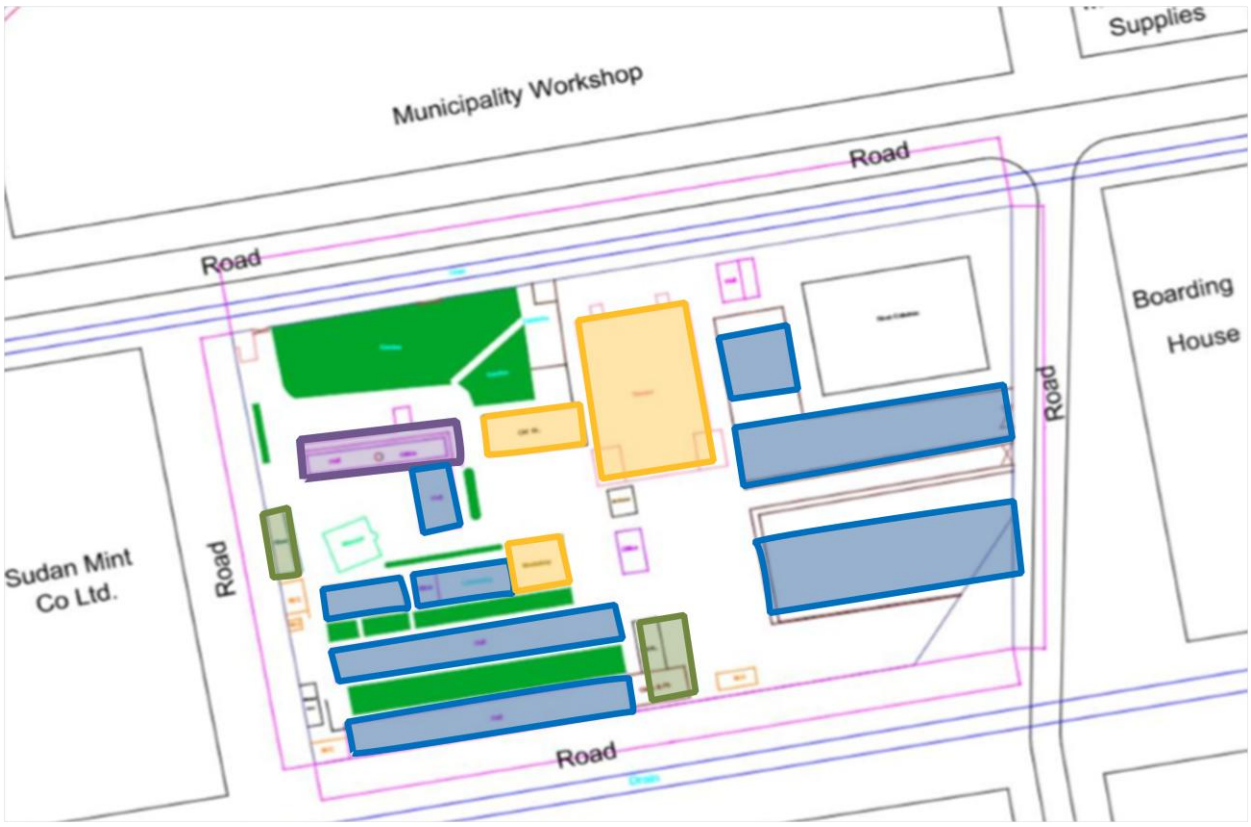


Figure 2.11 College Site

- **Advantages:**
  - It’s located in a central area which is easy to reach.
  - There are multiple training rooms which are sufficient for the users
  - The theater seats are movable which makes it flexible for multiple numberings.
- **Disadvantages** :
  - the building weren't designed according to the standard for musical and theatrical activities.

2.6.2 ROYAL WELSH COLLEGE OF MUSIC AND DRAMA :

- Location : Cardiff , Wales , UK
- Area : 4400.0 m2
- The design focuses on the core of the college community , namely acoustic learning spaces while giving theatrical activities less attention .
- The college consists of three new buildings and a renovated existing structure.

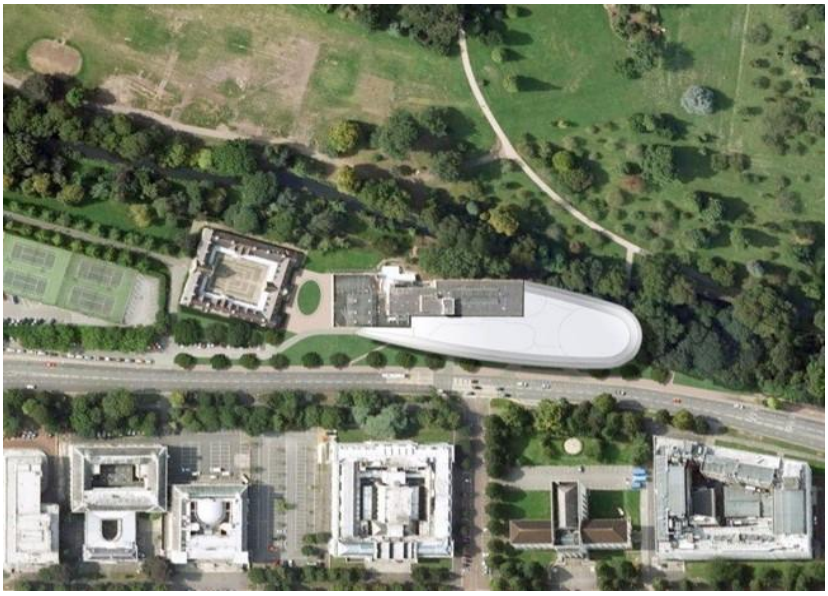


Figure 2.12 College Site

Figure 2.13 Interior View Of The Concert Hall

Figure 2.14 Exterior View Of The Concert Hall

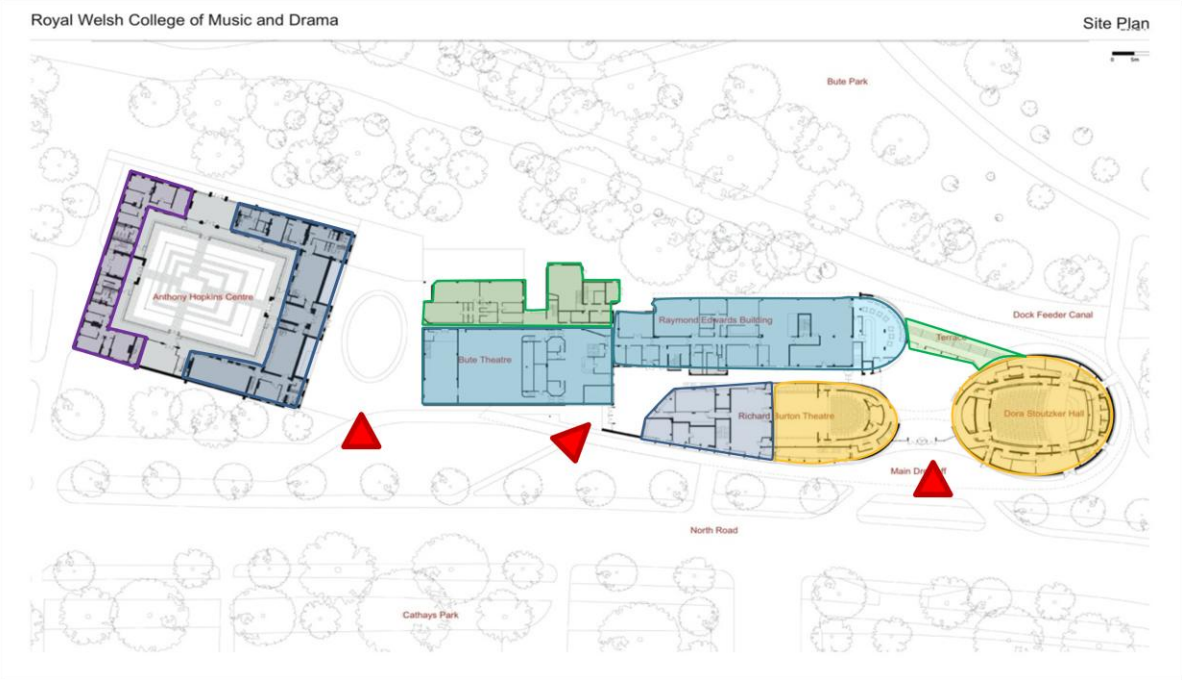


Figure 2.15 Master Plan

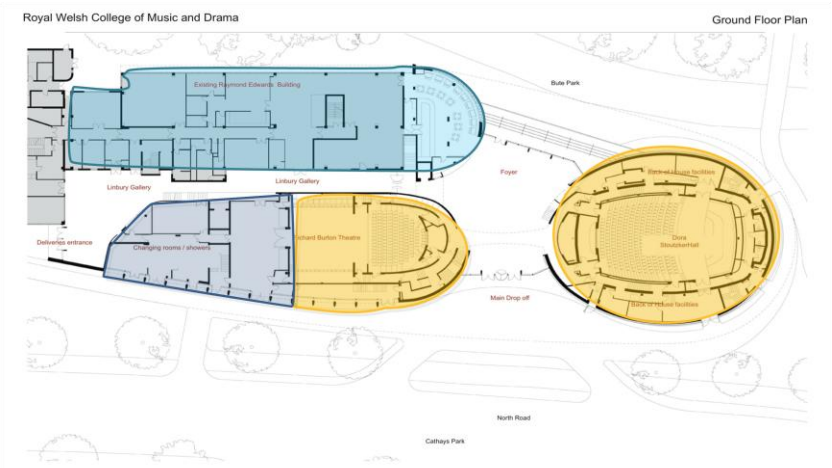


Figure 2.16 Ground Floor Plan

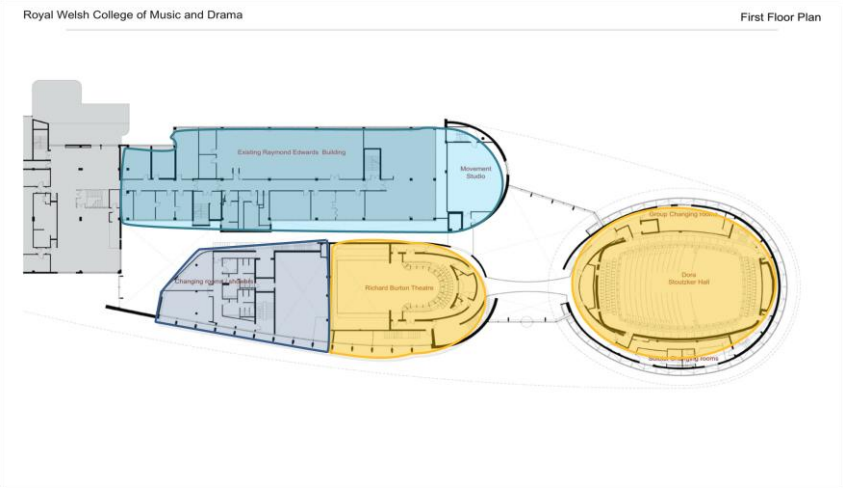


Figure 2.17 First Floor Plans

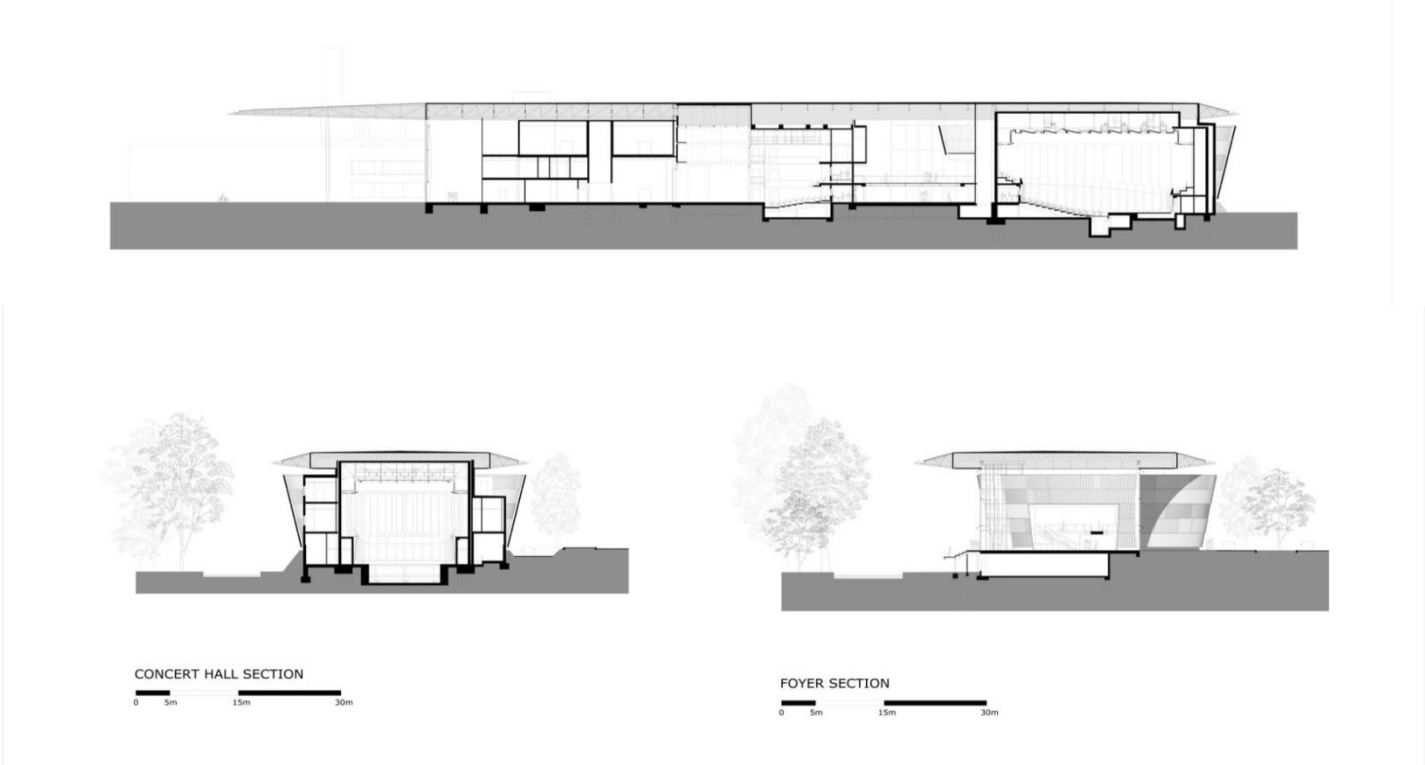


Figure 2.18 Sections

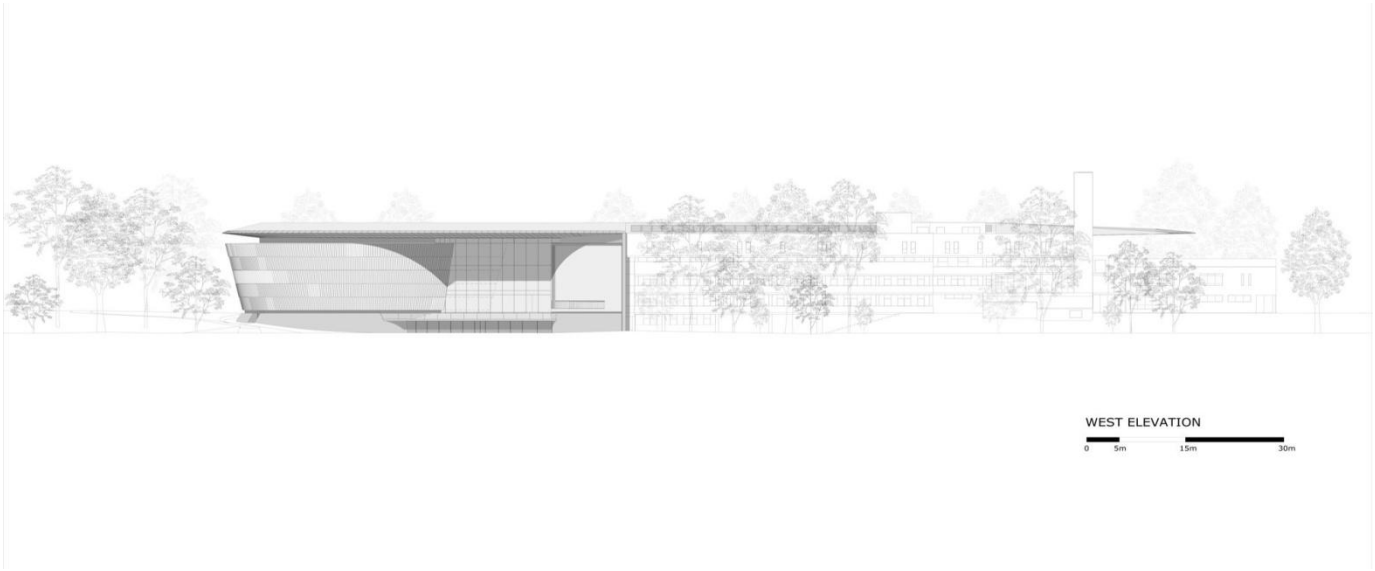


Figure 2.19 West Elevation

- **Advantages:**
  - There is a forest on northern side with provides fresh air and beautiful view
  - The theater is in a central area where it can be used for concerts and training as well.
  - Making use of the old college buildings and successfully merging them with the new ones.
  - The concert hall finishing on the interior and the exterior is compatible and highly luxurious, which makes it a great choice for the local area's events.
- **Disadvantages**:
  - The connection is uncoordinated with the buildings shapes.
  - The buildings are distributed along the site which makes hard to get from one side to the other.

2.6.3 Wenatchee Valley Colege Of Music & Art:

- Location : 1300 5th street , Wenatchee , WA 98801 , USA .
- Area : 8850 m^2 .
- This music and art center was designed on bases of the greatest challenge which was separating the art and music wings (because of unique program needs and diverse system requirements) while preserving the prized setting

Figure 2.20 College Entrance

Figure 2.21 college view

Figure 2.22 college view

- The center was thoughtfully designed to reflect the programs housed within .
- Sustainable design was not a high priority but eventually it resulted in an energy efficient building.

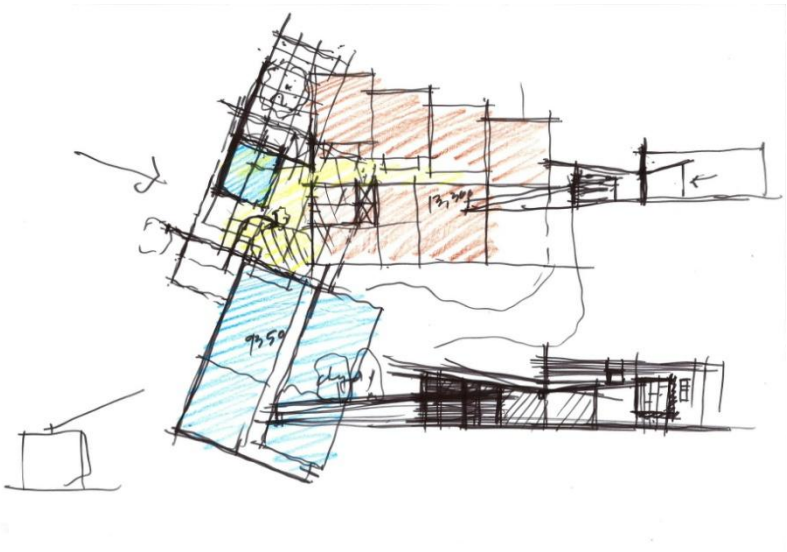


Figure 2.23

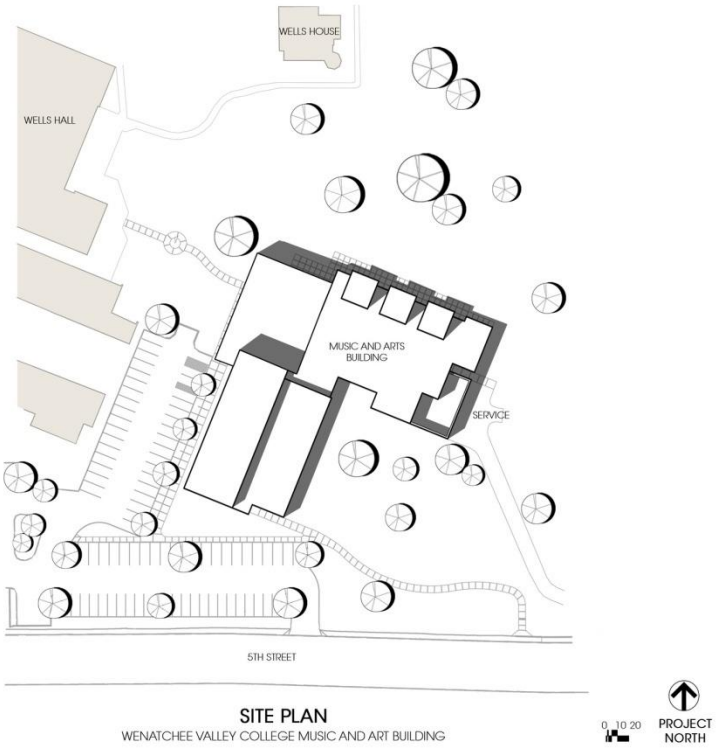


Figure 2.24 Site Plan

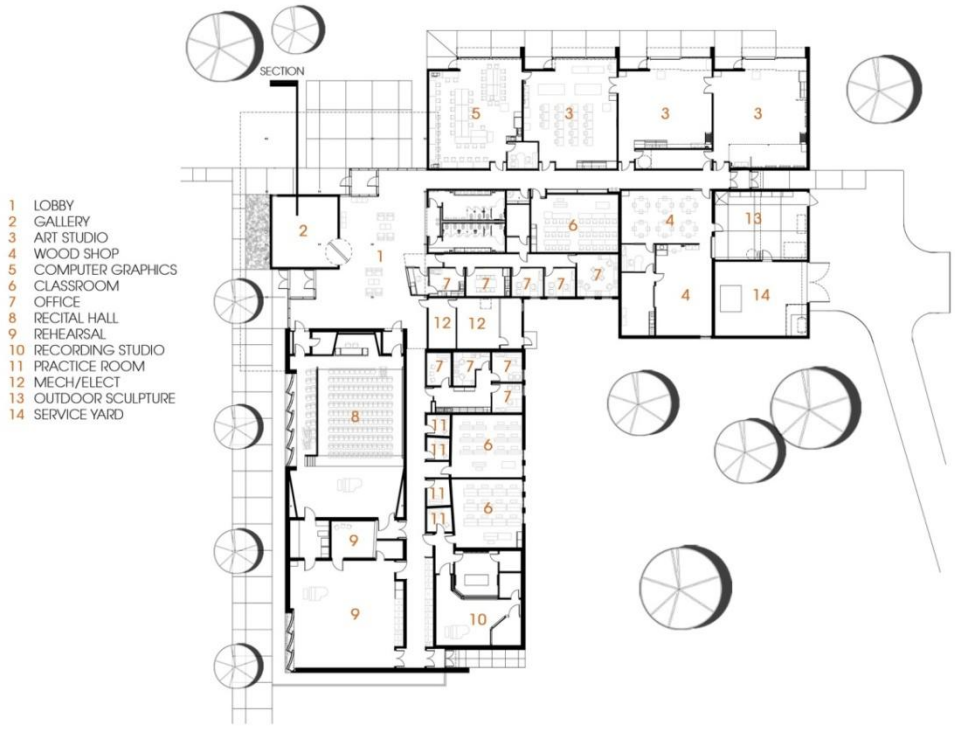


Figure 2.25 Ground Floor Plan

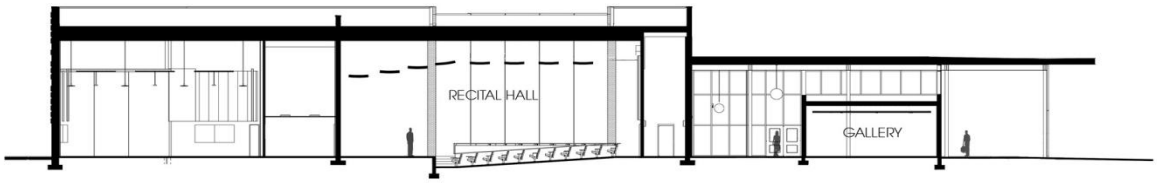
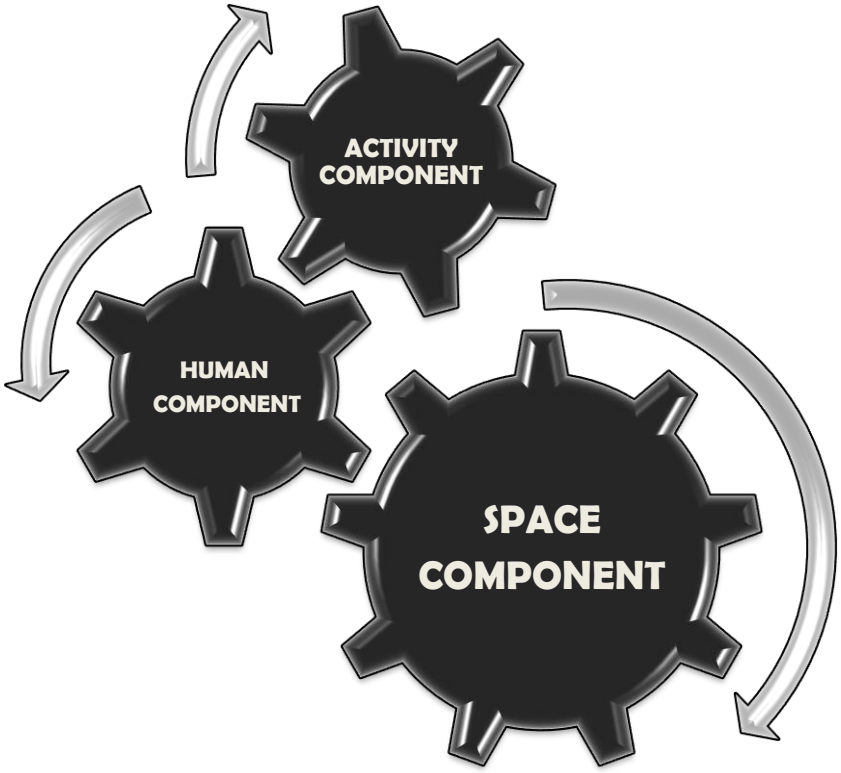


Figure 2.26 Section

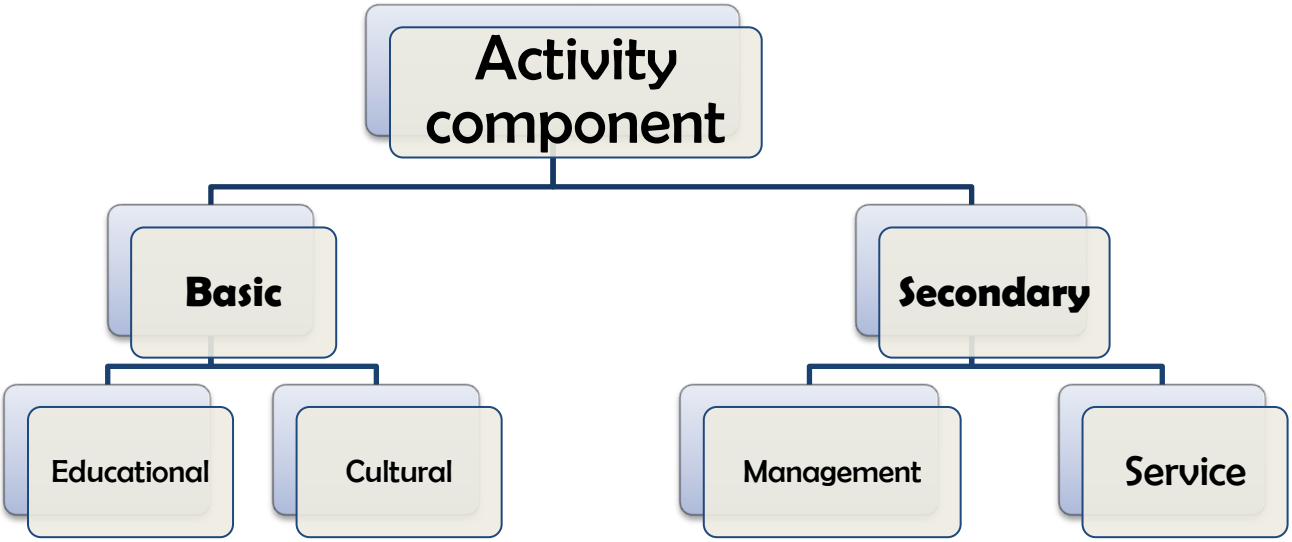
- **Advantages** :
  - The building uses sustainable techniques .
  - The design of the building achieved the essential need for seperating the music and art departments .
  - The buiding is located on the edge of a park which provides an excellent enviroment for the students , supporting their inspiration .
- **Disadvantages :**
  - There is no consideration of future expantion .
  - The elevations design focuses on the sustainable aspect while not reflecting the building's function .

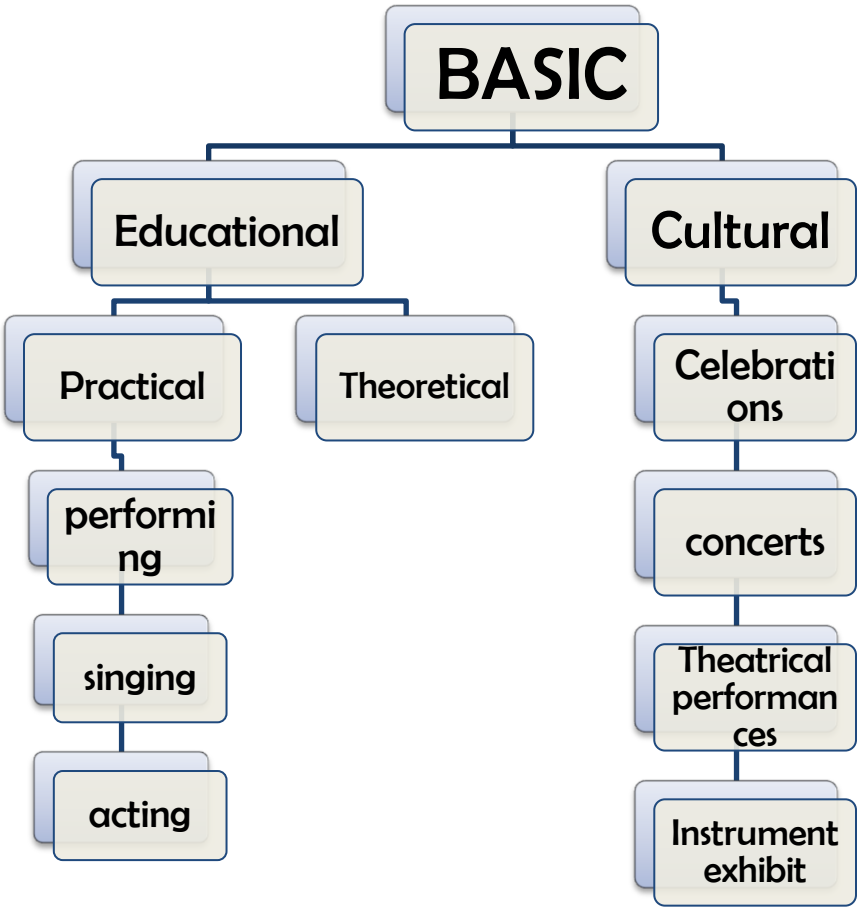
CHAPTER THREE

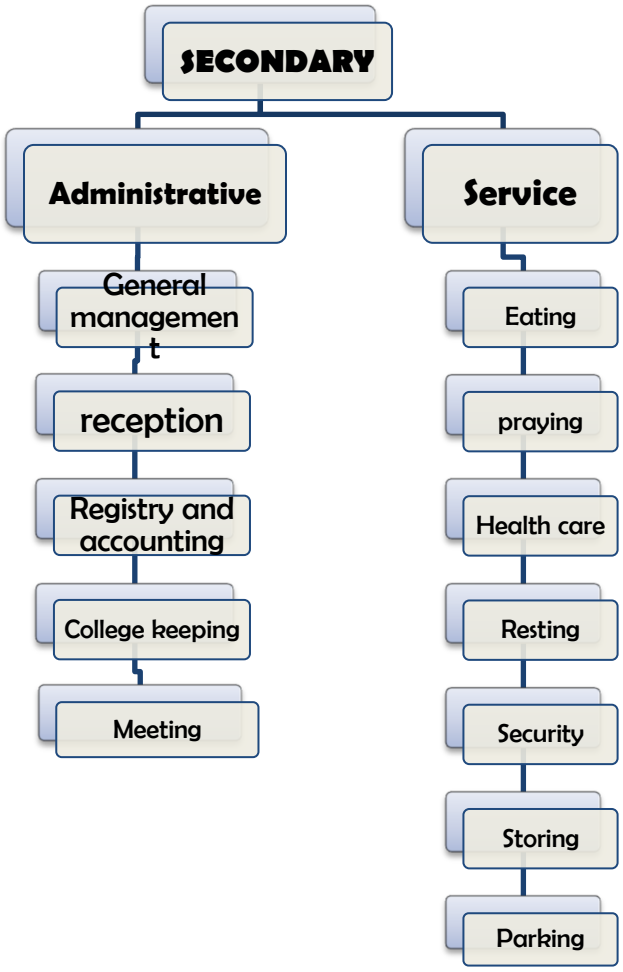
3. Components :



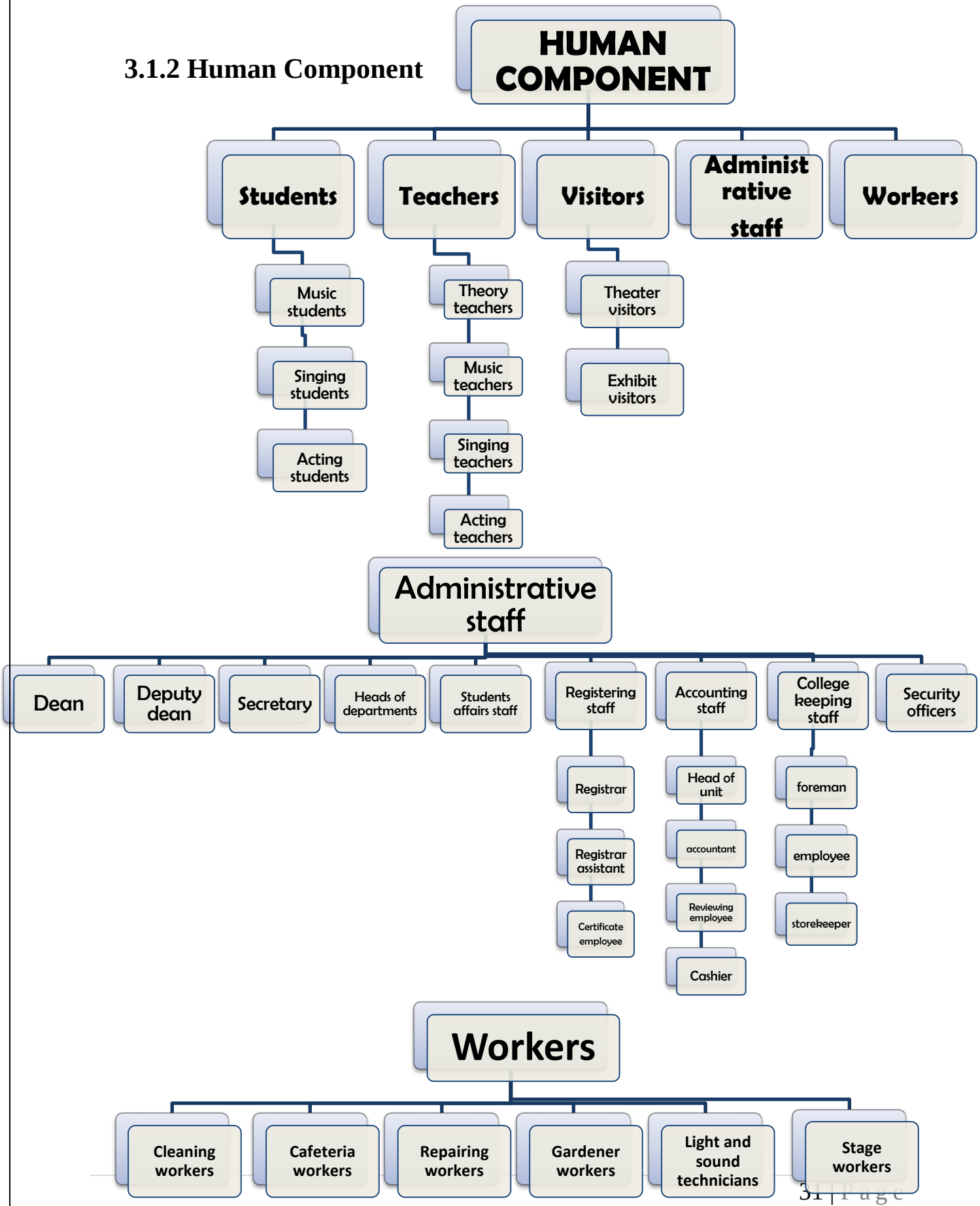
3.1.1 Activity Component



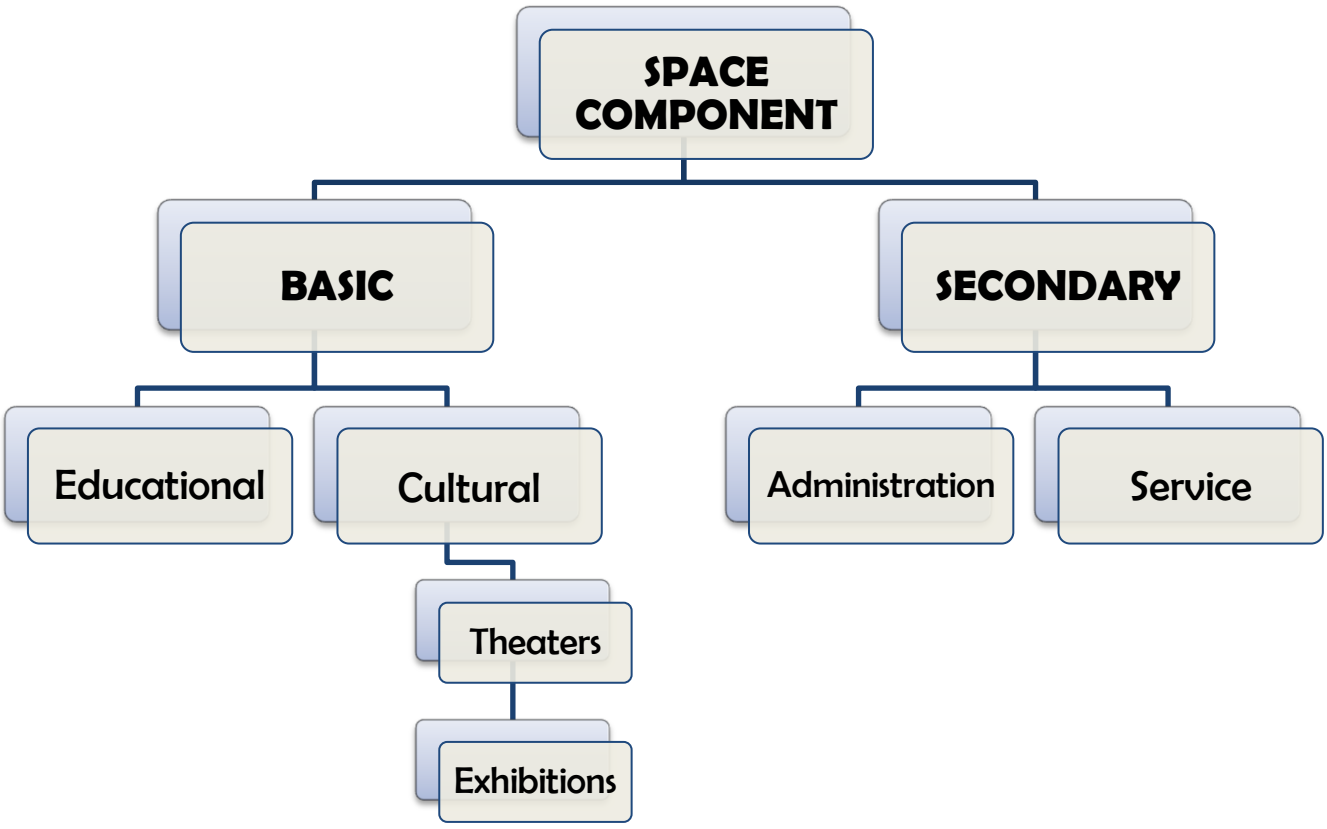


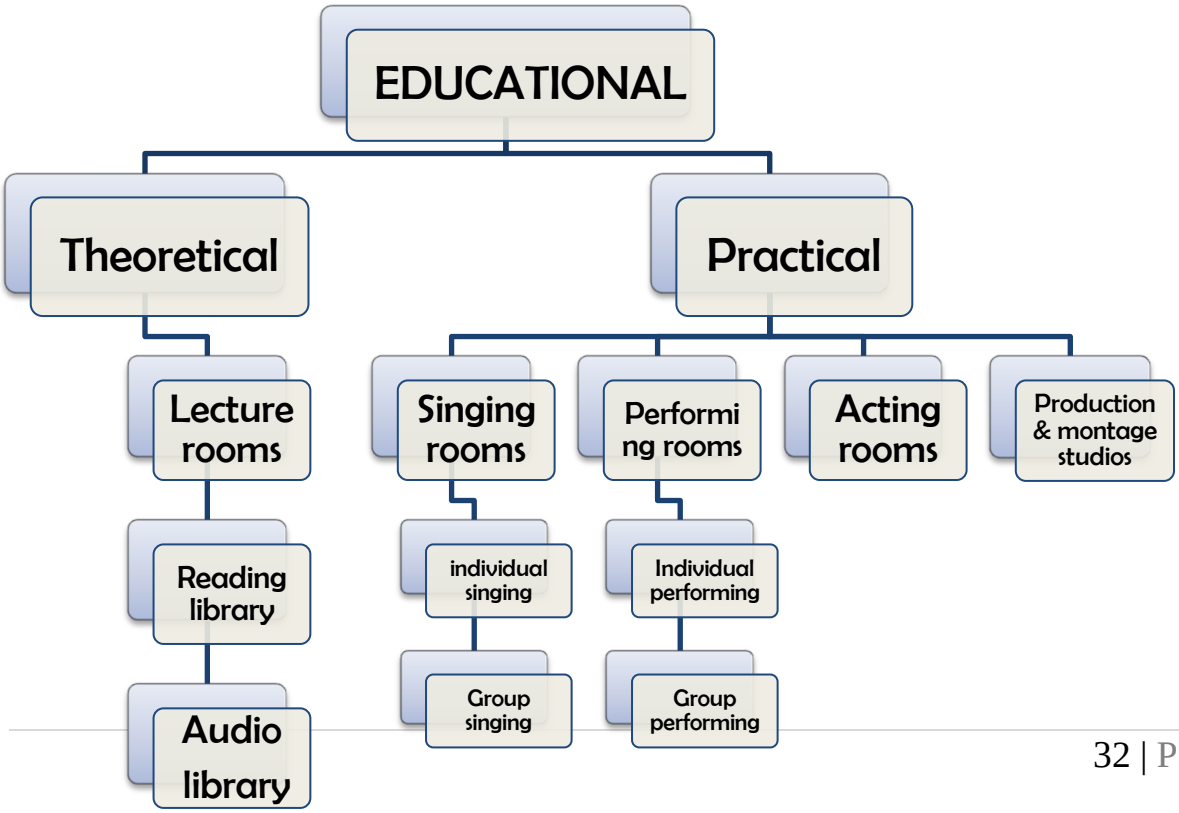

SECONDARY
Administrative
Service
General management
reception
Registry and accounting
College keeping
Meeting
Eating
praying
Health care
Resting
Security
Storing
Parking

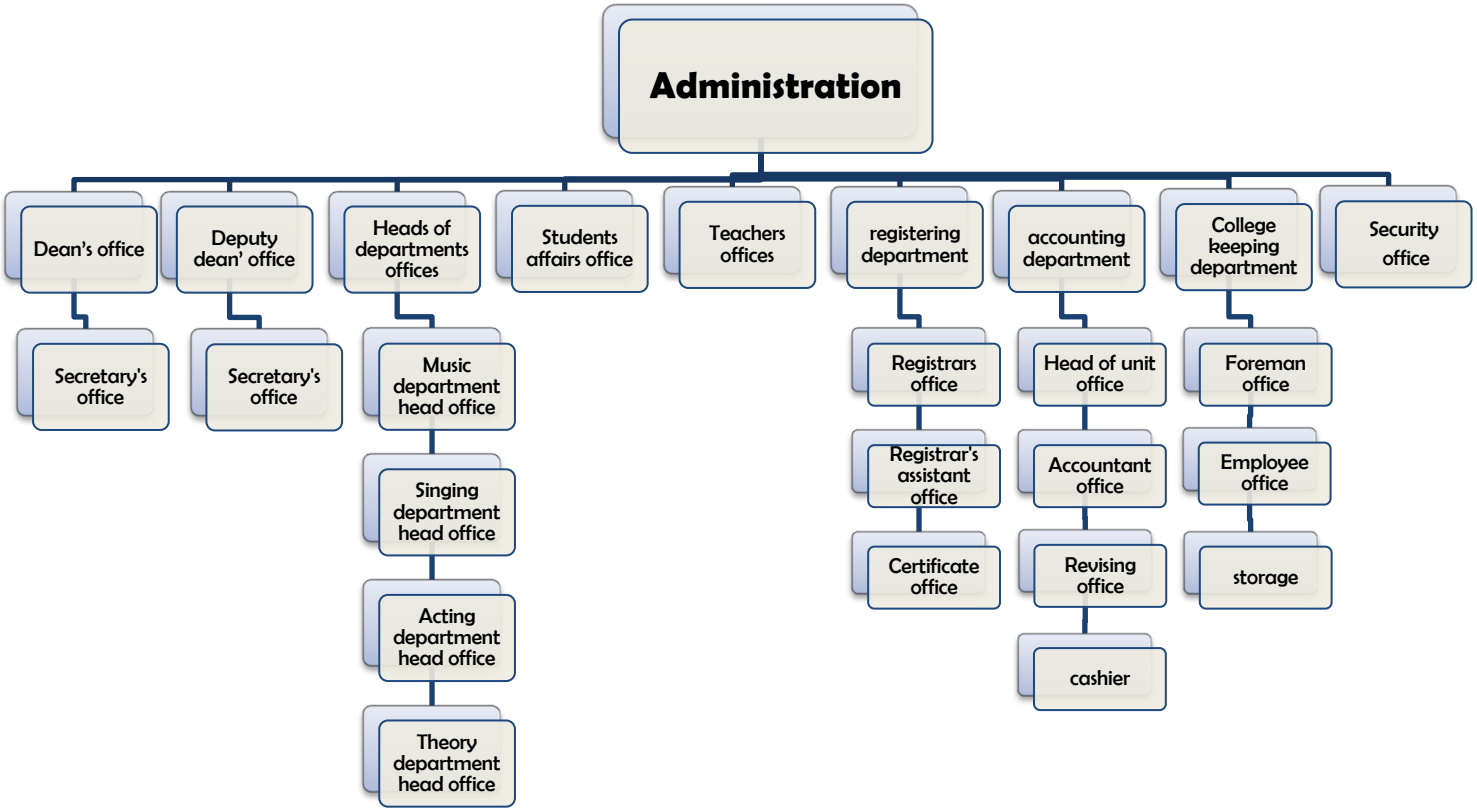
3.1.2 Human Component

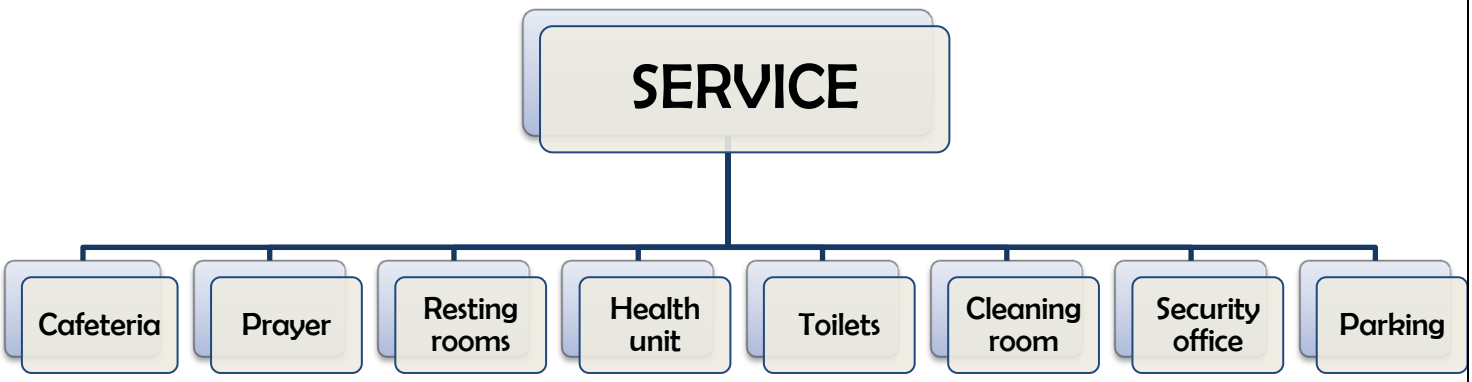


3.1.3 Space Component






Administration
Dean's office
Deputy dean' office
Heads of departments offices
Students affairs office
Teachers offices
registering department
accounting department
College keeping department
Security office
Secretary's office
Secretary's office
Music department head office
Singing department head office
Acting department head office
Theory department head office
Registrars office
Registrar's assistant office
Certificate office
Head of unit office
Accountant office
Revising office
cashier
Foreman office
Employee office
storage


SERVICE
Cafeteria
Prayer
Resting rooms
Health unit
Toilets
Cleaning room
Security office
Parking

3.2 Space Study

3.2.1 Solo Practice Room

- Area : 4*3.6 = 14.4 m^2
- There is a piano in every room for tuning
- The room is sound proof .

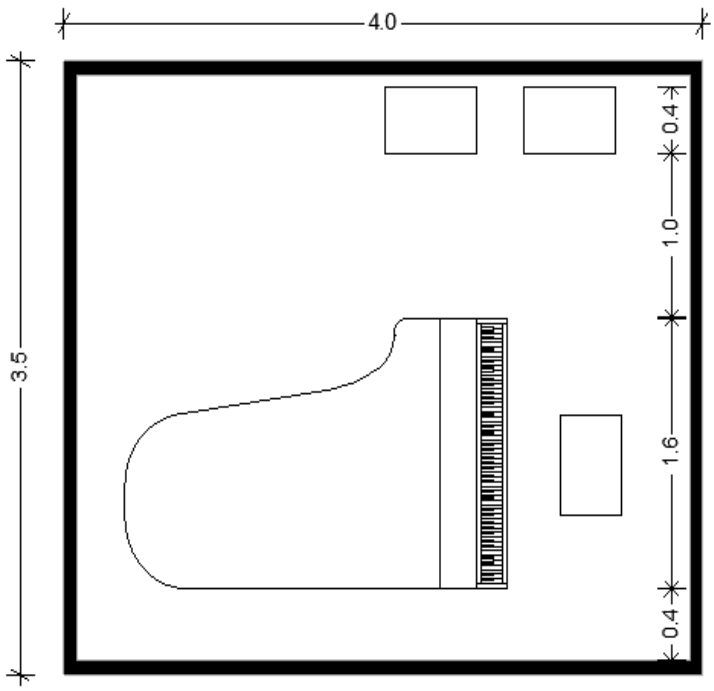


Figure 3.1 solo practice room plan

- Wall layers for a practice rom

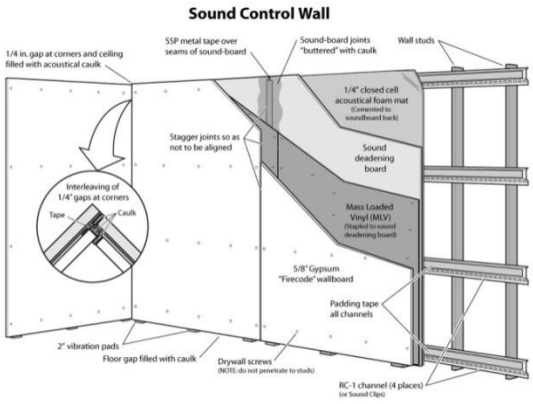


Figure3.2

View for a practice room.

Figure 3.3

3.3 Class rooms

- Area 6.6 * 8.4 = 55.44 m^2.
- A class room has about 36 seats in a maximum estimation.

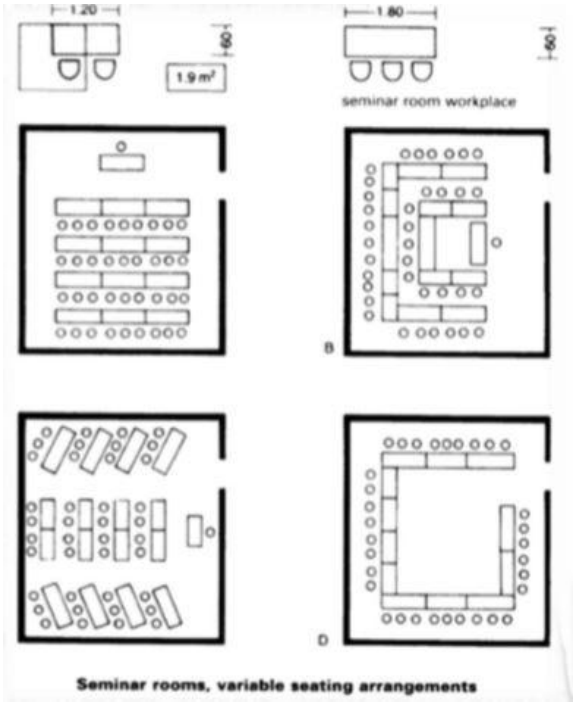
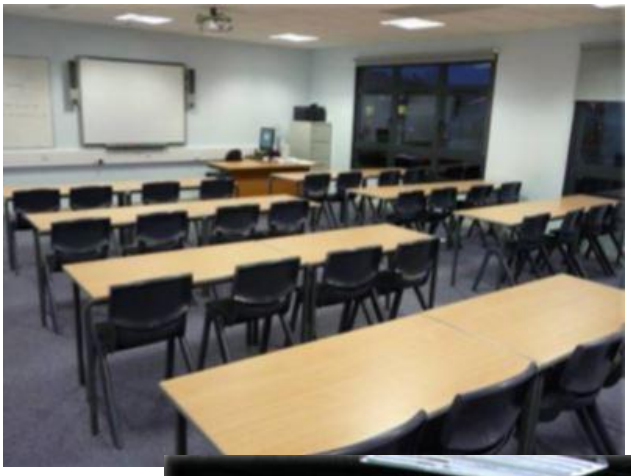


Figure 3.4



Examples of classrooms settings

Figure 3.5

Figure 3.6

1.1.1

3.3.1 Theater

- Number of users 500
- person's space = 1.40 m^2
- Area 500 * 1.40 = 700 m^2

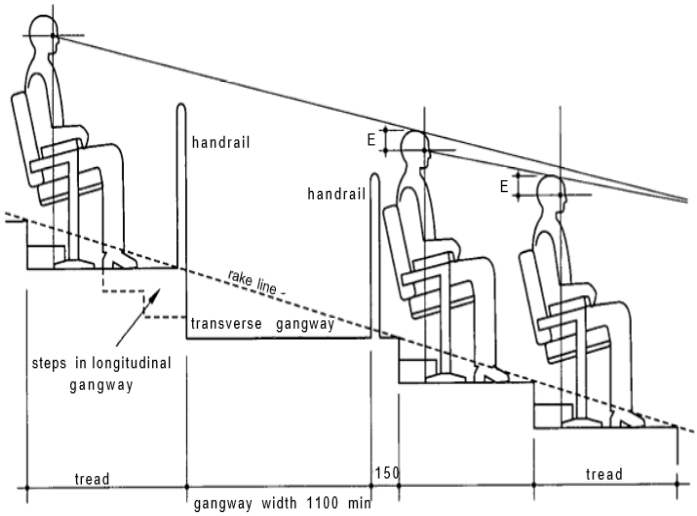


Figure 3.7

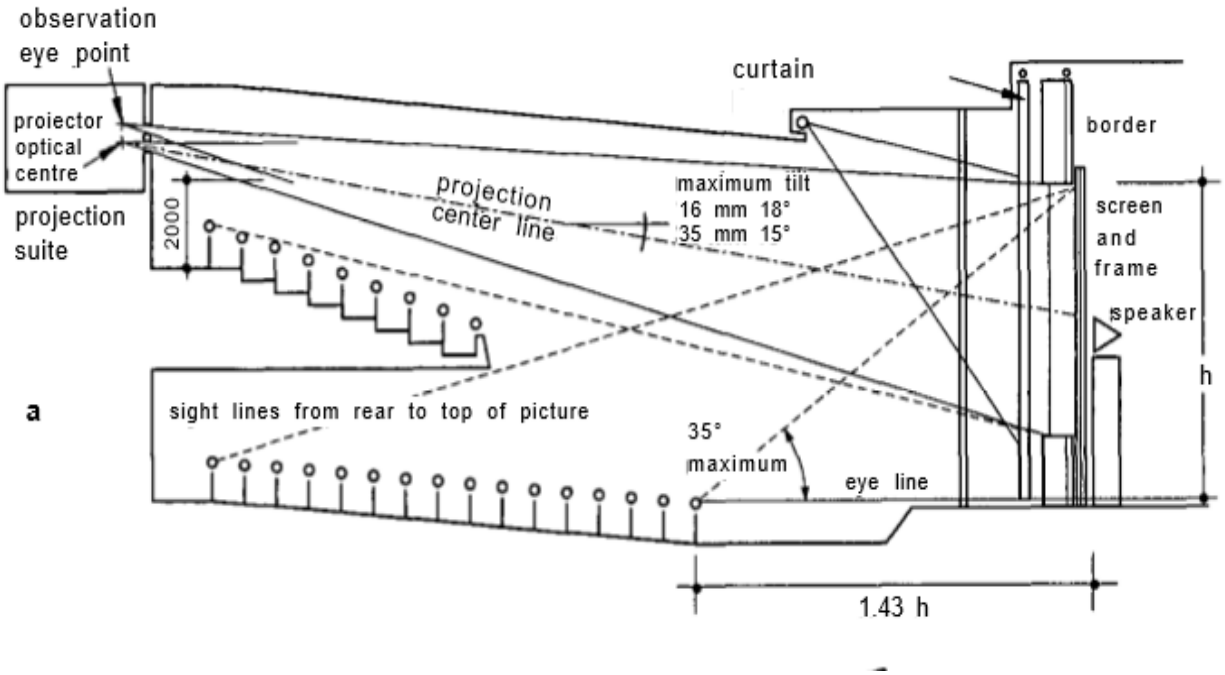


Figure 3.8

3.3.2

3.3.3 Library

- Person's area 2.60 m^2
- Total area 2.60 * 60 = 156m^2

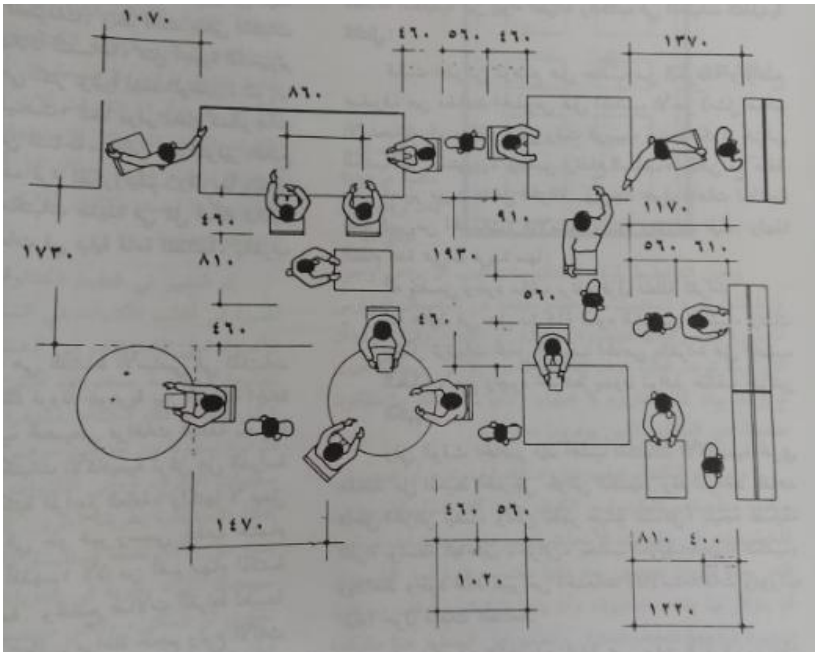
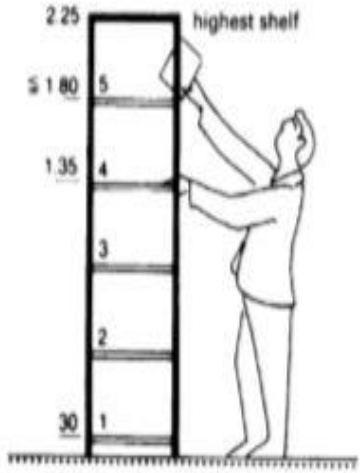
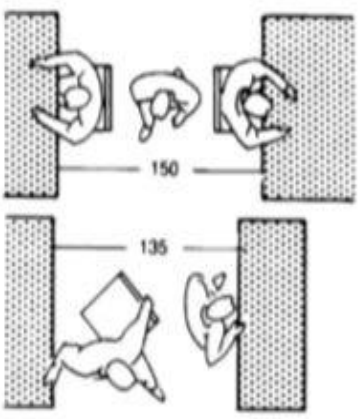
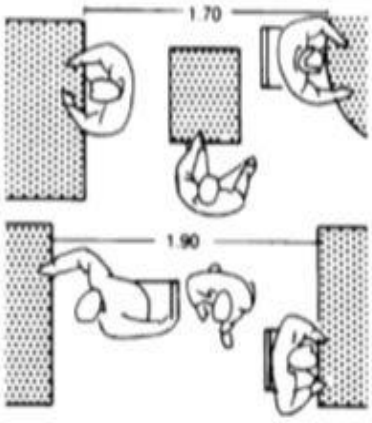


Figure 3.9





8 Minimum free space in reading area → 9



9 When books are moved between seated and standing users

(A) **(B)**

Figure 3.10 (A), (B)

Figure 3.11

3.4 Activities & Spaces Tables

3.4.1 Educational activities:

ACTIVITY	NO. OF USERS	PERSON'S AREA (m2)	Functional requirement	Space name	Space area (m2)	No. of spaces	Total area (m2)
Theory teaching	40	1.5	Teacher's table +seats + desks +board	Lecture room	60	6	360
Teaching music	40	2	Piano+ instrument+ table+ chair	music room	80	4	320
Teaching singing	20	1.5	Piano + seats	Singing room	30	4	120
Performing training	2	-	Instrument + chairs + mirror	Training room	15	40	600
Teaching acting	40	1.5	Cupboards+ seats+ mirrors	Acting room	60	4	240
Acting training	1 - 40	-	Cupboard + chair + table	Acting training	60	10	600

				room			
Reading	60	.9	Tables + seats + c cupboard	Library	54	1	54
Listening	60	.9	Seats + tables + DVD + cupboards	Music library	54	1	54
							2348

Table 1 Educational Activities

3.4.2 Cultural Activities :

Activity	NO. of users	PERSON'S AREA	Functional requirement	Space name	Space area (m2)	No. of spaces	Total area (m2)
Watching	700	1.5	Seats + sound systems	Theater hall	1050	1	1050
Performing	-	-	Lights + curtains	Stage	60	1	60
Equipment control	5	2	Tables + computers	Control room	12	1	12
Preparation	12	1.5	cupboard + seats + mirrors	Changing rooms	25	3	75
Ticket reserving	2	-	Locker + safe + seat + table	Ticket booth	12	1	12
reception	-	-	Table + seats	Reception hall	35	1	35
External watching	1000	1.5	Seats + stage	Outdoor theater	1500	1	1500
Exhibit	400	-	Tables	Exhibition	650	1	480

Multiple activities	500	-	-	Multi purpose hall	750	1	750
							3974

Table 2 Cultural Activates

3.4.3 Administrative activities :

Activity	NO. of users	Person's area (m2)	Functional requirement	Space name	Space area (m2)	No. of spaces	Total area (m2)
Management	1	-	Chairs + cupboard + desk+ couches	Dean's office	42	1	42
assistance	1	-	Desk + chairs + cupboard	Secretary's office	12	1	12
Lecture preparation	4	2.5	Cupboards + chairs + desks + drawers	Teachers office	30	8	240
Registering department	2	2.5	Cupboards + chairs + desks	Registrar's office	25	1	25
Students affairs	4	2.5	Cupboards + chairs + desks	Students affairs office	36	1	36
Accounting	5	2.5	Cupboards + chairs + desks	Accounting department	25	4	100
College keeping	4	-	Cupboards + chairs + desks	College keeping department	25	2	50

meeting	30	.9	Projector + table + chairs	Meeting room	36	1	36
							540

Table 3 Administrative Activities

3.4.4 Service activities :

Activity	NO. of users	Person's area (m2)	Functional requirement	Space name	Space area (m2)	No. of spaces	Total area (m2)
eating	60	1.2	Tables + chairs + counter + kitchen	Cafeteria	150	1	150
praying	60	1.8	Mats + shoes shelves	Prayer	120	1	120
Defecating	10	1.5	basin + toilet	Restroom	36	10	360
Resting	30	1.2	Couches + tables + shelves	Resting room	48	3	144
Cleaning	-	-	Locker + cleaning tools	Cleaning room	12	4	48
Storing	-	-	Cupboards + shelves	Storage	30	4	120
Security	2	2.5	Locker + desks + seats	Security office	12	3	36
Relief	-	-	landscape	Aisles + seats +	3000	-	4000

				grass			
parking	100	15	-	parking	1500	-	1500
							6478

Table 4 Service Activities

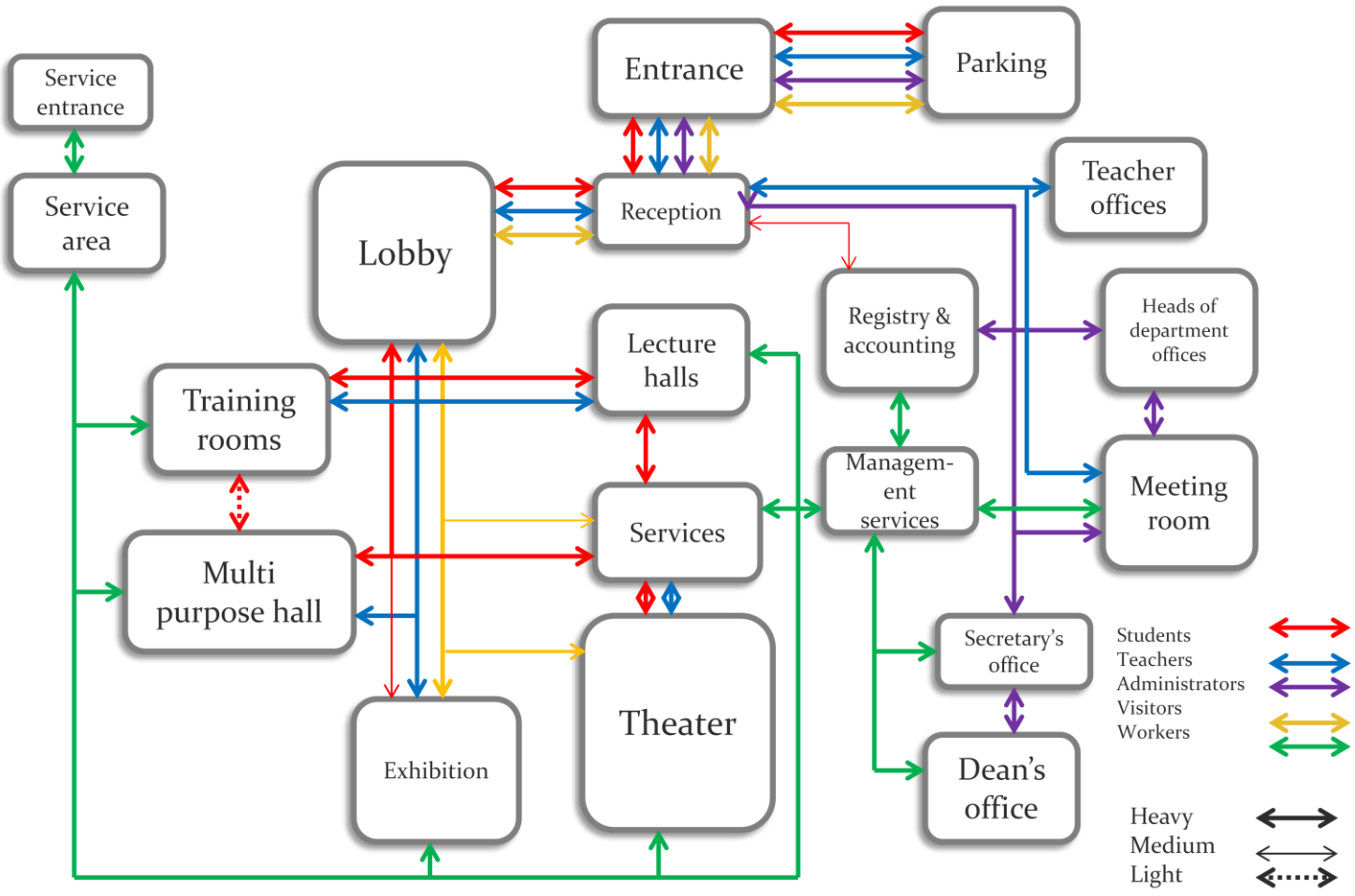
3.4.5 Spaces Table

DIVISION	AREA (m2)
EDUCATIONAL	2348
CULTURAL	3974
ADMINSTRATIVE	540
SERVICE	6478
MOVEMENT	4136
FUTURE EXPANTION	8738

TOTAL	27214

Table 5 Spaces Table

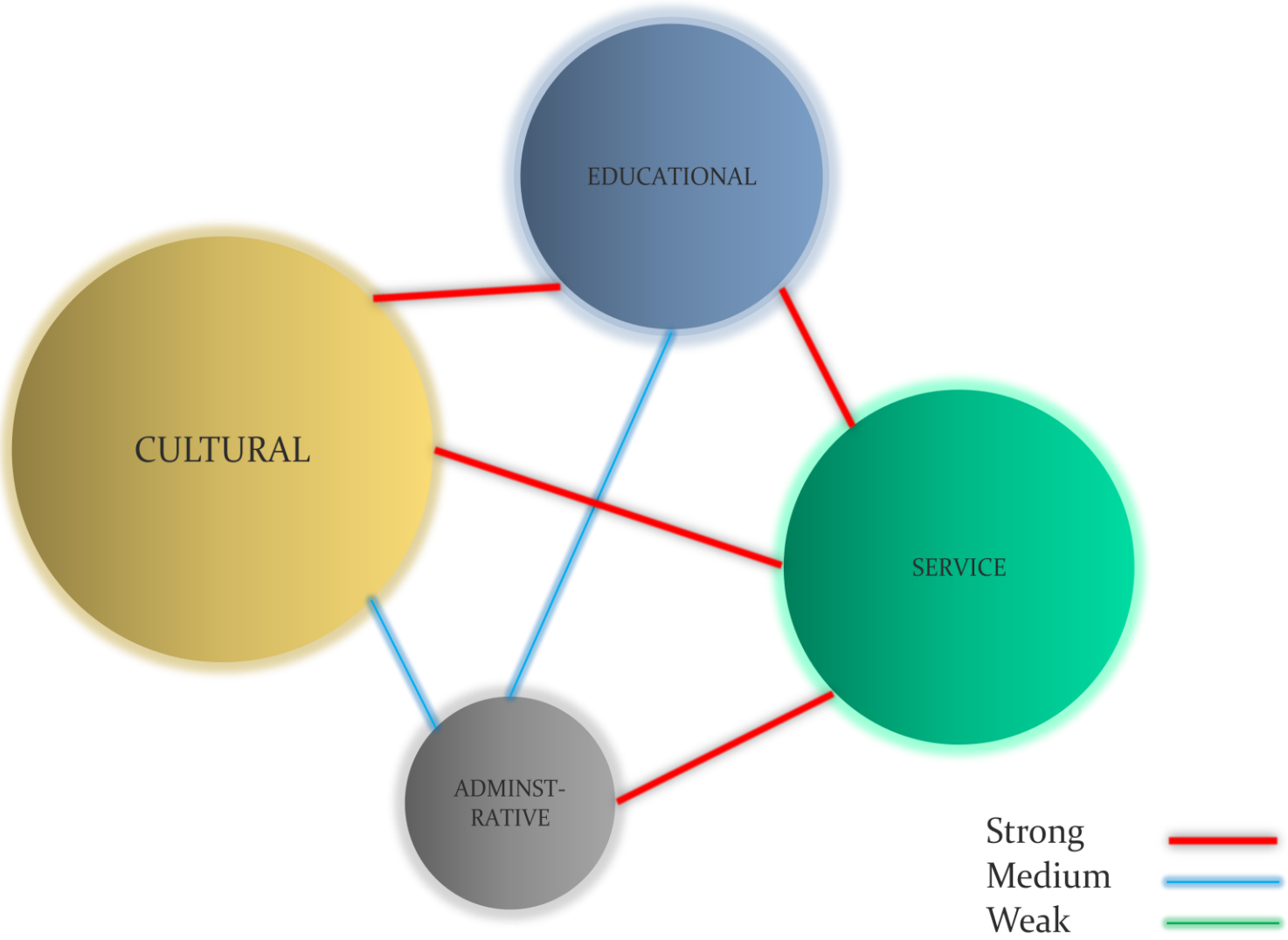
3.5 Movement diagram



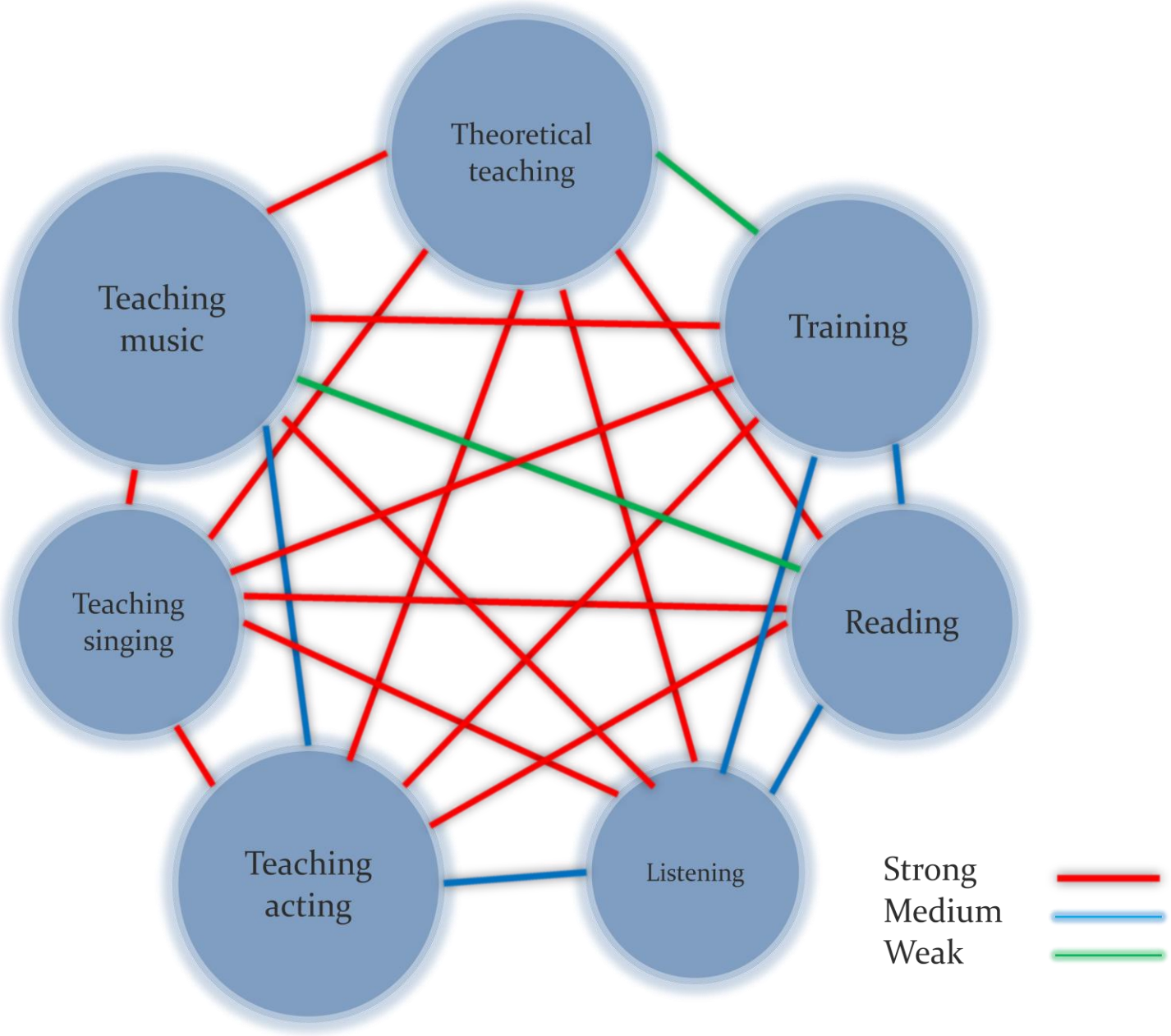
3.6 Functional Relations Diagram

3.6.1 Bubble diagram

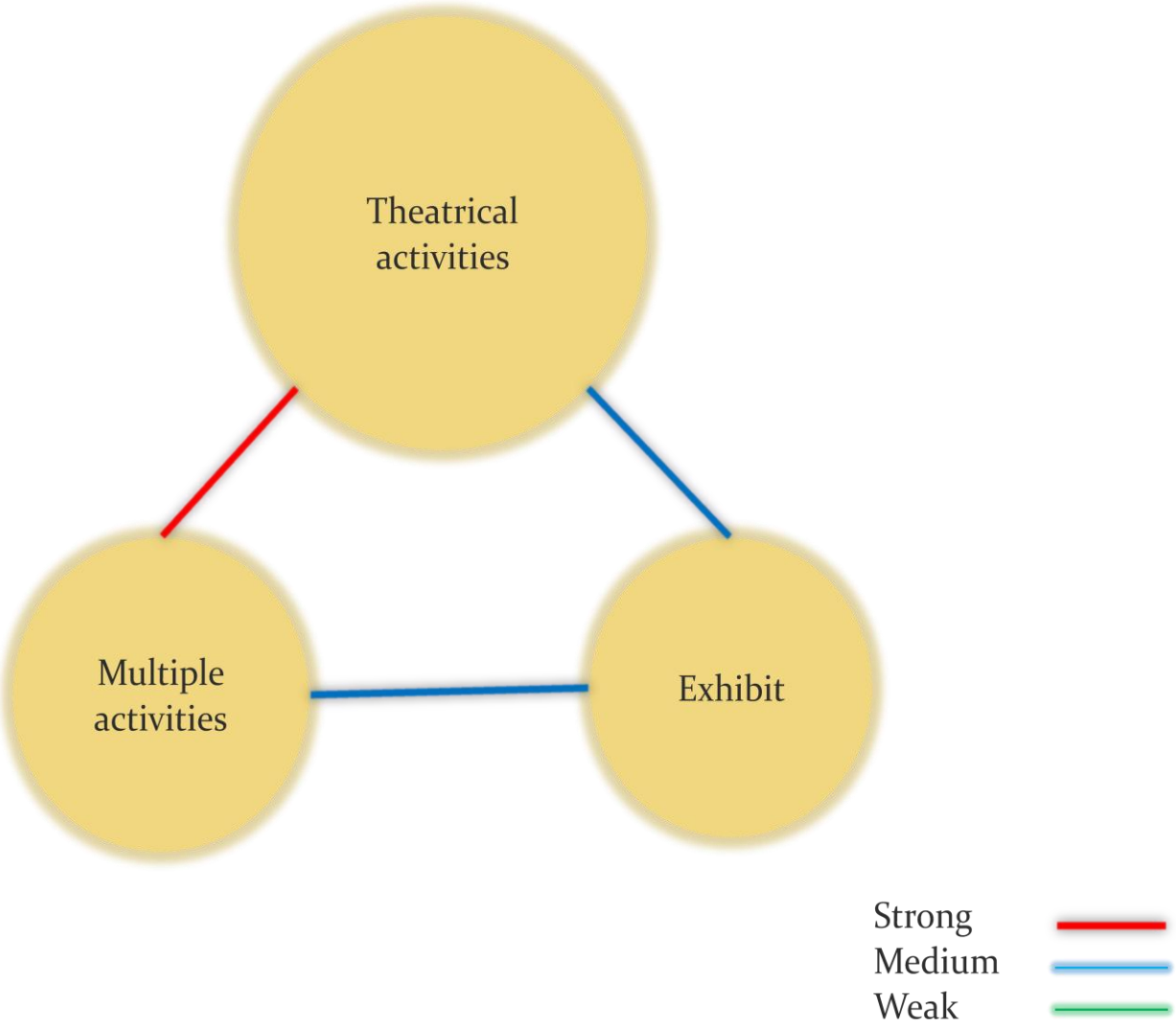
- General bubble diagram :



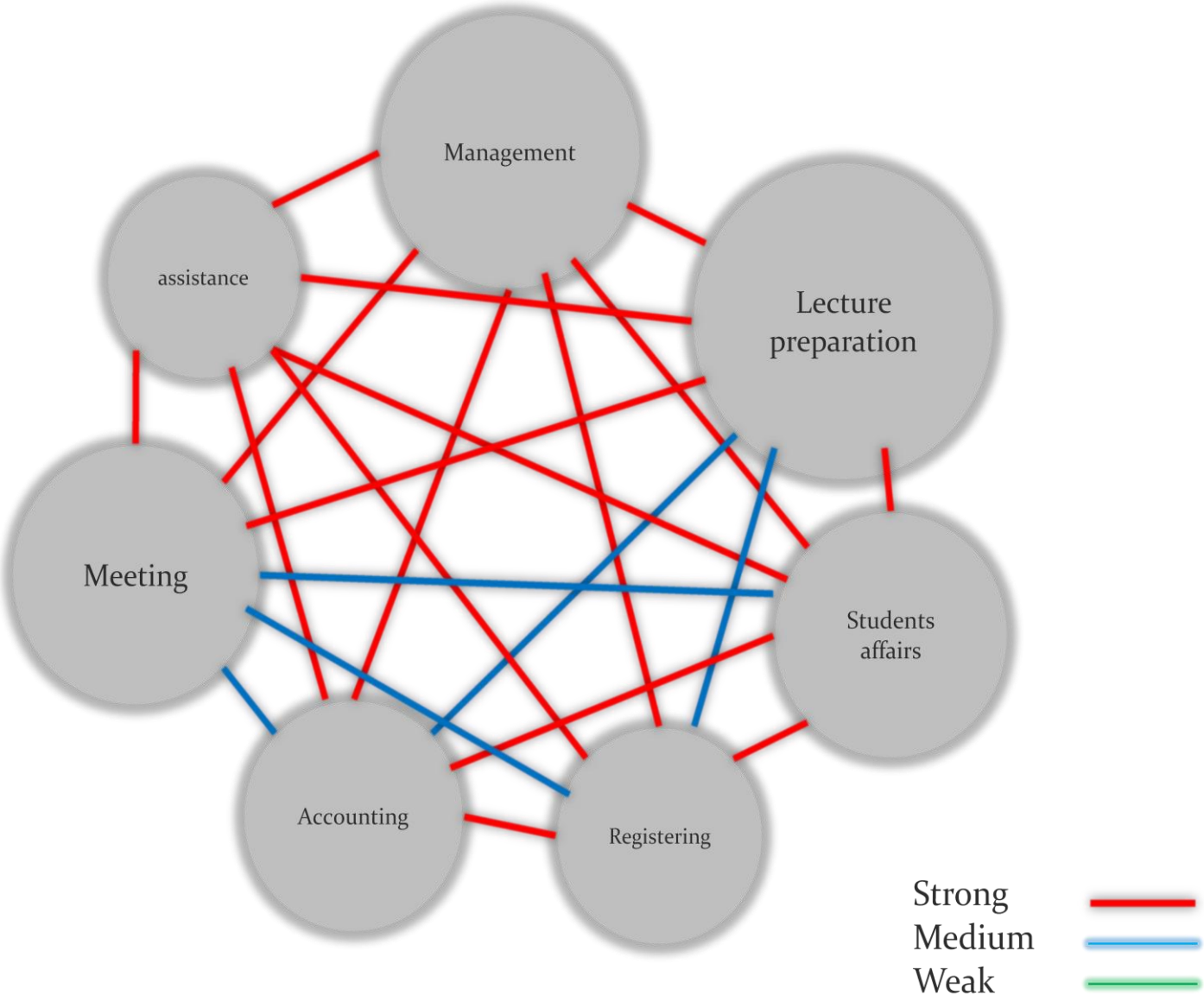
- Educational bubble diagram :



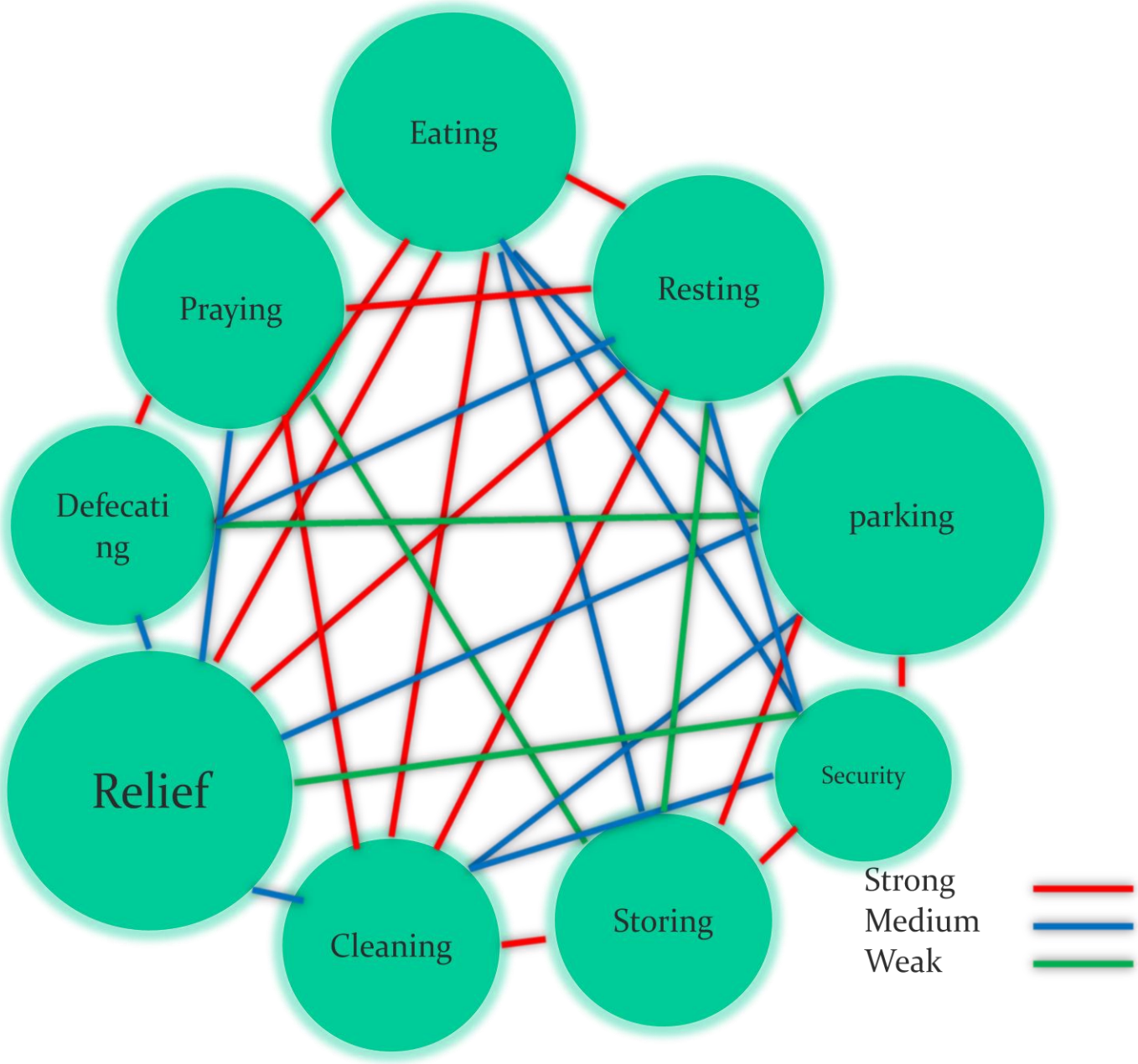
- Cultural bubble diagram :



- Administrative bubble diagram :

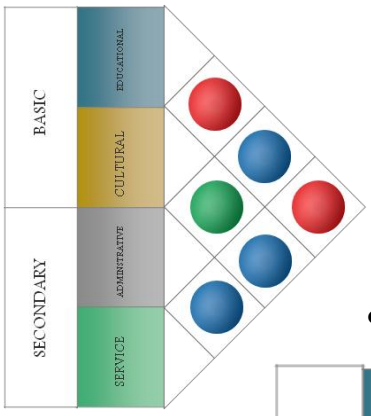


- Service bubble diagram :

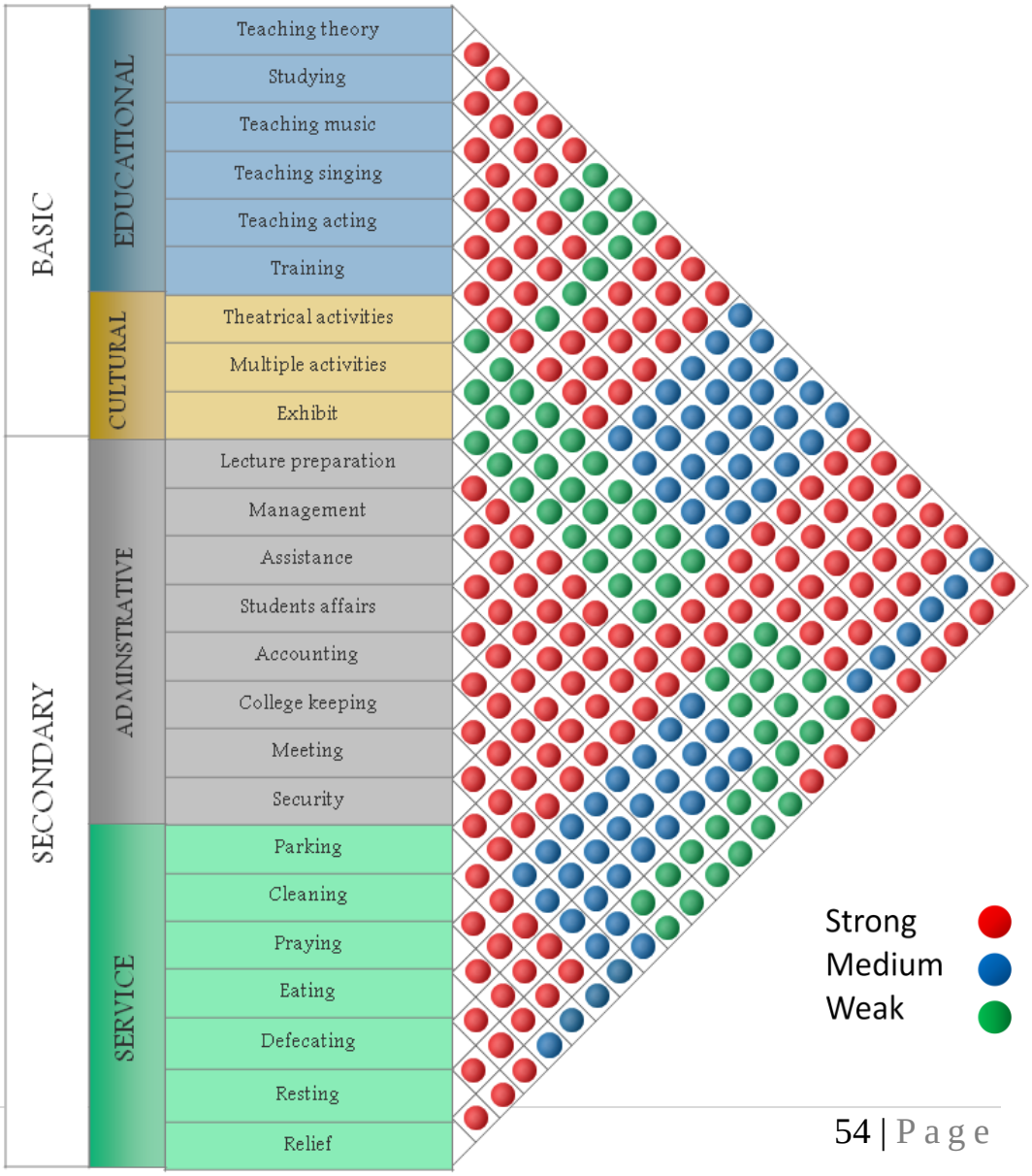


3.6.2 Matrix Diagram

- General matrix diagram



- Detailed matrix diagram



3.7 Site Analysis

- <u>Site information :</u>
-
  - location: Khartoum state, Khartoum , Bori
  - almahas
  - Area : 28,200 m2
  - Arrival : general transport
  - Neighboring areas :

Figure 3.12 SUDAN

North: Residential area

South: Alquyada street , residential area (alsafa neighborhood)

East : Spark city hall

West : Ebed- khatim street .

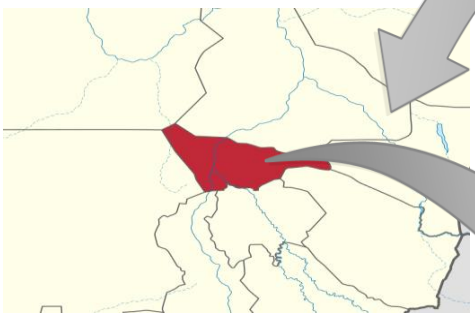
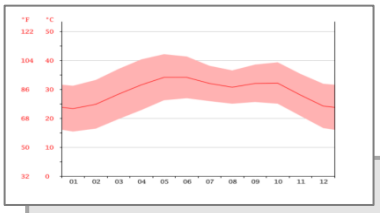


Figure 3.13 Khartoum

Figure 3.14 location

- Environment analysis :

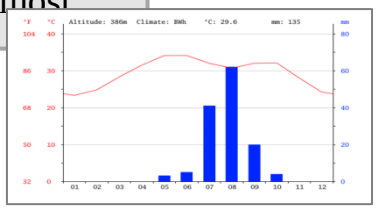
Figure 3.15



TEMPERATURE:

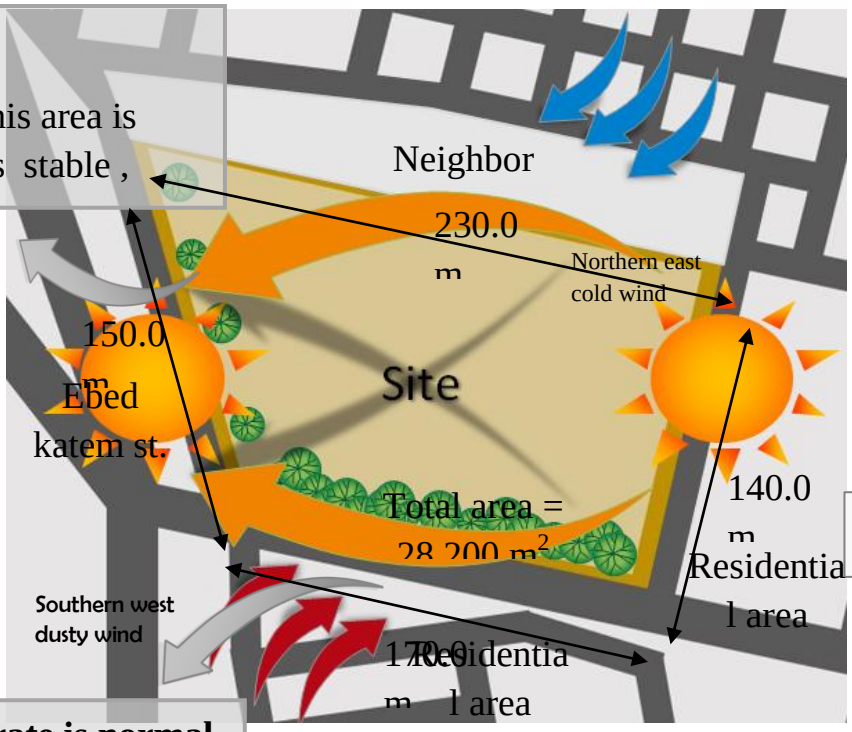
May is the warmest month during the year; the temperature average is 34.1 c,

The driest month during the year is January with 0.5 mm rain, while the most



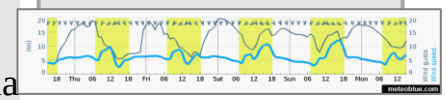
SOIL :

The soil in this area is clay which is stable ,



Wind :

The wind from the northern east side is



The noise rate is normal a tree belt is advised

- **INDICATORS :**

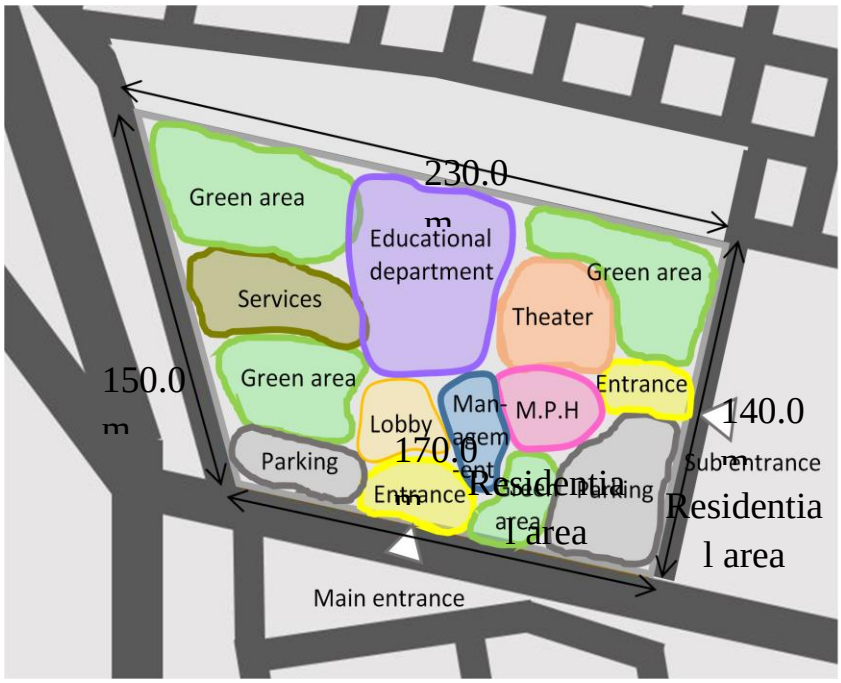
1. The main road is on the southern side .
2. The roads surrounding the site produce a considerable amount of noise .
3. There are sub roads on the eastern and western sides .
4. The wind flows through the north east and the south west sides .

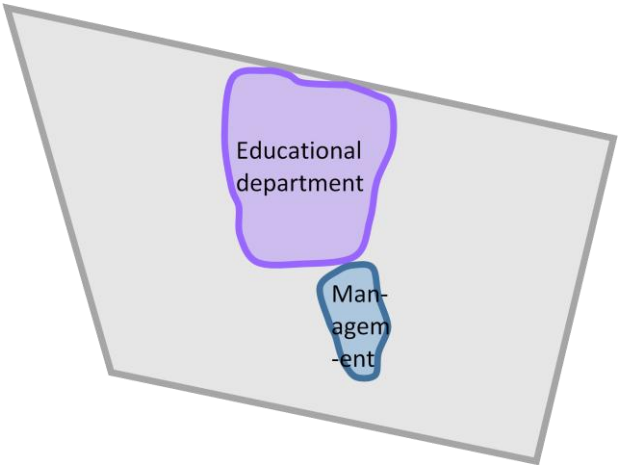
- **GUIDELINES :**.

1. The main entrance is best placed on the southern side .
2. Tree belts should be considered to control the nose .
3. The sub entrance for the college can be placed on the eastern side .
4. The building should be directed properly so as to make the best use of the wind .

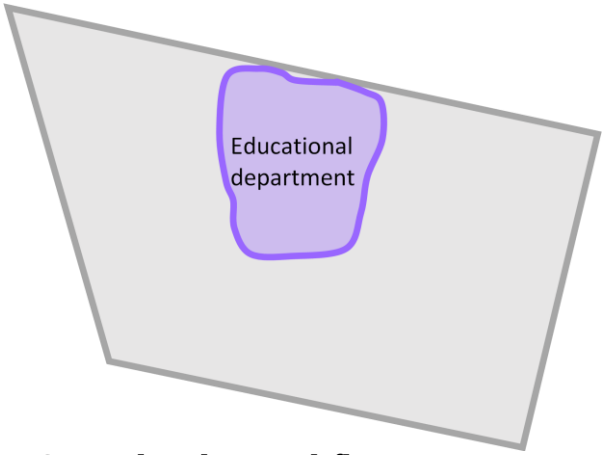
3.8 Zoning

- Ground floor zoning





- First floor zoning



- Second and typical floor zoning

CHAPTER FOUR

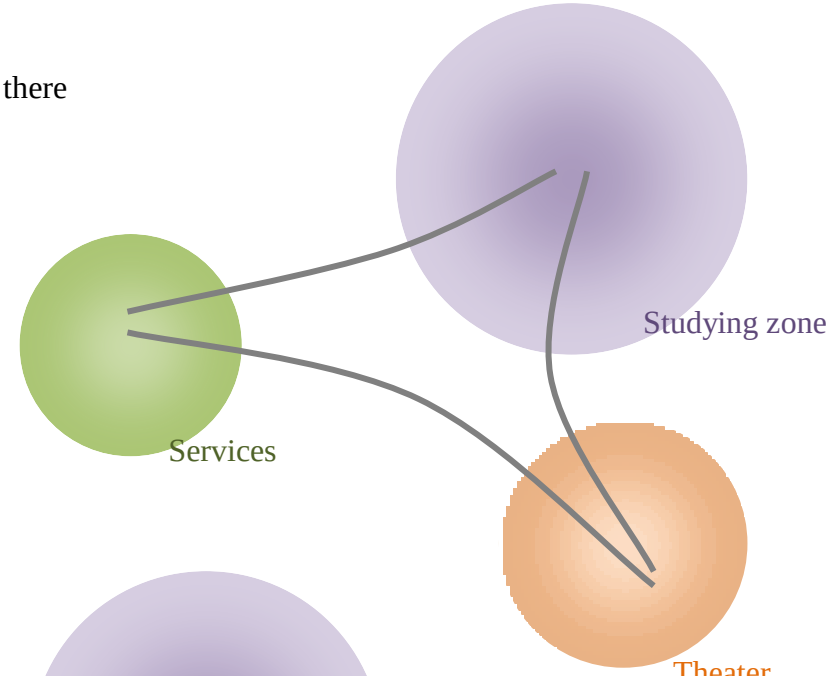
4 Chapter Four

4.1 Design concept :

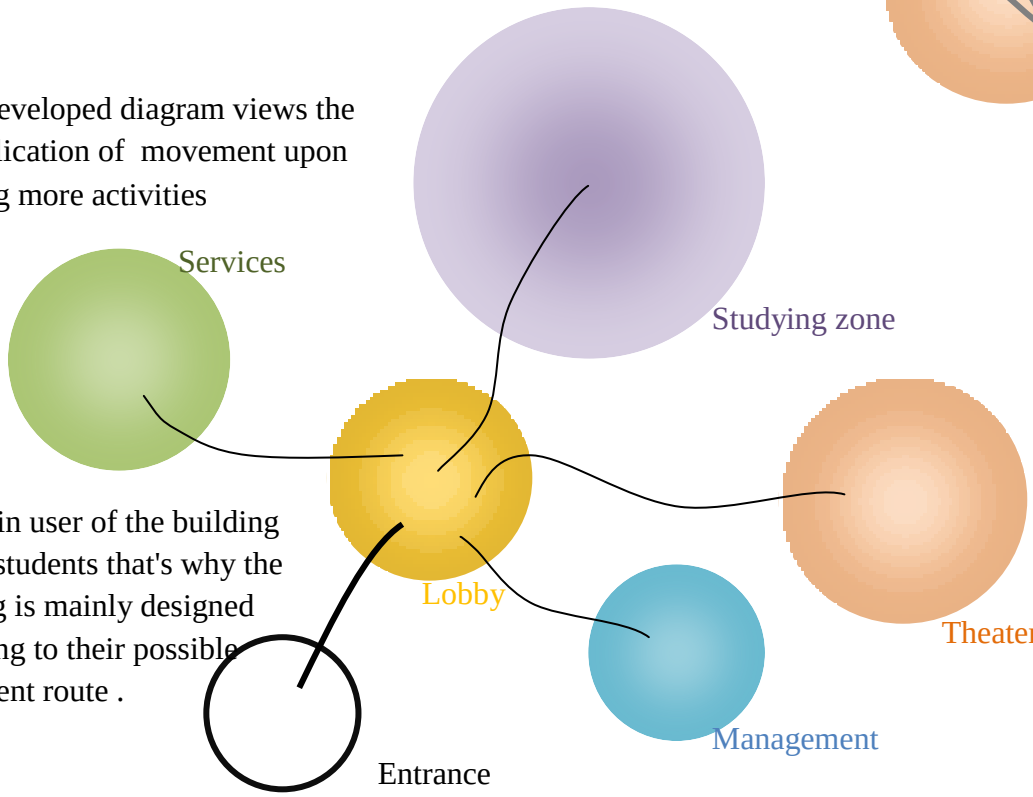
The concept is based on the circulation and the different zones of the project , and the main focus was the areas of connection between the different functions.

- As a music and drama college there are three main areas for the movement route which are :

1. The studying zone
2. The theater
3. The services



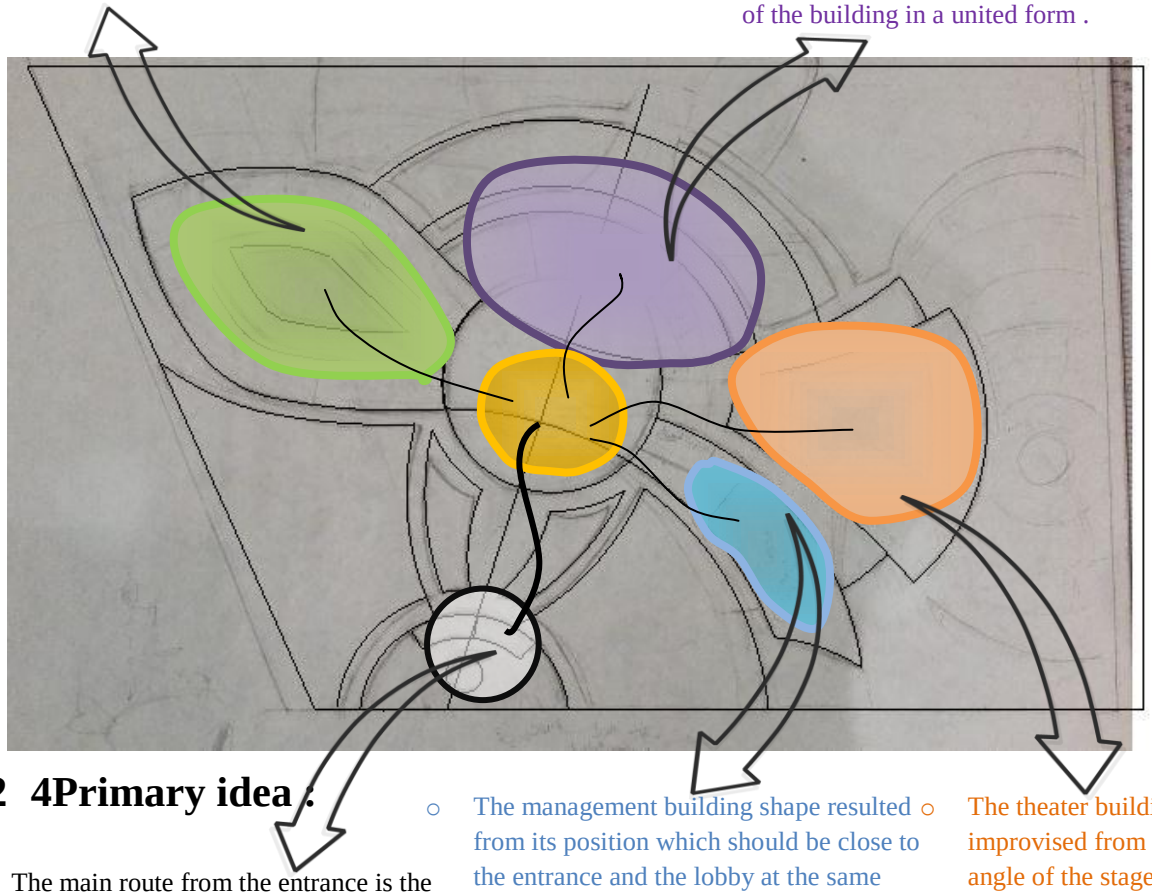
- The developed diagram views the complication of movement upon adding more activities



- The main user of the building are the students that's why the building is mainly designed according to their possible movement route .

- The form of this part f the building has emerged from to facts , the first : is the shape of the site which conducted the oval shape , and the second : is the need of a void in the middle as a breather .

- This part of the building -being the main one- with its central placement was shaped as showed below in an attempt to connect the different parts of the building in a united form .



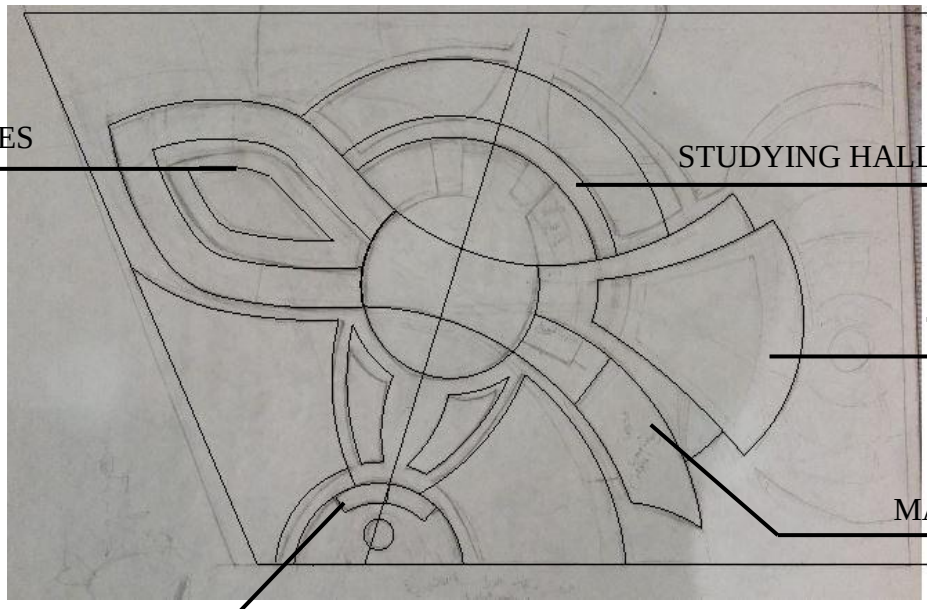
4.2 4Primary idea :

- The main route from the entrance is the lobby which will lead to the rest of the building parts .

- The management building shape resulted from its position which should be close to the entrance and the lobby at the same time , and due to it being close to the theater it affected its shape accordingly .

- The theater building shape is improvised from the view angle of the stage .

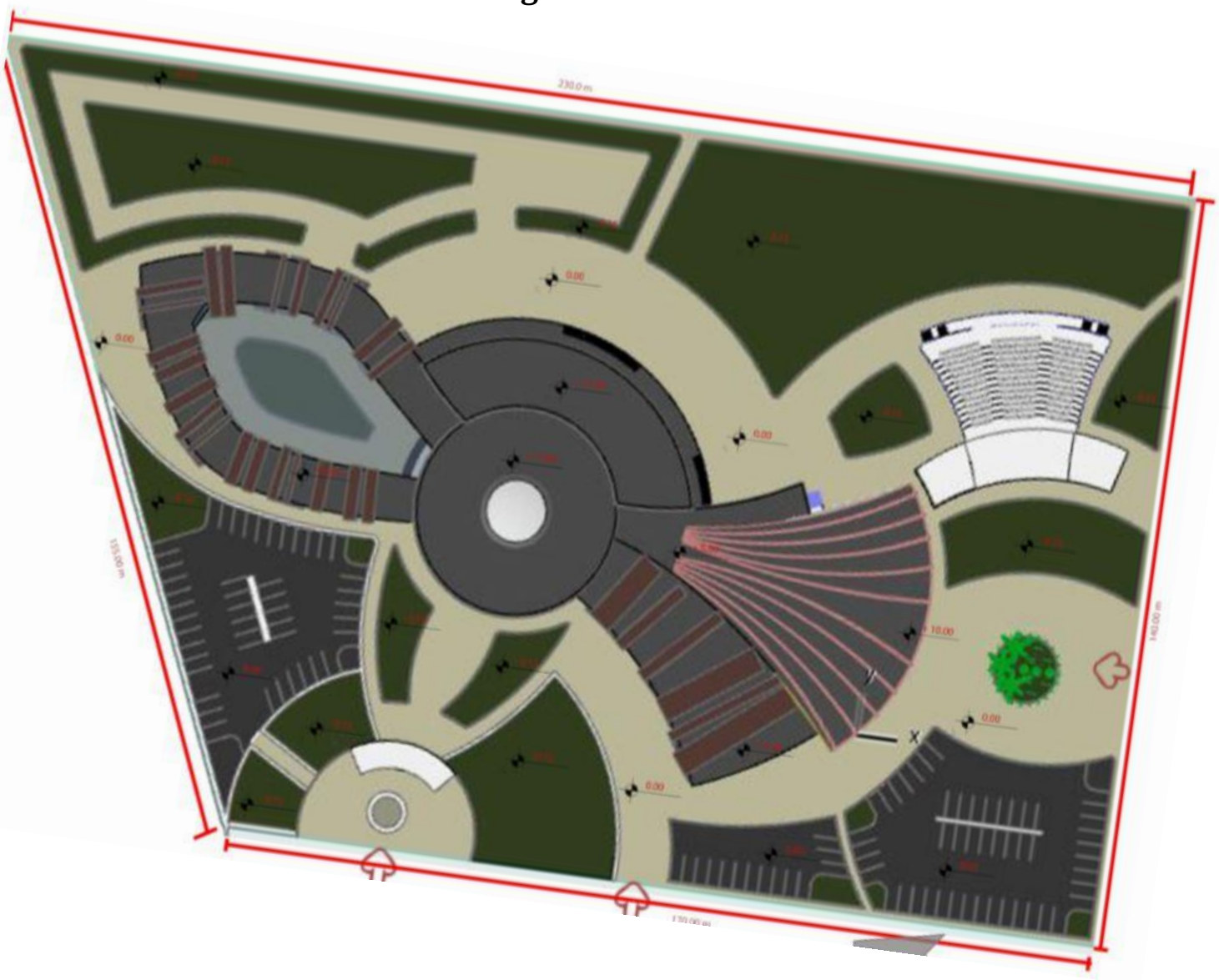
4.1



4.3 Developed Design :

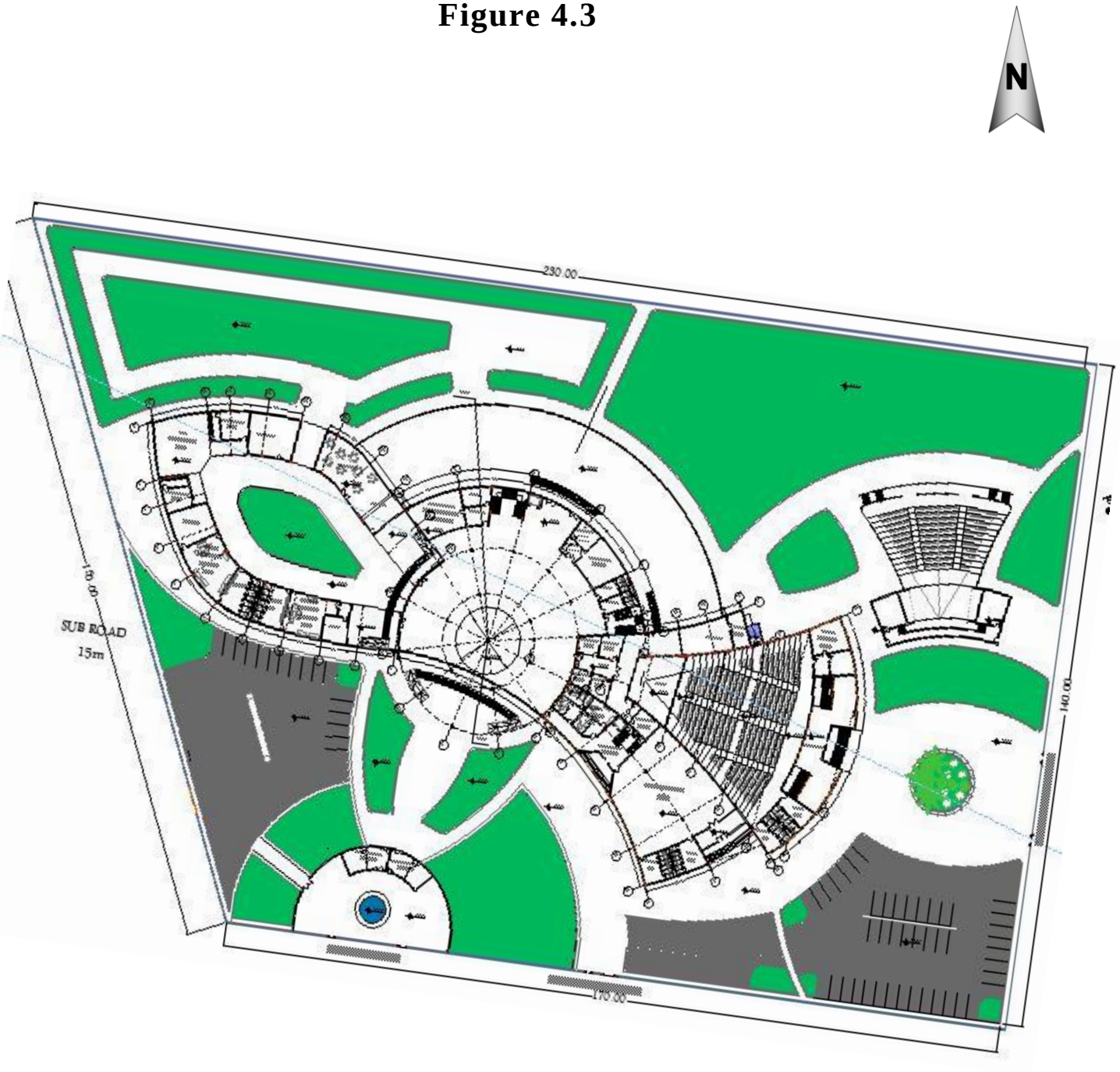
4.3.1 Site Plan

Figure 4.2



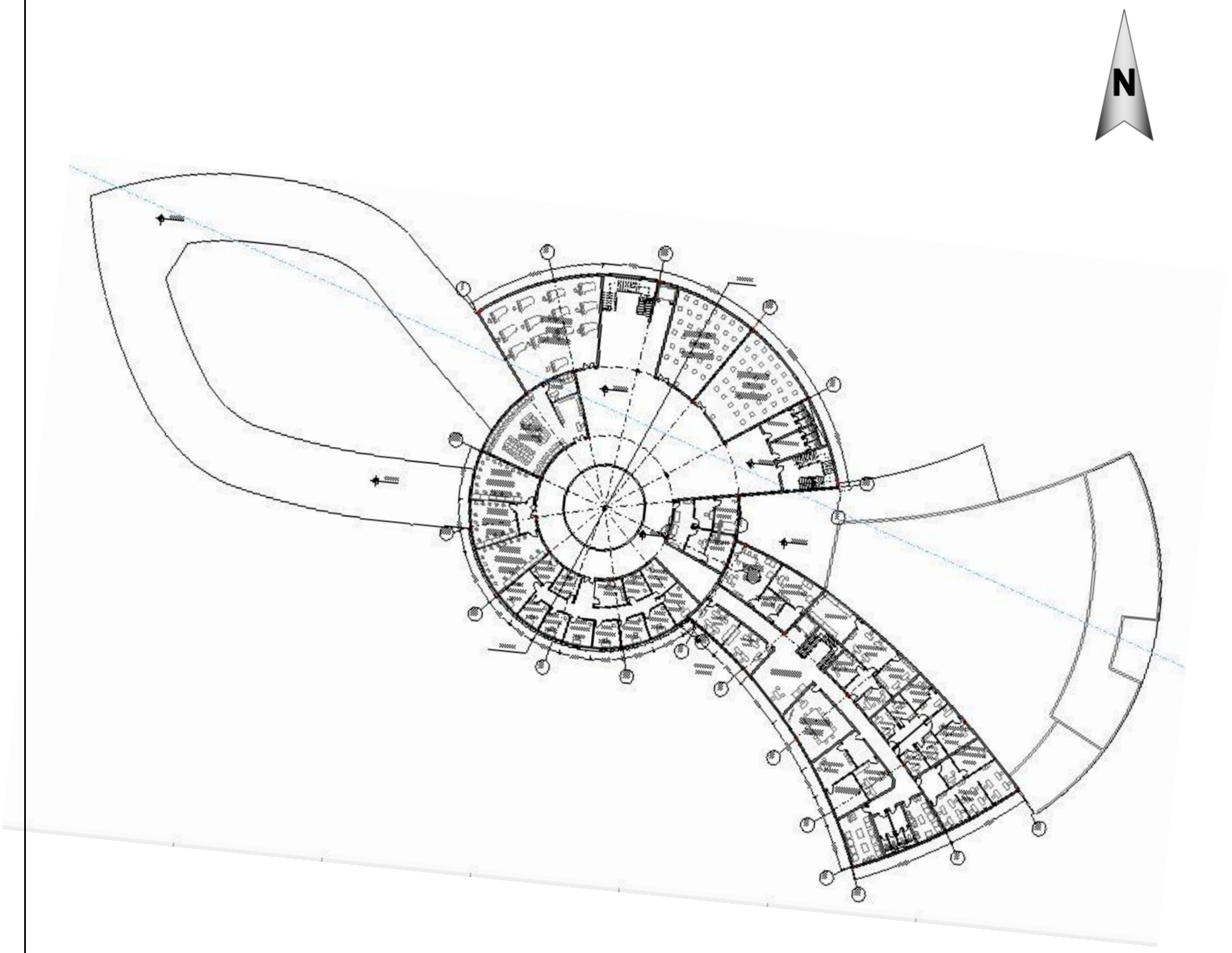
4.4 Ground Floor Plan

Figure 4.3



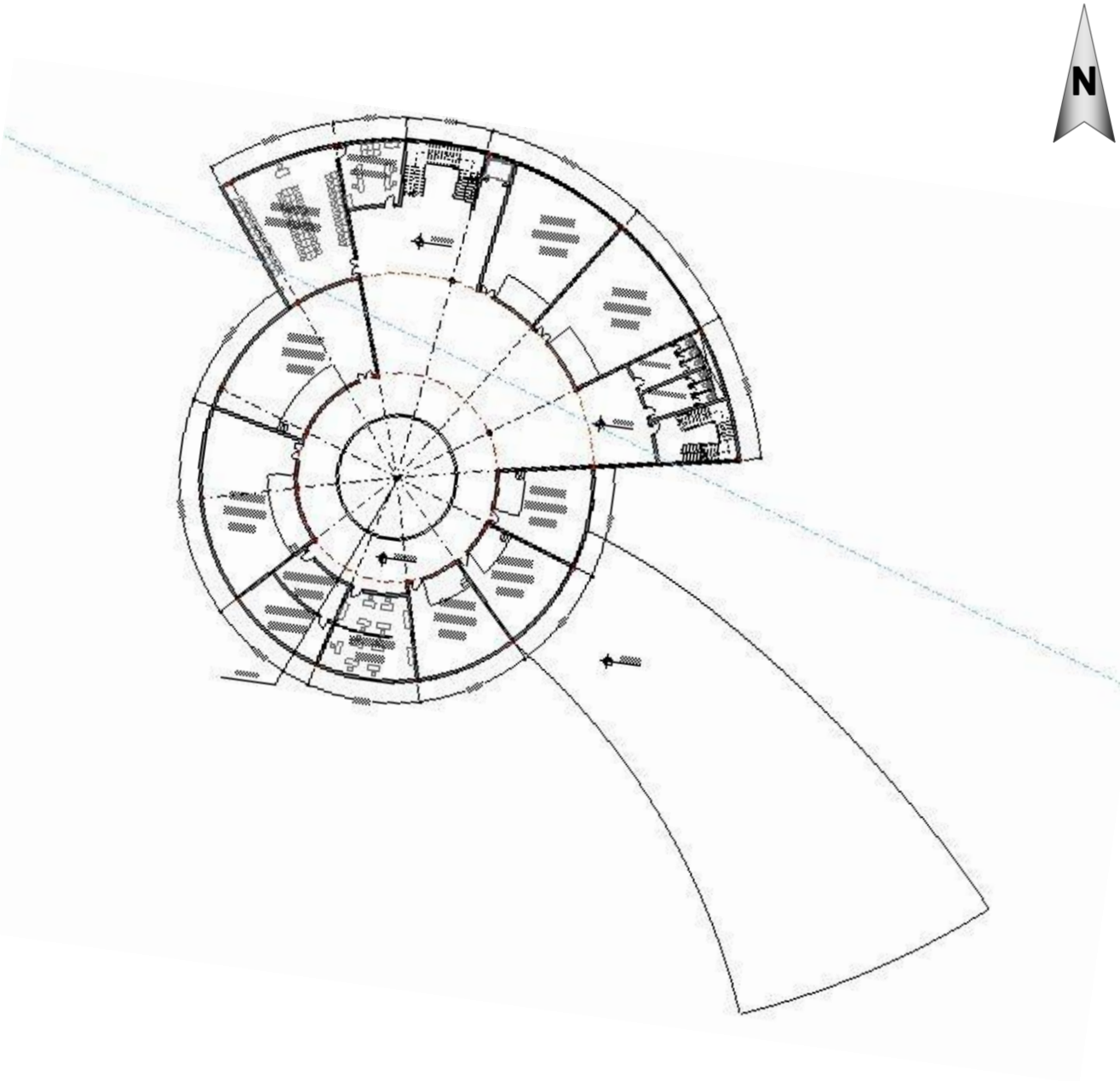
4.4.1 First Floor Plan

Figure 4.4



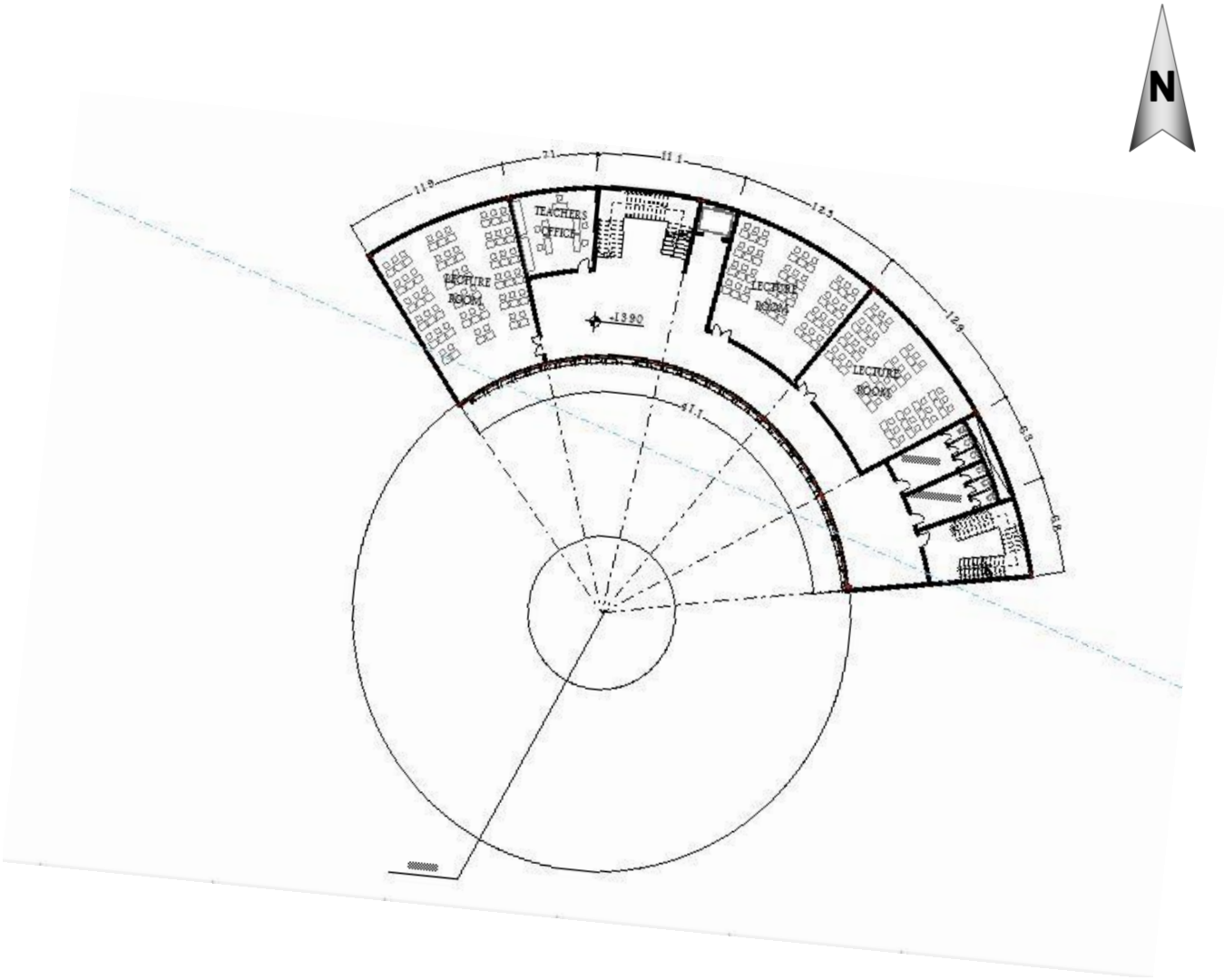
4.4.2 Second Floor Plan

Figure 4.5



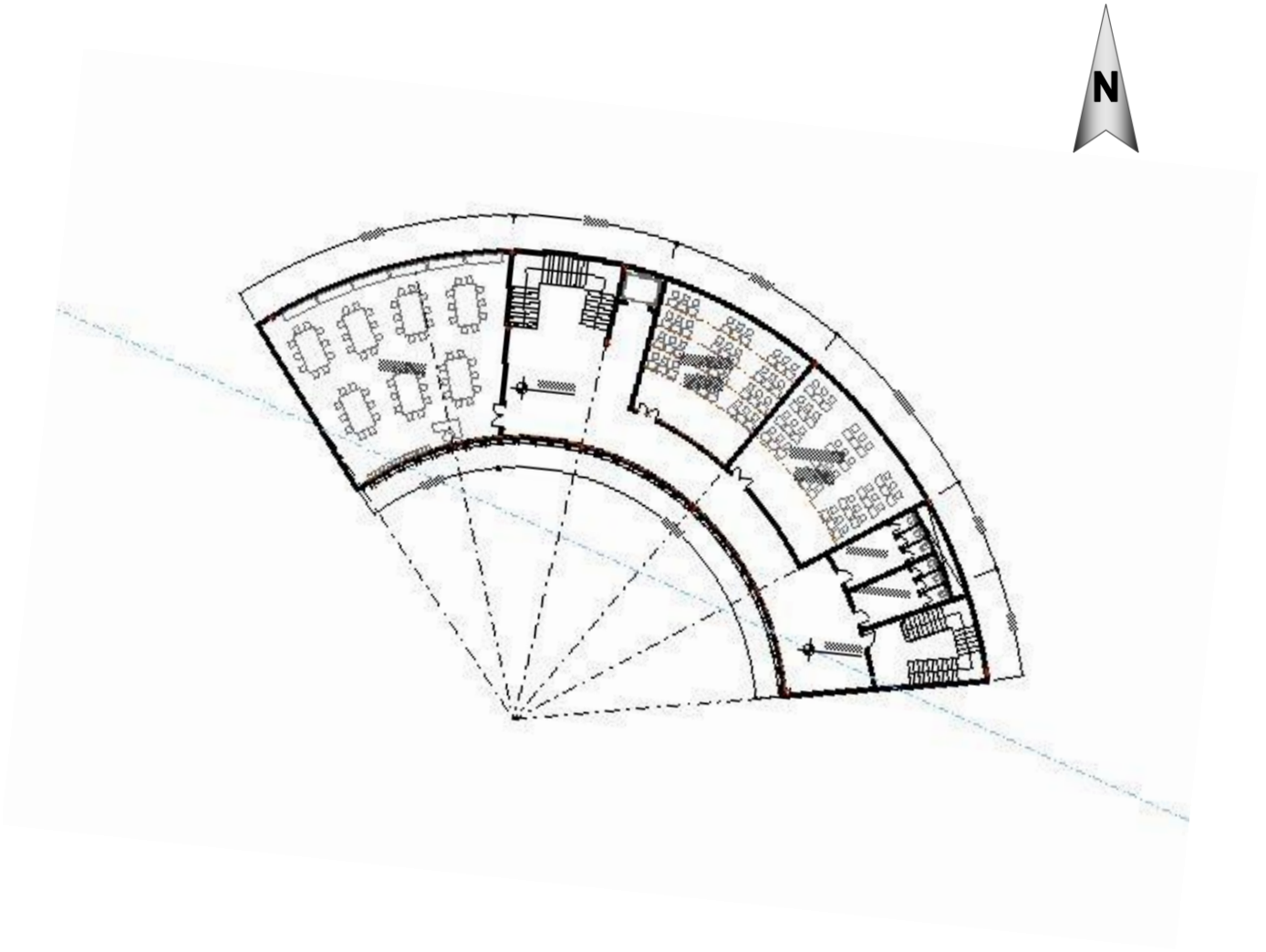
4.4.3 Third Floor Plan

Figure 4.6



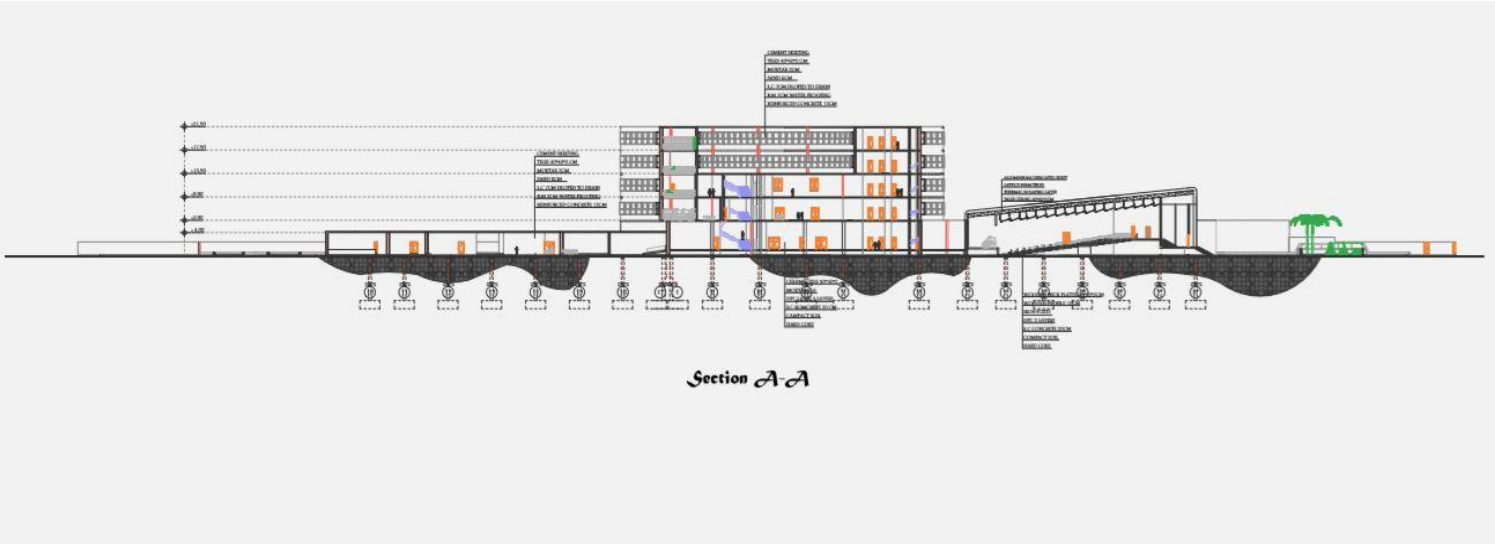
4.4.4 Fourth Floor Plan

Figure 4.7



4.4.5 Section

Figure 4.8

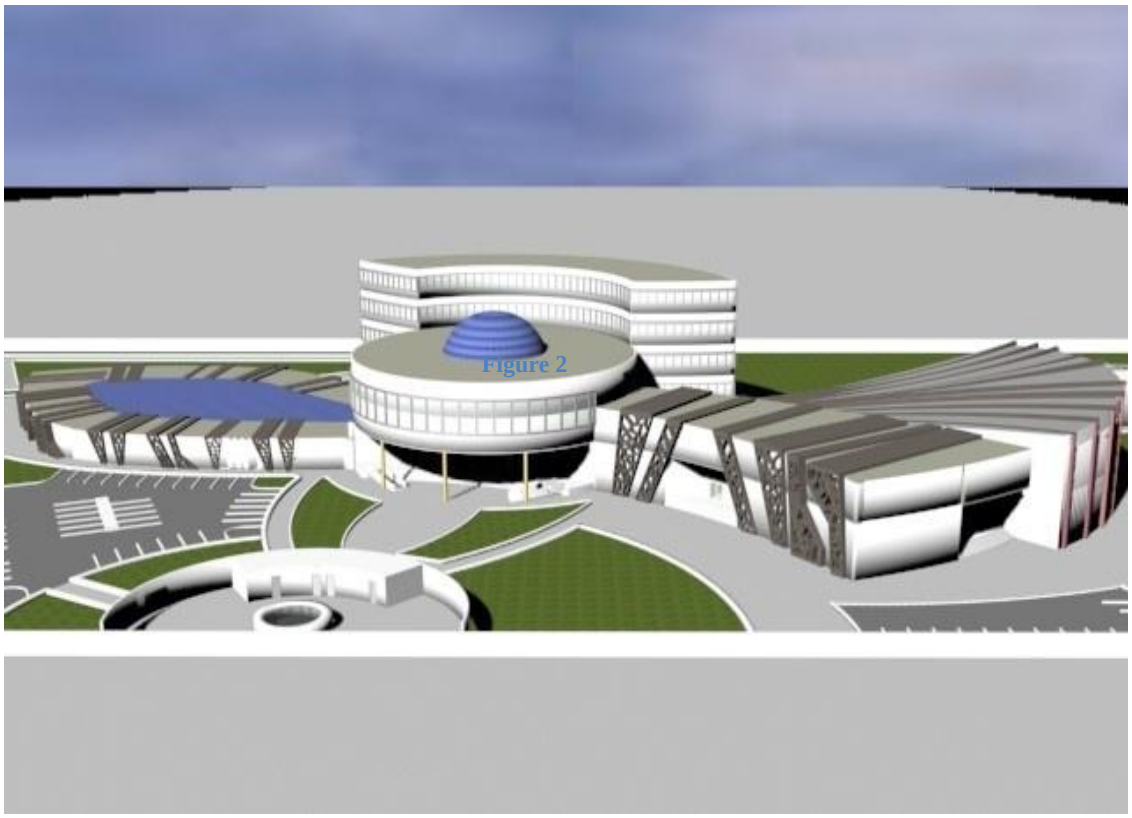


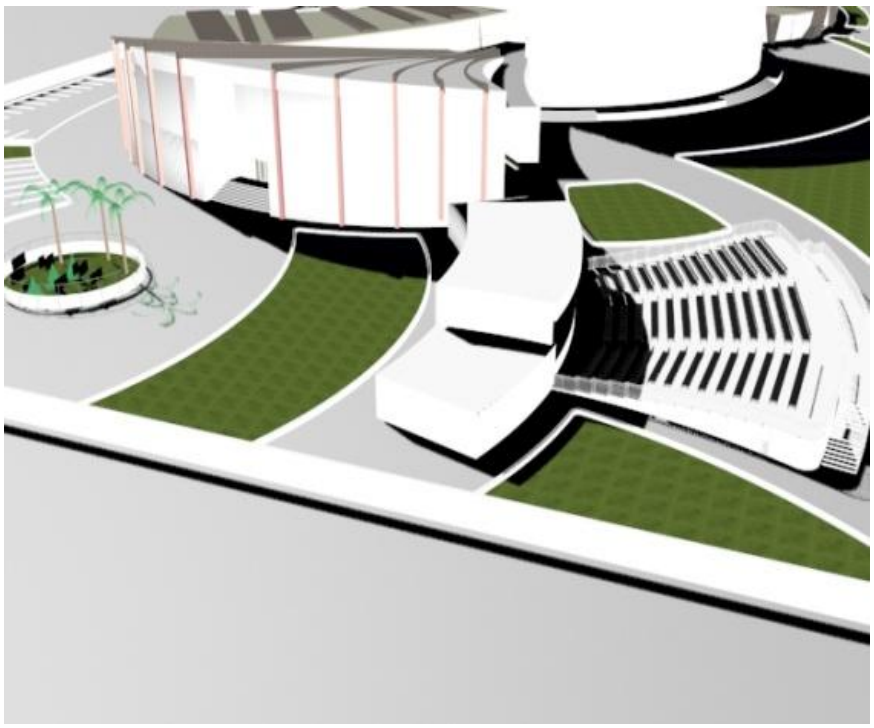
4.4.6 Elevation

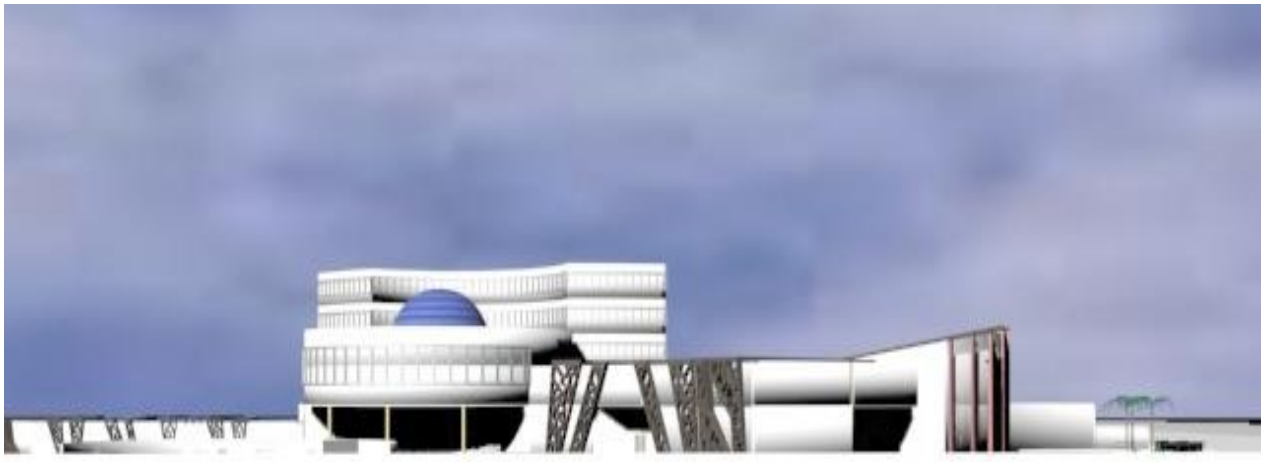
Figure 4.9

4.4.7 Views

Figure 4.10







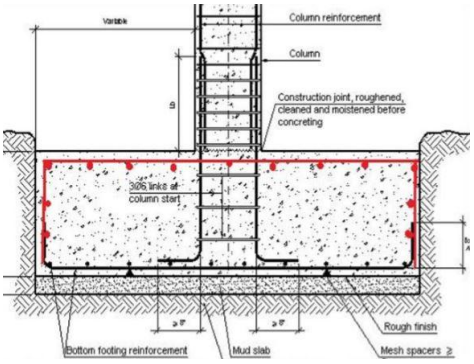
CHAPTER FIVE

5 Chapter Five

5.1 Structural system

5.1.1 Foundation

- The foundation used is the isolated foundation because the building consists of four stories in addition to the ground and it doesn't include a basement.



5.1.2 Columns

- There are two kinds columns used
  - In parts of the building steel columns are used (I section universal column)
  - Reinforced concrete columns are used in the service building.

Figure 5.1

5.1.3 Roofs

- There are three kinds of roofs used :
  - One way slab s used for the services building.
  - Two way slab is used for the lobby and classrooms building.
  - Double layer steel folded plate is used for the theater building.

5.1.4 Floors

- The floor outside the building consist of 60 cm earth layer , plain concrete layer 1 cm , finally interlock layer .
- The floor of the parking consists of a 50 mm layer of asphalt , beneath it a concrete layer and finally prepared earth .

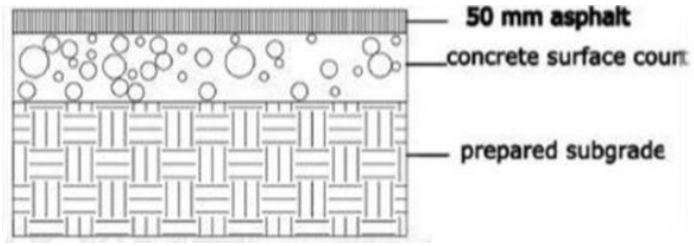


Figure 5.2

- For the green areas Indian grass is used which is placed on top of planting soil while using insulators.

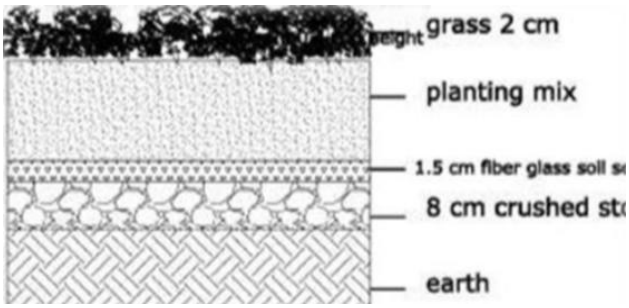


Figure 5.3

- The floors on different levels of the college are R.C concrete , plain concrete layer , sand mortar layer , and finally tile layer followed by carpet layer for spaces that need sound isolation such as the theater.

5.1.5 Walls

- The building walls are red brick walls followed by layers of plaster and defined color of paint with sound isolating materials for noise producing spaces.
- Structure plan

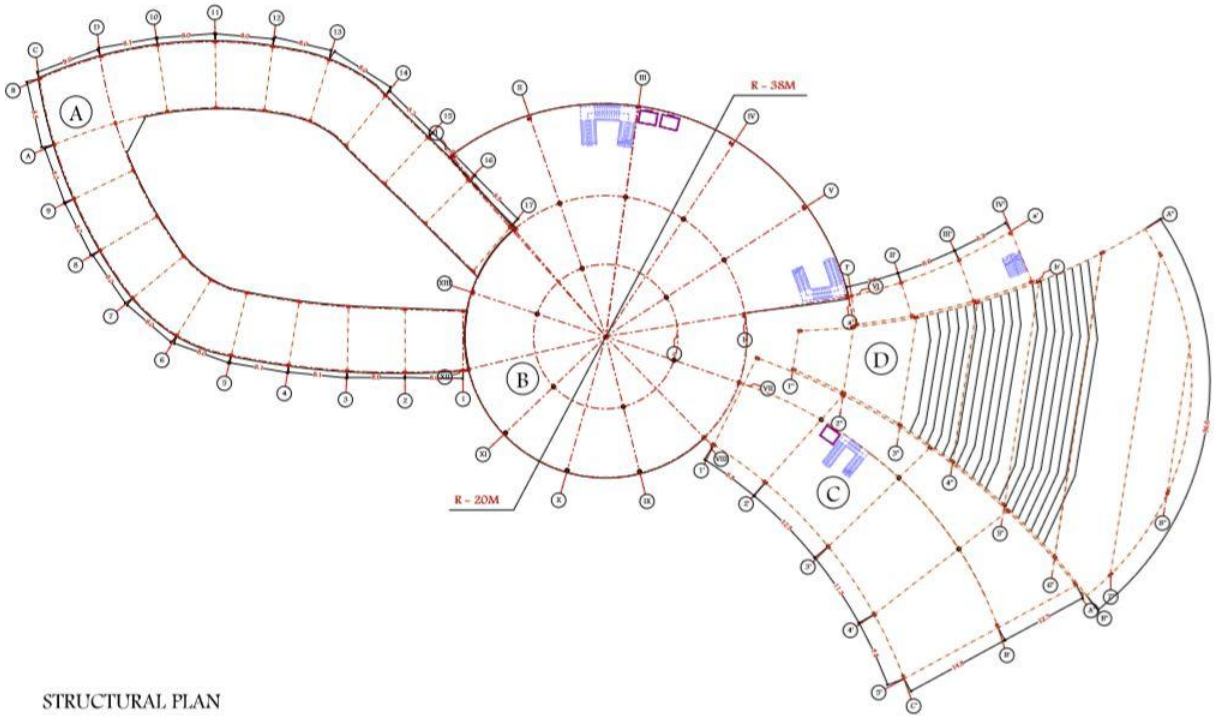
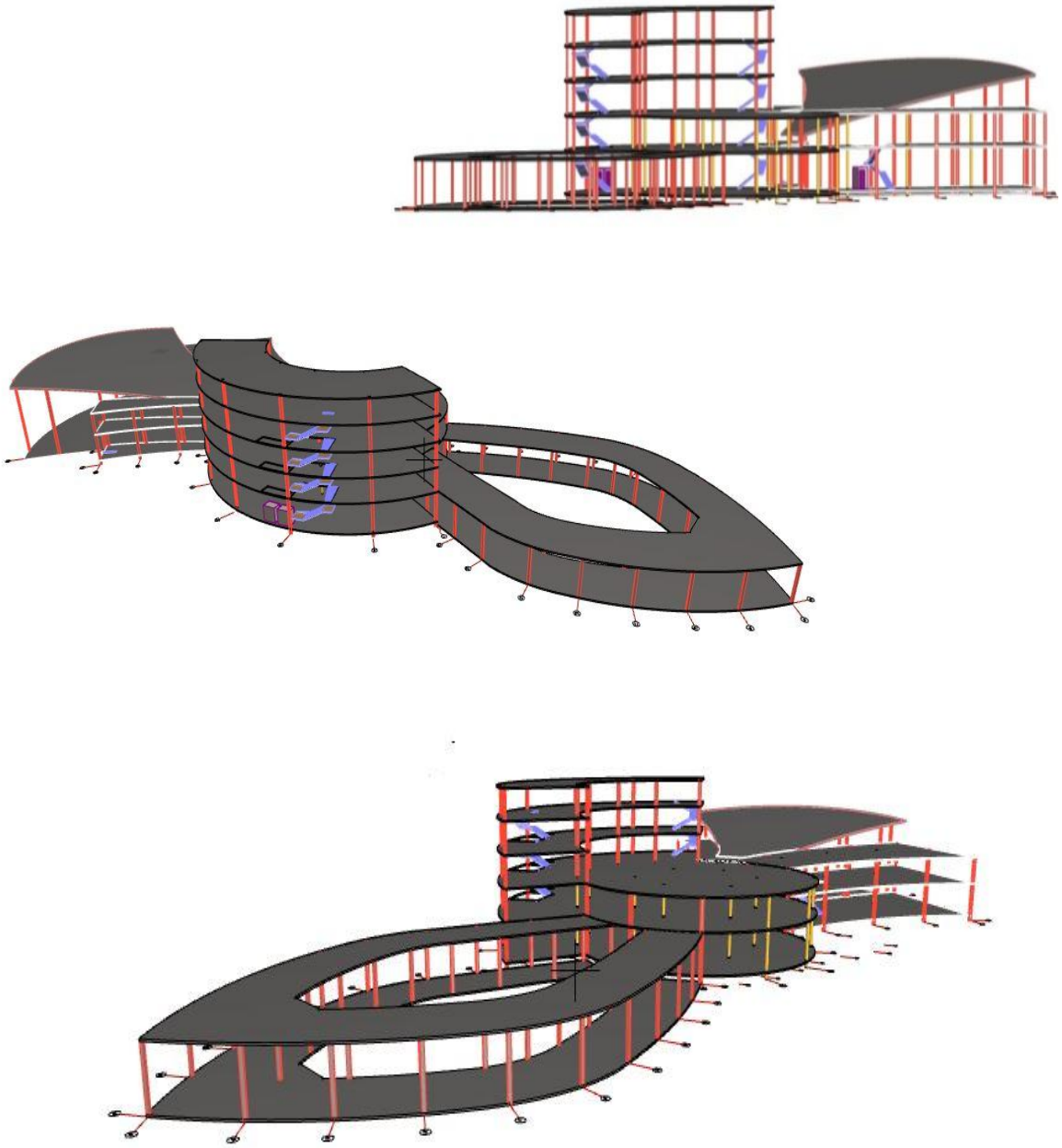


Figure 5.4

- Structure 3D

Figure 5.5



5.2 Water And Electricity Supply

5.2.1 Water Supply

- The project's site is supplied with water from a main pipe 8" south of the site, it enters with a 6" pipe, then distributed to:

  1\ the fire tank, that's connected to the main tank.

  2\ the main tank. Which then a 2" pipe take its turn around the site and supply all the buildings.

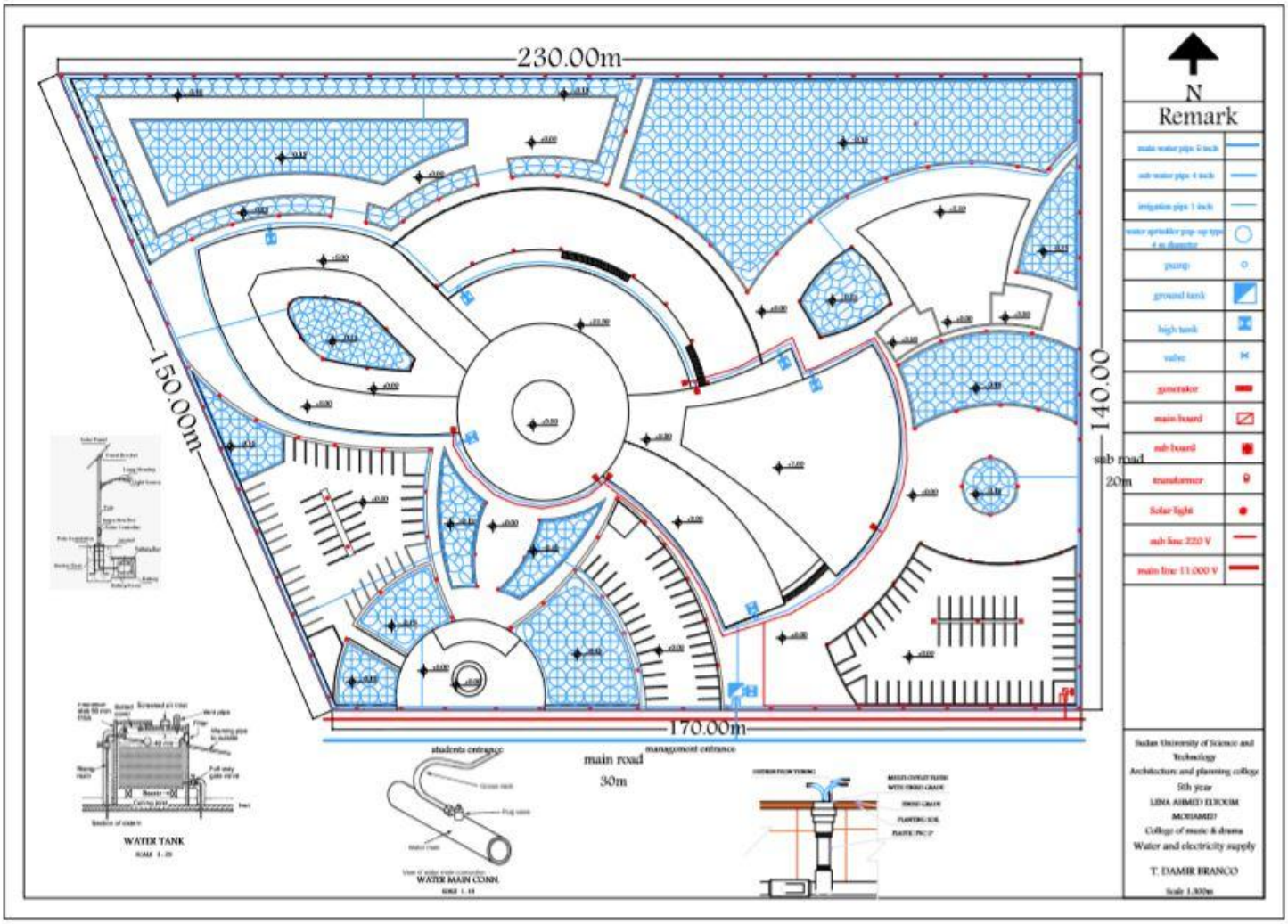
  *most of the buildings in the project are under 5 floors so they are supplied through a high level tank (on the ceiling). And connected to a water pump to secure high pressure.

  3\the green spaces tank -which is also connected with a pump to ensure good pressure - and also connected with the surface water station.

5.2.2 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 invertors 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 contain 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.

Figure 5.6



5.3 Sewage And Drainage

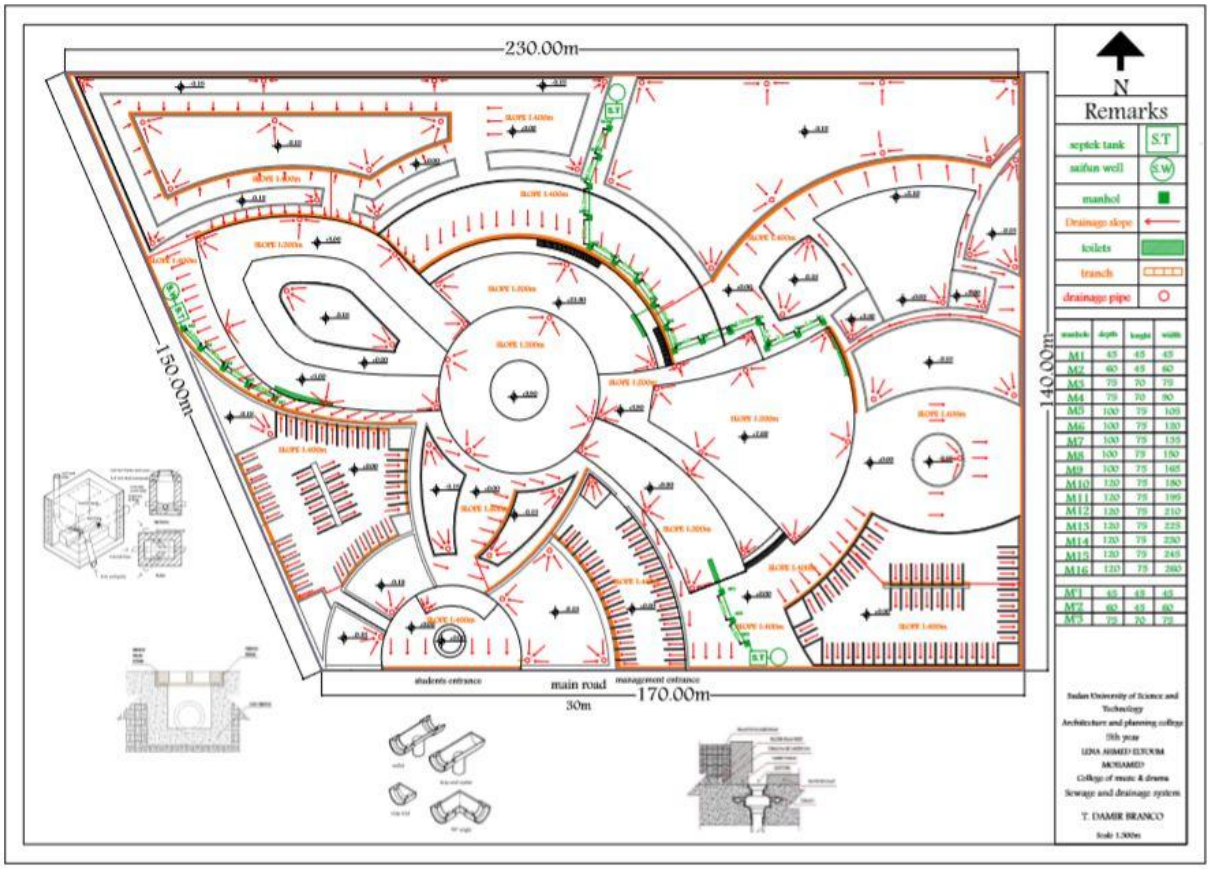
5.3.1 Sewage

- The two pipe system was used to the bathrooms.
- the manholes system was used for the bathrooms, and connected to a septic tank west of the site.

5.3.2 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.

Figure 5.6



5.4 Air Conditioning and Fire Fighting

5.4.1 Air Conditioning

- The system that's been used is the ALL-AIR system.
- Reasons for choosing this system:

  -Type of space: multiple spaces.

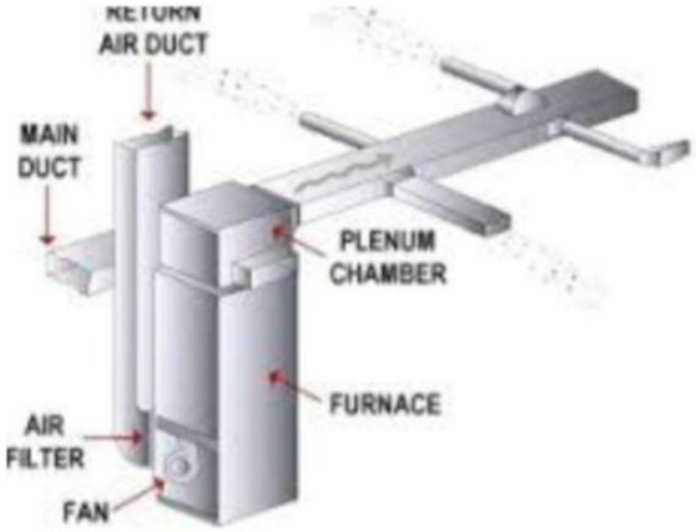
  -The need for the conditioning system: cool and heat.

  -Major needs: temperature, air renovation, quite environment.

  *Controlling this system is central and there is different sizes of spaces.
- The system's technical parts:

  - Air ducts, one for the supplied air and another for the returned air
  - Supply air outlets, which diffuses the clean air.
  - Returned air outlets, which return hot air.
  - Handling unit, which is the supplier and also it process the returned air through a filter and a fan.

Figure 5.7



5.4.2 Fire Fighting System

- 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.

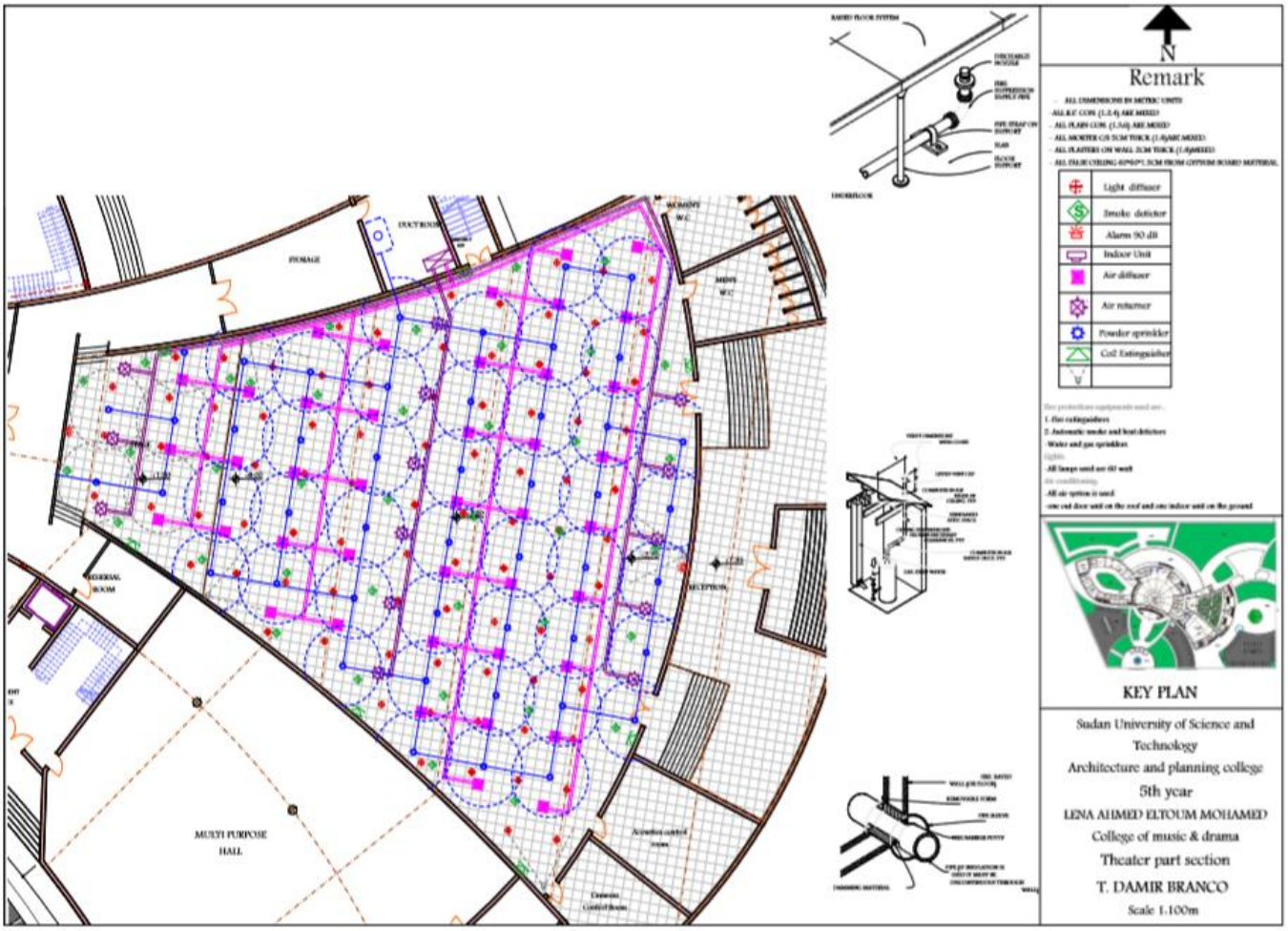

N
Remark
Light diffuser
Smoke detector
Alarm 90 dB
Indoor Unit
Air diffuser
Air returner
Powder sprinkler
Co2 Extinguisher
KEY PLAN
Sudan University of Science and Technology
Architecture and planning college
5th year
LENA AHMED ELTOUM MOHAMED
College of music & drama
Theater part section
T. DAMIR BRANCO
Scale 1:100m
MULTI PURPOSE HALL
RECEPTION

Figure 5.6

5.5 Special Parts of the Building

5.6 Theater

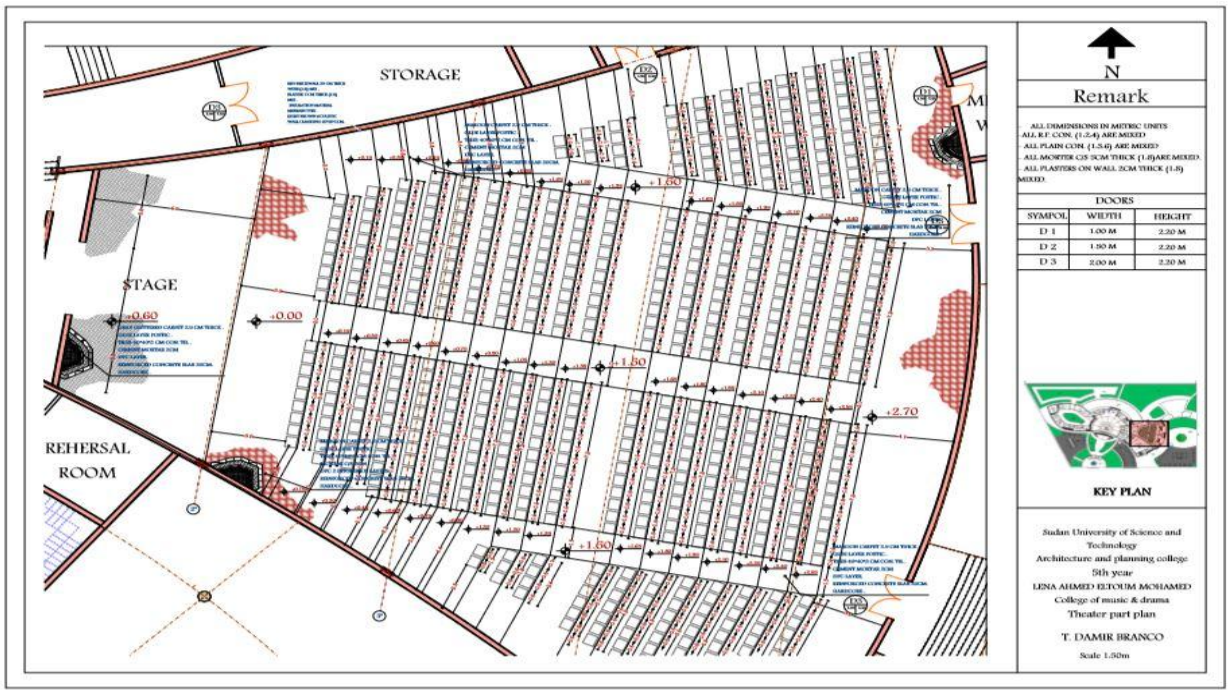


Figure 5.7

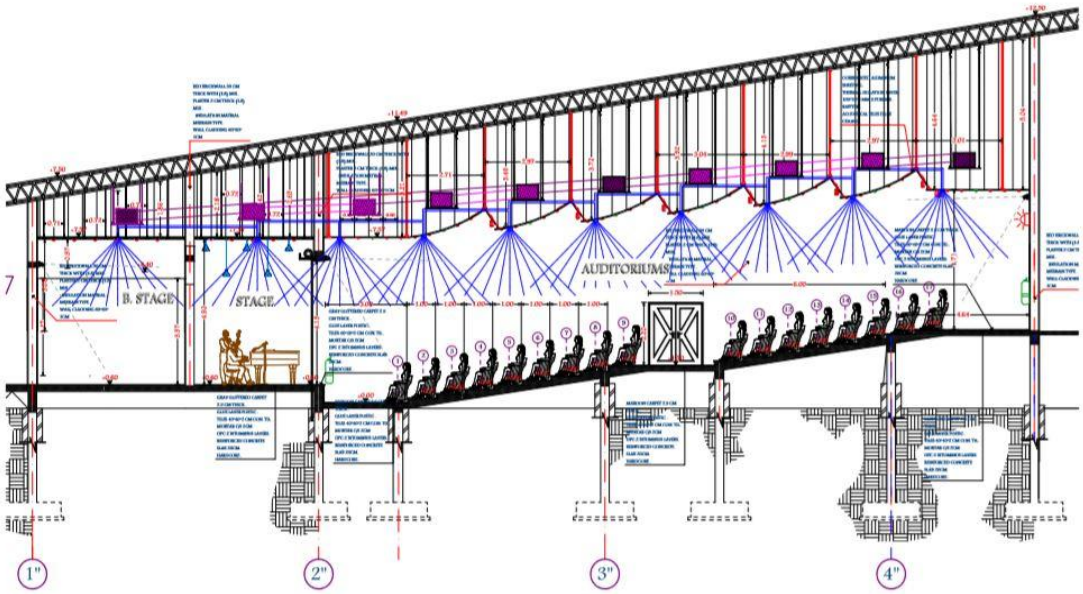


Figure 5.8

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