SOMMARY

Introduction
Problematic
genesis
Program
Ecological solutions
1- thermobimetal
2- sand
3-led
Structure

1- Introduction:

Mosques are a religious buildings where the frequency depends on the typology and the day We can find three types of mosques.

1- moussala
2- jumaa
3- central

the users of the mosques get higher in Friday for the jumaa and the Eid that's why we find a court associated to the mosque.

2-Problematic:

With the rise of the ecological debate and the green architecture trend, we found ourselves in the obligation of building eco-friendly buildings that generate their own power.

In the contemporary mosques, just like any typical building we can notice the increase of the energy consumption due to climate change "the excessive use of air conditioner"

The Islamic architecture is known for the traditional decoration "mosaic, mouchrabiah, dome etc….." which give the worshiper a certain degree of spirituality that can't be ruined with the new style "curtain wall, mechanic façade ….. Etc.".

so the goal here is to find the right balance between the traditional style and the modern building technics,

General problematic

How to give the worshiper the holiest sancity experience with the least energy consumption ?

3-genesis:

1-the choice of L:

if the mosque is known for something is the role that it plays in the gather resemble and unify people both physically the spiritually , so the aim here is the creation of a building that is considered both a praying and a gathering place for various social activities

After analyzing various examples (Jama masjid, Ibn toloun, el azhar….)

Figure 1: jama masjid delhi

Figure 2: mosque ibn touloun, cairo

After examining theses central mosques I settled on a L=120m in order to attend my objective of creating a central mosque with a large courtyard.

2-concept:

The vision of building a futurist mosque when it comes to form has always made a problem that it won't be acceptable from the Muslim community because it won't represent them as a rival architectural style in front of the Christians, with the fear of bringing these organic forms from the occidental world.

So I got the inspiration of building a futurist mosque based on an Islamic geometry and when we say an Islamic geometry we go to a circle the origin of every form

the project is composed by two circles the first one is the main prayer hall and the second one is a half circle which contain the gallery that surround the court and ends up with the minaret Like a passage from a static place which is the prayer hall to the dynamic one "the gallery"

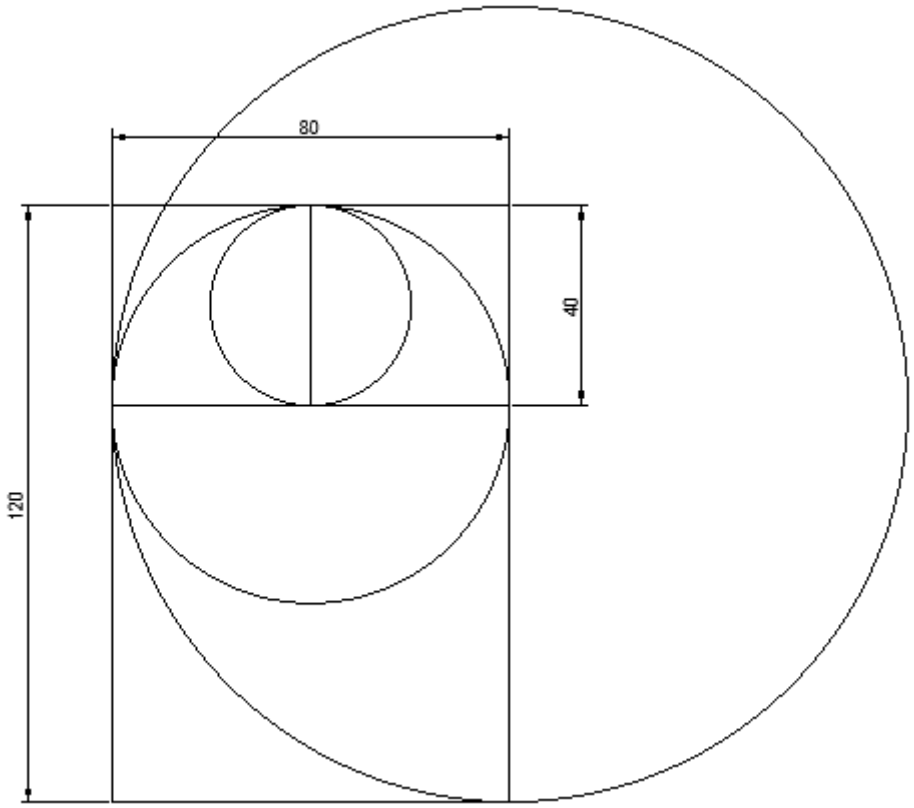


Figure 3 : geometric layout

3- program

the program came to complete the idea of creating an exchange place not just a praying hall
The courtyard is the most important space due to its role next to the gallery
Also the garden which is put in place to introduce the green architecture
the mosque has a capacity of 7000 worshiper inside and out
it includes a madrassa, a library and a book tower in the minaret open to the public

space	**Surface m²**
Prayer hall	1315
sedda	411
ablutions	352
Women's prayer hall	675,5
Women's ablutions	352
library	675,5
madrassa	200
gallery	690
courtyard	3524
Secondary courtyard	850
garden	1375

3- Ecological solutions

1- thermo-bimetal

In order to decrease the energy consumption in the mosque and get a natural ventilation when needed, the thermo-bimetal was used to cover the dome.

this mosque use the ambient air temperature to operate to allow hot air to escape. When the temperature is above 80˚F “26°c” , the thermo-bimetal curls. Once cooled, the system returns to a flat position and the surface to its non-porous state

to get back to the main problematic **“How to give the worshiper the holiest sancity experience with the least energy consumption ?”,** a grid was placed under the thermo-bimetal layer composed of a pure Islamic geometric pattern “moucharabiah”

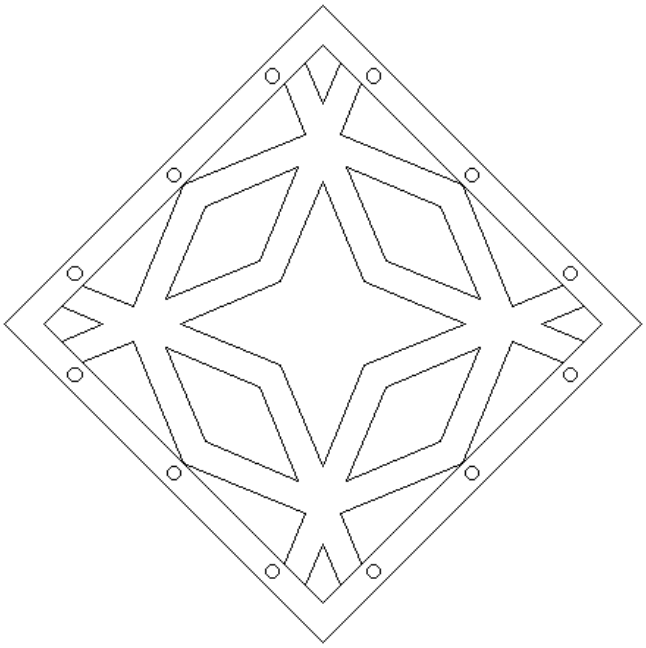


Figure 4 : geometric pattern

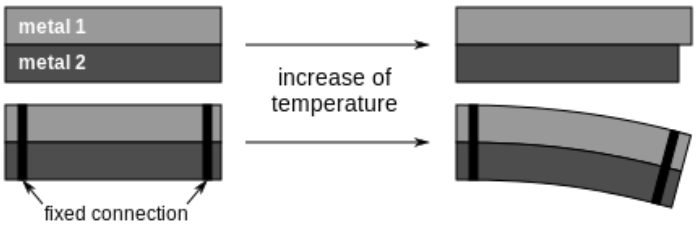


Figure 5 : thermo-bimetal

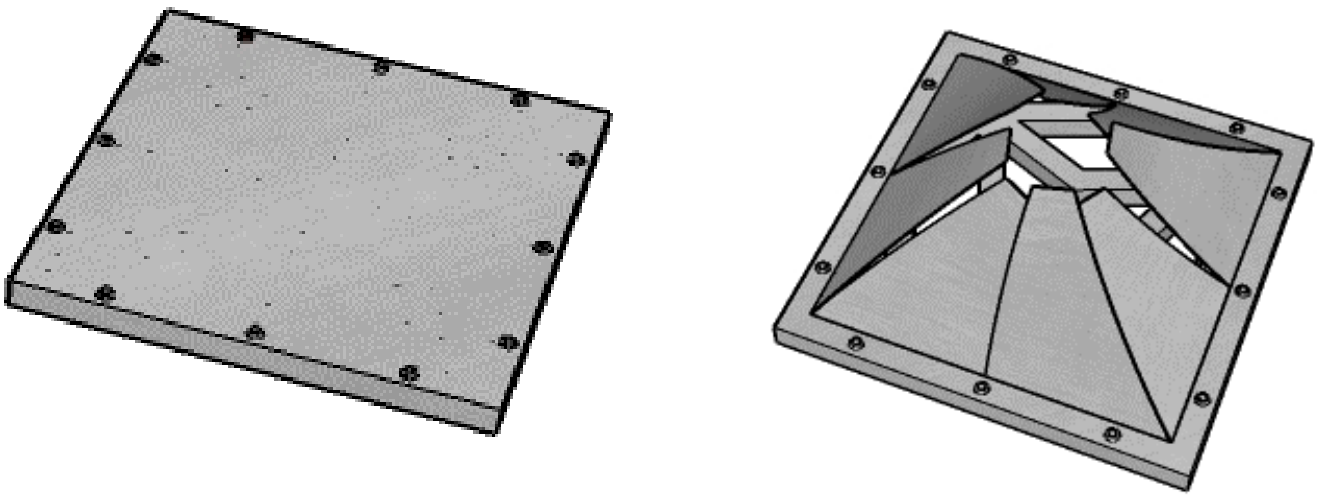


Figure 6 : the assembly of the moucharabiah and the thermo-bimetal

3- Ecological solutions

2- Sand

inspired of some mosques in the Algerian sahara, the sand is used to cover the ground

the sand is an hygrothermal regulator which significate that it cools the ground when it is hot and warm it when it is cold so it could also refresh the prayer hall which leads to a lesser energy consumption

Figure 7 : a jumaa mosque in oued souf algeria

3-LED

LED technology saves energy because LED (light emit diode) technology converts approx 95% energy into light and only 5% wasted as heat. LED lighting produces brighter light while consuming less power. LEDs not only save energy but are also long lasting, low maintenance, easy to install, UV rays free, and eco-friendly

LED light bulbs use only 2-17 watts of electricity (1/3rd to 1/30th of Incandescent or CFL). LED bulbs used in fixtures inside the home save electricity, remain cool, and save money on replacement costs since LED bulbs last so long

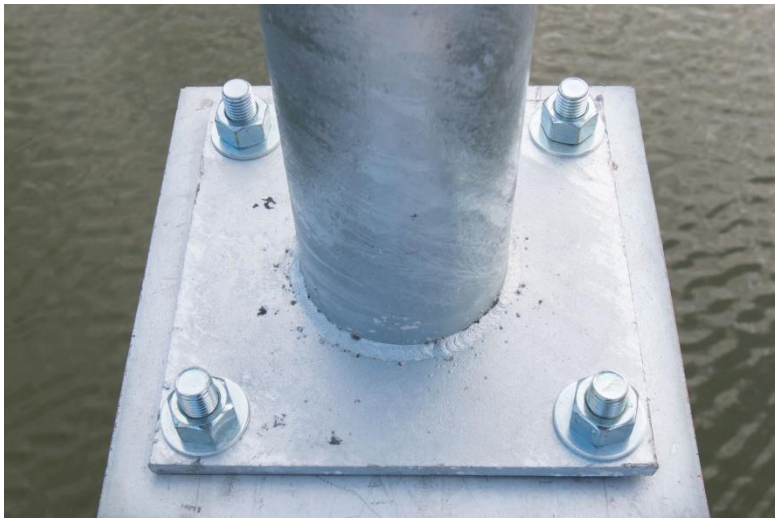
3- Structure

2- Dome

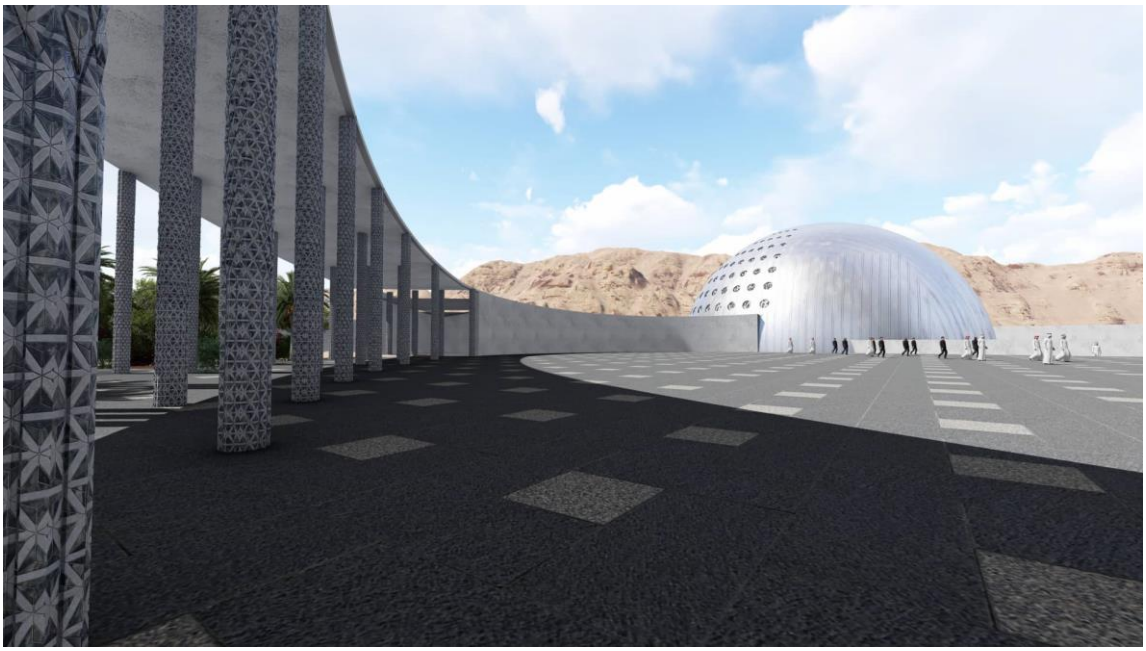
The dome has its own structure it is self-supporting thanks to its ribs

Figure 8 : the dome’s structure

The thermo-bimetal layer is assembeled to the moucharabiah through thick bolts



Renders



Renders