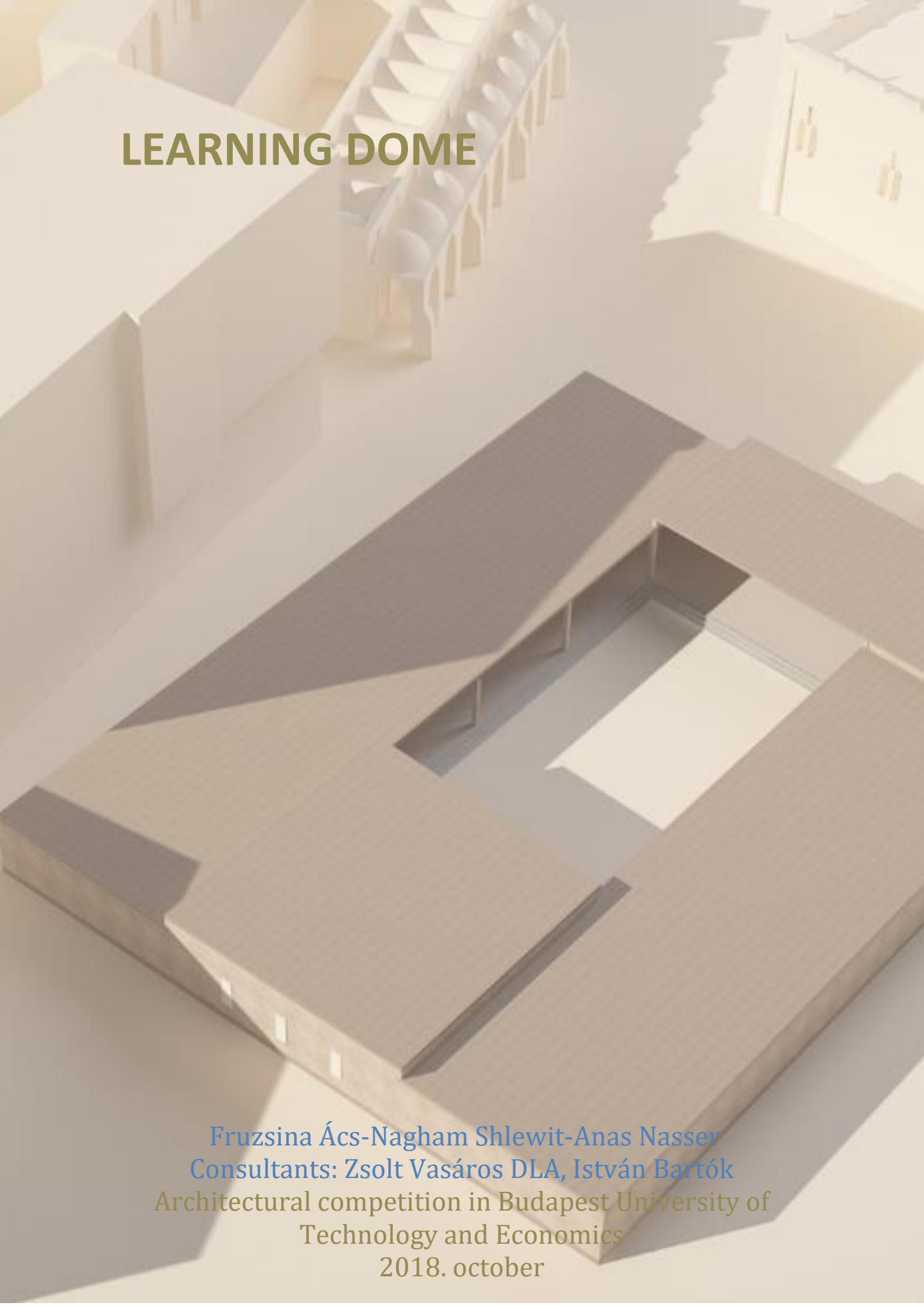
LEARNING DOME



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Architectural competition in Budapest University of Technology and Economics
2018. october

DESCRIPTION

AIM OF THE PROJECT

This project is aimed to design a new school building in New Gourna, Luxor. The reason we have chosen this task is relying on the one hand on the curiosity to design a building on such an extraordinary location, with specific materials, technology and habits (both in building and lifestyle). On the other hand, it is based on personal connections, because our team includes two students that are actually from the middle east, which means having personal experience with a very similar cultural background, and a hungarian student who has visited the exact site last spring. During that time I was lucky to get a personal sensation of the country itself, including the site, the lifestyle and the school system as well.

The egyptian school system has a lot of aspects to reflect on: the occuring problems of the country and the direct environment as well. The rapidly increasing number of people in Egypt puts a giant pressure to the government, because they not only should solve those people's housing, but also their education at least on an elementary level.

The housing itself is an enormous challenge due to the limited land that is appropriate for living conditions. The problem is, that only the valley of the Nile is fitting for that, which only takes a little fragment of the extension of the whole country. This area also has to be used for agricultural activities to provide the egyptian population the basic food. It is appalling to think about that the egyptian population has reached 100 million people (and this number increases 2,5% yearly) and all those people have to live on a site that is about the size of the third of Hungary.

The other challenge for the government to solve is the education of all those egyptians. Most of the communities cannot keep up with the informally increasing number of population, that is why they don't have enough buildings suitable for schools. The already existing schools usually have similar problems: way too big windows that cause bad ventilation and make the classrooms extremely hot during daytime, the bad orientation of the classrooms, classrooms with poor equipment, not enough classrooms with way less teachers than they would need. These are the reasons, that most egyptian schools organize the education of the students in two shifts: one in the morning, and one in the afternoon. That is for sure fairly exhausting for the teachers.

and also provides no daycare for the children in the other half of the day. Which means, they can't spend the day at a guarded place anywhere but at home.
The above mentioned questions related to the education are the ones, that we would like to answer with our plan.

ANALYSIS OF THE SITE

The possible site of the school was given, it is next to the main square in New Gourna, which is a part of Luxor designed by the architect Hassan Fathy. This part of Luxor was designed for the families who were living in the Valley of the Kings around 1945, whose main source of income was from looting the ancient tombs. Fathy's aim with this project was not only to relocate these people, but also to improve the lifestyle and life conditions of Egypt, starting with this community. However this project did not reached its aim, firstly because of several problems that occured, the village could not be built in its whole, only a part of it. Fathy used traditional building materials and structures but in a modernist form, he used mud bricks as the material of the walls, traditional shading elements, structures (for example domes), but the form in its whole somehow simple, the buildings often have the same, often occurring elements, they can be easily built, and often designed in a modular system.
As being said, the planning site is next to the main square, bordered by the mosque, the building of the Khan, and residential buildings. It is also really close to the theatre. On the site there are two buildings that are to be demolished.
The presence of such important buildings that determines the structure and often the centre of a village, is the reason, why we have to be so responsive by the design process- because we not only design a school, but in the meanwhile we define the square itself as well.

Pictures of the mosque

Picture of the theatre

ANALYSIS OF EXAMPLES

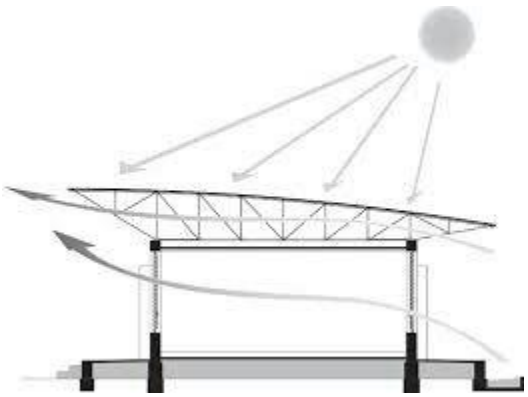
The design process has started with analysing some examples. After surveying an actual school in Egypt last year, there had to be a lesson to take from that experience. That school was made for both muslim and catholic students of a community, that also means a lot of children every that. That is why there had to be a lot of classrooms, a bigger courtyard in the middle, and some offices for the teachers.

We have also examined some schools built in Africa that also had some aspects that we could use in the designing process.

One of them is the school designed by Francis Kéré. The whole point was there to create a building built by the community, to use cheap materials but in the same time to create a functional school for the village.

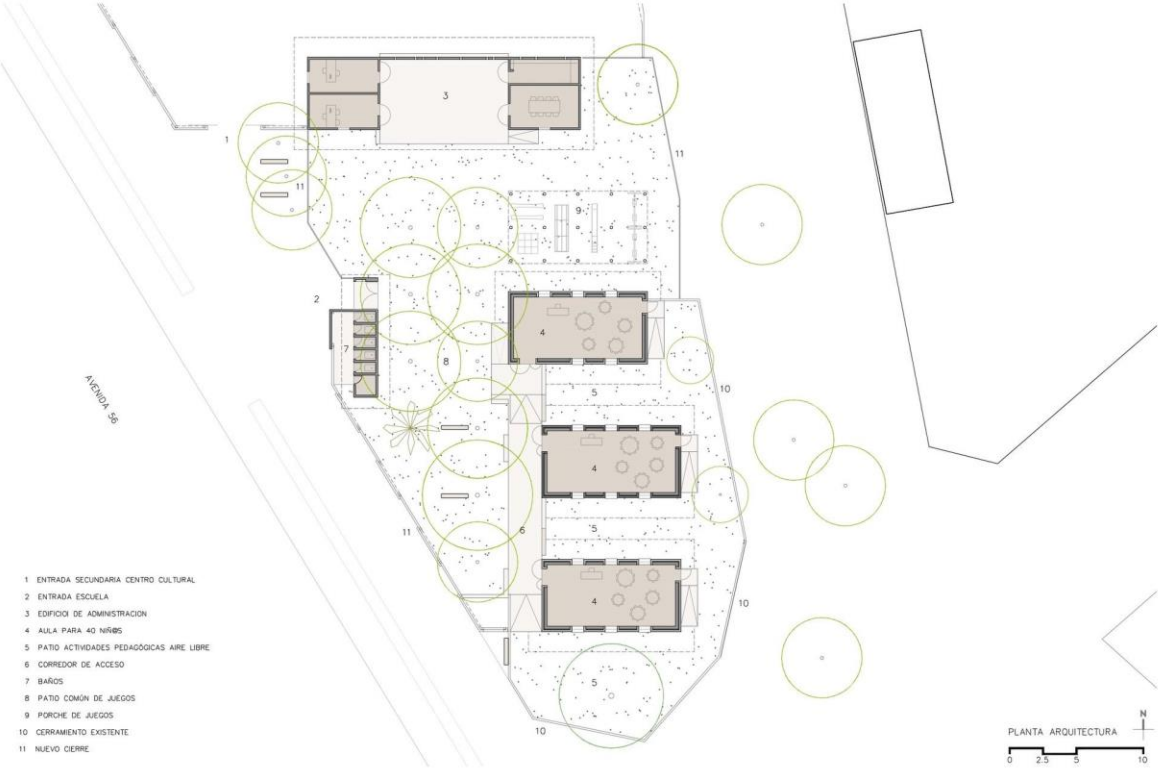
https://hu.m.wikipedia.org/wiki/F%C3%A1jl:Gando-School-Burkina-Faso.JPG

So the main point there was the orientation of the classrooms due to the hot weather. The other aspect was to build cheap, that is why they used brick, that the community made themself, out of clay. To solve the problem of the ventilation and to give shadow around the building they used a truss structure on the roof, and tall but slight openings on the wall in the appropriate direction.



http://www.kere-architecture.com/projects/primary-school-gando/

Another example we found interesting is a nursery school in Africa, Burkina Faso. The layout of the building units is designed to create little courtyards between them, which is a reference to the traditional houses in the region. The orientation of the classroom plays a huge part of the plan, it has an east-west axis in this case, to provide protection for the buildings in a possible storm.



Between the classrooms there are little courtyards, but the are all related to the big courtyard of the school.

The materials are also chosen to protect the indoor spaces from the heat and the rain in the wet season: brick walls, wooden and concrete elements, but the different units with different techniques: the administration block has traditional solutions, and the classroom unit has a little reformed structure.

A really light structured roof is used, to provide enough ventilation for the classrooms and it is prolonged and creates a front porch of the building.

LEARNING DOME

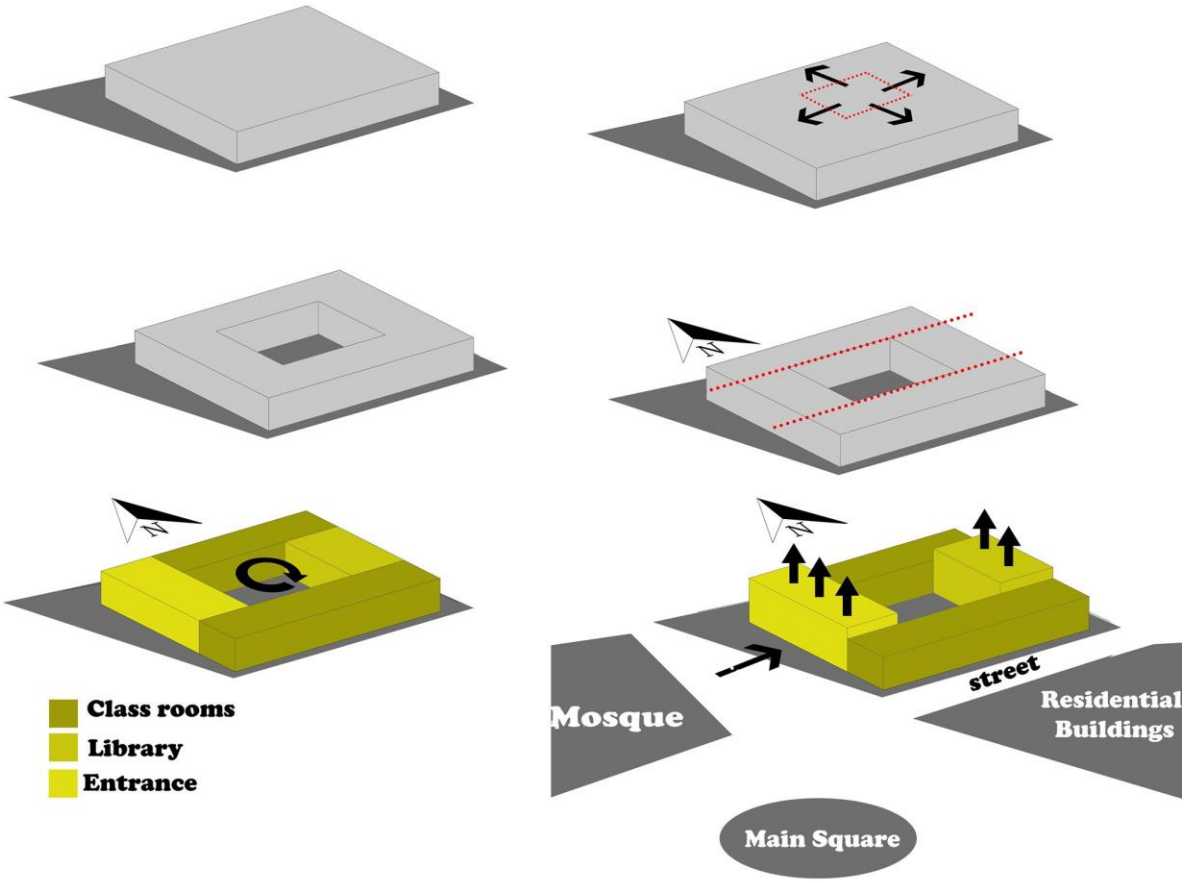
https://www.archdaily.com/588911/laafi-nursery-school-albert-faus

THE CONCEPT

Traditional school planning in modern cities usually provides students and children with an adult-scale campus environment at an excessively early stage. Such environment gives no help to them in coping with high educational and social pressure. Facing these phenomenon, it is the architects' responsibility to subversively break these conventions in school planning and offer children with space of their own scale and age in which they will enjoy living and studying.

The regular shape of the site and its orientation to the sun suggested a spatial distribution of the project in four main areas.
The base of our concept was a rectangular shape, because we wanted to create a middle part as a safe courtyard, and extend the building in four areas around that.

The main goal was to create classrooms that have good orientation, that is why we chose the north-south directions of the classrooms for the bigger opening possibilities. The two spaces between the red lines were chosen for special functions - the east part is a library and the west part is the school's main entrance and gathering place for students beside the covered area which is opened to the courtyard.
By placing the courtyard in the middle of the building it gives good ventilation and lighting to the building itself, because a covered area around it can evolve, which shades the openings on the sides of the passages.
The central area is a place reserved for relaxing. It occupies the middle of the plot. This strategic position allows it to serve as a central breakpoint for the school. The northern and southern areas include the classrooms, IT room, the teacher's and director's rooms, restrooms, and praying room.



ANALYSIS OF THE BUILDING

With the creation of the building we found important to provide the children as many space as possible. That is the reason why we extended the building as much as we could without undoing the order we previously defined. With this move the courtyard is as big as it could be, and the pupils can play both on a covered area and a safe courtyard, which regarding the number of children per shift (180 pupils both in the morning and in the afternoon) it couldn't have been too small.

The orientation of the entrance reflects on the main direction of the mosque and the main square as well, by that the situation of the square is more defined in the structure of the village.

The idea was to create an inner space which provides semi privacy plus by evolving the whole mass around the courtyard it provides good ventilation and excellent lighting for the classrooms around it. The aim was to extrude the roof part to

allow indirect light to come into the building. Moreover the key part was to allow natural wind to run everywhere. The corridors were made contemporarily with an old fashioned system which opens all of them to the courtyard like the arabic houses where you can find all the natural elements around you and you won't have to go out to feel them.

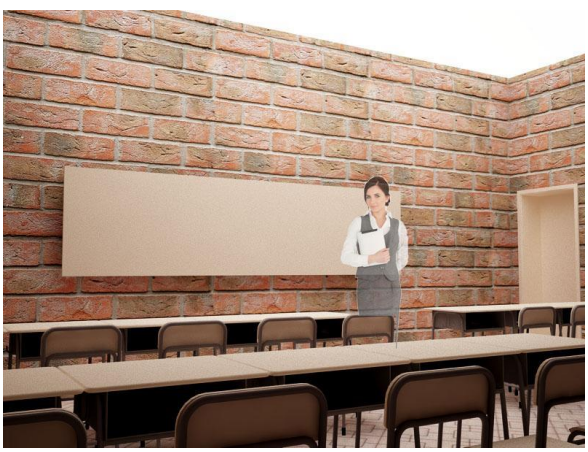
By raising up the heights of the entrance and the library (as they are special parts) these areas are emphasized from the other parts of the building, everyone should recognize them, it also enhances the importance of the entrance (since the students are young and also need a reminder on the start of the building in the first few days of the school year).

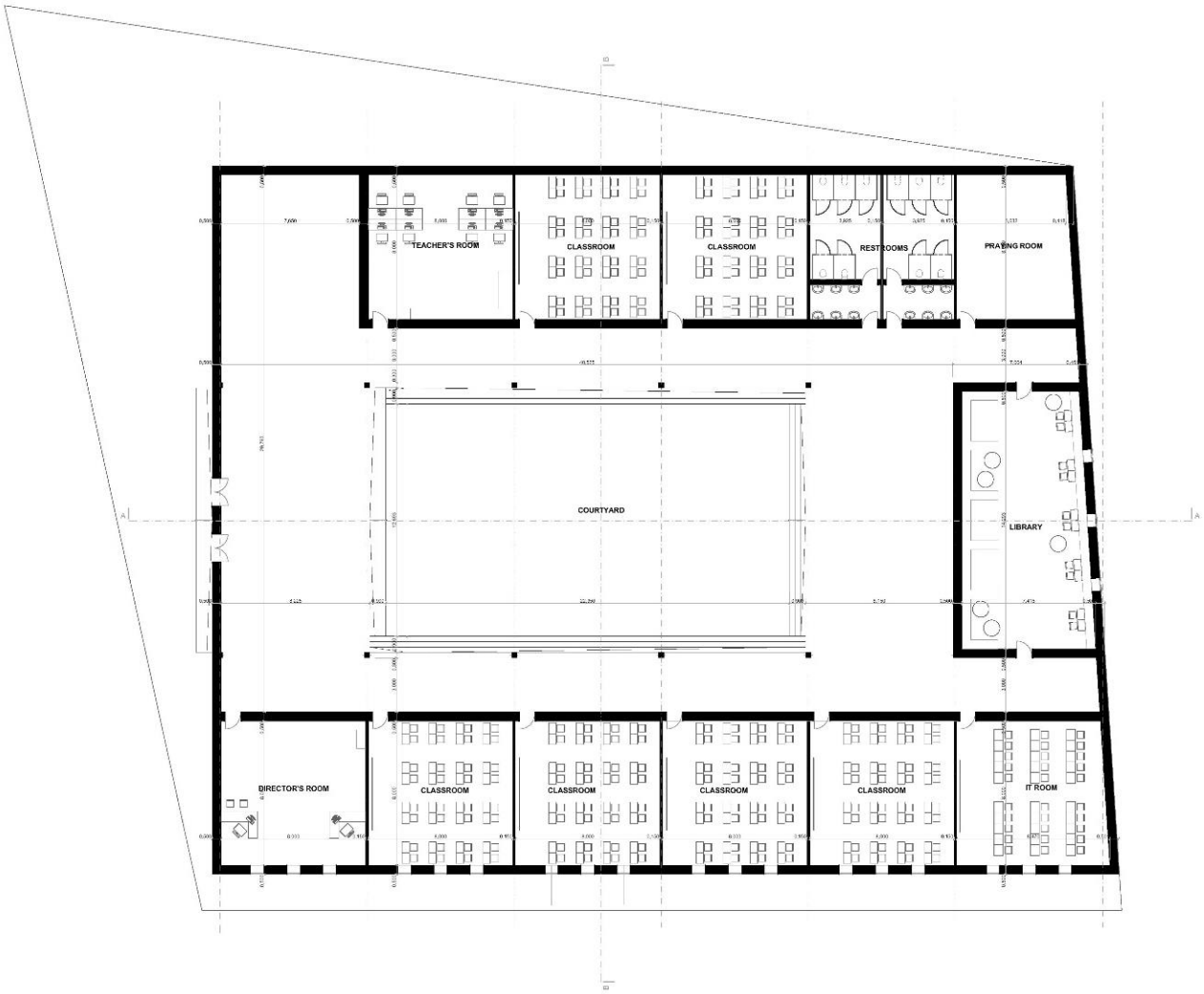
All of the classes are aiming to the north and south for the best orientation and all of them are opened to the courtyard as well, so there is a simple movement of the student without any complexity.

For the lighting of the classrooms we put high and narrow windows so the users can open the widows half or full range of motion. Above the widows there are also small openings which give continuous wind and light even if the windows are closed.

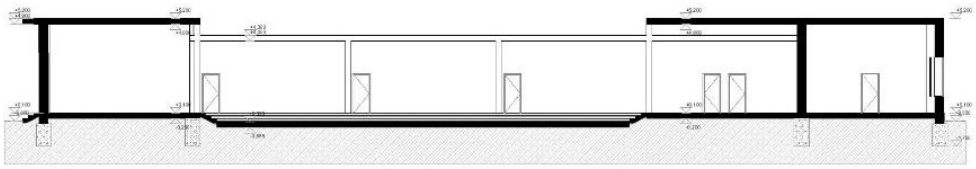
The materials of the facades were basically inspired by the surrounding buildings which were made from the clay by Hassan Fathy so we thought that the brick cladding will fit perfectly as a natural cover to the whole building. We also find that adding wood to the upper and the lower line of the facade also breaks the rhythm of the one material situation. The roof is covered by light brown ceramic tiling as well as the floor of the courtyard but in a lighter shade of gray.

In the interior corridors brick also was used and in some of the walls in the classrooms as a nice natural color which will give student comfortable vision.

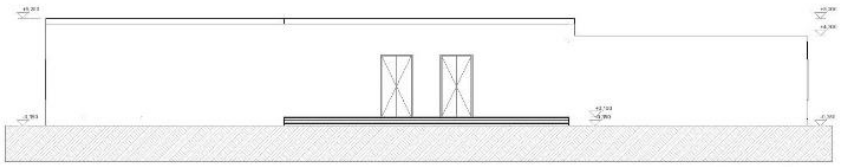


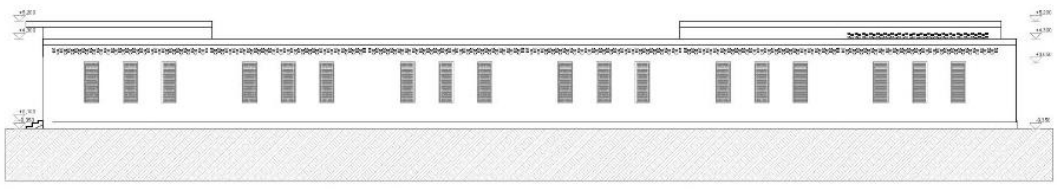

TEACHER'S ROOM
CLASSROOM
CLASSROOM
REST ROOMS
PRAYING ROOM
COURTYARD
LIBRARY
DIRECTOR'S ROOM
CLASSROOM
CLASSROOM
CLASSROOM
CLASSROOM
IT ROOM

Floorplan



Sections





Elevations

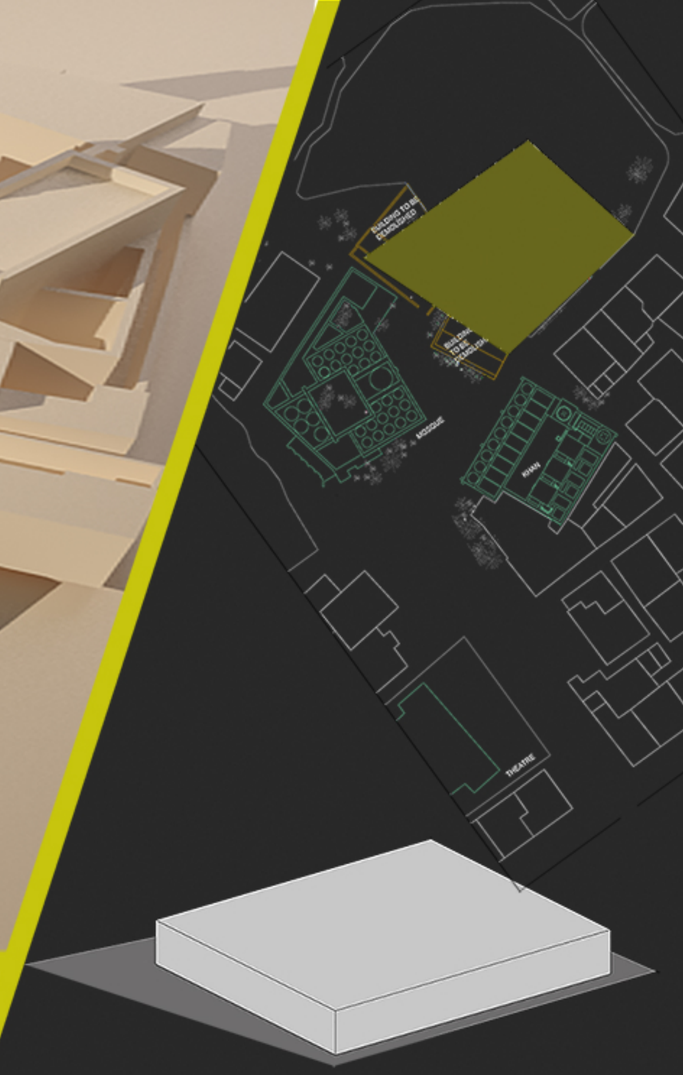
The Learning Dome

Corridors and lighting

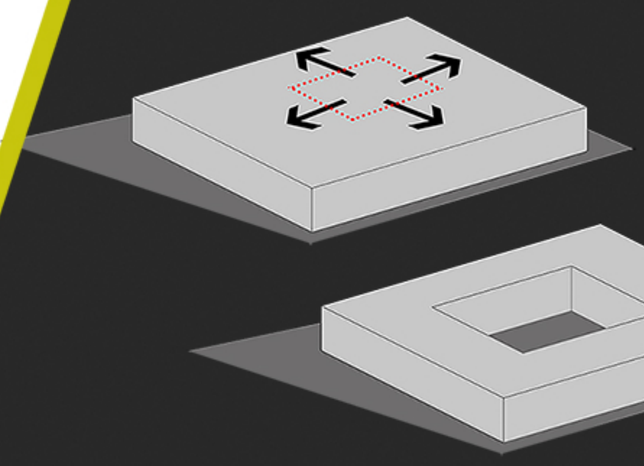
Open and Covered courtyard

Classroom atmosphere

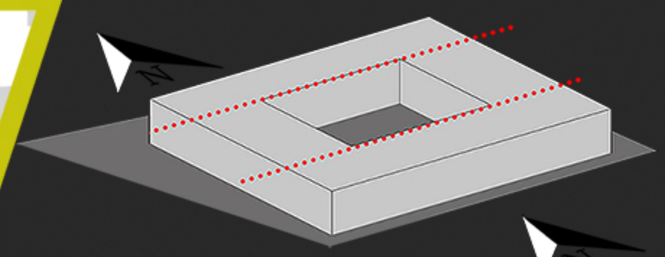
Site plan - Scale 1-1000

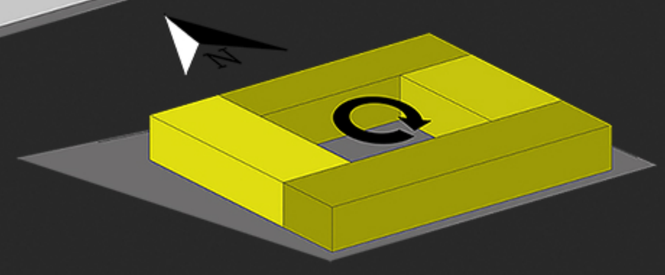


We started our concept with a rectangular shape and use the whole site.



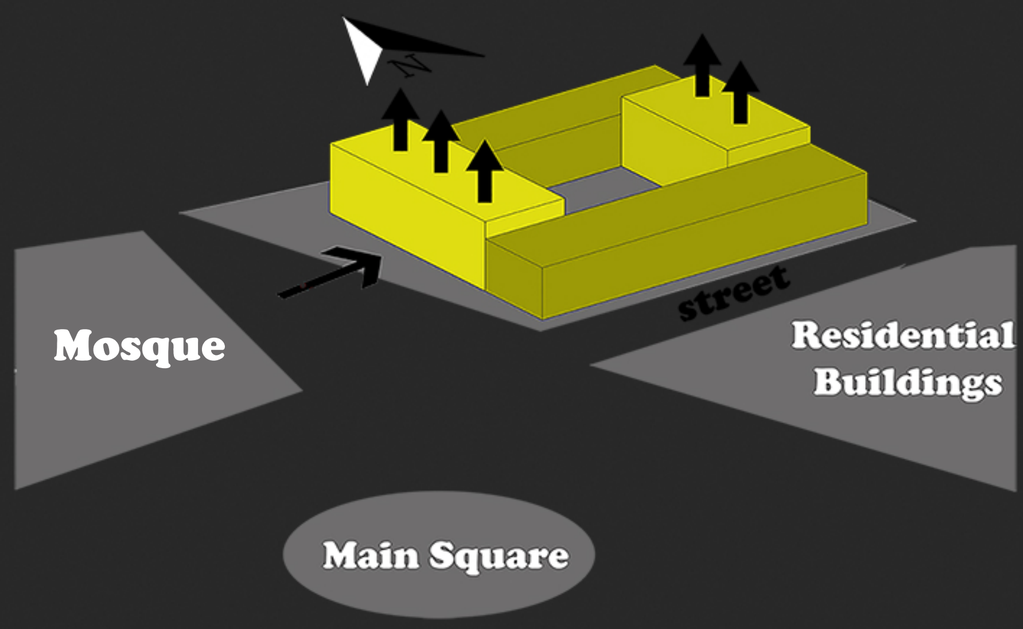
Create a courtyard in the middle of the building, that could give good ventilation and lighting to the building, in this way it is easy to provide a covered area around the courtyard.





Class rooms
Library
Entrance

Two special parts from the building on the north and south direction was chosen due to better orientation for the classrooms,which is separated by this red dot line .
Two spaces between the red lines were chosen for special founctions - The east part is a library and the west part is the school's main entrance and gathering place for studens beside the covered area which is opened to the courtyard.



- Raising up the heights of the entrance and the library as they are special parts in the middle of the project which every one should recognize.

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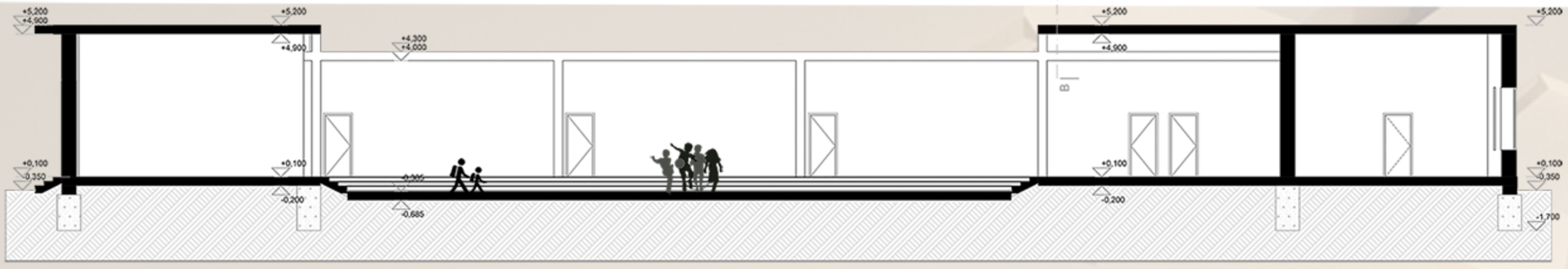
Ground Floor Plan -Scale 1/100



Section AA - Scale 1/100

Section BB - Scale 1/100

Western Elevation- scale 1/100

Southern Elevation- scale 1/100

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