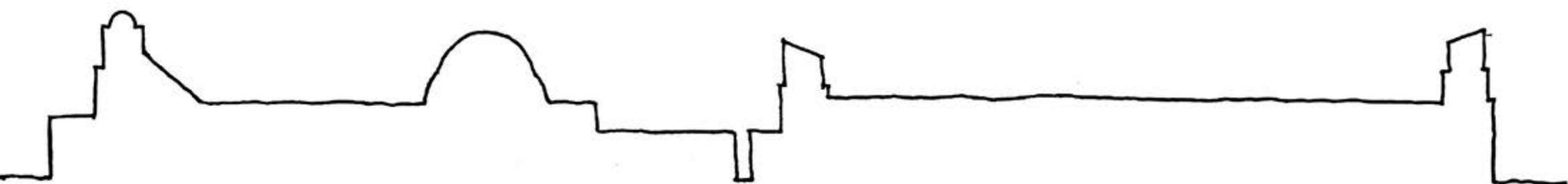


WIND-CATCH!



WINDCATCHERS

TDK_2018
SCHOOL FOR NEW GOURNA

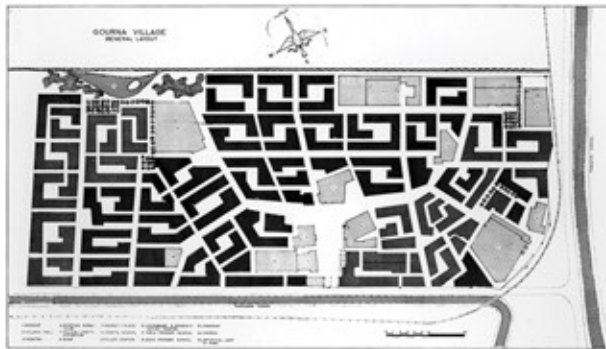
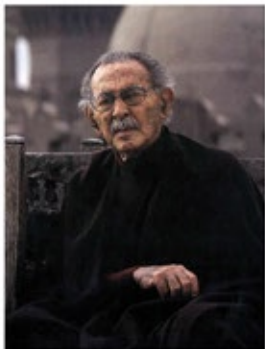
AUTHORS: DÓRA KALÁSZ, ANNA LUKÁCS
CONSULTANT PROF.: Dr. habil ZSOLT VASÁROS DLA

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INTRODUCTION

This year the theme of our TDK - under the department „Identity and culture” - is planning school for New Gourna. We are interested in this since it was announced, because in 2016 we both were parts of the team that got the opportunity to go to Luxor, to work in New Gourna village. Our work was connected to the well-known Egyptian architect's – called Hassan Fathy – work of life. The aim of our work was to precisely document the still standing architectural heritage of Fathy. New Gourna was the main location of his plans. His aim was to relocate the tribes that lived at the archeological area of the Valley of the Kings in the 20th century. It was a must to replace them since at this time they were systematically looting ancient tombs. He created the masterplan of the site that included the architectural design of the buildings and a complete social-lifestyle program as well. The project was never 100% finished but parts of it became constructed. Our design area has the mosque, the kahn and the theater nearby, so we can see that it has a central location. This area was planned by Fathy as the center of the village.



FEATURES OF THE SITE



Weather:

The average temperature in summer, through the day: 41°C, through the night: 23°C and in winter it is 23°C and 6°C.

Wind:

The main direction of wind is west, north-west

Rain:

The amount of rainwater per year is very small, just around 2-5 mm (just to compare, Budapest has 500mm/year). The annual quantity of humidity is also low, 39,9%. (Budapest: 68,1%)

Geology:

The site has a high level of ground-water. In the surrounding area most of the buildings that are made of mud brick went collapsed because they did not have the proper foundation and they also were not lifted up enough from the ground, so they let the ground-water impair them. It is possible to defend the structure by creating good foundation, footing level that goes high enough and using water-isolation.

STEP 0.

Before starting any planning part, we took a look on the site and the surroundings. We needed some analyzations and examinations about the area, how things work here, which parts are connected and how, how inhabitants use this part of the village in general, etc...

We started to ask ourselves questions we will have to answer by building anything here.

Do the village really need a school to be built up here?

Yes, definitely. Since 2,5-3 million children are born in Egypt per year - according to the studies - perhaps they need even more than one school to have the chance to have a proper education.



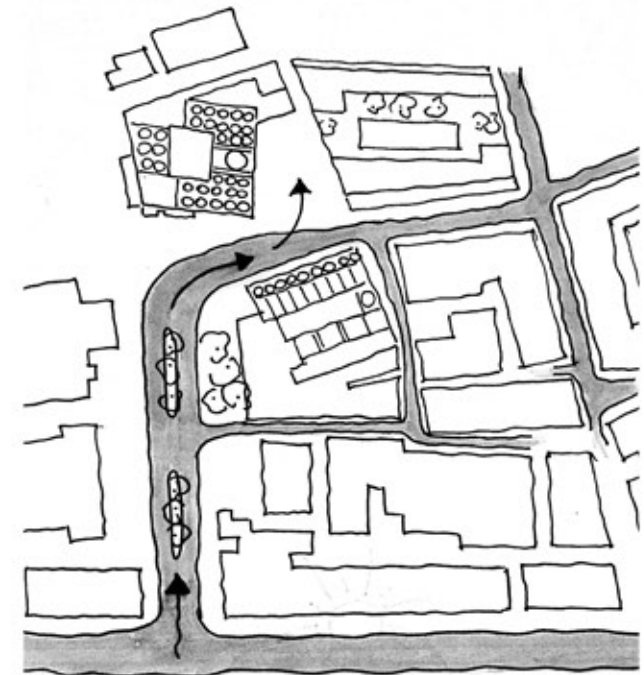
Will they be able to use this school as it is meant to be?

Yes, they will be able, if we provide them better conditions Here we are talking about climatic and functional conditions.

Will the area out of the borders of the site be used by the children and their parents, teachers?

Yes, it will be used. The site is located in a central position of the village. There is the mosque on the west side and the kahn on the south side. The main road leads us here next to these buildings, as we can see it in the picture below.

This area is able to work as the center of New Gourna Village, as Hassan Fathy originally planned it. Fathy created a plan that was never fully constructed, but it was a good start of developing this area of Luxor, of making the condition of the dwellers' life better. In our opinion it is important to keep Fathy's imagination up, it is important to not to forget his name when it comes to developing New Gourna in any kind of way.



CONCEPT

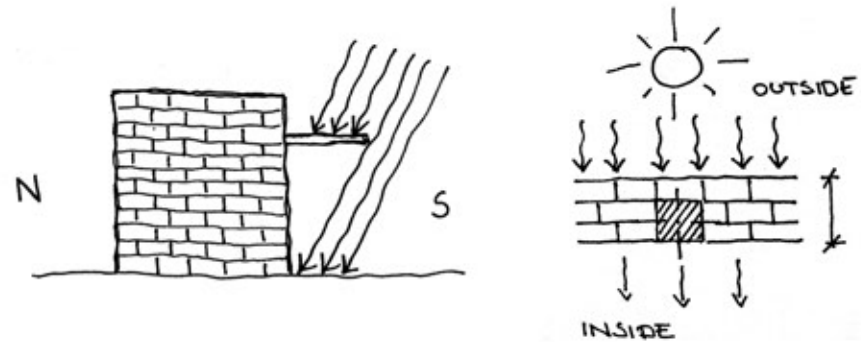
After having these analyses, to create the concept of the school, we have chosen three things to be our main principles.

FIRST PRINCIPLE - utility

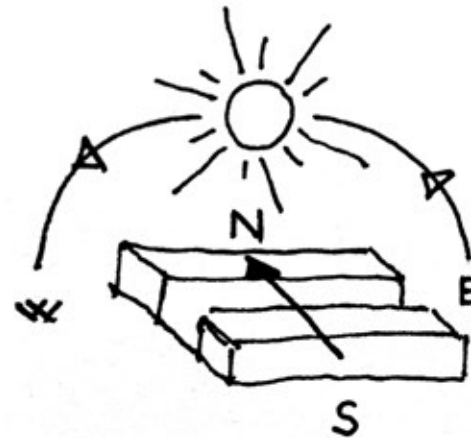


It is the most important part that we need to pay attention to. We have to give the children the chance to be able to study under good conditions. This area has a very hot and dry climate that is not so easy to handle for them,

even if they were born here and they are “used to it”. Focusing on the class while it is around 40 degrees outside (or even more) - and so it is inside - is very difficult. This is why we must pay attention to the cooling system of the building. Our aim was to use tools of sustainable architecture to keep the building cooler in an eco-friendly way. This contains elements like wind-towers that can catch the wind and make it run over the building, perforated walls that also help provide the airflow through the rooms,



thick wall structure that prevents the hot air to get through the walls through the day, roofs outside that can provide shadow and defend the walls from direct solar radiation.

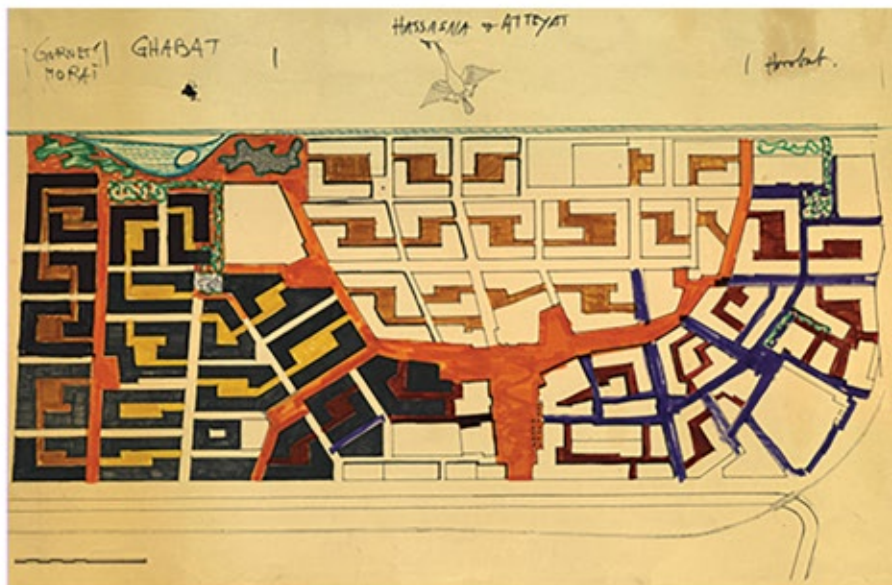
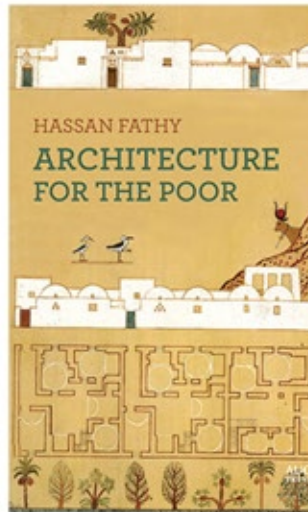


The orientation of the building is also an important part of this system in general, so this is what led us to place the functions to where they are now.

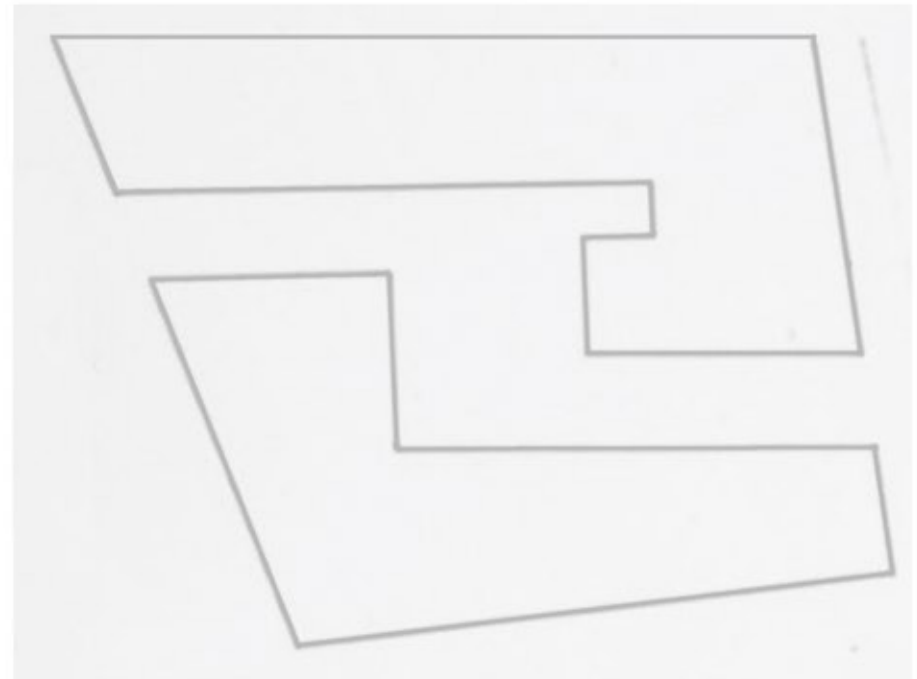
Making good connection between function and function also takes part of utility. Our building is meant to be used by children and teachers and we wanted to make them feel comfortable in it. Functionalism is the key to create the school perfectly user-friendly.

SECOND PRINCIPLE

As we mentioned it earlier, the oeuvre of Hassan Fathy is about the village of New Gourna, built up for the lower part of the society. Our second principle is connected to his name. Originally his plan for our specific site was to build houses for families here, just as in the rest of the village around the mosque and the kahn. His plan on this site never came to reality, but he left the drawings behind for the future generation so this way we can see what was in his mind.



In our opinion it is important to keep the memory of this great architect in mind and even go further, use his plans and imagination as a base of designing the school.



So this is how the idea came: why not to use the outline that he drew to create the building so it will remind all of us of his work, his imagination, it will keep his memory for the future generation.

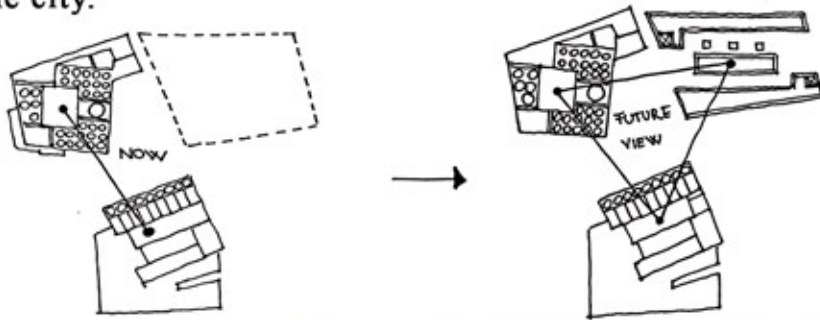
The first two principles made us create the shape of our building the way it is, we will talk about this process more detailed later. But before that, we have to mention our third but not last principle, to let you see the whole picture of our concept.

THIRD PRINCIPLE



So speaking of, the third component of our concept is about the site in a bigger view. At the beginning when we started with the analyzation part, we could not turn a blind eye over the

fact that this area has the central location and that according to the original plans it was meant to be as the center of the city.



The mosque, the kahn and the designing area all together creates a triangle, that has an empty space in the middle. This space could be used as the heart of this triple.



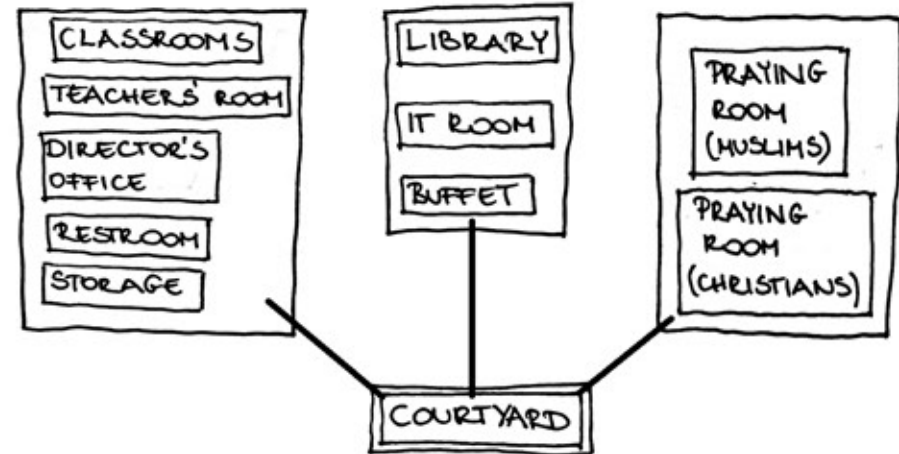
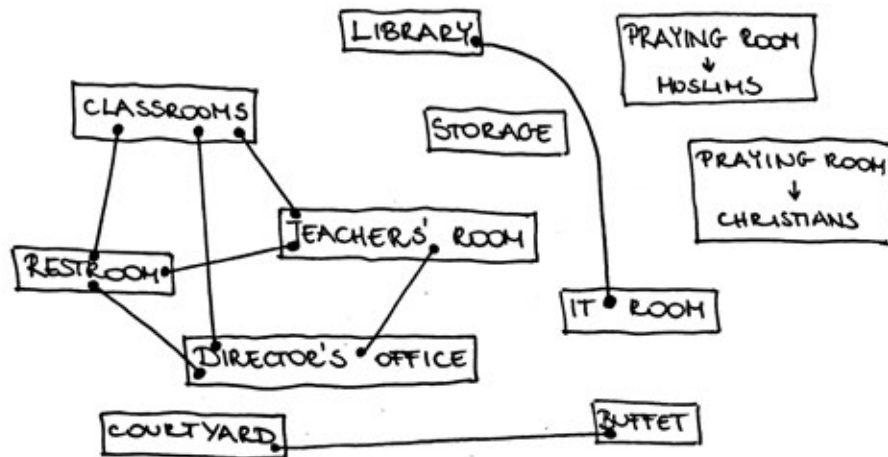
By paying attention on this bigger view of the area, we decided to handle the three building and the outside area that they have the middle as a unit. The mosque and the kahn are already communicating with each other and so as they will with the new school.

Seeing this, it is clear, that we must treat the triple as they need to be treated, as a unit, as the center of the village, there is no other way if we would like to create something that brings a better quality of social life in to the village.



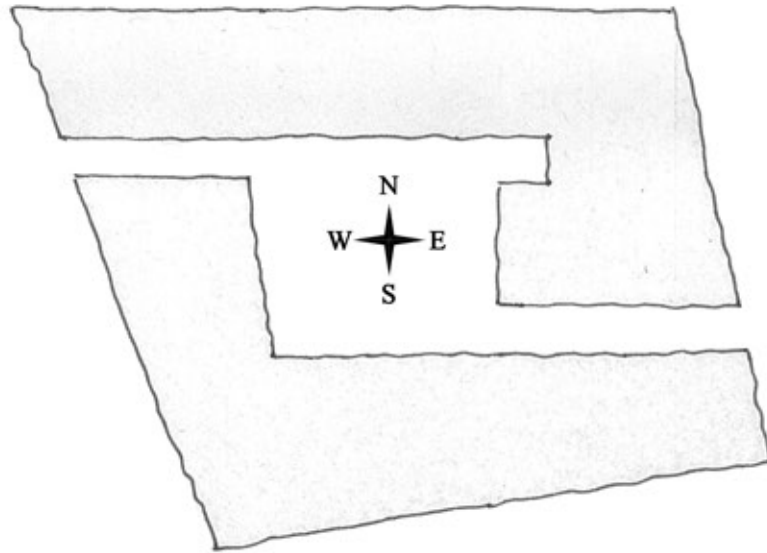
THE BUILDING

First of all, let's take a look at the functions we had to place here. At the beginning of the planning we drew sketches about which room needs to be connected to which, which ones can be located away from each other and which ones has to be close. The school needs six classrooms, that gives place approximately 30 children per classroom. One IT room equipped with computers, library where students can learn, read, spend their free time. Room for the teachers where they can prepare themselves for the classes, one office for the director, rooms for praying - one for Muslims and another one for Christians - restroom, storage and courtyard. Besides all these we gave an extra function to the school, we wanted them to have small buffet with covered terrace where students and teachers can buy drinks and some snacks, sit down and take a break.



We started the planning by creating groups of the functions, by examining the relations amongst them. Classrooms are supposed to be in one bunch, connected to the teachers' room and close to the restroom. It is also important to give them the direct connection to the outside spaces, to the courtyard and the garden where children can play while having a break between their classes. It is good if the director's office is close to the teachers' room and also to the classrooms, so if they need any help, they can easily reach him/her. The library can be connected to the IT room, these two rooms will not have the same load as the classrooms. The IT room is planned for having one class at the time and the library can be open all day but students use it when they do not have any classes - before, between or after them. The rooms for praying can be separated from each other and also from the other rooms, they can be independent just by themselves so the ones who want to use them, can "get out" of the school a little bit and focus on practicing their religion in a calm and silent way.

OUTLINE OF FATHY

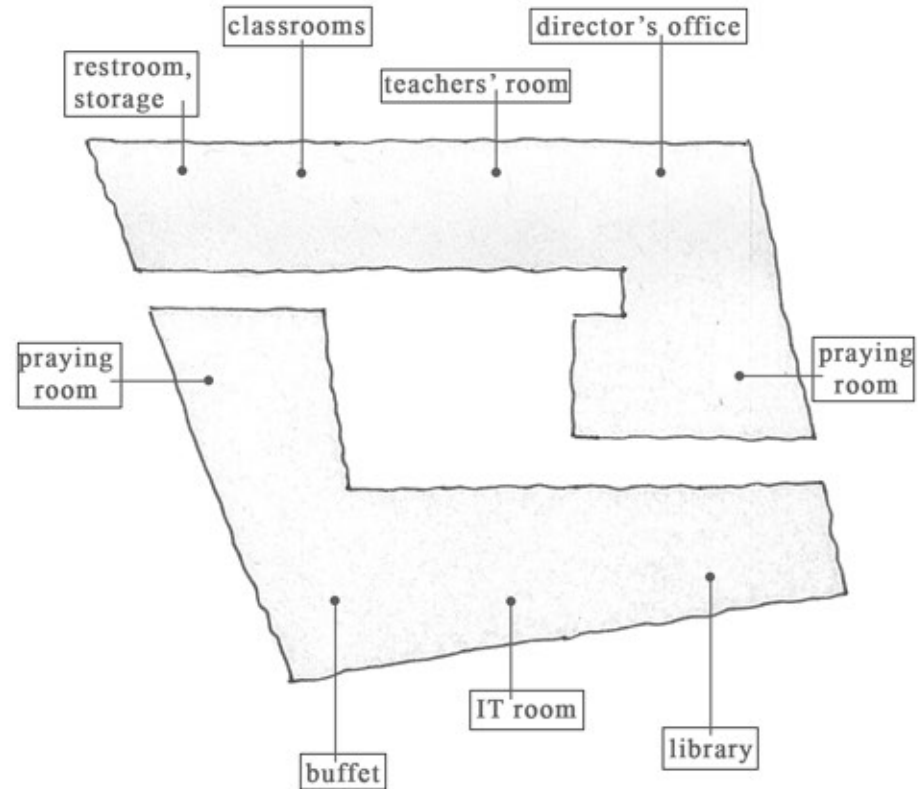


After a basic analyzation and grouping the functions, we drew Fathy's original plan down on the designing area. We had to see first, how he wanted to place the buildings here and why.

The outline of Fathy's plan shows that he wanted to use all the four side of the site, building it around, but with a bigger emphasis on the north and south side. It is obvious why he located the buildings this way: the good orientation here is north-south, because of the sun exposure. Even before we took a look at his plan, we already had it in mind to keep this orientation, so afterwards it was a good confirmation of our toughs.

We decided to place the classrooms in the northern wing. Since they are connected to the teachers' room and the director's office and we wanted to keep the restroom also close, these functions got also located in this part.

Besides this there is the library and the IT room, together they create a more quiet and calm unit. They are placed into the wing of the south side. We had a feeling that the two spots of the praying rooms are already given by the "ears" of the two main unit, that are facing to the east and the west side.

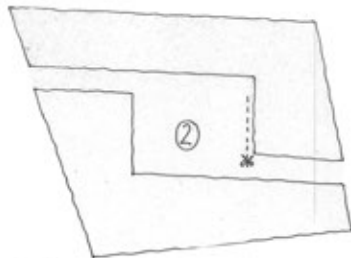


STATIONS OF CREATING

After finding out with which functions we will fill this basic lines of Fathy and how, we started to work on how the shape drew by him and the functions will fit together. One little move here, another one there, zooming in, zooming out, stretching, scaling, cutting, mirroring, long game of creating the layout we want to have. But at the end, we have found it. Just to make you understand the process better, here are the main steps we went through:

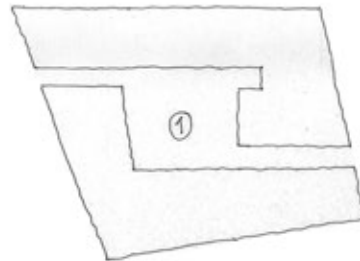
1st:

The original form of Fathy



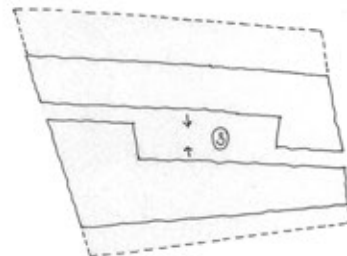
3rd:

After cutting down but leaving the same borders we realized that the size of the space in the middle that we wanted to use as a garden, happens to be way much bigger than it needs to be.



2nd:

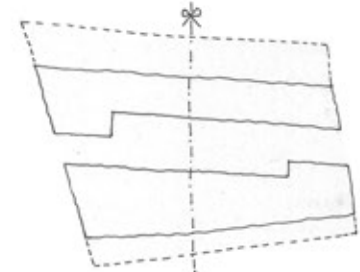
Cutting down parts that will not be used



Also we have palm trees close to the borders that we do not want to cut out. So let's pull the wings closer, this way we can reduce the size of the garden and also save the trees.

4th:

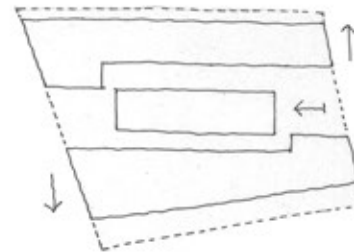
Placing the entrance. At this point we decided that we would like to open the school from the square, so let's mirror the shape and cut a little more down, so we can give it a representative main entrance.



5th:

On one hand, the space in the upper part is not big enough to contain all the classrooms and the other functions and on the other hand the garden is still oversized. **New idea:** place a new block in the middle so we can put the half of the classrooms here and also divide the garden into smaller parts.

This way all the functions have the good orientation and enough space, the side of the main entrance also opens more and we can separate the "noisy part" from the "silent part".



SET-UP OF THE BUILDING

People can enter the school two ways. One is the main entrance that opens from the side of the center, directly from the square. The other one is from the east side.

In the final version, the block on the south contains the library, the IT room and the small cafe. From the main door, we enter and find ourselves on the terrace of the cafe, that is like a small welcoming area of the complex. Here is an open space covered by roof and surrounded by walls from three sides. The walls are perforated, so the air can circulate and the roof provides the shadow. This way this area is just perfect to spend some time out even if it is a hot day (as it usually is). Going forward on this block, the next we can find is the IT room, then comes the library. At the end, there is a small reading corner we created in between the library and the praying room. The setup of this area is the same as the terrace of the cafe, the goal is to let the children use it as an outside library where they can read and relax a little before, between or after their classes. The block in the middle gives place for three classrooms. The other three is in the northern block together with the teachers' room, the director's office, the storage and the restroom. The praying rooms, as we mentioned earlier, are separated, they were set up on the edge of the east and the west side.

We have intended to keep as many palm trees as possible that are already given by the site. Two of them are standing in the middle of the northern block we wanted to place. So we decided to take advantage of this instead of cutting them out and build the walls around them, so as elements, can

even separate the restroom-storage part from the other parts. This way on one hand the restroom can have more privacy and on the other hand we can insert the nature into the built environment.

Layout:

- | | |
|--------------------|----------------------|
| 1. buffet | 7. teachers' room |
| 2. IT room | 8. director's office |
| 3. library | 9. restroom |
| 4. library terrace | 10. storage |
| 5. praying room | 11. courtyard |
| 6. classroom | |

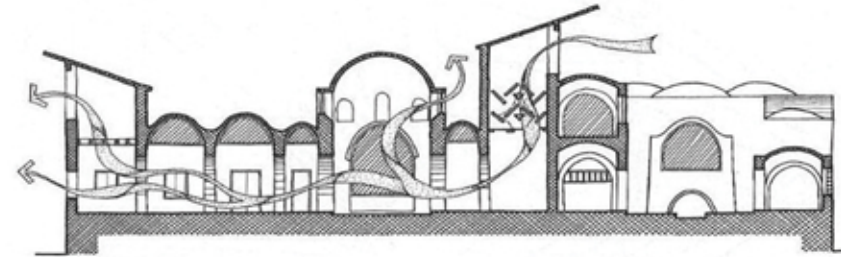
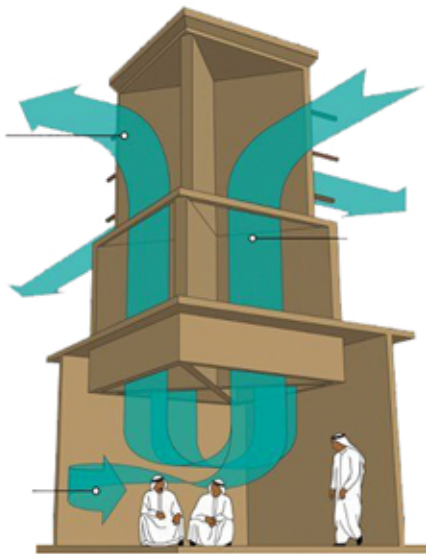


PROVIDING COMFORT

Next point of utility: providing comfort. As we said our aim is to create comfort inside the building in a sustainable way, by using natural cooling system. So at this point we made some researches about this topic, to see what kind of opportunities we have. As we mentioned it earlier, we used wind-towers, perforated walls and proper wall structure to reach the temperature inside of the rooms that make the time spent there bearable. Let's have a more detailed look on them now.

The wind-towers appeared earlier in the history of Egyptian architecture. They were built using local construction methods and natural materials.

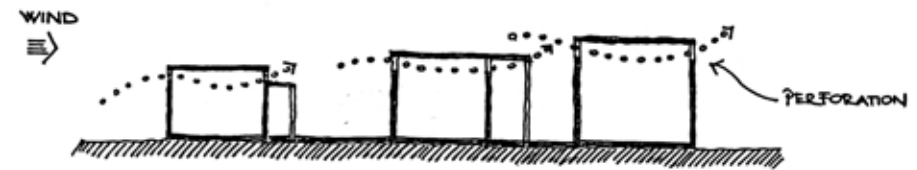
Hassan Fathy also used them as a tool of cooling the building in a natural way. They often reach even the height of 15 meters above the ground because here the wind velocity is the greatest and also the quality of the air is better and cleaner, since it is less filled with sand. By using an X form inside the tower, we create a funnel that helps to make the air circulation work.



In our case, we placed two towers on the top of the praying rooms, one of them faces east and the other one faces west. These towers have a role in not only cooling these rooms but also in emphasizing the places of religious activity that is a very important part of the life of this society. On the west side of the site the silo of the mosque also appears, so it was important to bring ours into line with it.



To the rest of the rooms we gave perforated walls to provide the air circulation through them. The wind is mainly coming from west-northwest, so we played with the heights of the blocks, coming from north to south they are getting higher a little so one will not close the way of the wind from the other.





Talking about the structure, we use concrete pillars and beams as the supporting structure and white limestone as filling structure. We have chosen limestone because this is a material that they are mining here. It is better to use the material they naturally have than to make any further effort to get something imported.

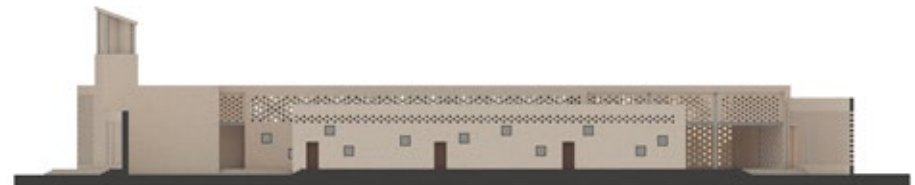


The main facades were formed by the perforation of the walls. Some surfaces are more opened while other ones are more closed. It is an interesting game with the rhythm of the pattern. The appearance becomes mysterious for the outsiders, since from some view they can see parts of the inside but it is neither fully opened nor closed from their eyes.

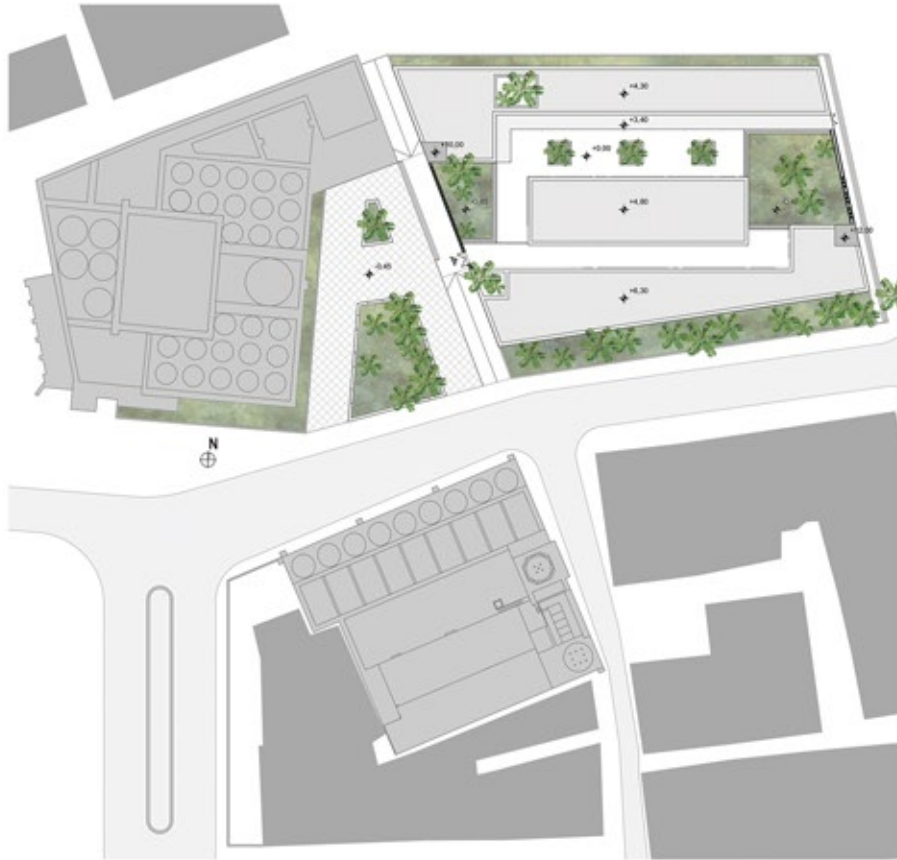


We use 50 cm thick walls and small (80x80 cm) windows placed the inner surface of the walls, so as the doors. This way we protect the rooms from warming up through the day. Windows are only open on the inner facades where they already are protected from direct radiation. In general, the air through the whole complex has a free way to circulate since we pulled the parts away from each other and gave them enough breezy space.

On the inner facades we put the windows to give natural light to the rooms. By creating the rhythm of these windows we gave a playful and jaunty atmosphere to the courtyard.



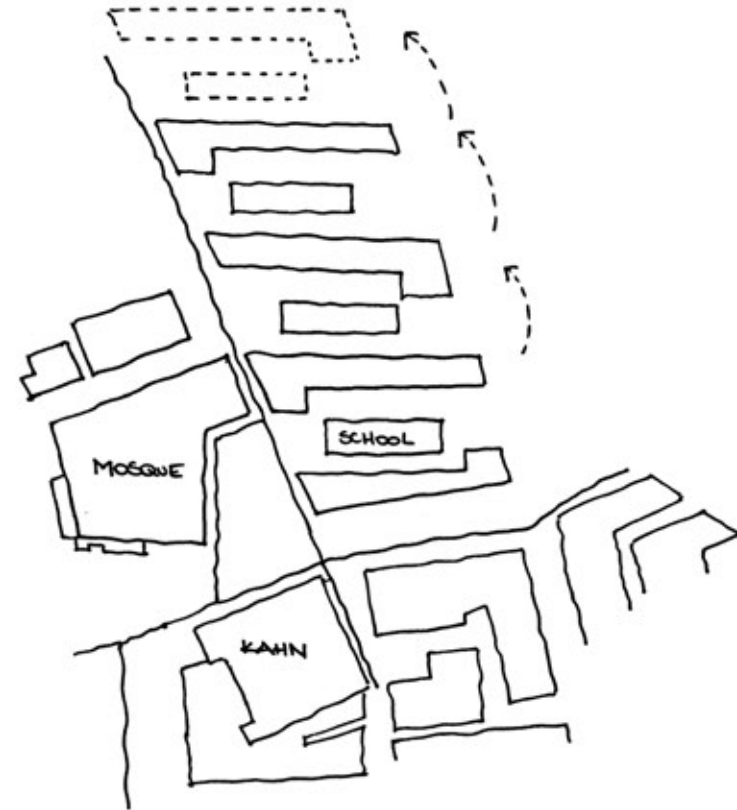
THE SQUARE



Amongst the buildings we intended to create the main square that they can use in their free time as a common area. We have chosen a simple way to develop this part, we created a mix of covered surfaces and plantation. People can walk through the square or sit down around the trees where we created small stone steps to be used as benches.

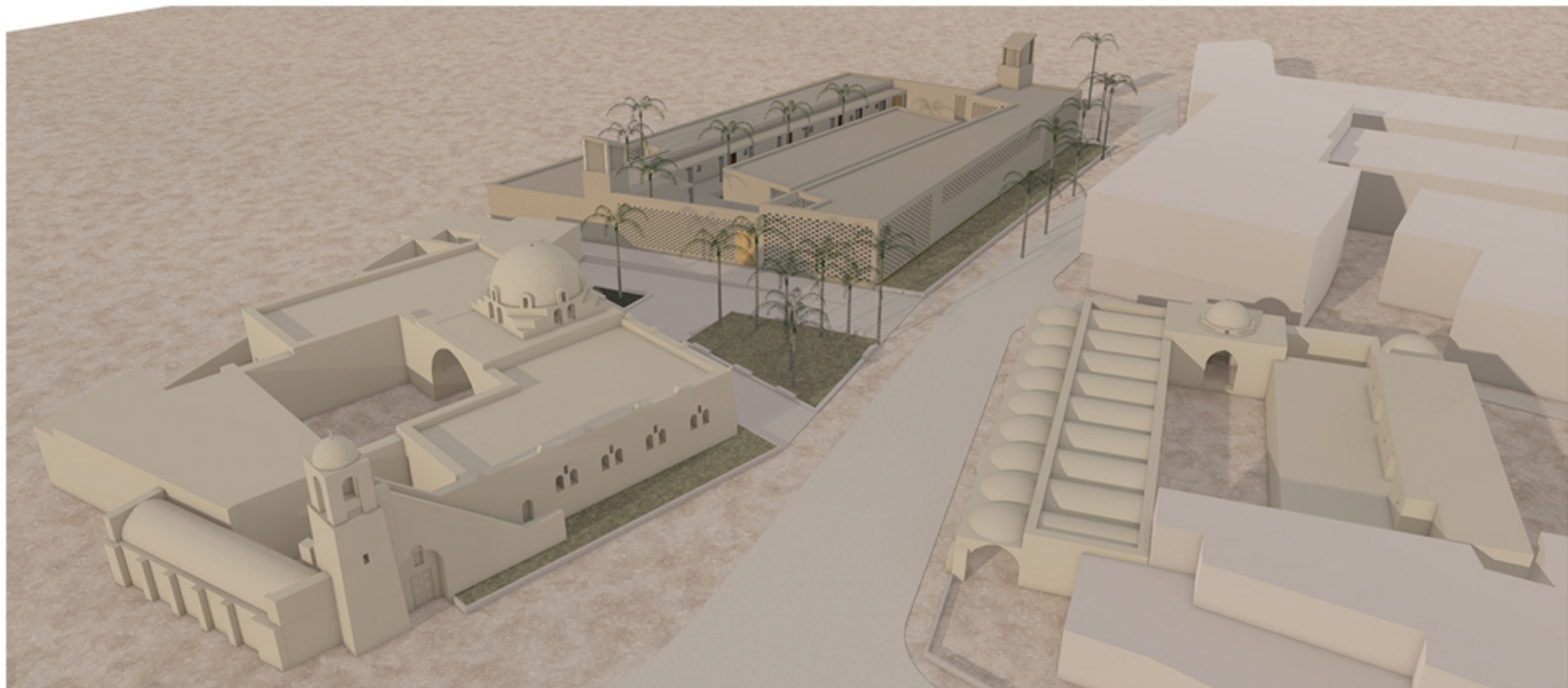
FUTURE VISION

If the growing of the population will not stop, they definitely will need more education facilities. So there is a chance that they will need to extend this complex. If we take a look at the map, we can see that northwards from the site there are no buildings, currently this is the end of the village. The opportunity is given: to extend the village in this direction. We would like to show you our vision about this future imagination:



SUMMARY

Our aim was to create a school that is sustainable, provides a good comfort for the users and also commemorates Hassan Fathy. It was also an important point of view to stay realistic and pay attention on the features of the site and what the inhabitants already have. By using materials, they already have and using tools of natural cooling, in our opinion school building could really come to reality.



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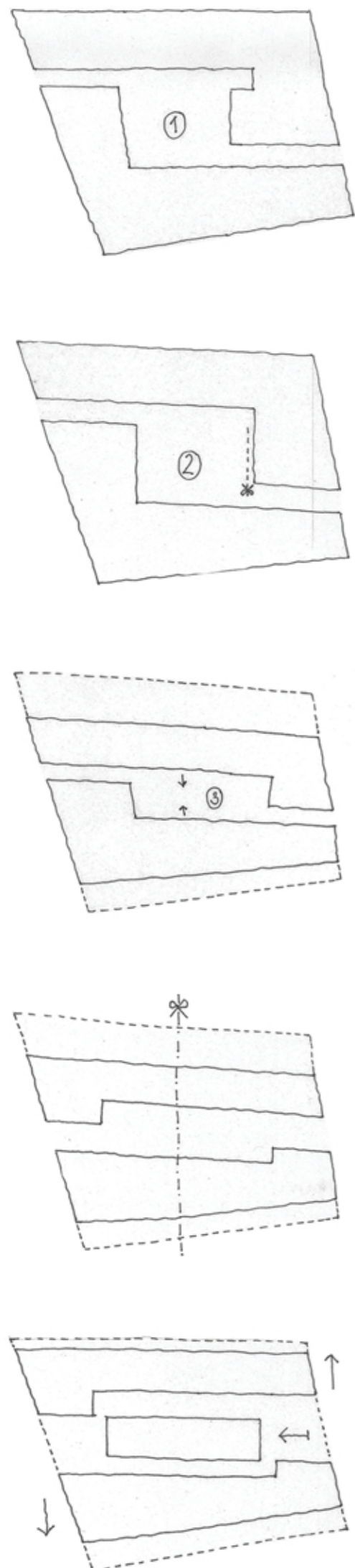
ABSTRACT

As the main topic of our TDK we have chosen to design a new primary school for New Gourná, located in Luxor, Egypt. This part of the city is connected to the world-known Egyptian architect called Hassan Fathy, whose oeuvre was planned to be built up here. The site of the school is in a central area, next to the mosque and the khan.

Our concept is based on three principles. First of all, utility. We must pay attention to the cooling system of the building, since this area has a very hot and dry climate. Our aim is to create a comfortable environment where children can focus on their studies for the whole day. By using tools of sustainable architecture, we will design the building in an eco-friendly way. The airflow through the house is provided by air towers. These towers have an important role not only in the cooling system, but they appear as conceptual design elements, contain functional areas and form the mass of the building as well. The second principle is to care about the facilities of the site. In our opinion the triple of the school-mosque-khan needs to be handled as one bigger scale, since it has the central location of the area. We also look at this project, as a chance to create a lively, useable, inhabitant-friendly centre of New Gourná. As we mentioned at the beginning, his oeuvre contains the plans of this site, but it was never completely build up. So our third principle is connected to the name of Hassan Fathy and our goal is to design the building and the surroundings in a way that refers to the original plans of Fathy, in memorial of his work of life.



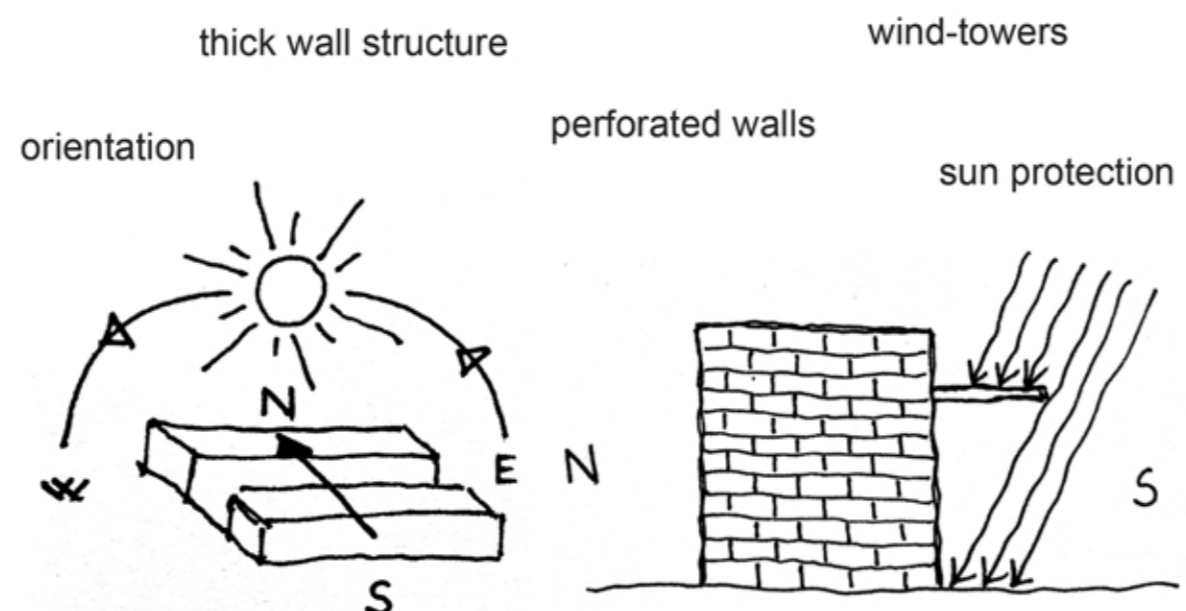
STATIONS OF CREATING



CONCEPT

FIRST PRINCIPLE - UTILITY

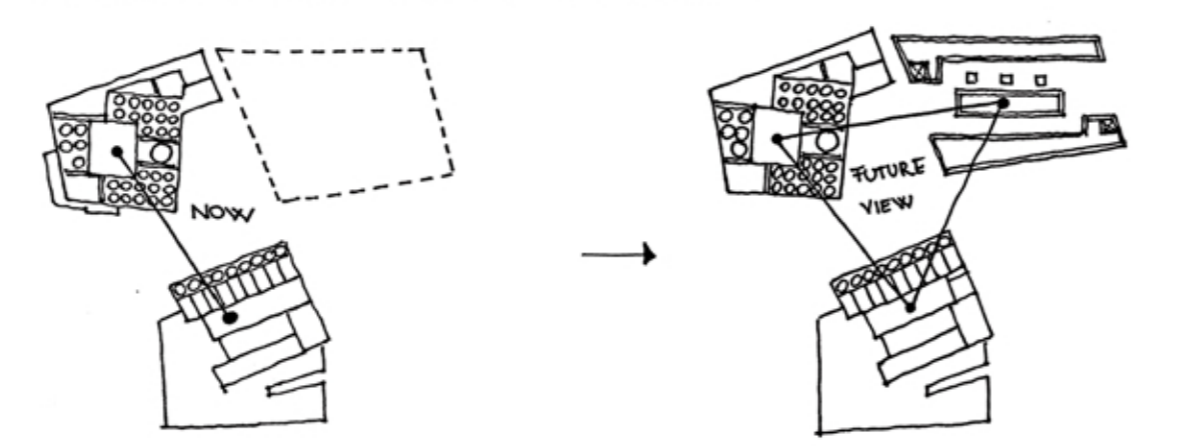
This area has a very hot and dry climate. We must pay attention to the cooling system of the building. Our aim was to use tools of **sustainable architecture** to keep the building cooler in an eco-friendly Cooling system elements:



SECOND PRINCIPLE - HASSAN FATHY IN MEMORIAL

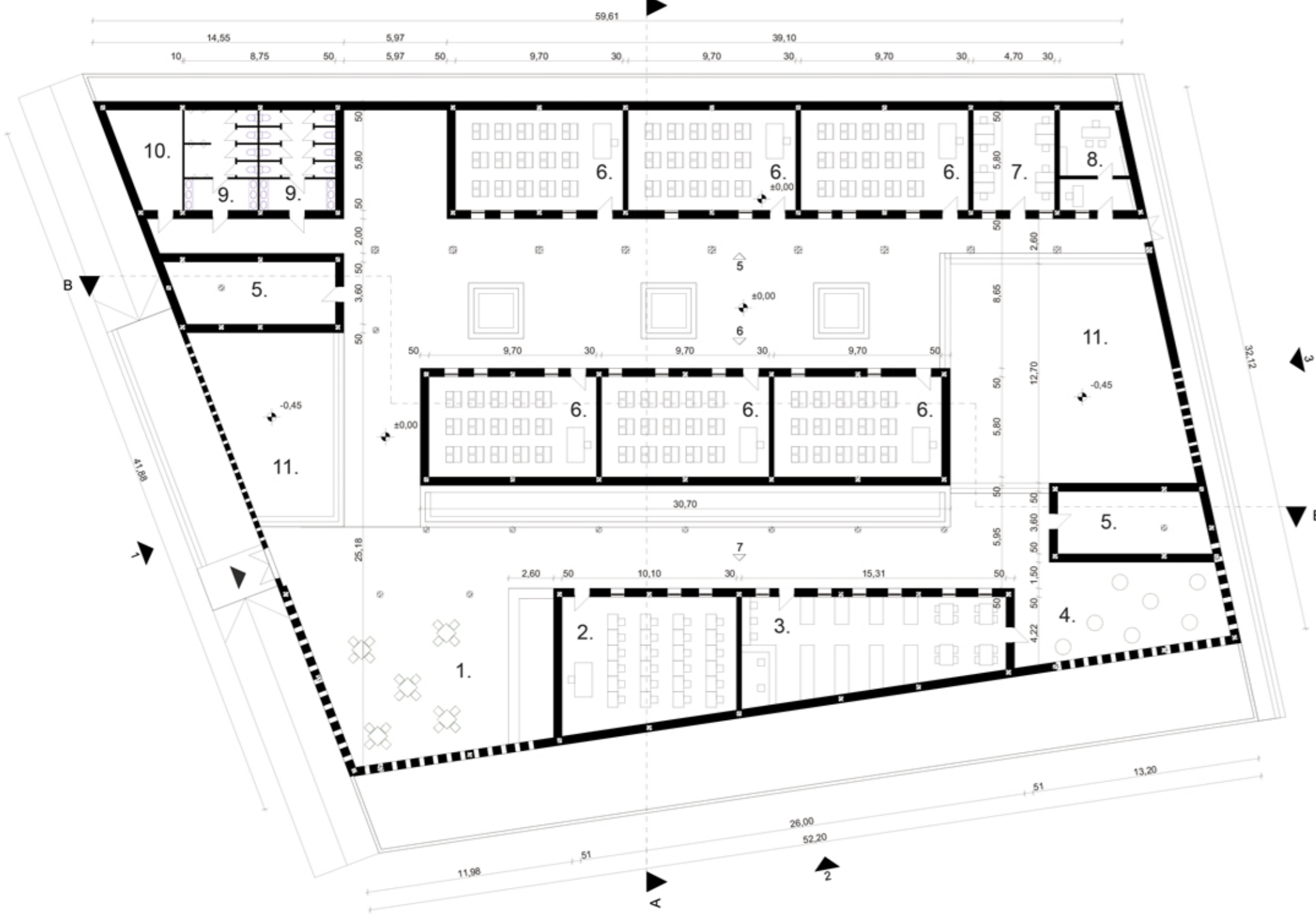
In our opinion it is important to keep the memory of this great architect in mind and even go further, use his plans and imagination as a base of designing the school. So this is how the idea came: why not to **use his outline** for this site as a base to create the building so it will remind all of us of his work and his imagination. It will **keep his**

THIRD PRINCIPLE - UNIT OF THE TRIPLE

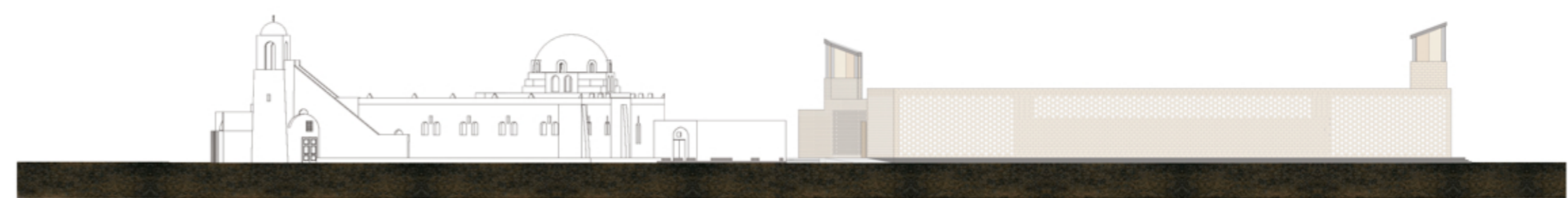
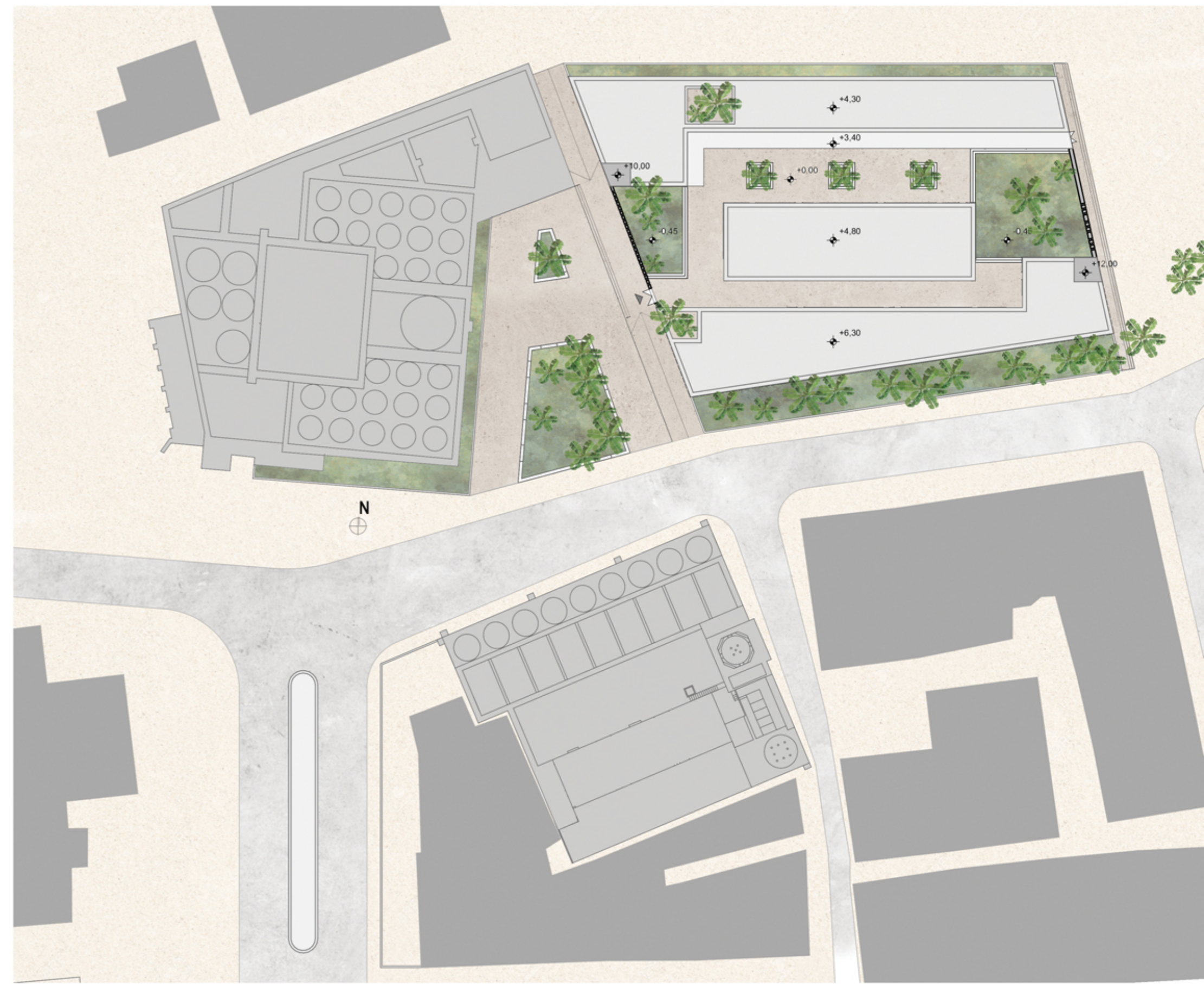


The area has the central location, it was meant to be as the center of the city. The mosque, the kahn and the designing area all together create a **triangle**, that has an empty space in the middle. This space could be used as the heart of this triple. By paying attention on this **bigger view** of the area, we decided to handle the three building and the outside area that they have the middle as a **unit**. The mosque and the kahn are already communicating with each other and so as

FLOORPLAN
M=1:200



SITE PLAN AND SITE SECTION
M=1:500



STEP-UP OF THE BUILDING

Entrance: People can enter the school two ways: the main entrance opens from the square, the 2nd one opens from the east side.

LIST OF ZONES

- 1. buffet
- 2. IT room
- 3. library
- 4. library terrace
- 5. praying room
- 6. classroom
- 7. teachers' room
- 8. director's office
- 9. restroom
- 10. storage
- 11. courtyard

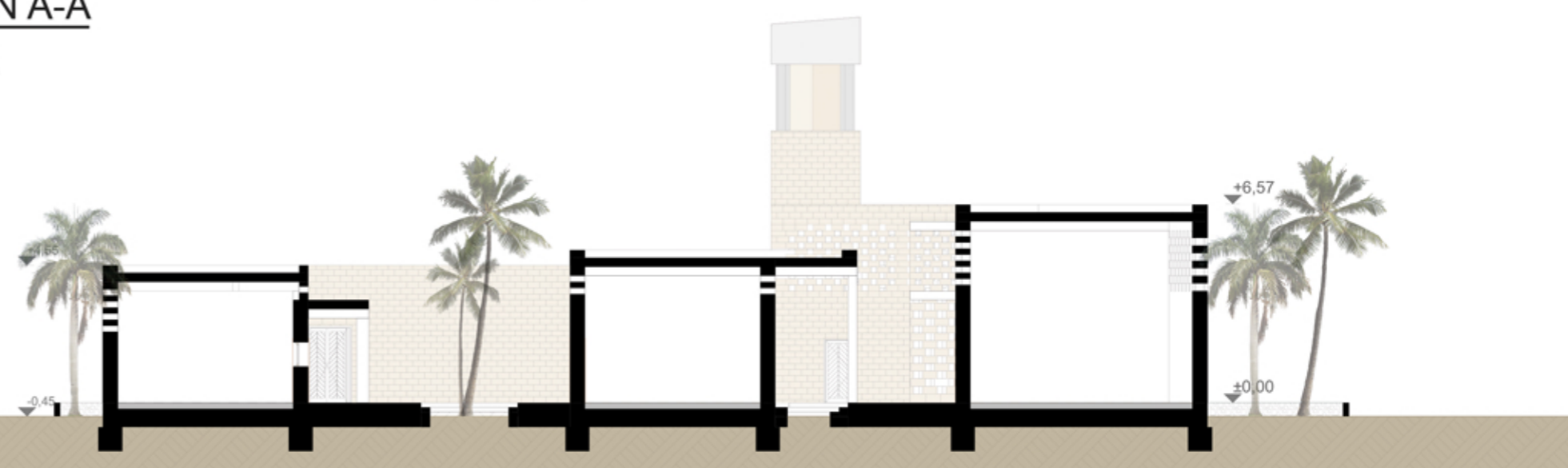
South block: contains the library, the IT room and the small cafe. From the main door, we enter and find ourselves on the terrace of the cafe, that is like a small welcoming area of the complex. Here is an open space covered by roof and surrounded by walls from three side. The walls are perforated, so the air can circulate and the roof provides the shadow. This way this area is just perfect to spend some time out even if it is a hot day (as it usually is). Going forward on this block, the next we can find is the IT room, then comes the library. At the end, there is a small reading corner we created in between the library and the praying room. The setup of this area is the same as the terrace of the cafe, the goal is to let the children use it as an outside library where they can read and relax a little before, between or after their classes.

The block in the middle: gives place for three classrooms.

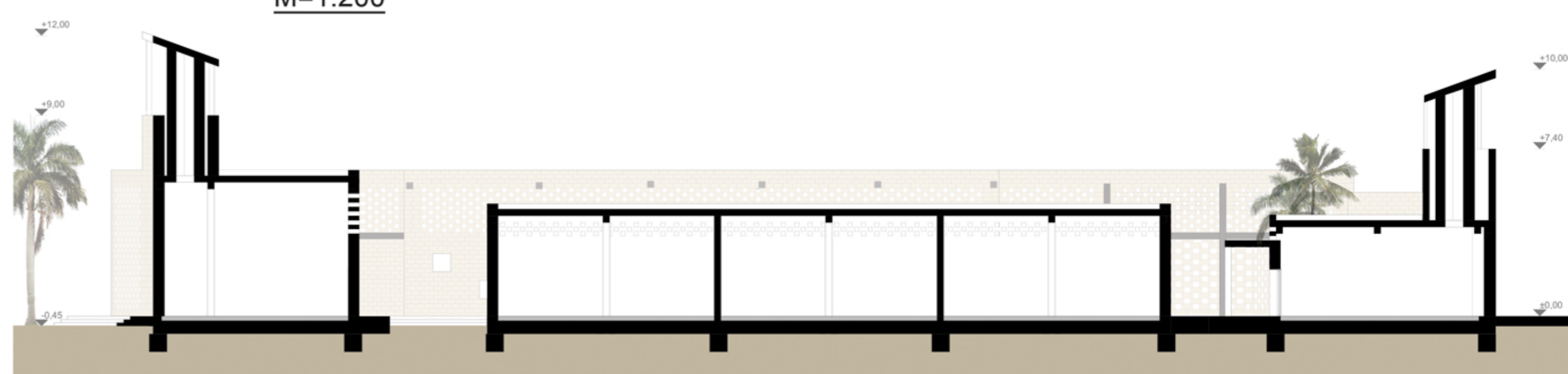
Northern block: has the other three classrooms, the teachers' room, the director's office, a storage and the restroom.

East and West side: here we placed the praying rooms, separated from each other and from the other functions, so they can become a calm and peaceful unit themselves.

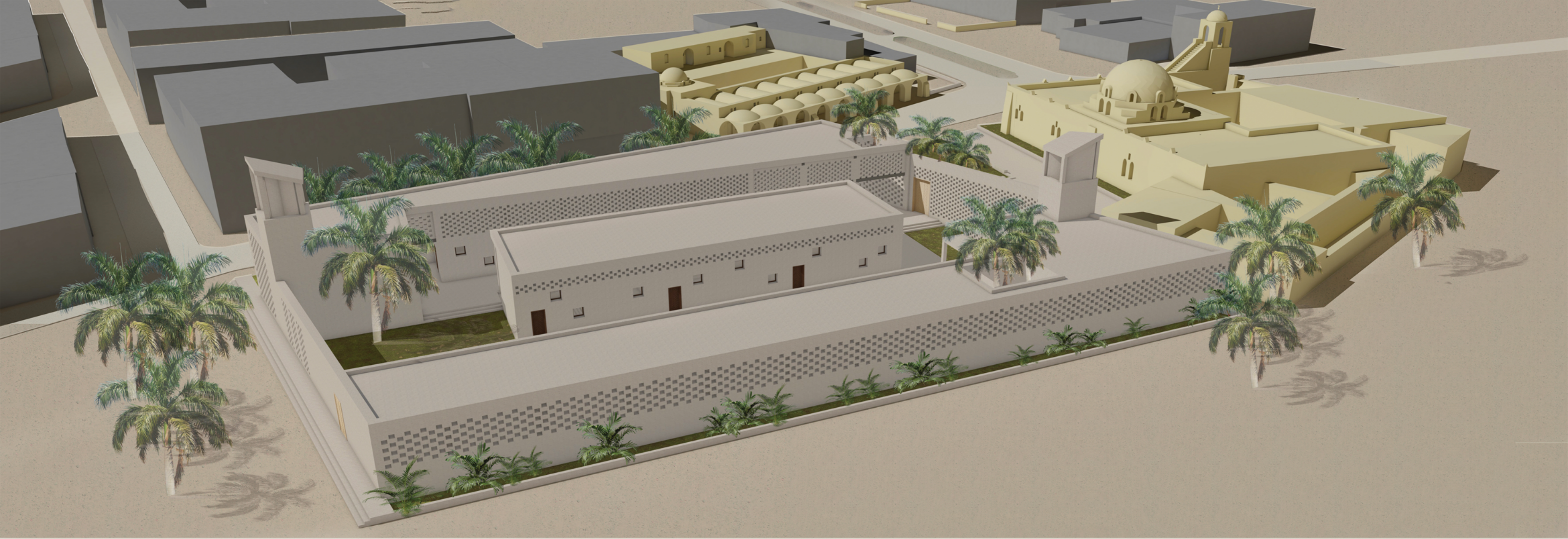
SECTION A-A
M=1:200



SECTION B-B
M=1:200

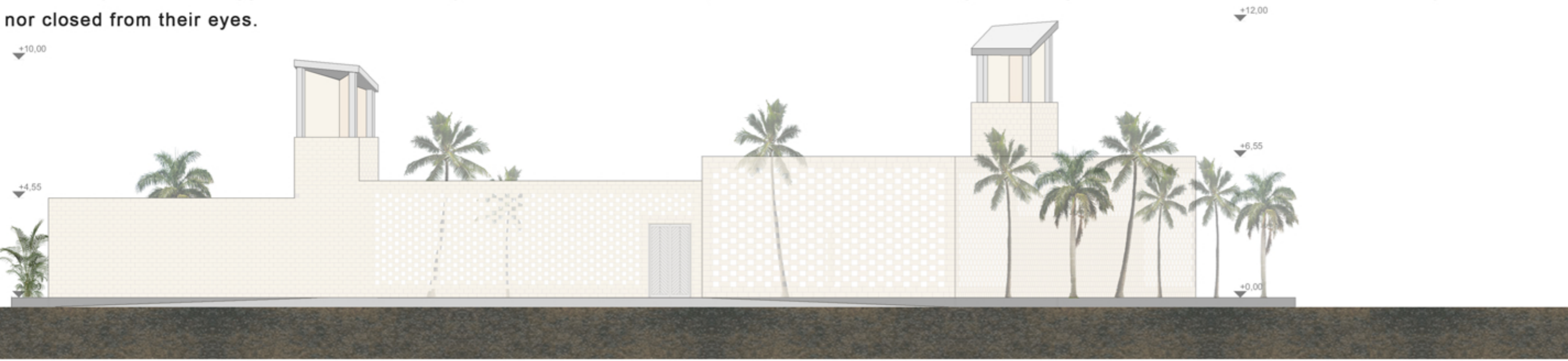


WIND-CATCH! SCHOOL FOR NEW GOURNA / DÓRA KALÁSZ, ANNA LUKÁCS / DR. HABIL ZSOLT VASÁROS DLA

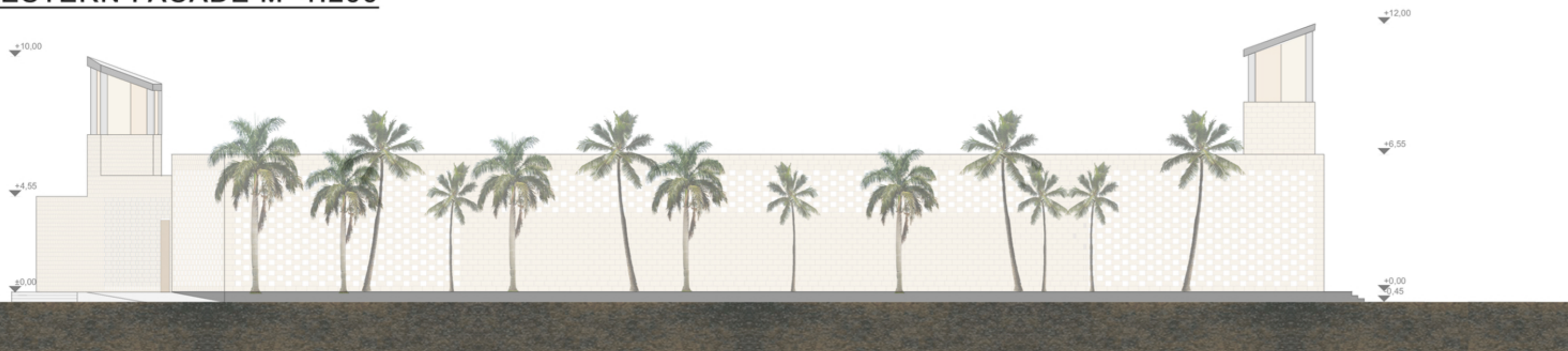


MAIN FACADES

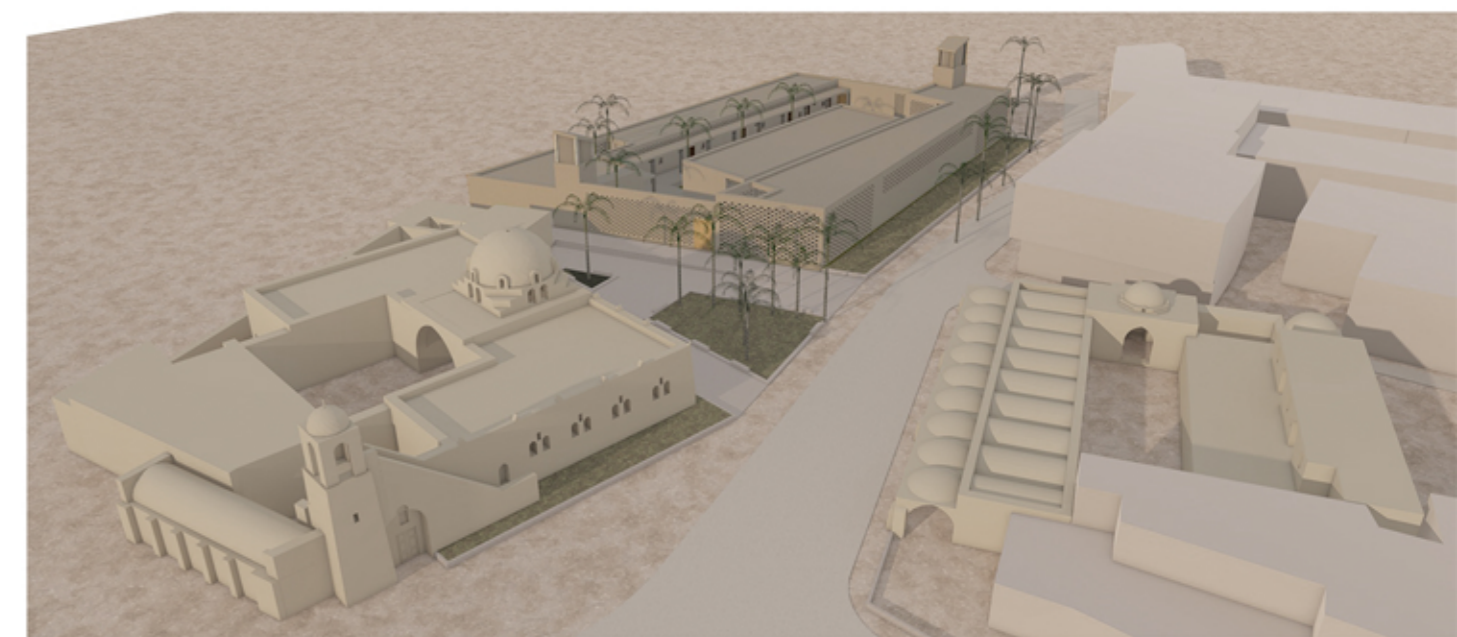
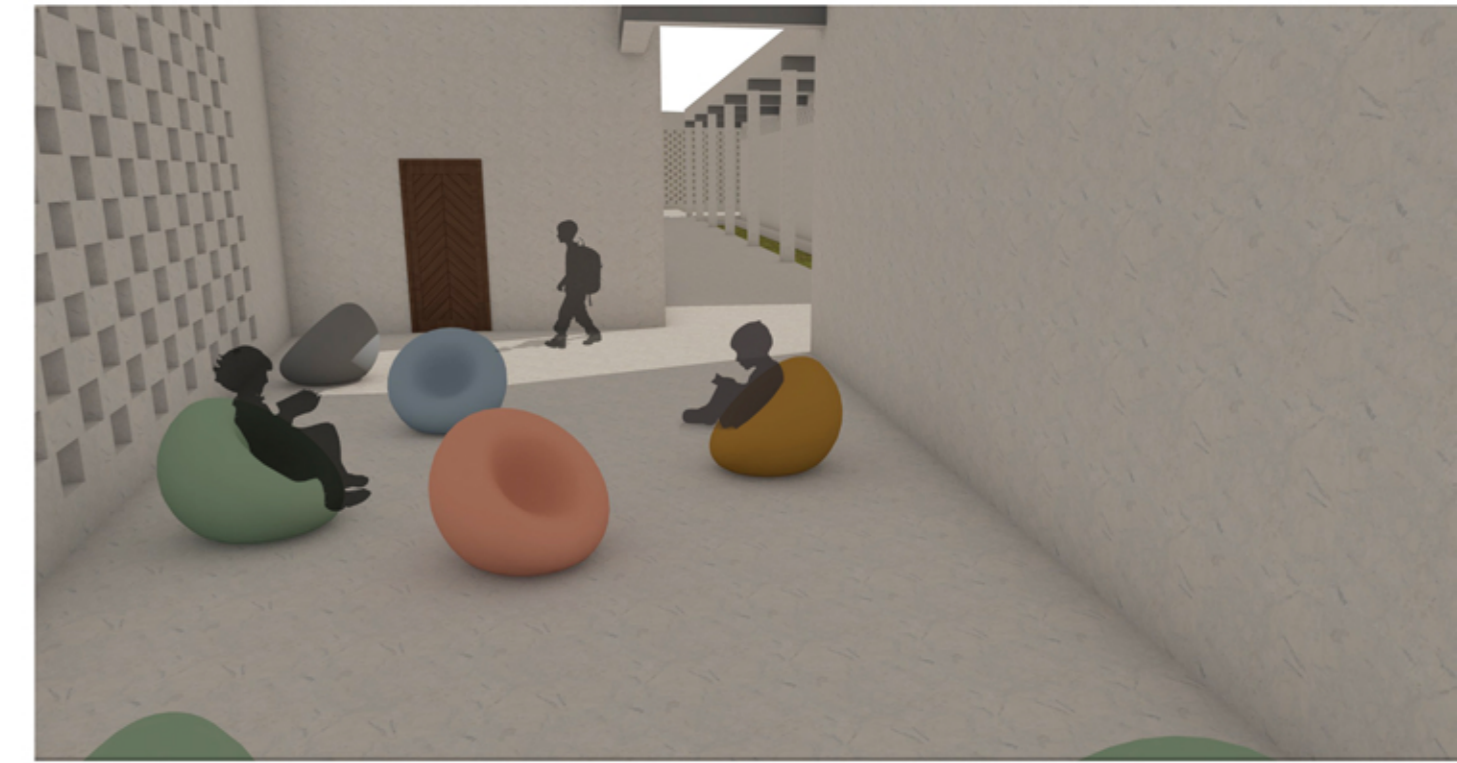
The main facades were formed by the perforation of the walls. Some surfaces are more opened while other ones are more closed. It is an interesting game with the rhythm of the pattern. The appearance becomes mysterious for the outsiders, since from some view they can see parts of the inside but it is neither fully opened nor closed from their eyes.



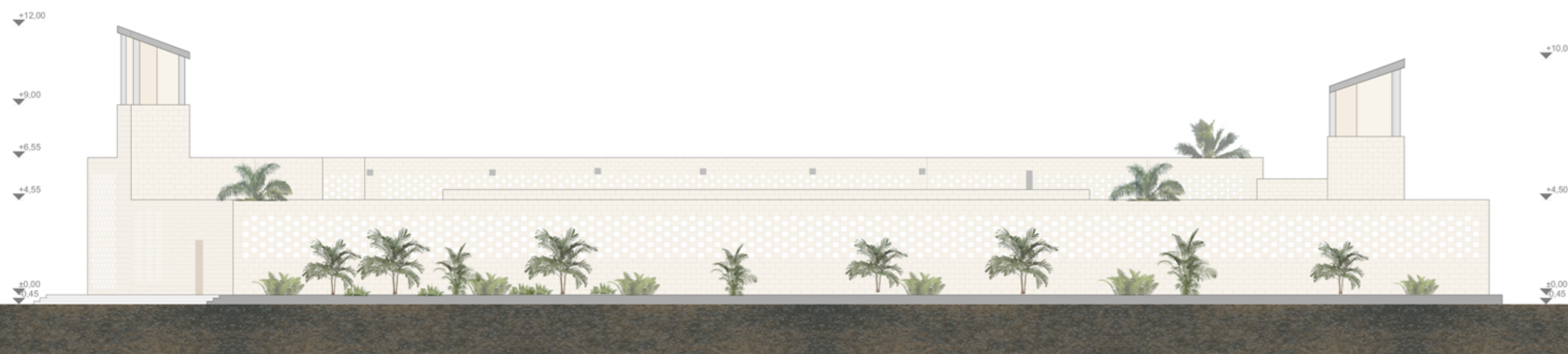
WESTERN FACADE M=1:200



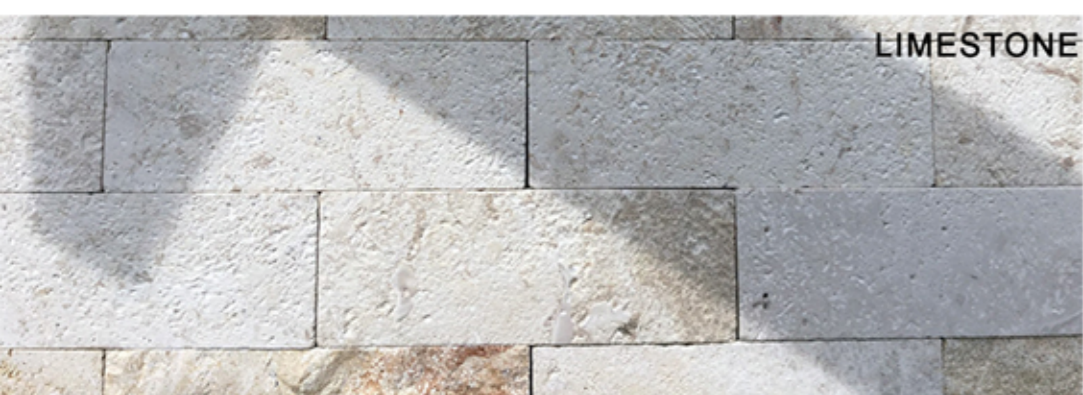
SOUTHERN FACADE M=1:200



EASTERN FACADE M=1:200



NORTHERN FACADE M=1:200



LIMESTONE



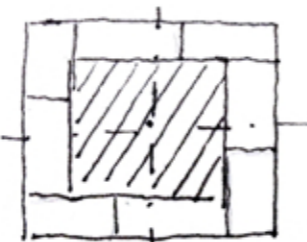
TERAZZO TILE



CONCRETE

STRUCTURE & MATERIALS

We use concrete pillars and beams as the supporting structure and white limestone as filling structure. We have chosen limestone because this is a material that they are mining here. It is better to use the material they naturally have than to make any further effort to get something imported.



We are covering the pillars with limestone, to give the same surface of the building.

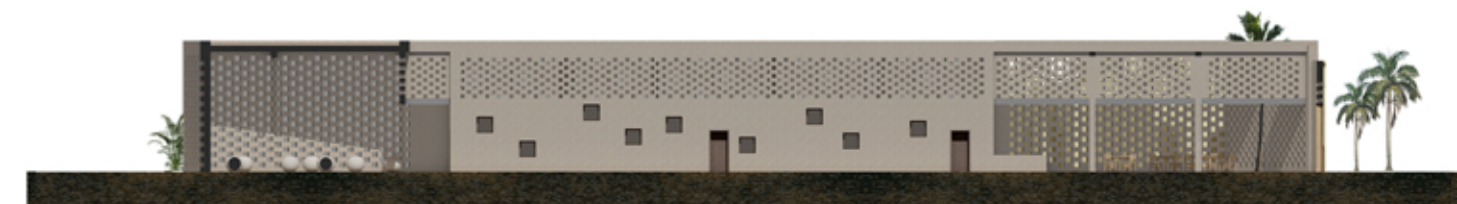


INNER FACADES

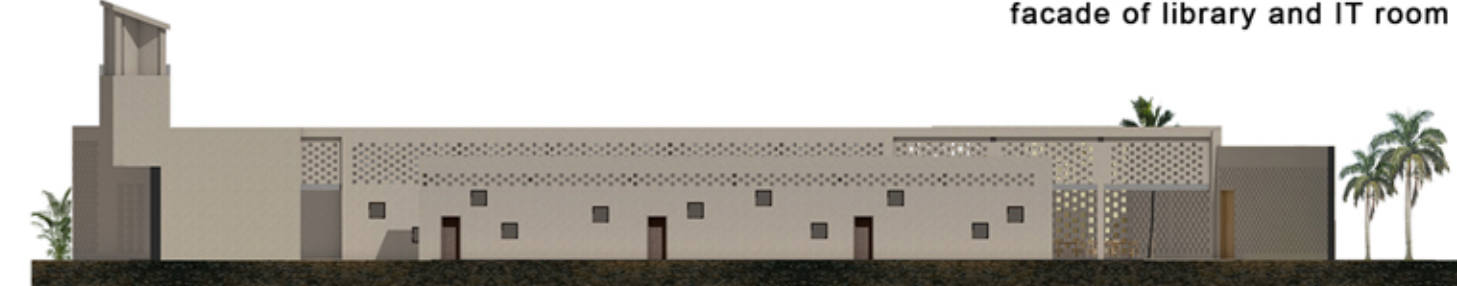
On the inner facades we put the windows to give natural light to the rooms. By creating the rhythm of these windows we gave a playful and jaunty atmosphere to the courtyard.



facade of classrooms



facade of library and IT room



facade of classrooms

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