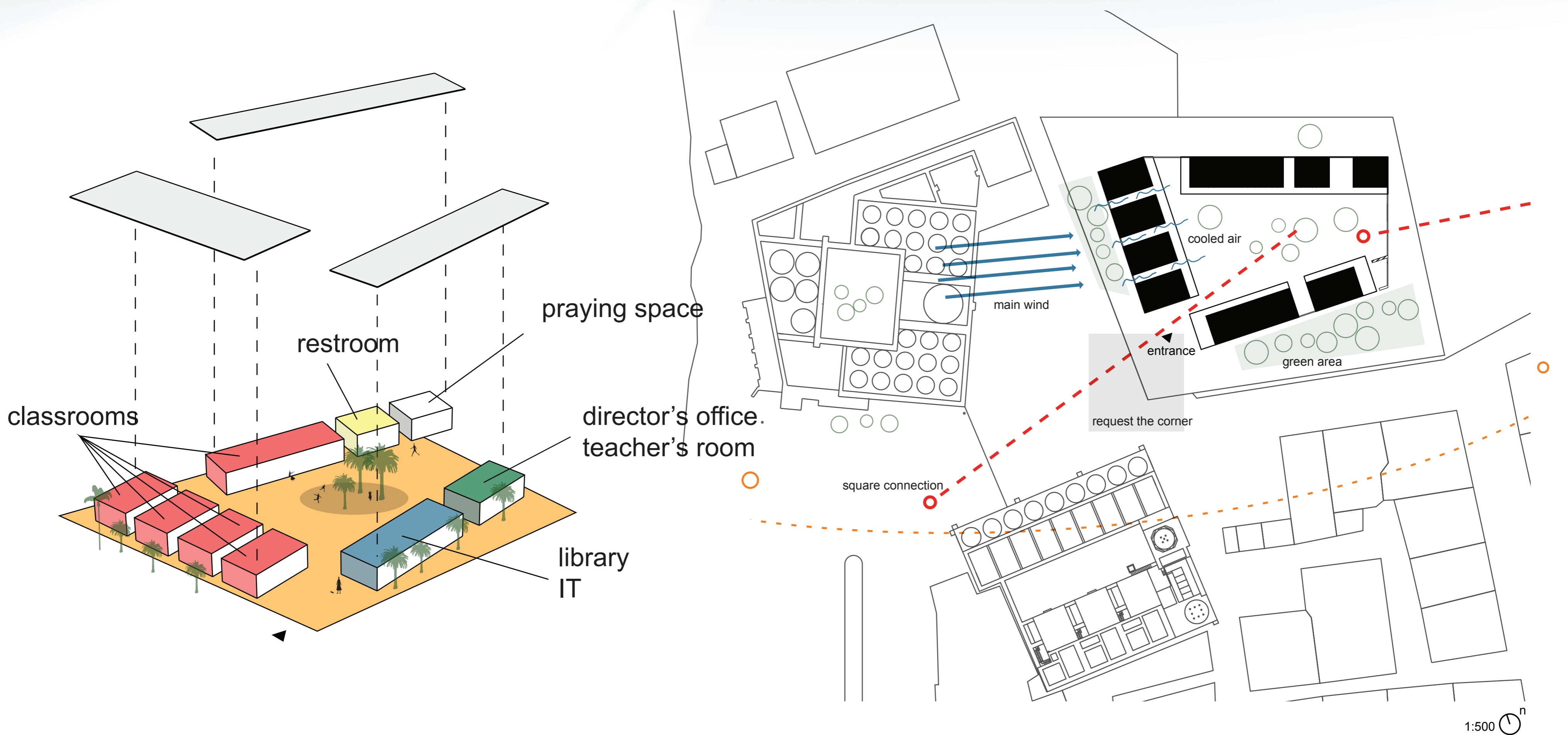
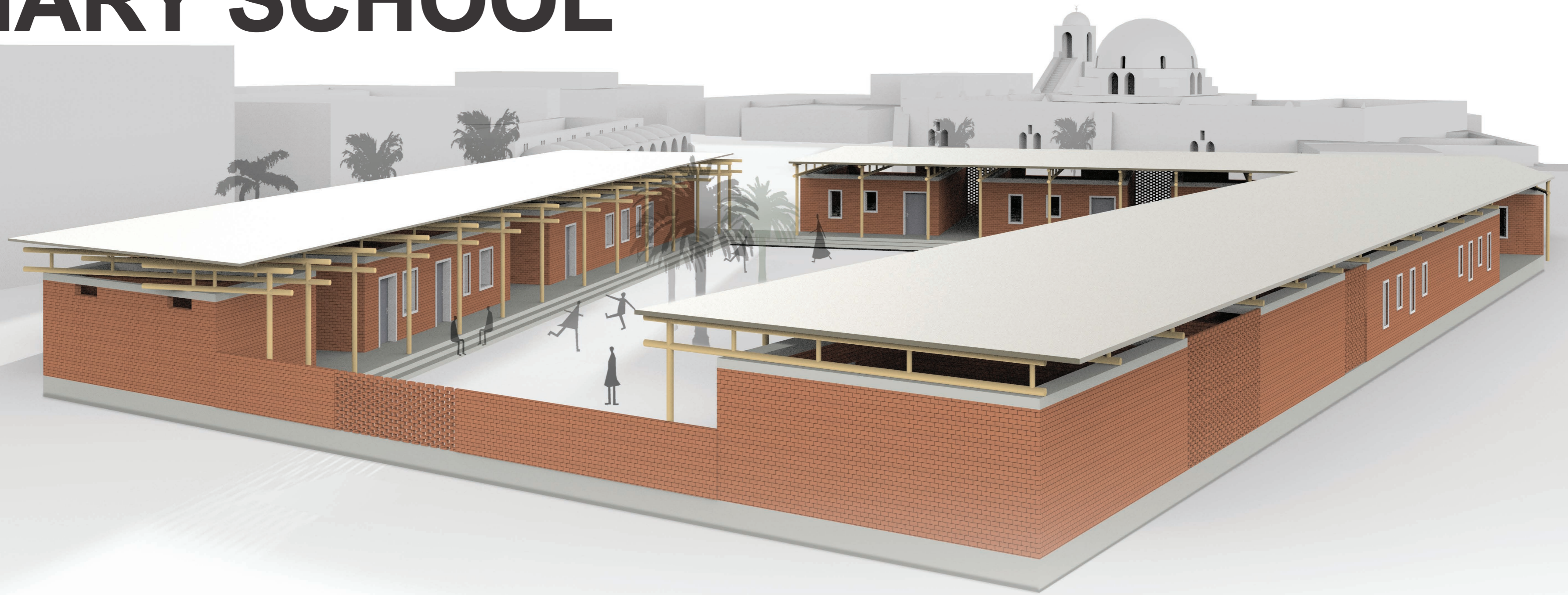
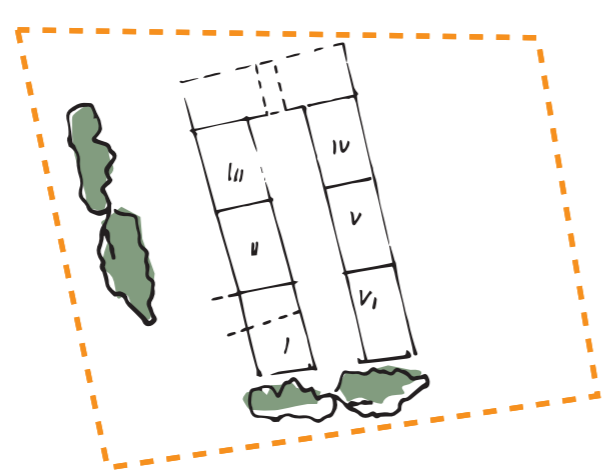


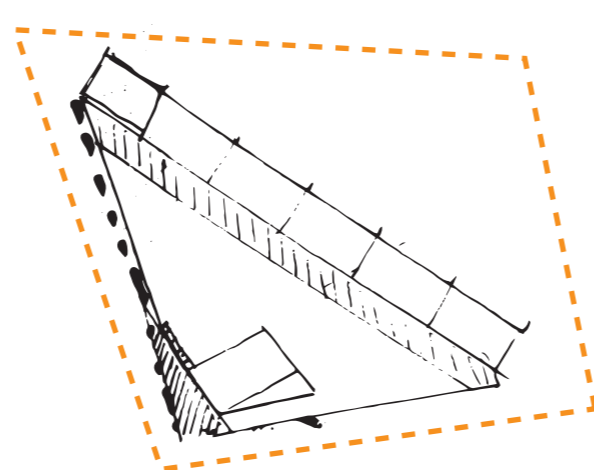
NEW GOURNA PRIMARY SCHOOL



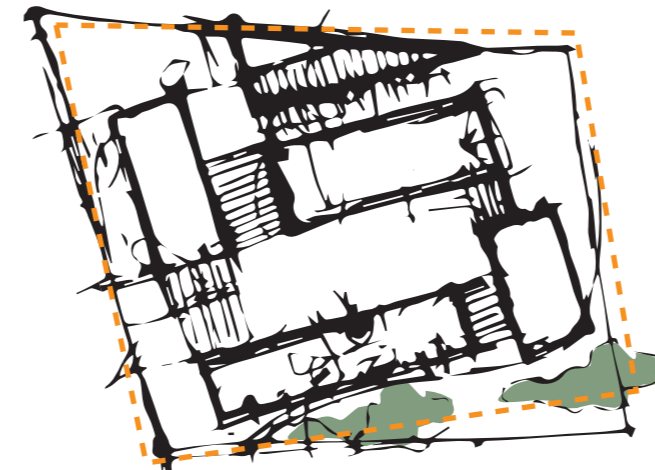
01 mirrored masses shifted longitudinal corridor/courtyard



02 mirrored masses east-West corridor/courtyard



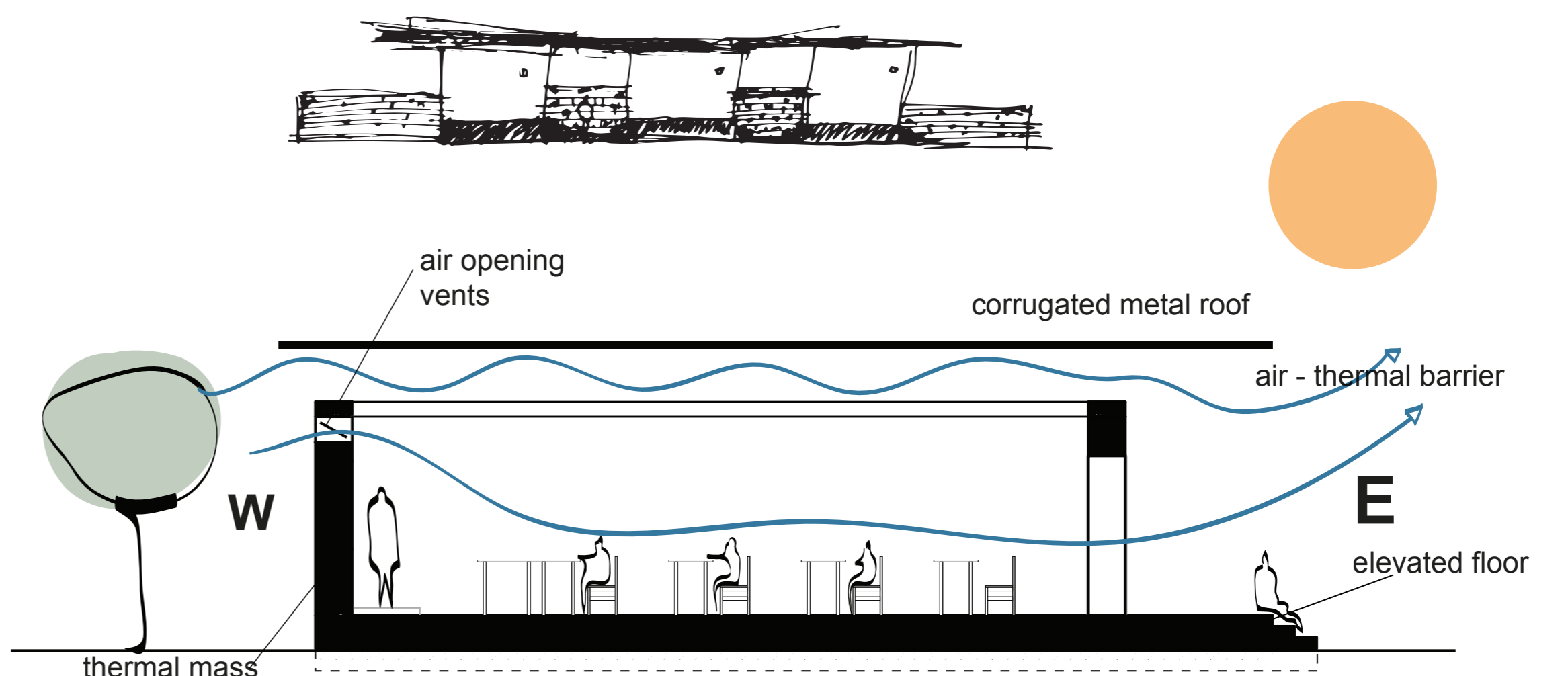
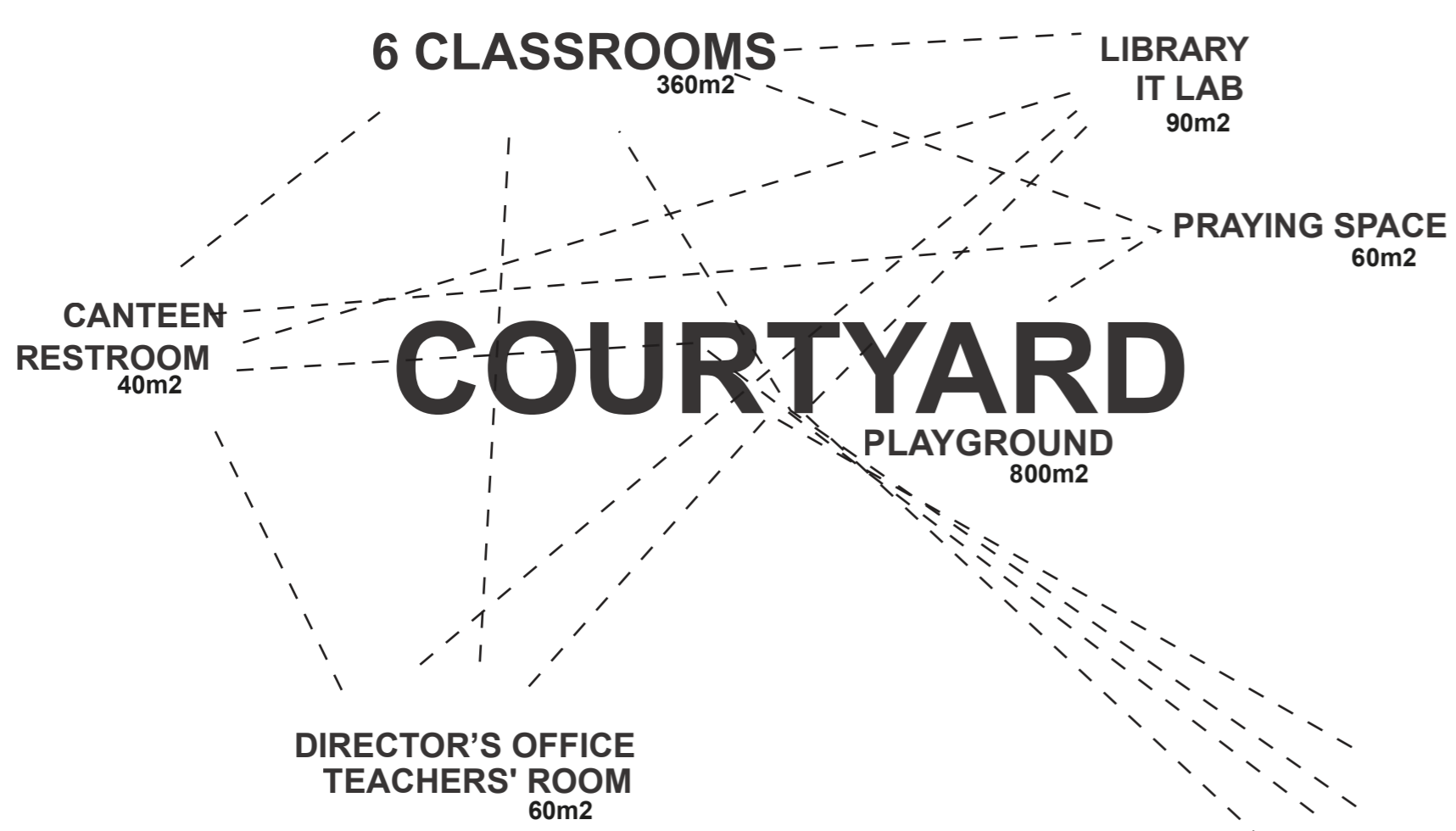
03 one-line east-West orientation square open



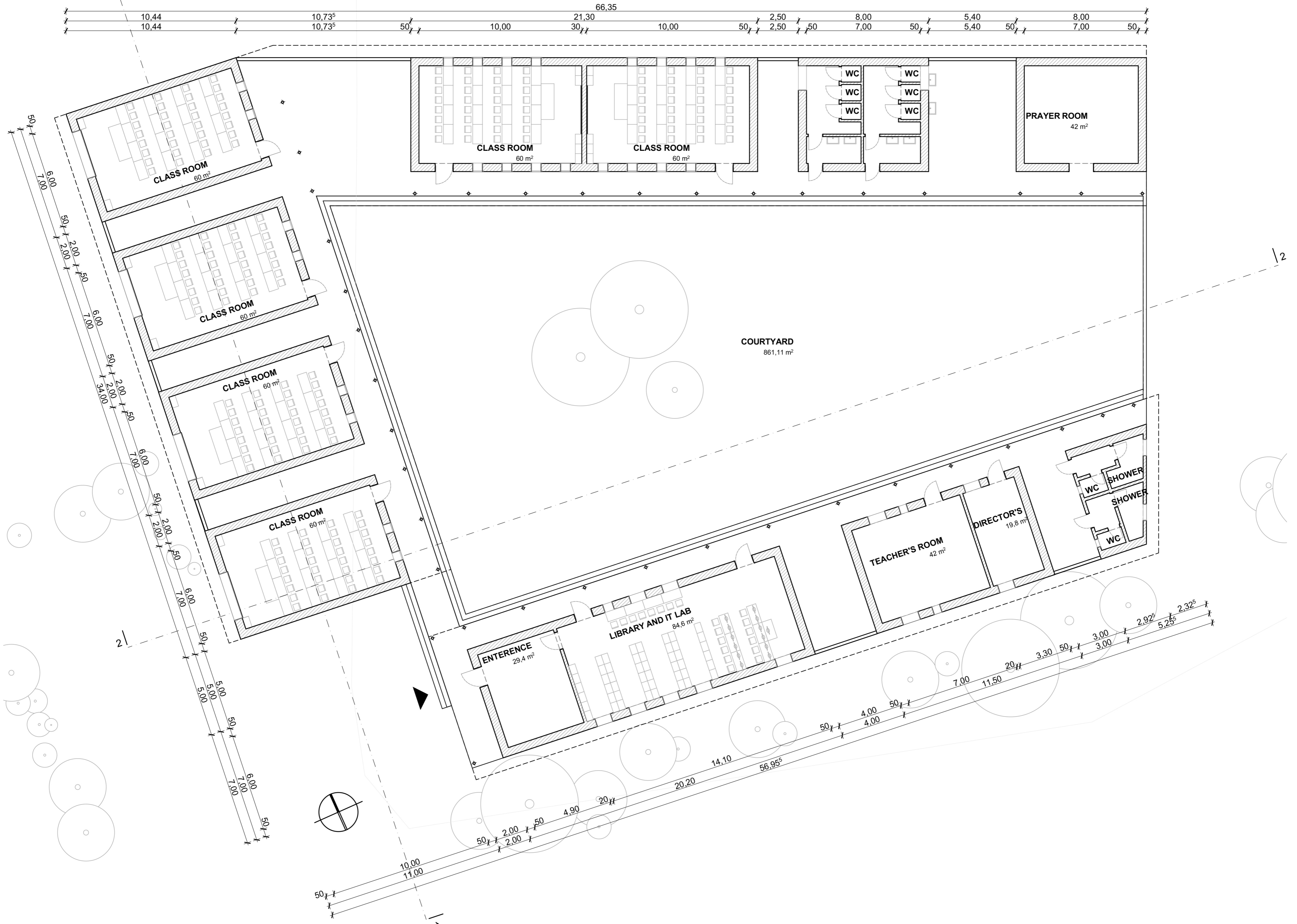
04 four side orientation clusters shaded connections



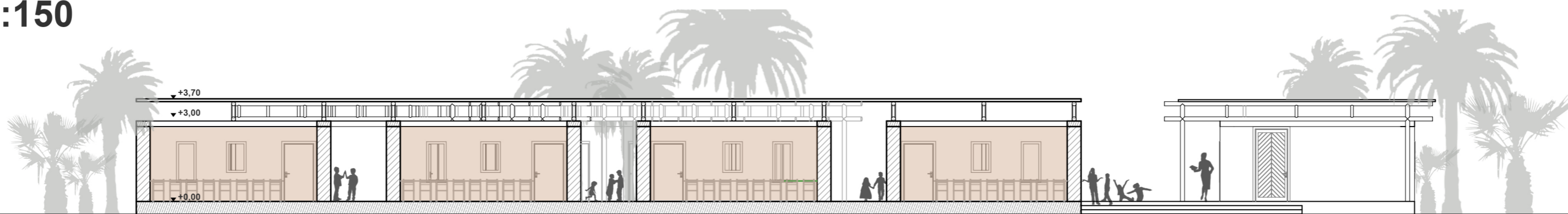
entrance view



LEARNING FROM THE LOCAL/ CSERGE TÓTH, DIMA AL-SHAER, GUILHERME LEICK / ZSOLT VASÁROS DLA, ISTVÁN BARTÓK DLA



FLOOR PLAN 1:150



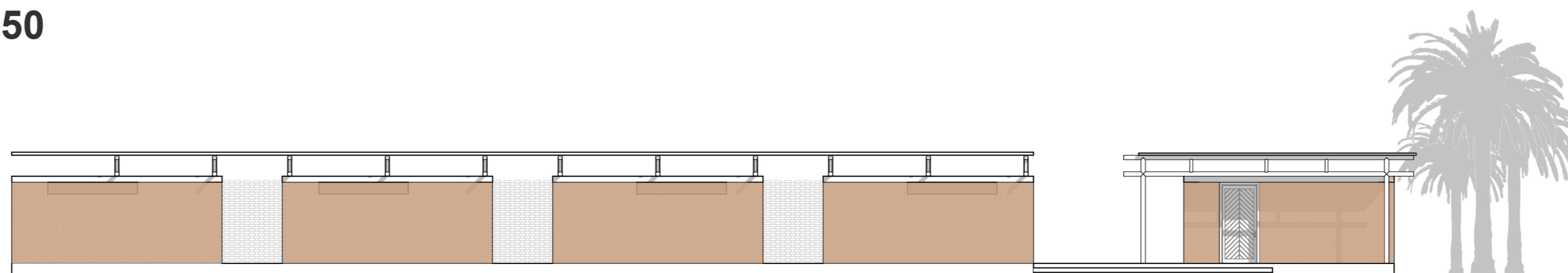
1-1 SECTION 1:150



2-2 SECTION 1:150



SOUTH ELEVATION 1:150



WEST ELEVATION 1:150

LEARNING FROM THE LOCAL / CSENGE TÓTH, DIMA AL-SHAER, LEICK GUILHERME / ZSOLT VASÁROS DLA, ISTVÁN BARTÓK DLA

NEW GOURNA PRIMARY SCHOOL
LEARNING FROM THE LOCALS

DESIGN TEAM

CSENGE TÓTH

DIMA ALSHAER

GUILHERME LEICK

CONSULTANT

ZSOLT VASÁROS DLA

ISTVAN BARTOK DLA



Primary School in New Gournia

- Introduction

The Village of New Gournia in Luxor, which was built between 1945-1948, represents the most significant project of the pioneer architect Hassan Fathy. Where he was trying to create a model that improves the living conditions of Upper Egypt. Integrating traditional materials with modern architectural principles, creating a sustainable architectural example adapted to the extreme Luxor climate conditions. At the same time reflecting his design philosophy based on his belief that architecture is for human beings, therefore it should be in dialogue with them, should shape itself in regards to the surrounding environment, where Architecture should express the culture of its users, respecting their life style, beliefs and their individuality.

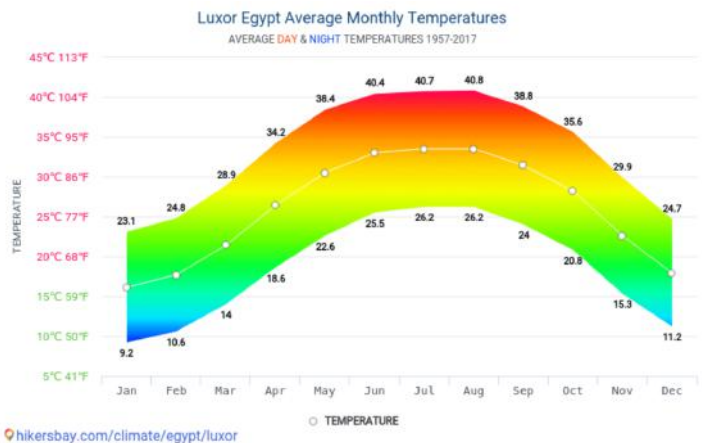
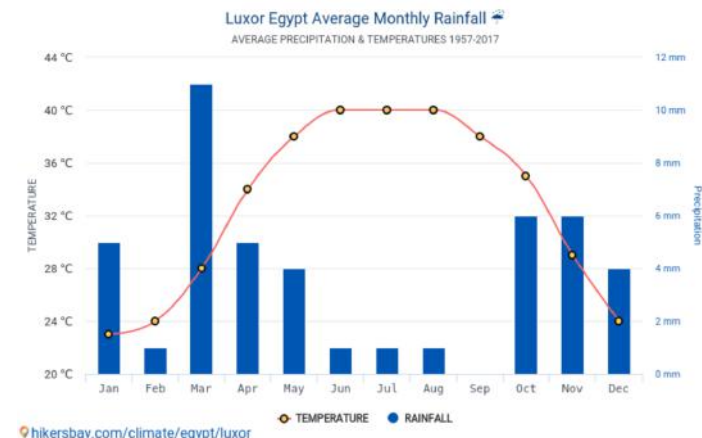
Fathy achieved that through connecting the locals to their built up environment, emphasizing their participation in the building processes, where community plays a main role in his architecture, creating its own identity.

- Luxor Climate Conditions

Luxor is characterized by its dry, hot weather. Where the average annual temperature is 33 °C, the hottest month of the year is June, with an average temperature is 40 °C. The coldest month is January with an average temperature of 23 °C. In regards to Luxor precipitation, the highest is March, October

and November 23 mm precipitation. The annual amount of precipitation of Luxor is 45 mm.

The prevailing wind in Luxor is the west breeze wind which has a dry, hot characteristics. Locals call it “khamasin”, because it is combined with a dripping fine sand and it is formed in the beginning of summer.



- **Inspirational Case studies**
- **Primary School in Gando**



Architects: Kéré Architecture
Location : Gando, Burkina Faso
Area : 310.0 m²
Project Year : 2001

Kere Design of this primary school relied on a list of parameters including cost, climate, resource availability, and construction feasibility. Aiming to create a sustainable solution providing a

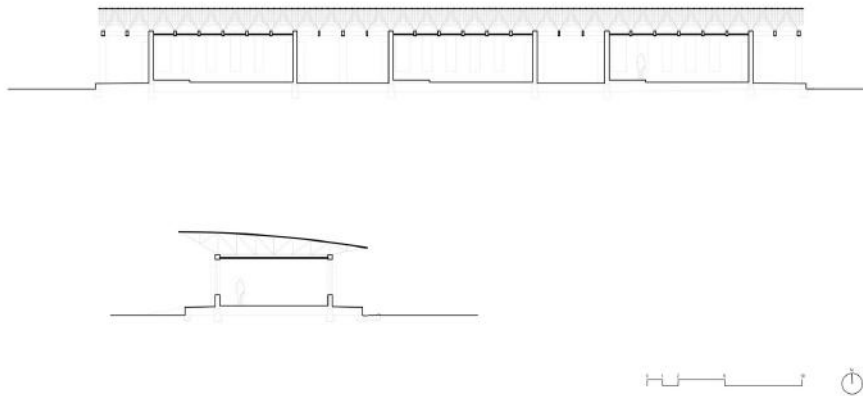
well ventilated and lighted spaces, enhancing the educational environment.



Achieve the goals of the project Kere used the available traditional local materials, and modified traditional construction techniques in modern methods. Where the local clay was used in the form of clay bricks as the main building material, which is a cheap, easy produced material, that provides a thermal protection against the hot climate.

To allow a maximum natural ventilation, Kere introduced a large overhanging corrugated metal roof, with dry stacked brick ceiling, where the cool air will be pulled in from the interior

windows and the hot air will be released from the perforated ceiling.



One of the important aspects of the success of this project is the involvement of the local community in the construction process of the school, starting from the future users (Children) to the local villagers, who traditionally used to work together to build and repair homes in rural Burkina Faso. The participation of the local community improved and developed the design, specially when it is about the building construction.

This project represents a very informative example of sustainable architecture that is based on the detailed analysis and understanding of the surrounding environment and adapting

it in a way that serves the goals of the design, Creating attractive learning environment, characterized with its simple form and clear flow.



- New School in Ulyankulu



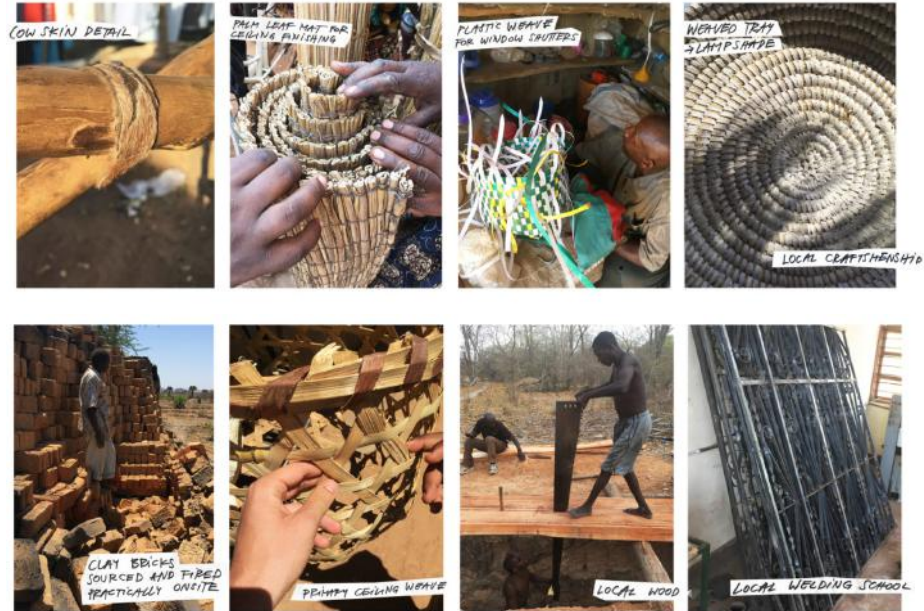
Design Team: Iwo Borkowicz, Adam Siemaszkiewicz, Lukasz Rawecki

Location : Ulyankulu, Tanzania

Project Year : 2018

In respect to the local heritage and identity of Ulyankulu, the design team proposed a school building that tackles the climate issues and provides an educational village. Where they tried to adopt to the existing situation and local environment emphasizing the natural ventilation in the site. Socially, They believed that it should be a place that accommodate social activities during and after school hours.

Architects integrated the local materials and craftsmanship techniques. Using palm leaf mats for ceiling finish, plastic weave for the window shutters and clay bricks that will be fired on site.



One of the central aspects of this design is the use of the Mango tress, where the classrooms were situated around them, forming an inner central courtyard protected under the canopy. The layout with these trees will increase the ventilation benefits as hot air will escape in the direction away from the trees, and the double roof will draw out the cooler air from beneath the tress.

To increase the thermal mass of the building a thick foundation was built, that retain the colder temperatures during the night

and help to cool the classrooms during the day.



Adding a more sustainability spirit to the building, roofs were designed to collect the rainwater to prepare for the annual droughts that the country suffers from. In this way architects did not only create a place for formal learning, they attached this building to the community by serving their needs.

To create a unique identity for the school, architect introduced a perforated serpentine wall, boarding the introverted courtyards between the classrooms. These courtyards will provide a play area for the kids containing play equipments like nets, swings and slides.

These design techniques provided a welcoming active educational environment inside the classes and outside in the courtyards.



Learning from the local, New Gournia Primary School

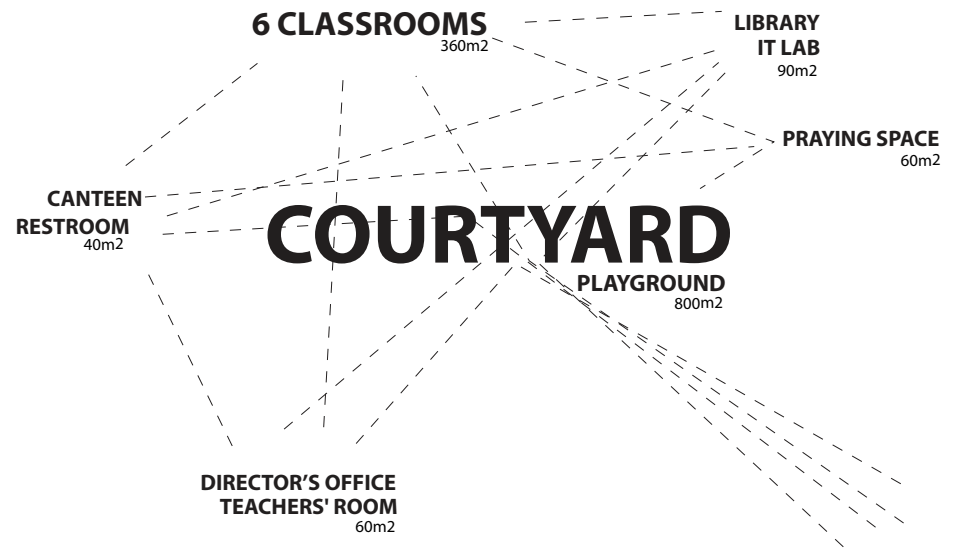
The Proposal of the new primary school is located in a very central important site in the Model village of New Gournia. Where this site faces the main square of the village, which represents the public platform of the locals, Surrounded by two of the most significant buildings of Fathy's design (The Mosque, and The Khan). Designing in such a site requires a careful study of the surrounding heritage, culture and economical situation, the understanding of the implemented passive techniques used, and a full understanding of the climate conditions and taking advantage of them.

Our design seeks to achieve a sustainable and cost effective construction through the use of simple local materials and building techniques, incorporating traditional building methods and engaging the local community. It also places the human-being on the centre, letting the building grow from the daily lives of the users (Students, Teachers, the local community), shaping and arranging it to serve their needs, whereas the design takes into consideration the main user (The Children) allowing them to progress all around the building and at the same time creating it's own identity in respect to them.

The program of the school was identified based on the current situation, conditions of the old school and the needs of the users. Directing us to the important of creating the right balance

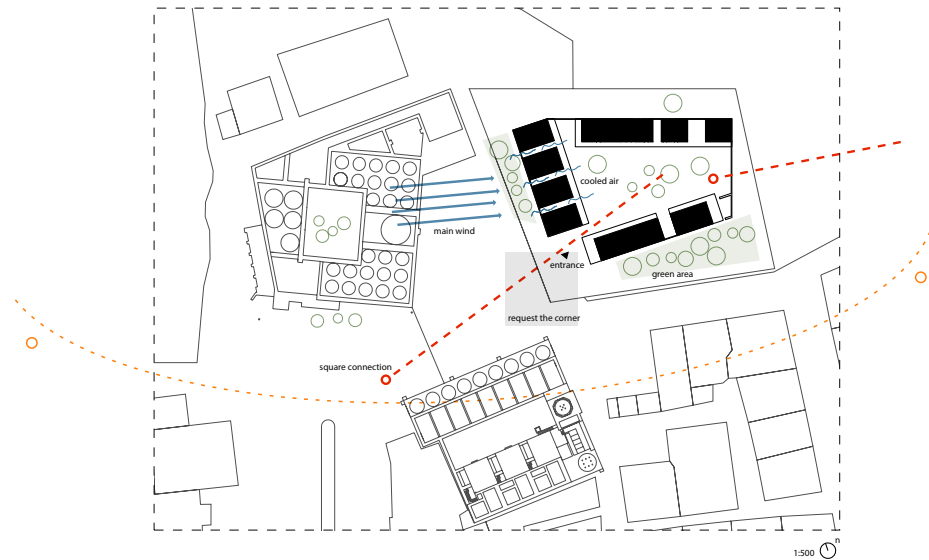
between light-shadow, materiality-proportion, to achieve a unique educational atmosphere.

In respect to the users needs we obtained the following areas, Which we arranged and connected in a way that integrates with the flow of the users.



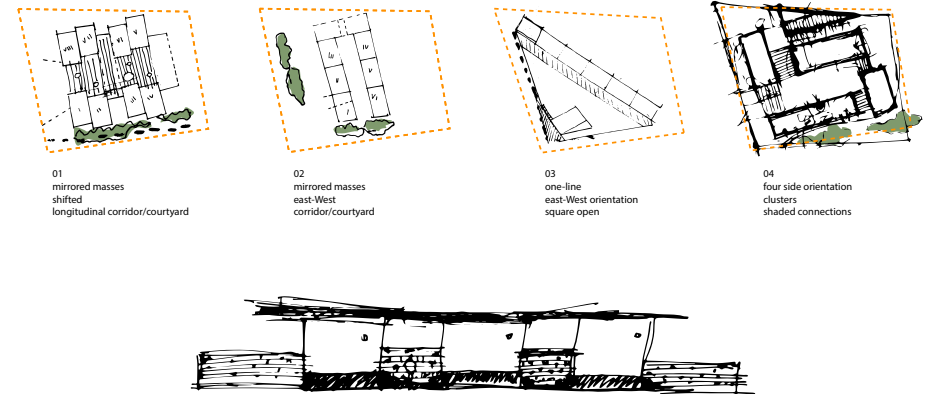
Where we tried to create a clear circulation system within the school, through the combination of the functions based on the users (only Students, only Teachers, Both Teachers and Students, The local community), we kept the classes in one defined space, having a direct connection to the restrooms unit, combining the principle room with the teachers room in one main unit, praying room represents a central common space for all the users, and the Library and IT lab combined together.

To create the best layout and arrangement for the school we analyzed the existing climate conditions, trying to find the best orientation for the massing based on the sun path, and the West prevailing wind, to provide a healthy balanced ventilated lighted atmosphere in all of the buildings.

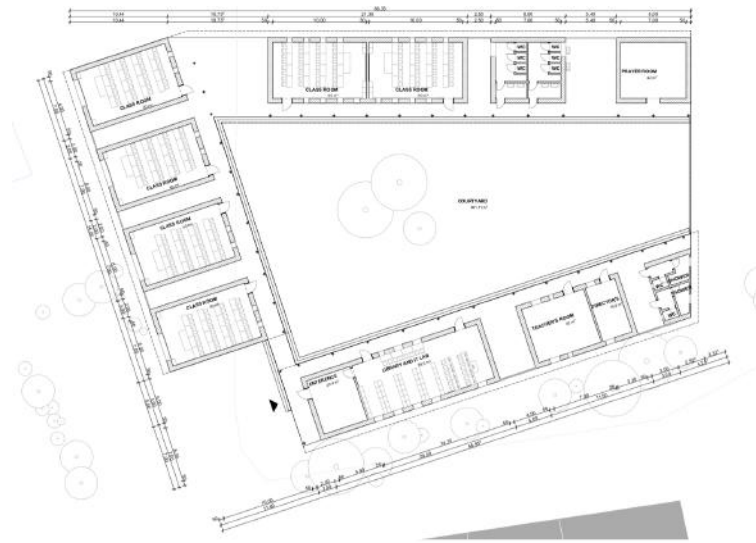
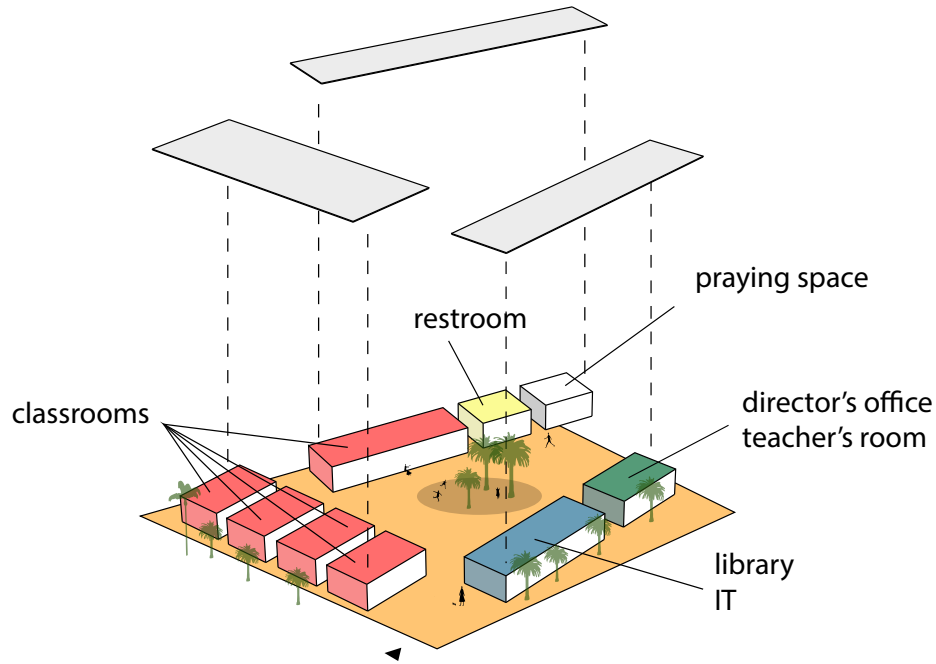


We also analyzed the relation between the site and the main square, in order to emphasize it, whether by creating a physical or a visual connection.

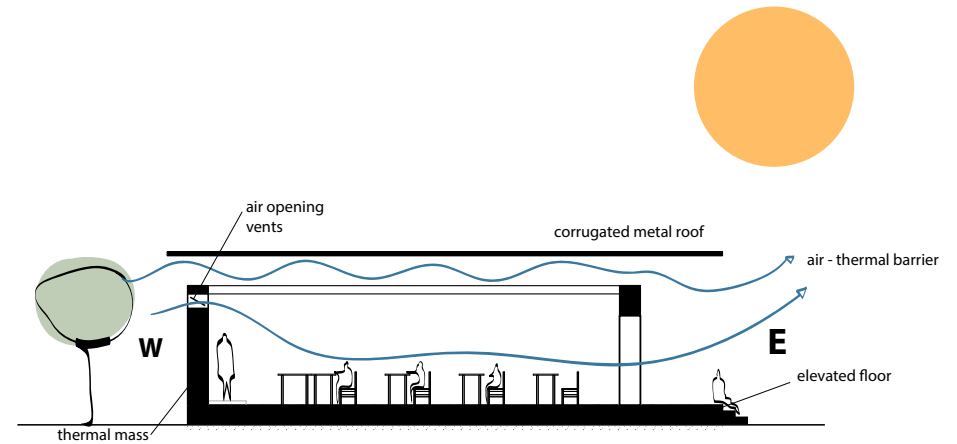
Based on the wind and sun directions, the functional arrangement concept, and the circulation concept, we introduced different proposals, and we identified the advantages and disadvantages of each one of them, trying to get the best proposal that summarizes our ideas.



In our final proposal we created a multi units separated from each other, enhancing adequate natural ventilation, and creating a series of small shaded courtyards in between, which will be a part of the informal education process where students will use them as a playing spaces. All the units are connected to a main courtyard that represent a gathering space, and an open platform from the locals to use in their public events where this courtyard opens to the main square. We considered the Library and the IT Lab as a shared space that could be used by the locals in evening time, therefore it was located near the entrance of the school, having a separated entrance too, to provide privacy and security to the schools inner space. We Tried to preserve the existing palm trees, and planting some of them in the courtyard to provide extra shaded spaces.



Regarding the orientation of the massing, we tried to provide adequate sun light and natural ventilation for the buildings without getting them too hot, and that was achieved through keeping the east facade as an open facade, where the sun in the morning can enter the courtyard and provides light for all the surrounding buildings, to protect the buildings from the overheating that happens in the afternoon we created a cantilevered shading corridors in front of all of the units, we also employed the natural ventilation strategies, by getting advantage from the surrounding palm trees that creates shading for the classes and also helps in cooling the air before getting into the classrooms, also the creation of the small courtyards helps in the cooling of the air and enhances it's flow within the building masses, we also created an elevated roof structure that helps in the release of the hot air from the inside space.



We introduced two different sizes of windows, in the direction of the prevailing wind we added a long and narrow windows, and on the other direction we added a rectangular windows, where we could enhance the flow of air circulation.

The construction material was inspired from Fathy's example, in order to enhance sustainability in the building, therefore we used a local construction material, which is the clay in the form of bricks, that can be created in the site by the locals, in this way we provide a cheap material that is easy constructed with the local techniques and by locals themselves. Engaging them in the construction process will enhance their sense of affiliation, and will be one of the key elements for the success of the project.

The elevated roof structure was made out of palm trees trunk, creating a simple frame that holds the overhanging corrugated metal roof.

To increase the thermal mass of the building and also to avoid any unwanted settlement of the buildings we used a thick concrete base that elevates the building 30 cm from the ground, this base will retain the colder temperature from the night and helps to cool the rooms during the day, they also provide a longitudinal steps that creates a shaded seating area for the students around the main courtyard.

We also increase the thermal mass by using a thick clay brick

walls, that will reduce the heat exchange between inside and outside, and preserving the cool atmosphere in the inner spaces.

To achieve security and control on the school, the buildings create an enclosure all around the courtyard, and in the places of the open spaces we created a perforated walls, with a simple pattern that is obtained from the shape of the bricks .

