"Mödravårdscentral och utbildningscenter, Mocambique"
"Maternity home and education center, Mozambique"

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THE SITUATION OF HEALTH CARE
According to the report *The United States Global Health Initiative, Mozambique Strategy 2011-2015*, "55% of the population live on less than a dollar a day. Health infrastructure is limited, with more than half of Mozambicans walking over one hour a day to reach the nearest health facility. Health facilities face frequent commodity stock outs and a general lack of basic amenities: 55% without electricity and 41% without running water. Likewise, human resources for health are severely constrained in Mozambique, with only 3 doctors and 21 nurses per 100’000 population - a proportion that is among the lowest in the world. System tracking, motivating, and retaining staff are weak. Frontline health providers are often poorly trained and have limited management skills, and GRM (Government of the Republic of Mozambique) capability to oversee its policies and regulations and to coordinate all health players is weak, resulting in poor supervision and coordination.”

MATERNITY HOMES IN MOZAMBIQUE
There is a large indigence for more maternity homes in Mozambique. Pregnant women often have to walk long distances to get assistance giving birth. The conditions of existing public hospitals are mostly very poor, partly due to limited water supply, no electricity, stolen medical equipment and lack of space. It is common that up to three operated patients share the same bed – sometimes both HIV-positive and HIV-negative.

The conditions are hard to improve because of the shortage of educated staff. Many women die giving birth, or their children die within the first month, because there is no help to get. It is also common that women, who, for different reasons don’t want to keep their baby, perform abortions on themselves with primitive tools. There is a great need to spread more information for women about pregnancy, birth giving, sexuality, and a woman’s right over her own body, as well as the necessities to educate more nurses and midwives.
BACKGROUND
The reason for choosing to draw a proposal for our bachelor project in Maputo, Mozambique is to get a different perspective of architecture outside of Sweden.

The original idea for the project was to create a “Casa de mãe Espera”, a waiting house for pregnant women with HIV/AIDS. After research in Maputo, we were advised not to choose such a narrow path. Attempts of creating special health care centers for HIV patients have already been made and have turned out to create more segregation than it has been beneficial. People with HIV/AIDS didn’t seek help in fear of being pointed out. Therefore the focus of the project is to create better conditions and a better future for pregnant women in general.

CONCEPT
The maternity home and education center is a combined program for women in Maputo, Mozambique. The purpose for this is – apart from improving opportunities and help for pregnant women – to create a connection between education and practice so that the pupils can do their practice at the maternity home before working out in the country. The two instances are therefore closely integrated with each other. We want to develop a program that is also long-term giving, a kind of payforward effect. The supposed consequence of the pay-forward effect is for graduated women to spread the knowledge to less educated midwives in the countryside and at a long term improve health care for women.

Today graduated midwives are placed out in the countryside, working their way in to the cities. The pay-forward effect will therefore also reach the areas where knowledge is most needed.

THE SITE
The chosen site is located at Catembe, a peninsula just south of Maputo. Today, transportation to Catembe is complicated, as the only possibility to cross the water is by boat (in very bad shape), and the roads are very poor. However, there are plans to, in three years, connect the parts with a bridge. There are also urban plans for a big developing of a housing project. The existing health care center will therefore have to expand to meet the new requirements.

The maternity home and education center will be situated next to the existing health care center, located North-West of the site, so that the instances can cooperate and gain knowledge from each other. The site is backland next to the main road of Catembe and located a few minutes from the Indian Ocean. To the North-East a long wall divides the site from a private home. There are a few trees and bushes, and the soil is reddish sand/gravel.
Pictures from the site and Catembe Health Care Center

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PROGRAM
1. Main entrance
2. Information center
3. Courtyard
4. Well
5. Classroom
6. Library
7. Storage room
8. Administration
9. Doctor’s office
10. Water tower
11. Waiting room
12. Reception
13. Examination room
14. WC
15. Weighing room for infants
16. Infirmary
17. Infirmary for women with complicated pregnancies
18. Delivery room
19. Laundry area
20. WC and shower
21. Casa de mãe espera - waitinghouse for pregnant women
22. Kitchen and dining room
23. Outside kitchen and dining area
24. Technical room
25. Teachers’ room
26. Entrance from the health care center
FACADES 1:200

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North-East

North-West

South-East

South-West

North-West

FACADES 1:200
STRATEGY
The architectural concept of the project is to use as much of the technical and material knowledge from Mozambique as possible. The chosen materials are local, and therefore the knowledge of building with them is utilized. Another goal is to keep the construction costs down without affecting the sustainability on the site, such as the existing buildings and nature. If the function of the building changes, it should be possible for the materials to be a part of a life-cycle perspective where it can be reused in different ways.

The main construction elements of the buildings are the foundation, the concrete blocks and the wooden beams. It is important to create natural ventilation, as well as shade and shelter for the patients and the staff. Shade is provided in the form of trees and sunscreens.

CONSTRUCTION STRATEGIES
GRID SYSTEM
The grid system is determined by the concrete blocks which are 400x200x200 mm. They are placed in the grid system, which is 840x840 mm, two concrete blocks with plaster in between. The grid has determined where the walls, doors and windows are placed in the buildings. The disadvantage when creating a fixed system is that there are limitations in terms of innovative architectural design. The advantages are that it is easy to understand the structure which facilitates repetitive construction.

FOUNDATION
The concrete foundation creates both the floor indoors and outdoors. The concrete is form moulded on site with reinforced concrete steel and an extra layer of concrete on top, which creates the floor.

WOOD STRUCTURE
The framework for the doors and windows are made from local wood, chanfuta. Chanfuta is a hard wood with a reddish shade. It is a bit expensive but is long-lasting and easy to maintain, and therefore the most sustainable option. The pergolas are made from laca-laca which is a local, cheap wood.
LOAD BEARING
The concrete blocks are load bearing with extra reinforcement. Over the doors and windows a concrete moulded beam supports the structure with concrete steel as reinforcement. They can be produced on site and laid to dry in the sun. Wooden beams support the corrugated steel roofs.

VENTILATION AND SUN
Natural ventilation is created with 100x100 mm square holes in the facades. Mosquito nets are placed in the holes. The steel roofs promote natural ventilation by allowing hot air to pass up through the holes in the corrugated steel roof. The windows that are most exposed to the sun have window shields of chanfuta wood.

ROOFS
There are two types of roofs: green roofs and corrugated steel with bubble wrap underneath. The green roofs help absorb the heat from the sun and are placed where it is most crucial to keep a pleasant indoor temperature: the delivery rooms, the infirmary, the casa de maé espera, and the kitchen. The bubble wrap underneath the steel roofs is to keep the hot sun from warming up the sheets.

LANDSCAPE
The entrance and the courtyard have stone pavement. The rest of the complex has concrete floors. There are three courtyards where lime-, mango-, and papaya trees will be planted both for shade but also to provide fruits. The trees make a natural meeting point in the waiting courtyard. Healing herbs and vegetables will grow in direct connection to the outdoor kitchen. The plants can be used by the patients and the staff.

ECONOMY
Health care centers in Mozambique are private or state funded. There is also the possibility for local communities to do fundraising among the inhabitants for social housing projects. An example of this can be that the community contributes with building material to the site. The use of concrete blocks is the cheapest way of building, with local cement and sand mixed together, and are often donated.

FLEXIBILITY
The site in Catembe allows the project to expand in the South-West direction. The project can be built in steps since there are several separated buildings. The structure with the concrete blocks allows buildings to be added on. The rooms are flexible in the sense that they can change function if needed.

WATER
Water pipes lead the rainwater to a central placed water cistern. The rainwater can be used for the plants and trees. The communal water fills up during the day in the water tank and provides water for the complex.
CIRCULATION
There are two main entrances to the building, one from North-East and one from South-West. The entrance facing North-East is easily accessed from the main road. The entrance from South-West is in direct connection with the existing health care center. South-East is the ambulance entrance. There is also a possibility for the personnel to access the existing health care center from South-West.

The roof-covered zones between the buildings provide circulation in between, and gives shade. The dimensions of the outdoor spaces are set after the grid system to provide accessibility for all.
Modell of complex
Model of site in Catembe
Building material
Building stone for our project and wood for frames
Driveway
Main road

A. Information center
B. Reception
C. Library
D. Classroom
E. Waiting room
F. Examination room
G. Delivery room
H. Operation room
I. Shower/ WC
J. Storage
K. Dormitory
L. Kitchen and dining area
M. Employees' room
N. Teachers' room
O. WC

Program for maternity home and education center

SECTION B-B 1:100