

MASTER

Respectful redevelopment

design of a rural health centre on a world heritage site, Ilha de Mocambique, as case study

Derks, R.

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Respectful redevelopment

Design of a rural health centre on a world heritage site, Ilha de Moçambique, as case study

23rd of August, 2012

Rob Derks

Colofon

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Justification

This is a publication within the framework of the graduation studio cultural Heritage and Sustainability: World Heritage cities as case study initiated by the chair of Architecture, History and Theory and led by Bernard Colenbrander, Ana Pereira Roders and Loes Veldpaus.

Author

Rob Derks

Tutors

Prof. Dr. B.J.F. Colenbrander

Dr. A.R. Pereira Roders

Msc. L. Veldpaus

Contact details author

Vloeteind 27

5502 PT Veldhoven

robderks1988@gmail.com

+31 6 28205783

Contact details university

Eindhoven University of Technology

Den Dolech 2

5612 AZ Eindhoven

+31 40 247 9111

Preface

This report concludes my studies at the University of Eindhoven, master of 'Architecture, Building and Planning' (Sept. 2006- Aug. 2012). The graduation studio 'cultural Heritage and Sustainability; World Heritage cities as case study' grasped my interest since it offered something more than other graduation studios, a preceding research part. The studio was led by Prof. Dr. Bernard Colenbrander, Dr. Ana Pereira Roders and Loes Veldpaus, MSc.

This graduation studio started on August 2011 with five students who were to study cultural Heritage in two different locations. One group was going to study the 'Amsterdam Canal district' while the other, my group, was going to study the 'Island of Mozambique'. A partnership between me and my colleagues, Sander Damen and Teun Metgod, with UNESCO made a three month internship possible in which we were able to actually live at the world heritage site 'Island of Mozambique'. Because of this possibility we were able to intensively investigate the island in cooperation with the local conservation office GACIM and the local university, Universidade de Lúrio, Nampula. Cooperation with these people was sometimes troublesome but nevertheless they helped us to understand the way they live and work.

One of our tutors, Dr. A.R. Pereira Roders, accompanied us to Mozambique. She was an essential factor in as well our daily lives, as in the research project. The result of the three month research, 'the Orange Book', would not have reached the same level of sophistication and scientific importance without her guidance

and participation. During these three months we have worked a lot to accomplish these results, but besides this 'work' one other valuable experience was living in Africa amongst the locals for three months. At first I was just like a tourists on the island. Later on, as time passes, you begin to feel more comfortable, and now I have got one more place on this earth which I can call my home.

This graduation studio offered me something the other could not. The studio offered me to do research on an academic level. Within this project I gained knowledge about research, writing, and designing. There is still room for improvement, as is the case with every project, but I am pleased with the result.

This graduation project, or experience if you will, would not have been possible without the help and support of some very important people. First of all I would like to thank my tutors, Prof. Dr. Bernard Colenbrander, Dr. Ana Pereira Roders and Loes Veldpaus MSc, for their guidance. In this case especially Ana because she dragged her family to the other side of the world to stand by our side during our first part of our graduation. Also I would like to thank Jens Hougaard, the local conservation architect, and all the other people who we met in Mozambique for the once in a lifetime experience they gave us. Special thank goes to Mart Bender, who shared his experience regarding his stay in Tanzania as a rural medical doctor. Last but not least I would like thank my family, friends and girlfriend for the support and friendship they gave me, not only during my graduation, but during the whole of my study.

Rob Derks

Summary

The island of Mozambique has been World Heritage since 1991 (ICOMOS, 1991). The local conservation office, GACIM, has until now failed to put an end to threats such as 'new development' and 'general degradation'. Figures show that from 1982/1985 until 2011/2012 the average state of degradation has dropped from 3.74 to 3.17 (Pereira et al, 2012). Since some essential attributes conveying the Outstanding Universal Value (OUV), such as the consistent use of material, building techniques and decorative principles, mainly emerge in the built environment, they are directly affected by the degradation of the built environment. Regular maintenance and redevelopment should take place to put a stop to this process of degradation. However, new development is also considered a threat since it is usually done without respect to the traditional building methods, thus affecting the OUV of the island. This project will set an example on how new development should take place, without affecting the OUV of the island, even contributing to its integrity. In order for development to take place without damaging the attributes or values, a good understanding of these attributes and values is necessary. The result of the first part of this graduation project, the 'Orange Book' describes these attributes (Pereira et al, 2012).

The new development of a Health Centre is a unique opportunity to show how changes in the built environment can positively affect the integrity of the attributes on the island while also complying with demands related to the new function and the local context of the design. That is why three different points of view conducted my design decisions exclusively. The first point of view is from a perspective of World Heritage, the second as seen from the users perspective, and the last from a purely practical and functional point of view. These points of view are explained more extensively on the next paragraphs. Architectural principles are considered, but remain inferior to the previously mentioned points of view.

On a smaller scale, on plot 24.01 it becomes visible that besides the building being part of the collective of buildings on Ilha, it has a history of its own that

should not be forgotten. For a long time, it has had the function of shops with a warehouse on the back. This becomes clear by the repetitive pattern of doors on the North-East facade and the back entrance to the courtyard. The remains of the time the building was used as shops, are still visible. The extents of the warehouse are still standing, as are the walls with the former entrances on the North-East side. These features should not be absorbed in the new design, but respectfully integrated. Therefore, they are converted into subtle exceptions in the new Health Centre.

For example, all walls still dating from 1982/1985 will be treated in a subtle, slightly different way than the new walls to prevent them from completely blending into the new design. Also, the extents of the former warehouse will be converted into exceptions in the new facades, to make sure this part of its history remains visible.

An analysis of the development of the whole block shows that it resembles the standard typology of the island: building volumes built up to the street, leaving an empty space in the centre of the block which is used as courtyards for the respective buildings.

The Health Centre will be used by both native people as by tourists or other people visiting the island. Within the island different religions exist, such as Christianity, Hinduism and Islam. This diversity of people with different origin and religion entails several demands, such as separated dorms for men and women and the distinction between normal and VIP treatment.

Furthermore, the Health Centre will be designed to have two, figuratively speaking, faces. The exterior will be designed according to a strict geometry, a clean and pragmatic look to exude confidence. The interior, in contrast with the exterior, will be designed to create a domestic feel. The courtyard will serve as the living room of the hospital, this is where people gather and live during the day, under the cool shade of the trees.

In 2011 a design for the new Health Centre was made. However, this design was rejected because it was not designed according to traditional building methods. The program of demands of this rejected project, was used as a base. A few adjustments were made in order to reach a higher level of health care and to fulfil some extra needs which were not yet integrated in the original program.

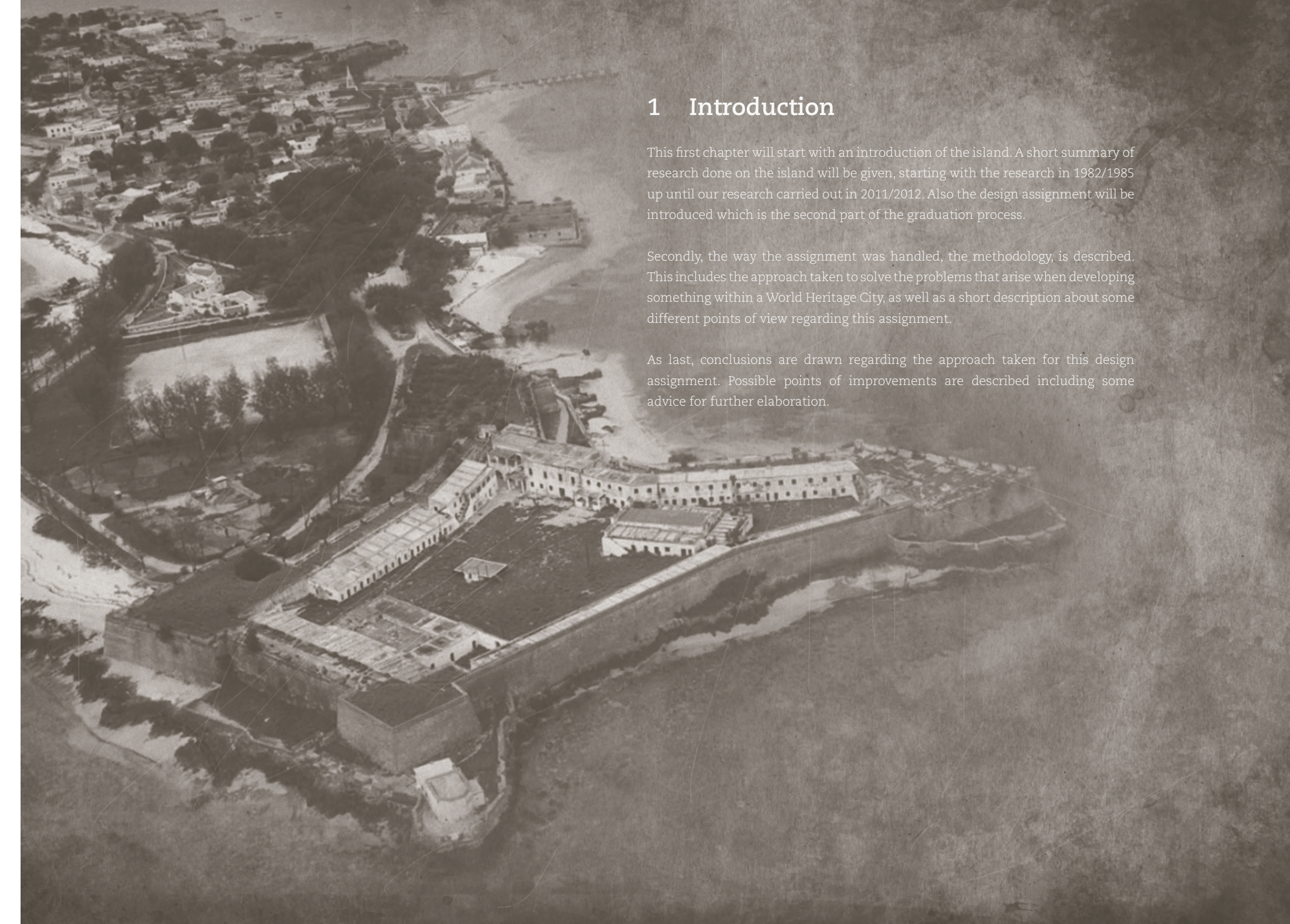
In order to create a layout that meets all demands of a Health Centre, information was gathered from a doctor who had worked in Tanzania for five years (Bender, M.H.M., personal communication – interview, March 18, 2012). The most important relationships between the clusters were defined, such as the relation between the entrance and the first aid and between the pregnancy department and the treatment centre. The layout was also designed according to flow charts of the different groups of users, to ensure the logic of the plan-layout.

Any hospital should be self sufficient on its most essential facilities. It should be self sufficient on electricity as well as water. The situation on Mozambique island in 2011/2012 regarding to water, as well as electricity is unsatisfactory for a Health Centre. There is a collective water supply system, as well as a collective electricity supply system but both of these systems fail at a regular base. For that reason, the new Health Centre will be designed to collect enough water for consumption, with the traditional method of a water collecting roof, and sufficient electricity by means of solar cells.

To conclude, the goal of this project: ‘to design a realistic Health Centre without sacrificing anything on behalf of architectonic wishes’ is achieved. The project is a solution to a puzzle. A puzzle that combines influences from the island as world heritage, influences from a pragmatic point of view needed to design a fully functional hospital in correspondence to local wishes and traditions. In other words, ‘Respectful Redevelopment’.

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An aerial photograph of a coastal town and a large, walled fortification complex. The town is built on a hillside overlooking the sea, with a church spire visible. The fortification complex is a large, rectangular structure with multiple courtyards and buildings, situated on a peninsula or a large island. The sea is visible in the foreground and to the right.

1 Introduction

This first chapter will start with an introduction of the island. A short summary of research done on the island will be given, starting with the research in 1982/1985 up until our research carried out in 2011/2012. Also the design assignment will be introduced which is the second part of the graduation process.

Secondly, the way the assignment was handled, the methodology, is described. This includes the approach taken to solve the problems that arise when developing something within a World Heritage City, as well as a short description about some different points of view regarding this assignment.

As last, conclusions are drawn regarding the approach taken for this design assignment. Possible points of improvements are described including some advice for further elaboration.

1.1 Introduction

Island of Mozambique, world heritage since 1991 (ICOMOS, 1991) has been subject to a thorough research project two times thus far. The result is a set of two reports describing the situation on the island. The first report, 'Island of Mozambique: Report 1982-1985' (Aarhus, 1985), generally known as the 'Blue Book', described, but not exclusively, the situation on the island, local customs, building techniques and methods. The second report, 'Island of Mozambique: Historic urban landscape in perspective' also known as the 'Orange Book' (Pereira et al, 2012) is the result of a research project carried out in 2012 under the supervision and guidance of Dr. Architect Ana Pereira Roders (TU/e) and Architect Jens Hougaard. This report accomplishes to relate ownership issues to different trends on the island. These two reports together help us understand the development, positive and negative, of the island from 1982 until 2012. Three students from the TU/e, Netherlands, contributed to the production of the 'Orange Book' namely, Teun Metgod, Sander Damen and Rob Derks. Undertaking this research is considered to be the first part of the graduation process of these students, with the 'Orange Book' as a result.

To improve the health care situation of the inhabitants of Mozambique Island, the government of Mozambique planned a new Health Centre on plot number 24.01 (image 1), which stands out because of its severe state of degradation. This need exists because the former hospital, due to the decreasing importance of the island as a trading capital, grew out of proportion. This former hospital is located on plot number 27.01 (image 1). This plan for a new Health Centre is the subject for the second part, the design part, of my graduation process. This report contains my considerations and decisions related to this design. This report does not aim to give a full summary of the research done in the first part of this graduation, but only appoint the parts which are relevant for my design.

In 2011 the government of Mozambique gave the assignment of designing a new Health Centre to Arch. Hanno Meister from VE-architects. This design, however, was rejected by GACIM because this design in no way respected the fact that it was going to be part of a world heritage site. As a consequence of this first design, a well elaborated program of demands is available. The approach that is taken for this project will be elaborated on in the next chapter.



Image 1 - Block- and plotnumber definition, scale 1:7500 (Pereira et al, 2012)

1.2 Methodology

According to several official reports, the Advisory Body Evaluation report (ICOMOS, 1991), the Nomination file (Mozambique, 1991), the decision texts (UNESCO, 1991-2011) and the Periodic reports (Mozambique, 2001), the two most important threats to the island are 'general degradation' and 'new development'. Generally new development affects the 'Outstanding Universal Value' (OUV) of the island, since it normally does not comply with traditional building methods. Which leads us to the essence of the assignment; develop a Health Centre on this world heritage site without negatively affecting the island's OUV.

In order for development to take place without damaging the attributes or values, a good understanding of these attributes and values is necessary. The result of the first part of this graduation project, the 'Orange Book' describes these attributes. The most excessively described ones are the consistent use of building materials, building techniques and decorative principles. These attributes mainly emerge in the built environment making these attributes vulnerable to changes in the built environment.

Therefore, this new development of a Health Centre is a unique opportunity to show how changes in the built environment can positively affect the integrity of the attributes on the island while also complying with demands related to the new function and the local context of the design. That is why three different points of view conducted my design decisions exclusively. The first point of view is from a perspective of World Heritage, the second as seen from the users perspective, and the last from a purely practical and functional point of view. These points of view are explained more extensively on the next paragraphs. Architectural principles are considered but remain inferior to the previously mentioned points of view.

To conclude, the goal of this project is to design a realistic Health Centre without sacrificing anything on behalf of architectonic wishes. The project is a solution to a puzzle. A puzzle that combines influences from the island as world heritage, influences from a pragmatic point of view needed to design a fully functional hospital in correspondence to local wishes and traditions.

World Heritage

Island of Mozambique is listed as a World Heritage property. All plots on the island together form the unique place called 'Island of Mozambique'. The island contains value mainly because it contains a collective of houses that have an exceptional unity considering the use of materials, techniques and decorative principles. Although plot 24.01 is an asset in a very bad state of degradation, plot 24.01 is an essential part of the island, as much as any other plot. Together they represent influences from the history of the island. For example, the island was influenced by the fact that it used to be a main trading port on the route to India and the invasion of Portugal after it was taken by the Arabians. In these cases, plot 24.01 is a small facet of a bigger history.

On the other hand, the plot also shares its own, more local, history. The plot bears witness to the development it has gone through. It got severely degraded after 1982 and the functions it was used for over time.

To conclude, plot 24.01 tells a story on two levels. It is a facet of a world heritage site 'Ilha de Moçambique', and the plot has a history of its own to share. The plot should still be able to share both of these stories after re-development.

Local community

The primary purpose of the new Health Centre is to improve the health care situation on the Island of Mozambique. It will directly improve the situation of those using the Health Centre, but the new building should also have an exemplary function for the local community.

The users of this Health Centre will exist out of Christians, Muslims, Hindus and Atheist. They have different customs and beliefs, it's important to realise they might be bound to different rules imposed by their religion and the consequences these different cultures entail for a design.

'It should be realised the future users of the Health Centre have different origins and varying religions, which results in extra demands for the design'

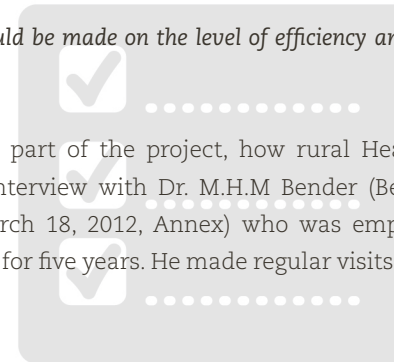
Some examples that are taken into consideration; due to the hot Mozambique climate, local people are more likely to live outside, even when they are ill. Also, various African hospitals have luxury rooms for tourists, so extra money can be made. Furthermore, Muslim religion forbids mixed dorms for men and woman. All of these issues need to be considered from the start of the design process.

Functionality

The aim of this assignment is to design a realistic Health Centre which can actually be used by the Mozambique government as a starting point for the realization for this project. Therefore, within this project, a pragmatic and realistic approach is taken regarding functionality. For example, like any other hospital, a rural Health Centre cannot be fully dependant on the local supply of energy, and in this case it cannot be completely dependent on the local supply of fresh drinking water either. An ineffective routing in a hospital is unacceptable, every second can be a decisive one.

'No compromises should be made on the level of efficiency and usability of this Health Centre.'

Information on this part of the project, how rural Health Centres work, was gathered from an interview with Dr. M.H.M Bender (Bender, M.H.M., personal communication, March 18, 2012, Annex) who was employed as a doctor in a hospital in Tanzania for five years. He made regular visits to rural Health Centres.





2.1 Pre-design, Redevelopment with regard to world/cultural heritage

In this chapter, an overview will be given of attributes and values of the island. Some valuable features that the plot has, related to the plot its own personal history, will also be described. In the design these aspects are handled in a way that they comply with the following ground rules.

First of all, concerning the plot being part of a World Heritage site, the redevelopment of the contributes to restoring the integrity of the attributes of the island. It will once again be a building, not standing out because of its severe state of degradation, but standing out because of its exemplary function when it comes to traditionally built structures.

And second, not many walls stood the test of time from 1982/1985 until 2011/2012. Not a single wall that is still standing in 2011/2012 will be demolished for the sake of redevelopment. Solely punctuations will be allowed, and only if necessary for the functionality of the hospital. Everything still existent in 2011/2012 related to the essence of the history of the plot will be integrated in the new design, and wherever possible kept visible. However, no attempt will be made to exactly restore the former situation.

These guidelines formed the foundation of the design in regard to world- and cultural heritage. In chapter 3 'Design', the way these guidelines have influenced the design will be elaborated.



Image 2 - State of degradation 1982 - 1985, scale 1:7500 (Pereira et al, 2012)

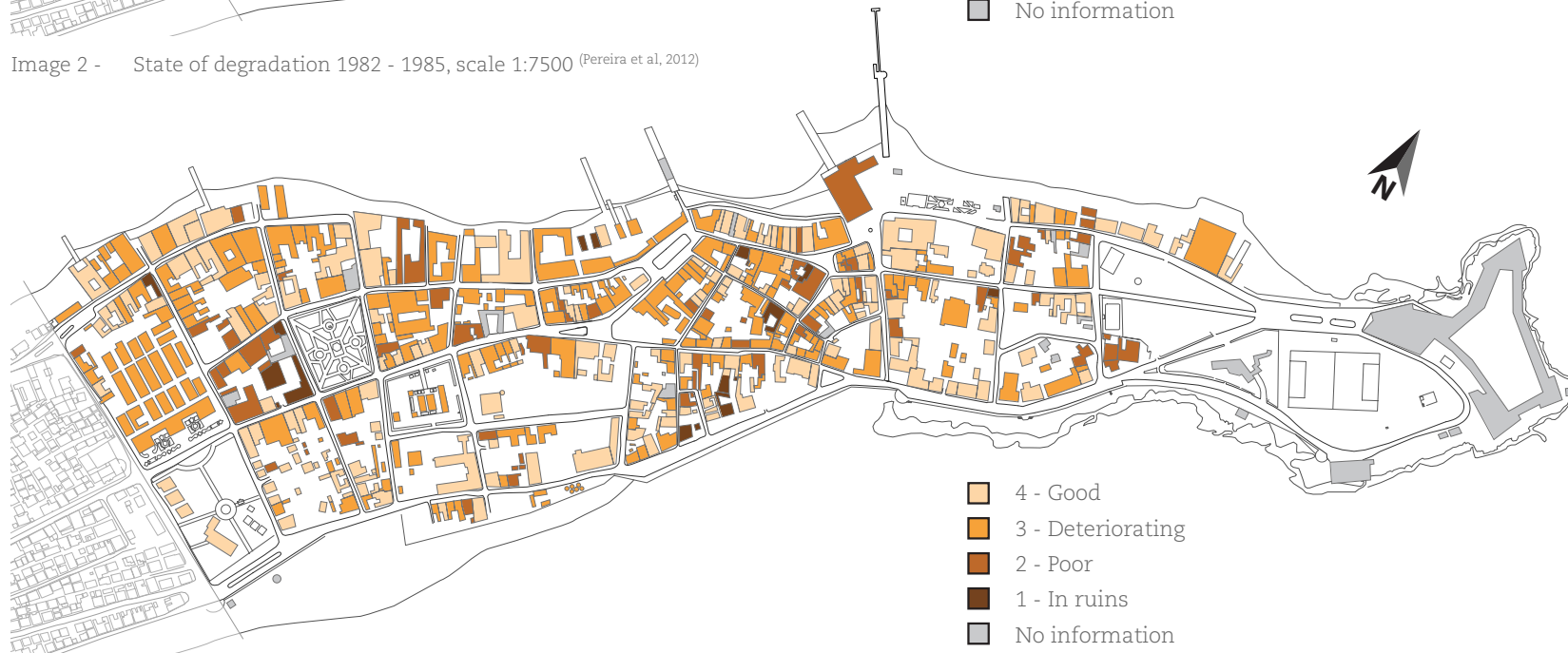


Image 3 - State of degradation 2011-2012, scale 1:7500 (Pereira et al, 2012)

2.1.1 Island of Mozambique, situation

In the 'Orange Book' the situation in 2012 is described in relation to the current ownership situation on the island and when possible in relation to the situation in 1982. This comparison illustrates the current trends on the island. Some of these are worrying.

Since the attributes mainly emerge in the built environment, degradation of the built environment directly affects these attributes. General ,when put into figures, shows at what rate the built environment on the island is degrading. The score for the condition in general (an average of the condition of the walls, the wall surfaces, the roofs, floors and windows) has dropped more than half a point from 3.74 in 1982-85 to 3.17 in 2011-2012 (image 3, Pereira et al, 2012).

The general degradation of this built environment calls for large scale restoration projects and redevelopment of houses. However restoration and new development are currently considered to be threats to the OUV of the island. Most cases of redevelopment are executed with disrespect to the attributes and values of the island. This should change.

'The aim of this project is to set an example on how development can unite with world heritage, to show a way where development meets world heritage, in other words: Respectful redevelopment.'



Image 4 - Traditional white border on a coloured facade

2.1.2 Island of Mozambique – attributes and values

In order to understand how new development can comply with guidelines imposed by the fact that the island is World Heritage, you should comprehend the attributes and values the island represents. This paragraph will concisely elaborate on these attributes and values, and their corresponding current state of integrity on the island (Pereira et al, 2012).

Consistent use of building materials

Characteristic for the island, as a wall material, is the use of coral limestone masonry. However, over time other materials have been introduced to the island. Materials such as cement block masonry, or bamboo combined with stones and or mud as a building material. Coral limestone masonry is still by far the predominate wall material (image 6, p.20). From all houses in 'Stone Town' 96% are built out of coral limestone masonry, 2% out of block masonry and 2% out of other materials such as bamboo. On plot 24.01 all walls that are still left are built up with coral limestone, which is to be valued.

Besides the wall materials, flat traditional roofs are constructed in a consistent way: 'the beams which are about 20 x 20 cm in section span between 4 and 6 meters from wall to wall. (...) Secondary joist, about 10 x 10 cm are fixed on top of the beams. The joist are spaced about 10-15 cm apart so that they can act as a bearing for coral limestone blocks. (...) Thick rough screed of lime mortar and limestone gravel is laid on top of the stone bed (...) The wearing surface is a 1.5 – 2 cm render layer consisting of a fine lime mortar' (Aarhus, 1985). Nowadays only 52% of all buildings in 'Stone Town' have traditional flat terrace roofs. Most of these roofs have collapsed due to lack of maintenance. The roofs also collapsed on plot 24.01, due to the prolonged vacancy of the building.

Consistent use of building techniques

There are three architectural elements which illustrate the use of the same building techniques being roof type, plan type and opening type. The consistent use of building techniques is coherent with the consistent use of building materials. For example the roofs, as described, are built out of wooden beams

topped off with several layers. This typical technique for building roof is still existent on 52% of the buildings in 'Stone Town'.

Considering the traditional coral limestone walls, an extensive process is needed to prepare the mortar in the right way, which will not be further elaborated. Wall-openings traditionally are vertical, spanned with wooden beams (image 6, p.20). Important to consider is the need for conservation of these building techniques.

Consistent use of decorative principles

Buildings in 'Stone Town' are decorated consistently according to several principles. For the consistent use of the same decorative principles only the facades facing streets have been taken in consideration. The first is colour scheme. The facades and the opening borders are often coloured in different colours, creating different colour schemes. Traditionally, the facade is coloured and has white opening borders (image 4), however this colour scheme only remains on just over half of the houses (51%), the rest has different combinations such as the reverse, coloured borders on a white facade.

The second decorative principle is the opening border. The kind of opening border most present in 'Stone Town' is a border with relief in relation to the facade and surrounds the whole opening. About 54% of the buildings have this traditional 'full 3D opening border' around the majority of its openings.

For the last decorative principle three kinds of principles are taken together: the pilaster, the cornice and the facade border (in most cases only a plinth). About 89% of the buildings have one or more of these principles on their facade(s); the other 11% have none.

To conclude, figures from the 'Orange book' (Pereira et al, 2012) illustrate the integrity of certain attributes. For example the traditional rain-collecting flat roof which only exists in less than half (48%) of the houses. The traditional colour scheme on the island, coloured facade with white decorations, is only existent in just over half (51%) of the houses. These attributes are affected by certain threats such as new development. These will be elaborated in the next paragraph.



Image 5 - New development as a threat, building 25.36



Image 6 - Severely degraded traditional opening in a coral limestone wall

2.1.3 Island of Mozambique – Threats and causes

Not only attributes are mentioned in the official documents. These attributes and their correspondent values are threatened. The main threats, filtered from the UNESCO documents are new development, general degradation, natural disasters and some unidentified threats. The first two threats are the only ones which possibly have an apparent reason related to verifiable issues or causes. According to the analysed documents 'the lack of or insufficient regulatory framework' is the most important cause for the threats prevailing on the island.

The factors which were found directly affecting the architectural unity are mainly 'new development' and 'general degradation'. New development normally does not comply with the traditional building methods, materials and decorative principles (Pereira et al, 2012).

Since 2006 the local Conservation Office (GACIM) has been responsible to control these tendencies to rebuilt buildings different (image 5) then they originally were or from what allowed according to the laws and legislations. As GACIM lacks the manpower and capabilities to monitor, these tendencies are not being reversed and will probably continue on affecting the architectural unity of 'Stone Town'.

'Instead of affecting attributes with new development, new development should contribute to the integrity of the attributes on the island.'

The OUV of the island mainly emerges in the built environment of 'Stone Town'. These tangible objects are subject to deterioration. The comparing results from 1982-1985 to 2011-2012 have proven the increase of deterioration. In thirty years the general condition score of 3.74 dropped to 3.17. (image 6) About 41% of the buildings in 'Stone Town' are generally in good condition and 39% are deteriorating. The other buildings have structural problems: 17% of the buildings are in poor condition and 3% are in ruins. Speculation already stated that the general condition was getting worse, but now figures exist to prove it. Hopefully, local and national authorities get alarmed by these numbers and will take action.

Even though GACIM has only been operational for six years, no efforts have been found to create and keep a monitoring routine, as well as, to regulate and control new development. Even though new development is not considered as a major threat at the moment, it will probably become in the near future. It is generally assumed that tourism is increasing and building prices are rising. Though, there are many buildings being reconstructed without technical advice.

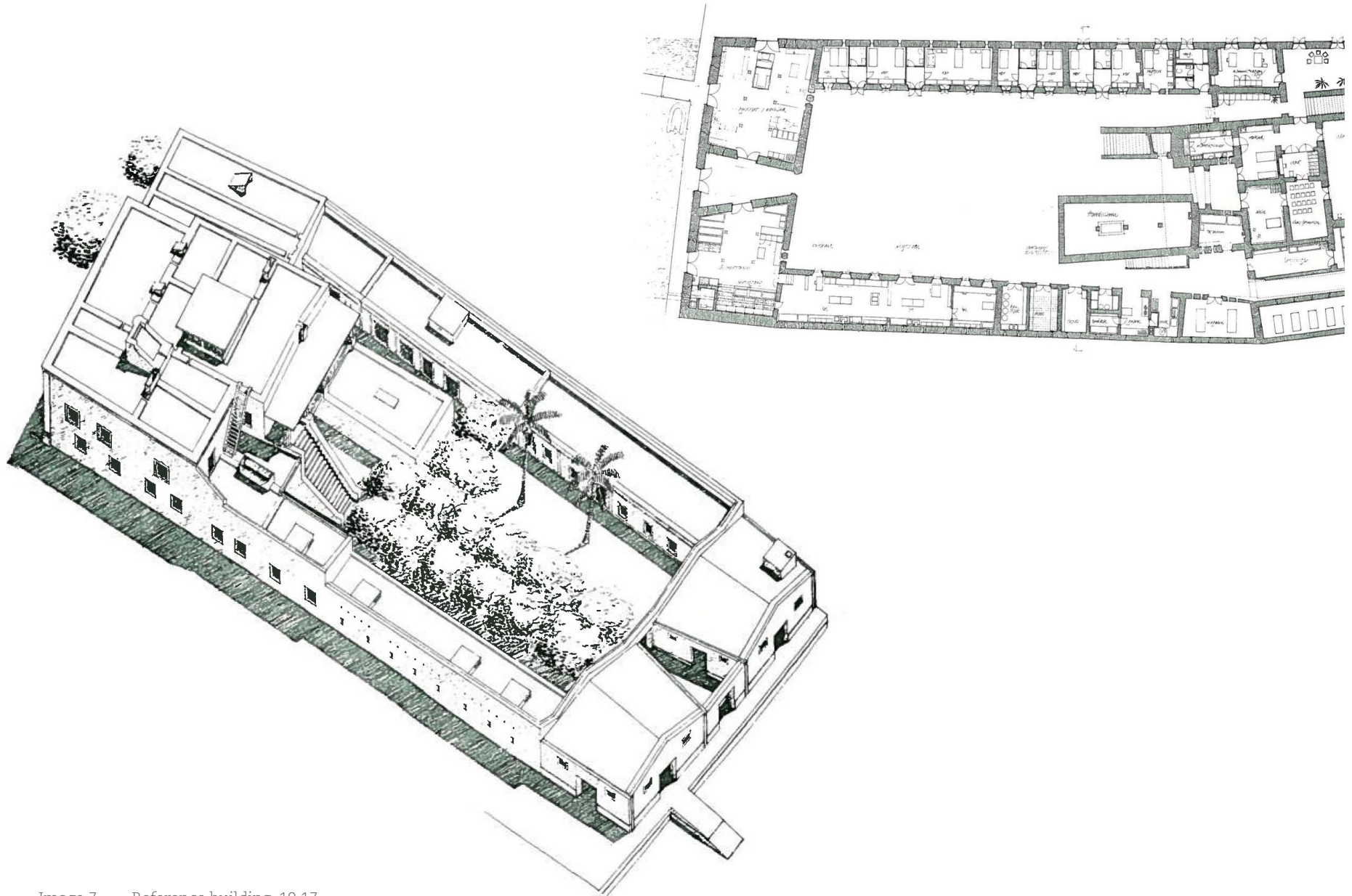


Image 7 - Reference building, 19.17

2.1.4 Development of block 24

The standard layout of a building on the island is based on an open space in the back with a building volume dividing this open space from the street. The courtyard in the back is usually accessible through the building volume. One of the advantages of this principle is that it allows a consistent flow of air through the building which helps keeping the indoor climate acceptable.

The buildings on block 24 are no exception to this traditional building layout, as can be concluded from the analysis of the development of block 24 over the past two decades (image 8). The buildings are built up onto the block border, leaving an open central space which is divided in individual courtyards. Small additions are made between 1982 and 2012 in the central open space. This tendency is also visible on other blocks on the island.

Furthermore, there are other large scale buildings on the island that show the courtyard typology. A main building facing the street, often two levels high, with annexes defining the plot borders on all sides. A reference building built on plot 19.17, comparable to plot 24.01, (image 7), indicates that a corner building of this scale, logically should stay consistent in the use of the courtyard typology, possibly complemented with annexes on the sides.

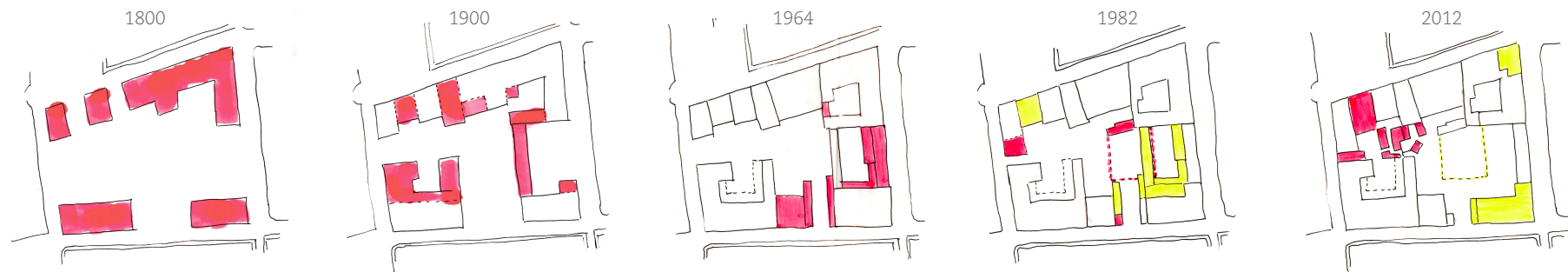


Image 8 - Development of block 24, 1800 - 2012

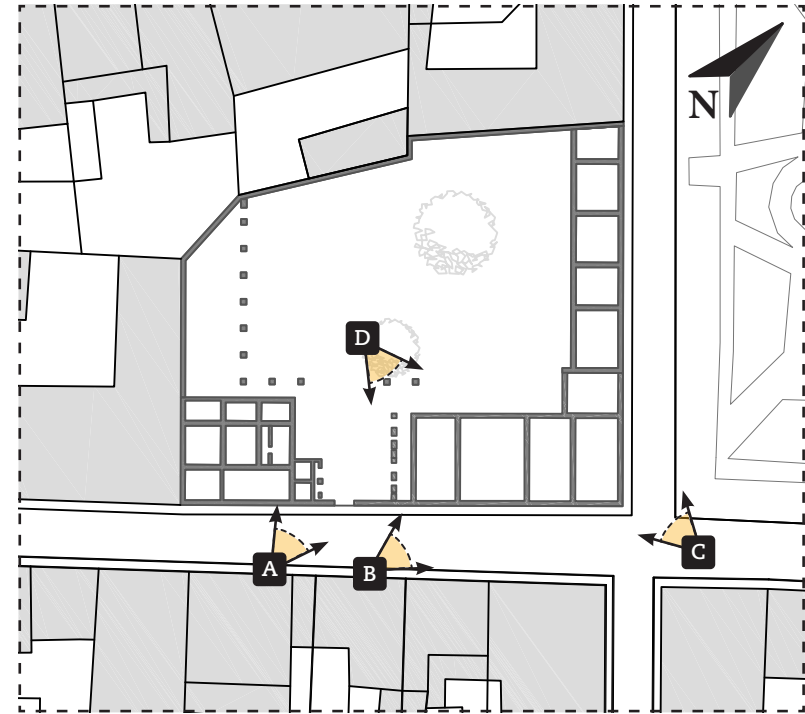


Image 9 - Photographs of plot 24.01 dating from 1982-1985

2.1.5 Plot situation 1982/1985

Photographs taken during the field research for the Aarhus report illustrate the situation in 1982/1985 (image 9). These photographs help to understand the development the plot has gone through the past few decades. Ever since 1982 plot 24.01 has always been one of the buildings in the furthest state of decay. Since 1980 the building has not been used. However, you can still assume the building was once used as a series of shops in combination with a warehouse. You can tell from the repetitive pattern of doors on the North-East facade (image 9C). This presumption was confirmed by the function-map from the blue book (Aarhus, 1985 p.44). The plot was built according to a courtyard principle with a back-entrance on the South-East facade (image 9A).

Before 1982 a project had started for the redevelopment of the plot. The concrete pillars are part of this project (image 9D) thus are no part of the original building. This project however, was never finished. The plans, or purpose of this project remain unclear. The local conservation office did not offer any clarity on what the plans were for this plot, neither did Jens Hougaard, the local conservation architect.



2.1.6 Plot situation 2011/2012

With this set of photographs from 2011/2012 (image 10) a complete representation is given of the situation of the plot. This plot is in the worst condition of the whole island. Every roof has collapsed, including most of the walls. These walls and roofs have fallen onto the ground which have made the ground level on certain places rise 0.5m - 1m. Over time grass has grown over to cover these building materials.

The part with the most walls standing is where once the shops used to be (image 10B & 10D). Some of the doors that used to be the entrances to these shops are intact, including some of their door-frames.

According to Jens Hougaard, before this piece of land was cultivated, the ground level used to be higher than you can see on these pictures. Some parts of the walls are actually not built, but carved out of the ground (image 10B). At some places you can still see the layers of sediment deposited over millions of years.

The back entrance for the courtyard is still intact (image 10A). The high piece of wall a little further on the right indicates a corner of a building volume which once was there. The definition of this same volume is confined by another piece of wall still standing (image 10C).

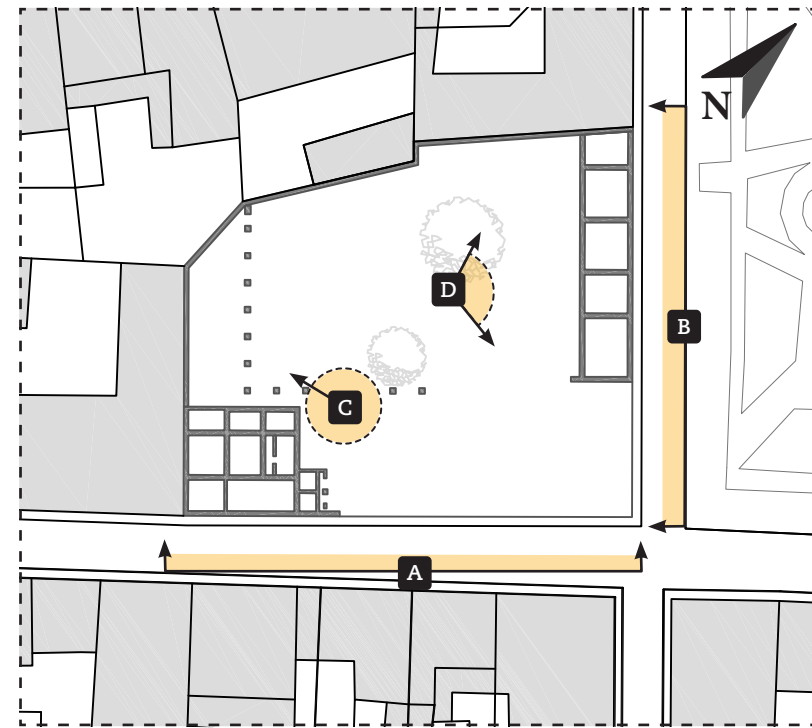




Image 10 - Panorama's of plot 24.01 from 2011-2012

2.1.7 Two storeys

The overview of the island, in which two-storey buildings are marked (Image 11), indicates you could expect plot 24.01 to have two levels as well. Most of the plots with a similar scale as plot 24.01 are built up two levels. The only two buildings with a similar scale that are one level high, are warehouses which are built up to a height comparable to a two storey building, but don't have a floor which divides the two levels.

Furthermore, a theory exists that buildings on corners on the island, tend to 'go up'. The following figures strengthen this theory. From all of the buildings on the island 16% are buildings with two or more floors. Out of all buildings in 'Stone Town' 24% of the buildings is built on a corner. With a standard distribution

you would expect that roughly one fourth of the two-storey buildings would be situated on a corner. However, from all of these two storey buildings 51% is situated on a corner. To conclude, these figures are in keeping with the theory that states that corner buildings tend to be built up to a higher level.

The previous conclusions indicate that a building with two levels would be appropriate for plot 24.01. At least, an exclusion of a two storey building on this spot is proven to be unnecessary.



Image 11 - Overview of two-storey buildings 2011-2012, scale 1:7500 (Pereira et al., 2012)

2.1.8 Wall treatment principle

Over time almost all the roofs and walls have collapsed, only a few remain. Before the process of degradation began this structure was used as shops. From of 1982/1985 the building became vacant and started to degrade. The fact that this building has degraded up until the state it is in right now is as much part of its history as anything else. That is why you should not conceal the remains of this period of time in which the building degraded so severely. These walls left-over are remains of the time that this building was uninhabited and not maintained.

In the final elaboration of the project a distinct but subtle difference of wall treatment will be used. This distinction shows what once was part of the last remains of a building in an advanced state of decay, and which parts are rebuilt later (image 12).



Image 12 - Back entrance, situation 2011_2012 (down) Wall treatment principle (up)



Image 13 - Overview of the volume borders of the former warehouse, 2011-2012

2.1.9 The remains of a building volume

Although the former warehouse in its original form is completely gone, there are some last pieces of wall still standing . These last pieces of wall (image 13) indicate where the extents of the former warehouse once stood. To recapture, no attempt will be made to reconstruct this warehouse but the remains that are still existent will not be demolished. Instead they will be respectfully integrated within the new design. To prevent these pieces from being absorbed/swallowed in the new design they are converted into subtle exceptions in the new Health Centre.

For example in the south-east facade, a small piece of wall is designed to have a deviating height compared to the higher and lower part for no apparent reason. This exception however, represents the height of the former warehouse.

Besides this example there are also less visible assets which are integrated in the design. Like the original position of the extents of the walls are maintained in the new design. As well as the back entrance in the south-east facade (image 38, p.68, CAD - drawing) is positioned on the same place the back entrance had once been when it was still being used as a shops with adjoining warehouse.



Image 14 - The state of the warehouse in 1982-1985

2.2 Pre-Design, Redevelopment with regard to the local community

This chapter will focus on wishes, demands and perception of the future users that are going to use this new Health Centre, consisting of patients, visitors, personnel as well as the local community in general. Some aspects that will be elaborated are the following;

A design should always comply with the needs of the future users. This Health Centre is no exception on that rule. However, the divers groups of users entail distinct demands: demands imposed by religion or demands belonging to the origin of the user/patient.

Besides the more pragmatic demands of the people, the influence the building should have on the perception of the local community will be described, as well as the impression people should get when they observe the building from outside will be, and the impression when the building is entered. The sense people should get who are hospitalized for a longer time is another issue elaborated in this chapter. Another matter described in this chapter are some of the positive effects the Health Centre can have on the local community.



2.2.1 General appearance

Figuratively speaking, the Health Centres will have two sides. From the outside the Health Centre will blend in with the other facades of the island. These facades are all built up until the street, are designed on the basis of strict geometry and they have an impenetrable, clean and pragmatic appearance (image 15). Then on the other side, the inside, a homely feel will be created (image 16). This will be exaggerated by the contrast with the outside as soon as you enter the building. A variety of open and closed spaces, in combination with overhangs and warm materials will help to accomplish this feeling. Also, the courtyard, is used as the living room of the hospital. This space facilitates interaction, which will help people to feel at home.



Image 15 - Concept-sketch of the outer facade, pragmatic and strict



Image 16 - Concept-sketch of the inner courtyard, a domestic feel

2.2.2 Customs

It should be realized that a Health Centre is a place where people from different cultures temporarily live together. This results in varying demands. For example, due to the hot climate, it is customary for locals to live outside, even when they are ill. This results in the need for an outside living space.

Differences between the patients using the Health Centre can come from different aspects such as religion or country of origin. Some religions forbid their proponents to sleep in shared dorms between men and women which results in the need for dorms divided between the two sexes. People from western countries are usually richer and used to more comfort than local inhabitants which results in the need for separate, more private rooms for tourists and the possibility of buying prepared food in the hospital.

2.2.3 Role of the courtyard

The courtyard will function as a living room for the patients. It should be a comfortable place, a place to talk, a safe secure spot and a place to spend time with relatives or friends.

The design of the courtyard and its direct surroundings can be divided in three parts (image 17). First of all there is the ward, although it is shared, it is the more private part. Then, as an extension, there is the veranda which goes all around the courtyard, which is the semi-public part. It is designed so it always offers protection from the sun, but exposes you to the fresh prevailing South-eastern winds. Outside will be the public place where families meet their relatives who are hospitalized. A place where pregnant woman get educated and have their

babies measured and weighed. This place is also designed with spots to sit in the shadow provided by nearby trees, in short an open space, usable in various ways.

Local people are used to live outside even when they are ill. Hence there is a need for an exterior place for them to use as their 'living room'. It should be a safe place, a familiar place, a place they could temporarily call their home. This description complies with a courtyard design which is similar to building styles found elsewhere on the island, gentle/inviting facades and enough cool shadowy spots to protect people from the sun.

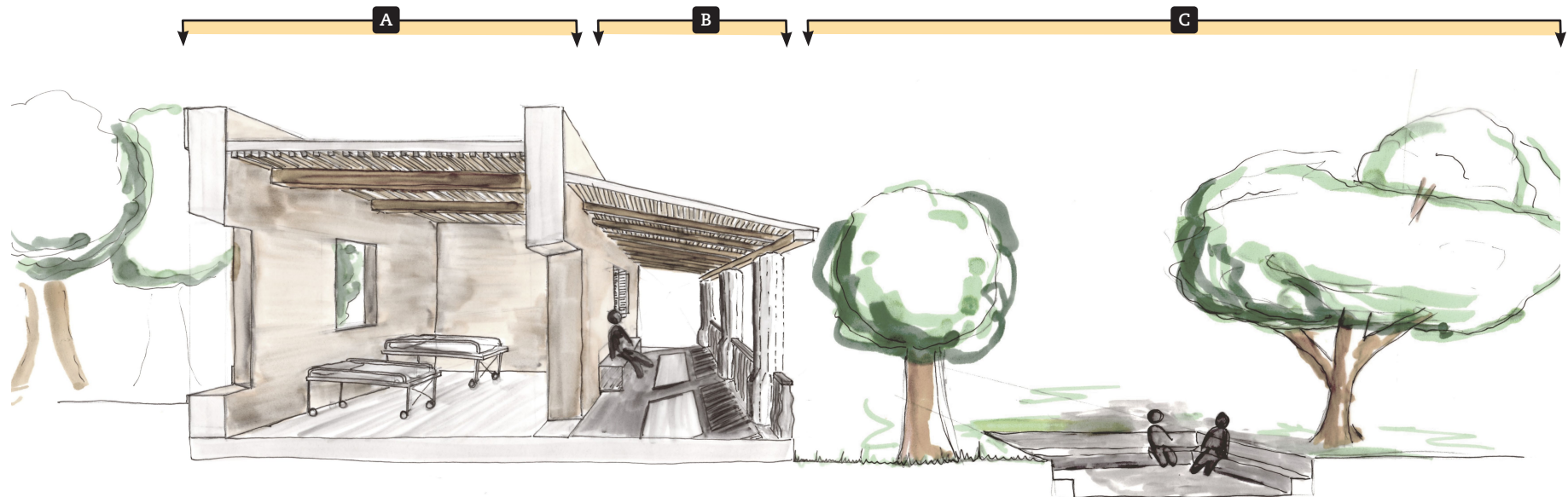


Image 17 - Concept-sketch of cross-section



2.3 Redevelopment with regard to functionality

Designing a Health Centre entails many demands regarding the functionality of the building. With this design project, the aim was to build a fully functional Health Centre. Information regarding these demands were derived from an interview with a doctor who's worked and lived at a hospital in Tanzania for five years (Bender, M.H.M., personal communication, March 18, 2012).

. Subjects paid attention too during the design process are the following; First of all, the program of demands, as used in the design which was not approved by GACIM in 2011 will be analysed. For the vast majority, this program of demands is well thought out, however some adjustments are made in order to complete it.

Second, the routing of a Health Centre is very complex. There are several groups of users which use various parts of the building. The complexity is a result of the different groups of users, such as inpatients, medical staff but also from outside groups such as visitors or outpatients. Furthermore, the relations between the different parts of the buildings are very strict in some cases, such as the relation between the pregnancy department and the operating room in case of a caesarean sections.

Last, the fact that the Health Centre is going to be built in a third world country. In Mozambique certain facets of infrastructure are less a matter of course then in the western world, such as electricity and water. Which are both indispensable when running a Health Centre. The challenge is to solve the need for an infallible supply of water and electricity in a third world country.

2.3.1 Program of demands - definition

The government of Mozambique has plans for the development of a Health Centre on plot 24.01. In 2011 a design for this plot was made by Architect Hanno Meister from VE-architects. However, this design was rejected because it was in no way designed in correspondence to the context of the environment, even neglecting the fact that it was going to be built on a world heritage site.

The previous design by VE-architects provided a program of demands, which was taken as a base for this project. This program of demands has already been approved by the local government. Some adjustments were made to the original program of demands but in general the program of demands retained its original form. The adjustments made are as follows;

The program of demands was corrected for the lack of a kitchen in the program of demands. The original program states there is a need for separated rooms for important people, such as tourist or persons from the local/national government. Tourist or other 'wealthier' people have higher standards and entail a need for a catering service. However, the program did not yet state the need for a kitchen. Local people generally can't afford to be cooked for the entire time they are in the hospital. In these cases the family of this person will cook for them at home and bring the food over. Another solution is to include cooking facilities in the hospital for relatives to use. However, due to the location of this Health Centre, situated on an island from which most of the patients come from, this will not be necessary since all families live in a 2 mile radius.

A reception was added. The function of this will be to take care of the registration of patients as well as an entry point which can keep some surveillance. Combined with the reception, the need for a central waiting room is added.

Due to the scale of the Health Centre, the amount of five diagnostic/consulting was considered to be a surplus. This amount was reduced to three, since all of these rooms would have the same facilities available. A desk, some storage and an examining table.

When designing a Health Centre you should think about up until what level of health care you would like to be able to help people. This Health Centre should be able to perform small operations such as caesarean sections or other small surgery. In this case an additional operating room would be needed in order to perform such operations simultaneously with cases like patients who need a few stitches for which a complete operating room would be excess.

This choice was made because of two reasons. Firstly, since the closest other hospital able to perform this kind of operations is a three hour car ride away and second, the government wants this Health Centre to become a Health Centre 'plus'. This means that there should be additional facilities on top of the normal standards for Health Centres in Mozambique. This is due to the special status Mozambique Island has, as a result of tourism and its subscription as world heritage.







		Amount	Needed space	Exterior
		#	m ²	m ²
	Entrance			
0.01	Reception/medication issue	1	15	8
0.02	Waiting room	1	40	0
0.03	Pediatric screening (diagnostics)	1	15	6
0.04	Adults screening (diagnostics)	1	15	6
0.05	Medical Consultation	1	15	6
			100	26
	Inpatient wards			
0.06	Observation room, children 7 beds	1	45	18
0.07	Observation room, women 5 beds	1	33	13,2
0.08	Observation room, men 5 beds	1	33	13,2
0.09	Sanitary block (3 functions, children, women, men)	3	45	18
0.10	Storage	1	10	4
			166	66,4
	Pregnancy department			
0.11	Ward for 10 beds (maternity)	2	50	20
0.12	Delivery room	1	20	8
0.13	Internal bathroom	1	6	2,4
0.14	Pregnancy ward	1	15	6
0.15	Area outside (weighing, waiting)	1	0	6
			91	36,4
	Treatment centre			
0.16	Treatment room	1	15	6
0.17	Operating room	1	15	6
0.18	Laboratory	1	15	6
0.19	Pharmacy	1	15	6
0.20	Sterilization room	1	10	4
0.21	Storage	1	10	4
0.22	Mortuary (temporary) 2 beds	1	15	6
0.23	First Aid	1	40	16
0.24	Technical office, maintenance	1	15	6
			150	60
	Services			
0.25	Laundry room	1	35	
0.26	Storage	1	10	4
0.27	Sanitary block, public	1	30	12
0.28	Location for waste	1	8	
0.29	Location for organic waste			4
1.30	Kitchen	1	15	6
1.31	Sanitary block personnel	1	30	12
1.32	Changing room for personnel	1	20	8
			148	46
	First floor			
1.33	Office for the direction and administration	1	15	6
1.34	Office for the management	1	15	6
1.35	Special ward (VIP's or tourists) 4 beds	2	33	13,2
			63	25,2
	Total		718	260

Image 18 - Adjusted program of demands from VE-Architects

2.3.2 Program of demands, clustering

An analysis of this program of demands resulted in a very strict clustering of functions. This is beneficial to the efficiency of the Health Centre and it creates possibilities for a logical routing. These clusters are the following; Entrance, Inpatient department, Pregnancy department, Treatment Centre, Services, First floor. These clusters are described with a short description and some extra restrictions and demands.

Entrance - The main entrance is where all patients and visitors enter. It is meant to bid welcome to these people and to register the patients. The reception will also take account for some level of surveillance and security. When patients leave, this reception also serves as a place for the issue of medication and to check out.

The reception should be directly connected to the waiting area. From the reception people are instructed to wait there until a doctor has time to see/treat them. This space ideally is an open, cool space protected from influences from outside such as direct sunlight or rainfall.

The diagnostic/consulting rooms should be directly connected to the waiting room. The medical staff uses these room to have private talks with the patients and to establish the first diagnostics. After they are done here a patient can be directed further to the treatment department, to be hospitalized or told to go home. For cases of emergency the waiting area should also have a direct connection to the treatment centre.

Inpatient department - The inpatient department is where the patients sleep and live for the time they are hospitalized. Although they have shared dorms this is their private domain. Not many visitors are allowed here, for sizeable groups of visitors the courtyard is the intended place to meet. Every dorm has their private bath and toilet room to shield those from public use. Three wards are available, one for men, one for kids and one for children. These wards serve as the private space for the patients. They should be connected to the public courtyard, separated by some kind of buffer to sustain the separation between public and private space.

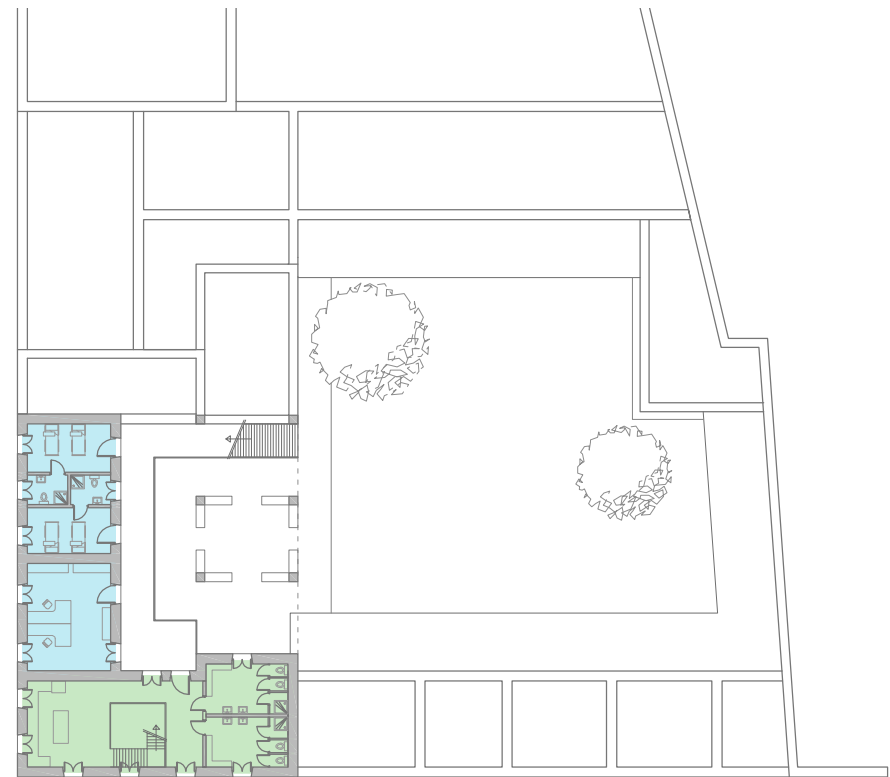
Pregnancy department - Two wards are available for pregnant women, ten beds in total. They have access to a rather sizeable bath and toilet block, since it is also shared with the outpatient pregnant women. Directly connected are the dilation room and the delivery room with internal bathroom. The dilation room is meant for when you are about to have a baby but you are waiting for the '10 cm'. The treatment centre is easily accessible from the pregnancy department, in case of a needed caesarean section or other complications during birth.

Treatment Centre - The combined facilities of the treatment centre is one of the 'closed' departments. Patients are not allowed to go in without supervision from the medical staff. This is one of the reasons it is convenient that all these functions are clustered. The other reason for the clustering is that these functions are often used in succession of each other. For example when a patient from the first aid needs to be operated on after all. Or if a patient passes away the mortuary needs to be close.

The treatment centre is closely related with the entrance for cases of first-aid emergencies, as well as related to the pregnancy department for cases of urgency related to caesareans. The inpatient department is situated further away, because in this case urgent matters are less/not probable.

Services - The other part of the Health Centre not accessible to patients or visitors is the part for services. This includes laundry rooms, storage, rooms for personnel, kitchen and such. From the services part, the personnel can easily access both floors and this part is also connected to the street. This ensures the Health Centre to be supplied with easy, with goods such as food or medication.

First floor - The first floor is a little bit more remotely connected to the courtyard than other parts of the Health Centre. The offices as well as the VIP-wards are situated here, hence only staff or VIP-patients are allowed up here. This first floor allows a bit more privacy and tranquillity to these functions. Of course, if desired the VIP-patients can go down and mingle with the local patients. These patients will have a more remote place to efface oneself. The first floor is directly connected to the kitchen, and the rest of the service part so the VIP-patients can easily be offered a higher quality of service.



- Entrance
- Inpatient department
- Pregnancy department
- Treatment centre
- Services
- First floor

Image 19 - Program of demands clusters, ground floor (left), first floor (right)







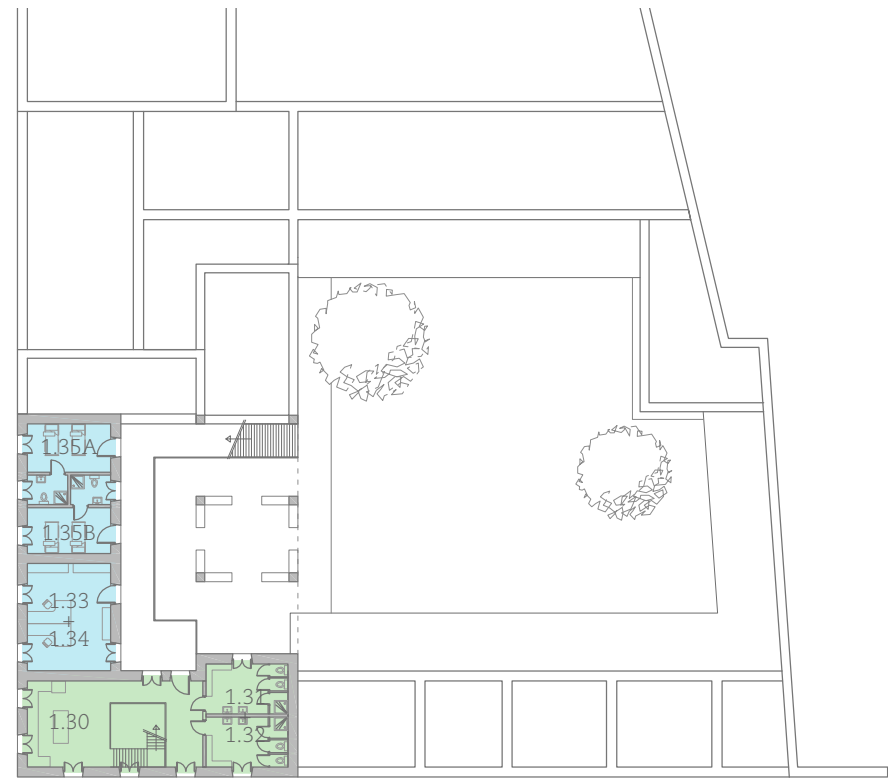
		Amount	Needed space	Available space	Balance
		#	m ²	m ²	m ²
	Entrance				
0.01	Reception/medication issue	1	15	14	-1
0.02	Waiting room	1	40	178	+138
0.03	Pediatric screening (diagnostics)	1	15	16	+1
0.04	Adults screening (diagnostics)	1	15	16	+1
0.05	Medical Consultation	1	15	16	+1
			100	240	+140
	Inpatient wards				
0.06	Observation room, children 7 beds	1	45	44	-1
0.07	Observation room, women 5 beds	1	33	35	+2
0.08	Observation room, men 5 beds	1	33	36	+3
0.09	Sanitary block (3 functions, children, women, men)	3	45	43	-2
0.10	Storage	1	10	10	0
			166	168	+2
	Pregnancy department				
0.11	Ward for 10 beds (maternity)	2	50	78	+28
0.12	Delivery room	1	20	23	+3
0.13	Internal bathroom	1	6	23*	+2*
0.14	Pregnancy ward	1	15	23*	+2*
0.15	Area outside (weighing, waiting)	1	60	71	+11
			151	195	+44
	Treatment centre				
0.16	Treatment room	1	15	24	+9
0.17	Operating room	1	15	50	+35
0.18	Laboratory	1	15	22	+7
0.19	Pharmacy	1	15	24*	-1*
0.20	Sterilization room	1	10	24*	-1*
0.21	Storage	1	10	38*	+13*
0.22	Mortuary (temporary) 2 beds	1	15	23	+8
0.23	First Aid	1	40	52	+12
0.24	Technical office, maintenance	1	15	38*	+13*
			150	233	+83
	Services				
0.25	Laundry room	1	35	51*	-6*
0.26	Storage	1	10	51*	-6*
0.27	Sanitary block, public	1	30	37	+7
0.28	Location for waste	1	8	51*	-6*
0.29	Location for organic waste	1	4	51*	-6*
1.30	Kitchen	1	15	25	+10
1.31	Sanitary block personnel	1	30	37*	-13*
1.32	Changing room for personnel	1	20	37*	-13*
			152	150	-2
	First floor				
1.33	Office for the direction and administration	1	15	39*	+9*
1.34	Office for the management	1	15	39*	+9*
1.35	Special ward (VIP's or tourists) 4 beds	2	33	47	+14
			63	86	+23
	Total		718	1042	324

Image 20 - Program of demands, relating demands and netto built area

* The sum of the different functions using the same space



- Entrance
- Inpatient department
- Pregnancy department
- Treatment centre
- Services
- First floor

Image 21 - Layout of the Health Centre, showing the clusters and room-functions

2.3.3 Flow charts

As discussed in the paragraph about clustering there are several important relations between the different clusters in the building. In this chapter the way these relations affect the flow charts will be discussed. The different groups of users will be discussed separately. Basically there are three entrances and exits which are meant for daily use. Entrance 1 is the main entrance, while entrance 2 and 3 are secondary entrances for side-purposes.

Considering the following scenarios:

Inpatient – *‘A patient who is admitted to a hospital or clinic for treatment that requires at least one overnight stay.’*

A woman is severely ill and decides to ask her family to take her to the hospital to be checked up on. She enters the hospital, registers at the reception (A) and is told to sit down in the waiting room (B) to await her turn. Next, one of the doctors is ready with their previous patient and asks her to come into the examination room (C). After the conversation and some tests, the doctor decides that she has to stay in the Health Centre for further tests. A nurse is called for, she helps the lady to finish up some registration and takes her to one of the available beds in the inpatient department (E).

Inpatient, pregnancy – *‘The group of pregnant women is considered as a separate group of inpatients since they are situated in a different cluster with different demands’*

As is the case with ‘normal’ inpatients, a pregnant woman that is almost having her first baby comes in through the main entrance (A), registers and is told to wait in the waiting room (B). As soon as a doctor is available she is asked in the diagnostic rooms for examination (C). Afterwards she is told that hospitalization is necessary so she is taken to one of the two wards for pregnant women (F). From then on she always has every possible facility nearby for emergencies. She can go to the dilatation room (G) when she is almost having her baby, next to the delivery room (H) when she is sufficiently dilated or if needed to the operating room (D) in case of a caesarean section. After she delivered her healthy baby, she can rest in the maternity ward (F). All rested, mother and child can check out and leave through the main entrance (A).

Outpatient – *‘A patient who is admitted to a hospital or clinic for treatment that does not require an overnight stay.’*

A man cuts himself very badly and needs to get some stitches. He goes to the hospital and registers at the front desk (A). He is told to wait for a bit in the waiting room (B, optional). Shortly after he sits down, he is picked up by the medical assistant who takes him to the first aid room (D). All facilities necessary for small procedures are available in this room. The assistant stitches the wound and prescribes some antibiotics. The man goes to the reception (A), picks up his medicines and leaves.

Outpatient, pregnancy – *‘There is a large group of outpatients, coming to the Health Centre for their baby to get checked upon.’*

Mother and child come into the Health Centre and get registered at the reception (A). Afterwards they continue to the pregnancy department, to the outside waiting room (I). A lot of pregnant women or women that just had a baby, are here for counsel, vaccination, measuring and weighing of the baby. Afterwards they go out through the main entrance (A) with a possible prescription for medicine which they can also pick up here. These women raise their children at home but visit the Health Centre regularly to properly monitor the progress of their child.

Visitors – *‘Friends or relatives from an in/out-patient’*

Friends or relatives, come in through the main entrance (A). This way the receptionist can control whoever enters and leaves the building. If necessary the receptionist provides information about the whereabouts of the patient in question. The visitors go through the public space towards the person they came here to visit (J). After their visit they can leave the same way they came in.

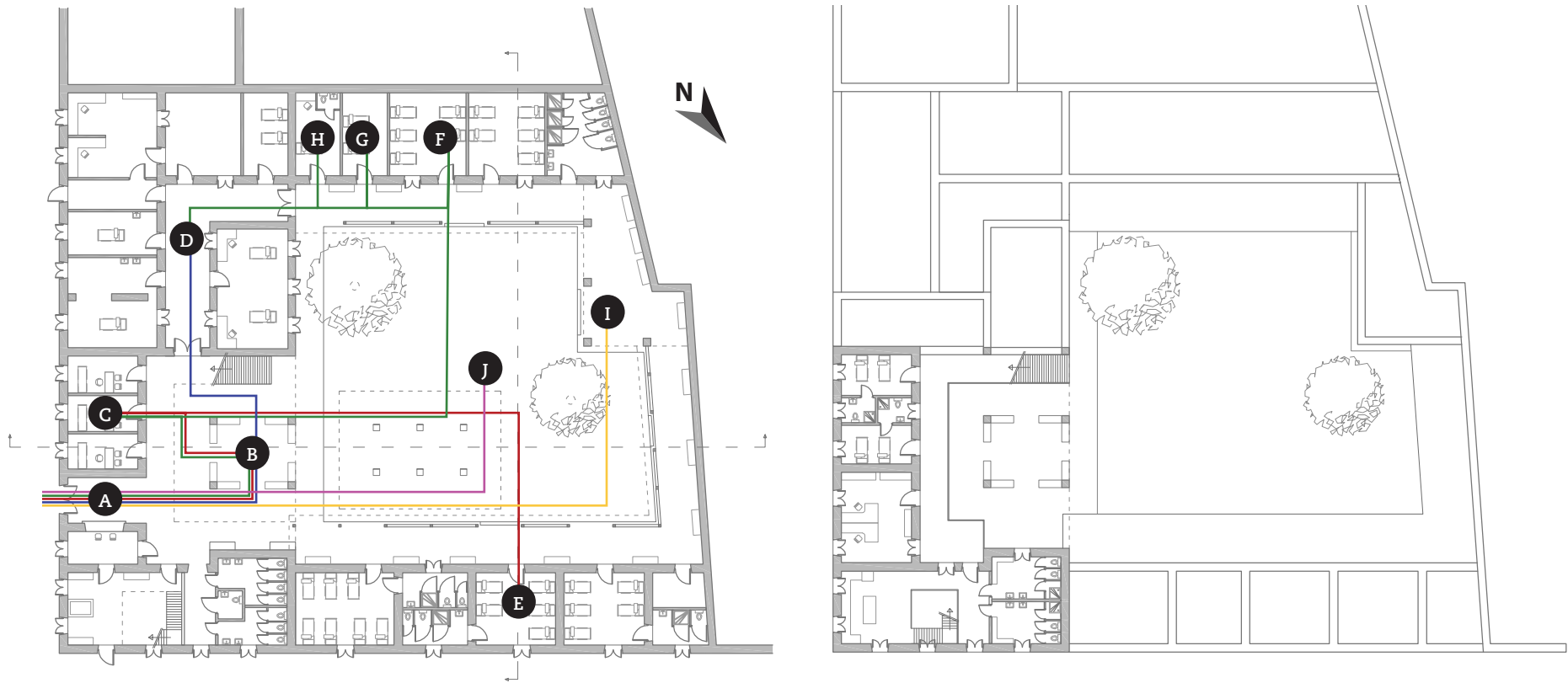


Image 22 - Layout of the Health Centre, showing several flowcharts, ground floor (left), first floor (right), scale: 1:500

Personnel – *‘the medical staff as well as the supporting staff such as secretaries or cleaning personnel’*

The entrance most North is the entrance to be used for personnel (A). From there they can directly go upstairs to the changing rooms to get dressed and store their belongings (C). These two rooms, the one they just entered and the one vertically adjacent (A&C) can be appointed as the personnel hall. From this hall both floors are accessible without having to go through the waiting room or other public spaces. For this reason also the kitchen is situated here (C), as well as the laundry room (A). This prevents that cooked food, which will mainly be destined for the tourists on the first floor (D), has to be transported through public spaces. In principal, the personnel hall acts as a basis for everyone working in the Health Centre. After their shift they get back to the changing rooms (C), freshen up, take their belongings and leave through the same entrance/exit (A).

Goods – *‘Everything which comes in and goes out of the hospital which, such as medical supplies, food as well as the remains of the deceased’*

Both side entrances (A&B) are used for the delivery and removal of goods. Goods such as medical supplies and food. Medical supplies usually enter through entrance 3 (B) and go directly to the medical storage (E). These deliveries will be weekly by estimate. This side entrance (B) entrance is also necessary for carrying out the remains of the deceased. Since this would not be appropriate to do through the main entrance. The mortuary is situated close to this entrance (F) in the private parts of the treatment centre.

Food supplies will come in through the entrance most North (A) where they can be directly delivered to the kitchen (C). Through the same exit, garbage will be taken out.

Important to note are the similarities between the flow charts of all patients (and visitors). Every single one starts at one central point, followed by the waiting hall. From there, all patients go their own way to their respective department. In case of possible emergencies the treatment centre is always directly connected. After treatment, all patients leave through the same exit.

These flowcharts ensure that patients and visitors never have to cross through private parts, as well as taking into account the urgent relationships between different clusters and functions. The courtyard is a living space as much as it is a place for traffic within the Health Centre. Personnel on the other hand is allowed to go anywhere in the hospital and for these flowcharts is aimed to make everything as easily accessible as possible.

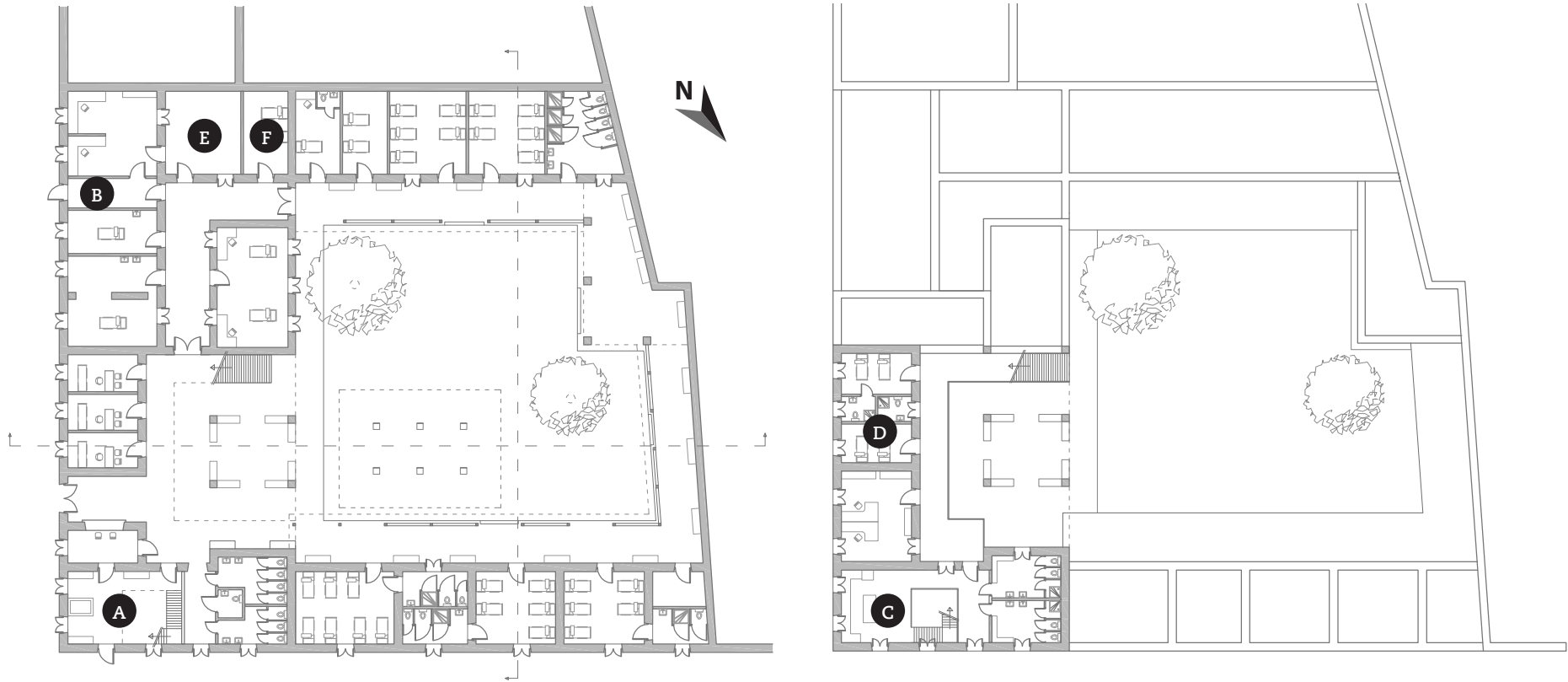


Image 23 - Layout of the Health Centre, showing several flowcharts, ground floor (left), first floor (right), scale: 1:500



Image 24 - Overview of access to water storage, 1982/1985 (up) 2011-2012 (down), scale 1:7500 (Pereira et al, 2012)

2.3.4 Infrastructure - water

Traditionally, rainwater was collected on the flat roofs and stored for later use. As a consequence of the degradation of the houses, the collapsed roofs and the rebuilding of roofs in a non-traditional way (e.g. sloped roofs with iron sheets), this way of gathering drinking water becomes less and less considered as a standard on the island.

The amount of houses with access to water supply by general waterworks and water storage has increased over the last 20 years (image 24). In 1982 - 1985 only 16% of the houses had some kind of water storage facility, but in 2011-2012 an estimate of 43% (59 out of 137) houses have access to water storage facilities. Despite these facts, 'improvement of water' still remains one of the highest priorities of change among local people .

'This project is going to be an example to other large scale buildings, it will show a way in which a small intervention can greatly improve living standards of the local community by sharing its surplus of water with the local community.'

The building will collect as much rainwater as possible, use it for consumption and give the surplus back to the local community via a public water pump. An estimation tells us that a building of this scale with this occupation can collect close to a tenfold of the amount of water it needs for daily consumption (drinking and cooking). For hygiene purposes salt water from the sea can suffice. An installation for gathering salt water has to ensure enough salt water is available for hygiene purposes. The 'public water distribution pumps' will have a positive effect on the living standards of the local community. Hopefully more public buildings will follow the example and share their surplus of water to create an homogeneous water supply system (image 25).

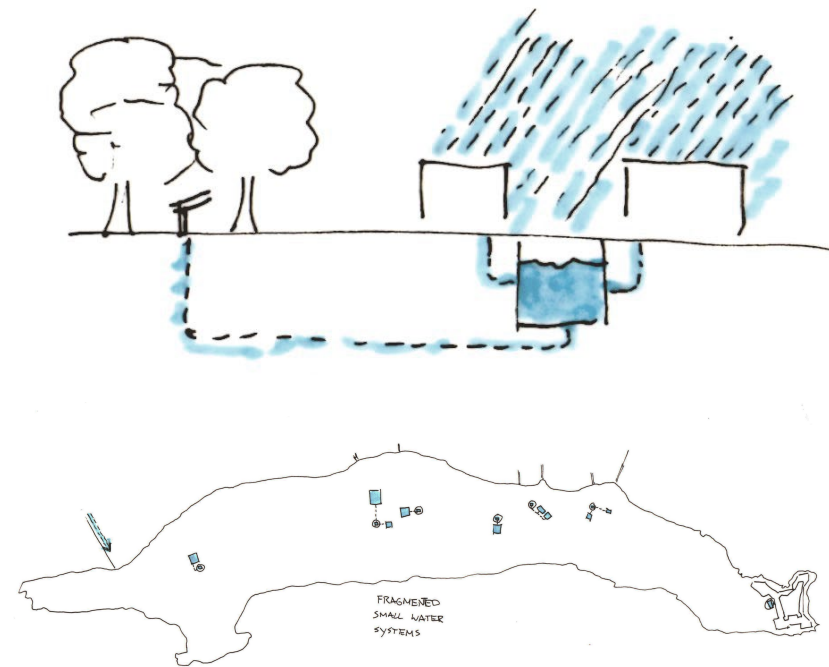


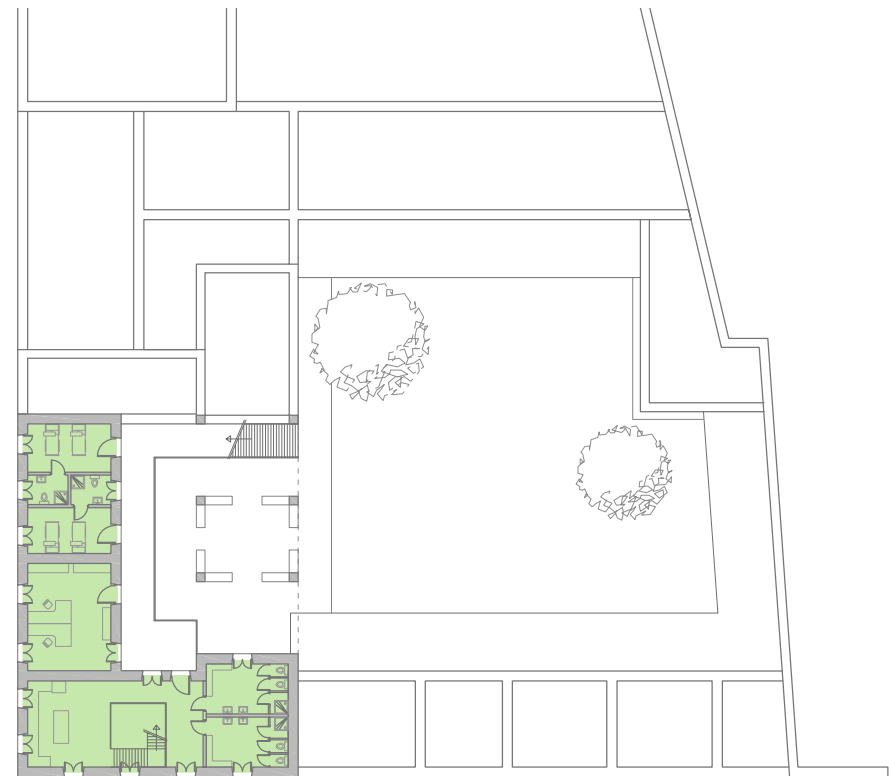
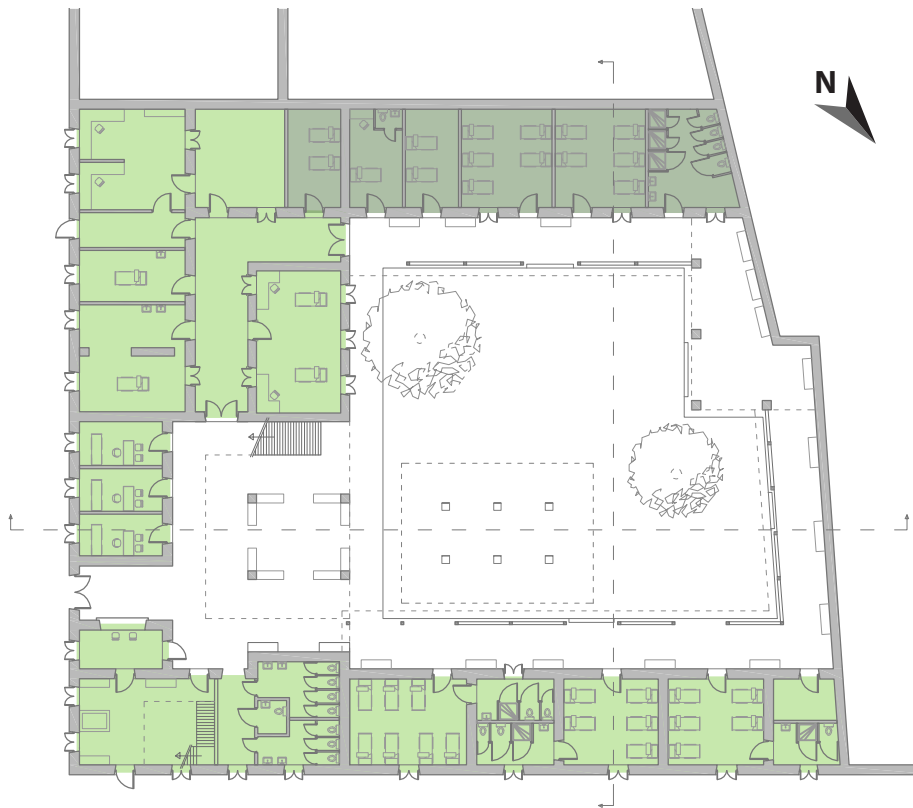
Image 25 - Concept of public buildings sharing their surplus of water with the local community, concept (top) overview of the island (down)

Sweet water demand

Drinking + cooking <small>(Basics water cycles, 2009)</small>	5 L/person/day
Estimated occupation	40 persons
Total annual demand	73.000 L

Sweet water supply

Water collecting roof area	956 m ²
Average annual rainfall <small>(Aarhus, 1985)</small>	751 mm
Total annual water collection	717.956 L



- Cross ventilation (Depth \leq Height * 5)
- Single banked ventilation (Depth \leq height * 2.5)

Image 26 - Ventilation principles, ground floor (left), first floor (right)

2.3.5 Infrastructure - ventilation

With the hot climate and considering the nature of a Health Centre, well ventilated rooms are necessary. An efficient natural ventilation scheme is necessary since the alternative of air-conditioning in every room is unrealistic and unattainable.

The traditional plan-type of the island allows natural ventilation to cool buildings. Ilha's standard plan-type has an entrance connected to the street. This main entrance in the middle of the street elevation opens onto a wide corridor. From this corridor there is access to four rooms and a way out to the yard. All of the rooms are often connected by doors and there is a window to each room in the external wall. These features provide the building with good through ventilation. Smaller plan types are reduced to a four room format, while the larger types sometimes have nine rooms. Regardless of the size of the building, its ventilation is based on cross-ventilation, made possible by the windows in the elevations and the doors connecting the rooms.

Ideally the new Health Centre would also be based on cross ventilation for all parts of the building. In some cases however this will not be possible due to adjacent plots. Some basic rules of thumbs apply in these situation. Cross ventilation is sufficient as long as the total depth of the building is less than five times the ceiling height, and as long as there are no object or walls blocking the flow of air. If there are, they should be provided with the same size or larger openings than the outer walls. Most part of the Health Centre will rely on this principle. The scheme (image 26) shows that this will suffice in the whole building.

The pregnancy department however will rely on single sided ventilation. A rule of thumb for single sided ventilation, with more than one opening states that this will be sufficient when the depth of the room is less than two-and-a-half times the ceiling height. The scheme (image 26) shows this will be sufficient. If in practice this appears to be insufficient, wind catchers can be installed on the roofs of these parts to increase air flow.

To conclude, the design was made in such a way that no unrealistic systems have to be implemented in order for this building to create a comfortable working and place of residence space. The building can rely completely on the natural flow of air without having to waist energy on air-conditioning or other climate control units.

2.3.6 Infrastructure - Electricity

Besides being self providing for the supply of water, a Health Centre needs to be self dependant on the supply of electricity. For this cause the building will be equipped with solar cells on the highest roof. Not only does this secure the Health Centre of its independence regarding electricity, it is also considered to be a durable solution. Besides these solar cells the Health Centre will be equipped with an emergency generator for rare cases of power cuts from the solar cells.

You could state that the investment of solar cells is too big for a Health Centre in Mozambique. However, large scale producers of solar cells are flooding the market with cheap, average efficient solar cells which makes them a funded investment for a rural Health Centre like this one.

Solar cells are not something typical for this region. Actually, these would probably be the first one existent on Mozambique. These solar cells should not affect the traditional feel of the building, for that reason they are submerged below the building's elevations (image 41, p.70, CAD-drawing).

3 Design result

The previous chapter 'pre-design' elaborated on how the definitive design should be influenced with regard to 'World Heritage', 'the Local Community' and 'Functionality'. These three paragraphs each have their own way of describing demands that should be incorporated in the Health Centre. This chapter gives an overview of the definitive design, by means of describing various essential features. The following features will be treated; Introduction to the design, the plan-layout, the facades (North-East, and South-East) and the courtyard.

First of all the definitive design will be introduced by means of describing the general feel of the building, the way it fits within the current built environment, and the way this building positively affects the attributes and values.

Second, the plan-layout will be elaborated, by means of describing the way the design complies with functional demands, as well as with demands derived from World Heritage and demands from the local community.

Third, both prominent facades, adjacent to the street are visually presented which is followed by a short discussion in what way these are influenced by the previously mentioned points of view.

Finally the way the courtyard, the most characteristic feature of the building, complies with all influences derived from the three different points of view.

To conclude, this chapter will attempt to amplify the sophistication of the way the demands, derived from 'redevelopment with regard to World Heritage, the Local Community, and Functionality' are combined within one design without doing concessions to either one of them.





Image 27 - Exterior impression before (down) and after (up)

3.1 Introduction of the design

Mozambique Island is characterized by a distinct unity in architecture. The official documents; ABE (ICOMOS, 1991), the Nomination file (Mozambique, 1991), the decision texts (UNESCO, 1991-2011) and the Periodic report (Macamo, 2000) state that the most apparent attributes on the island are related to this unity in architecture, e.g.; the consistent use of building material, the consistent use of building techniques and the consistent use of decorative principles. Any new development on the island should comply with principles derived from this infallible consistency.

Although new development is considered a threat to the OUV of the island, this Health Centre proves that new development can also contribute to the OUV. The new Health Centre designed on plot 24.01 complies with the attributes filtered from the official documents. The building blends into its environment with the typical white borders on a coloured façade, the rhythmically placed openings and the characteristic pilasters, cornices and plinths.

Also, the design of this Health Centre meets the demands of the new Health Centre 'plus', as intended by the Mozambique government. On first sight it is a prestigious public building and it is equipped with facilities that exceed other standard Health Centres in Mozambique.

3.2 Layout

The layout of the new Health Centre is subject to influences from many different aspects. For example it needs to comply with complicated demands and routing needs associated with a Health Centre, such as the different groups of users and flowcharts as well as required direct relations between different functions. Besides these logistical demands, some functional demands apply. For example the layout of the new Health Centre needs to facilitate sufficient natural ventilation in every room. The new layout also needs to create varying spaces. Like a public entrance, and public living room, as well as more private spaces.

The traditional courtyard typology offers solutions to most of these problems. The courtyard becomes a living room as well as a space for transportation. The courtyard has the positive feature that most of the spaces can be cross ventilated, which creates the possibility to rely completely on natural ventilation. The colonnade around the courtyard serves as a buffer between the public courtyard and the private dorms. It also facilitates a dry routing during rainy season and offers shade during, the more common, hot days.

Besides the courtyard, all functions were clustered which simplifies the complicated requirements with regard to the different relations between functions, the different groups of users, and the flowcharts. The second floor creates the possibility to separate some functions that need to be more independent.

The remains from 1982/1985 are completely integrated in the new design (image 34, p.66, CAD-drawing). The former small shops now serve as dorms for patients and the former back entrance still serves as a back entrance to the treatment department. No walls were demolished to allow for this design to be built. Only perforations are made in some walls, but only when needed for functional or ventilation purposes.

To conclude, the simple concept of a courtyard complies with the traditional building typology and seamlessly merges with the demands associated with the function of the Health Centre. Furthermore, the layout in general complies with all needs as described in chapter 2.3 'Redevelopment with regard to functionality'.



Image 28 - Layout section, ground floor

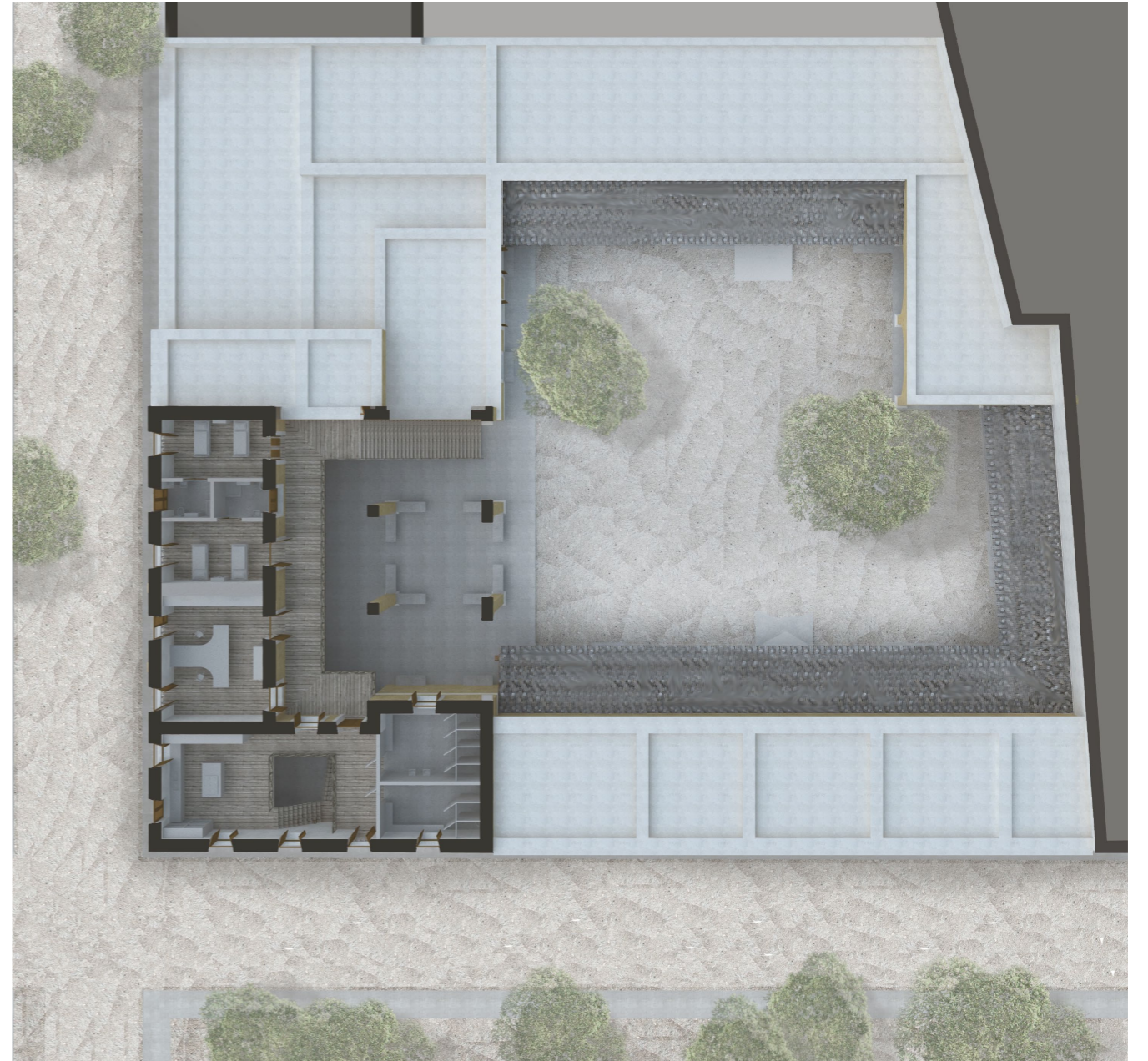


Image 29 - Layout section, first floor



Image 30 - South-East facade, impression before (down) and after (up)

3.3 Elevation, South-East

Some of the attributes mentioned in the ABE (ICOMOS, 1991) primarily emerge in the building elevations. For example the consistent use of decorative principles and the consistent use of building materials. Any newly developed building should take these principles into account for the design of their facades.

Moreover, demolishing building parts on a World Heritage site is not allowed. Since this project is a redevelopment of a former, severely degraded, group of stores and warehouse, the remains of these buildings should be integrated in the new design. Respecting them as part of the new design, not only because it is not allowed to demolish those parts, but also because these remaining walls are part of the history of the plot. A history that should be conveyed even after redevelopment.

The visualisation of the North-East façade shows the current situation (image 30) as well as the situation after redevelopment. Important to notice are the decorative elements which are consistently used in a traditional way. Some differentiation is made between the higher elevation and the lower elevation by using complete borders for the main building, and partial borders for the side building. There is one part of the façade which distinct itself from the higher elevation as well as the lower part. This part of the façade is a residue of the building volume which once used to be a warehouse. This deviating part is an indication which is respected and integrated in the new design.

Both facades adjacent to the streets have a sound and trustworthy emanation with their strict rhythm, and two level high elevations. These facades are designed in a pragmatic way which suits a hospital.

Furthermore, important to note is the difference between the wall-treatment of the new parts of the façade compared with the parts that remain from 1982/1985. The old parts are treated in a rougher way than the new parts, so that they differ from each other. The rougher treatment is done in a way that the original texture with the stones and rocks that the wall consists of are shown. The newer part will be stuccoed to make it a smooth surface like any other traditional wall on Ilha.

3.4 Elevation, North-East

The North-East façade is designed using the same design rules as the South-East façade. However, some extra rules apply. Most of the remaining part from 1982/1985 are situated close to this façade. This was the part where the shops were housed. This is indicated by the repetitive pattern of doors. All openings, windows and doors, which were already there in the building remains of 1982/1985 are restored in their original form. This results in some doors being restored to their original form while they are going to be used in the new design as windows. This does not result in any logistical complications since every opening on the ground floor needs protective bars anyway for security reasons.

To conclude, both facades blend into the architectural unity the collective of facades on the island resemble, built with traditional building materials and techniques and decorated according to traditional principles. The facades comply with functional needs for the new Health Centre, while paying respect to the remains of the 1982/1985.



Image 31 - North-East facade, impression before (down) and after (up)



Image 32 - Courtyard, impression before (down) and after (up)

3.5 Courtyard

With the hot Mozambique climate, people are more likely to live outside. This resulted in a courtyard, which should be a safe haven for the people who are hospitalized in the Health Centre.

The adjacent building volumes create a sense of security within the courtyard. The inner facades are designed with the aim to make the patients feel at home and at ease. High elevations are brought back to the human scale with small sized overhangs. A contrast between open and closed spaces within the interior facades creates a contrast between the inviting, domestic courtyard and the exterior noble, stately facades.

The courtyard facilitates the interaction between the patients and visitors as well as the patients amongst each other. Plenty seating facilities will be integrated, protected from the burning sun. These will be situated under the trees as well as integrated within the colonnade which runs around the courtyard. To conclude, the courtyard is going to be the 'living room' of the Mozambique Island -Health Centre.

3.6.1 CAD - Layout, ground floor

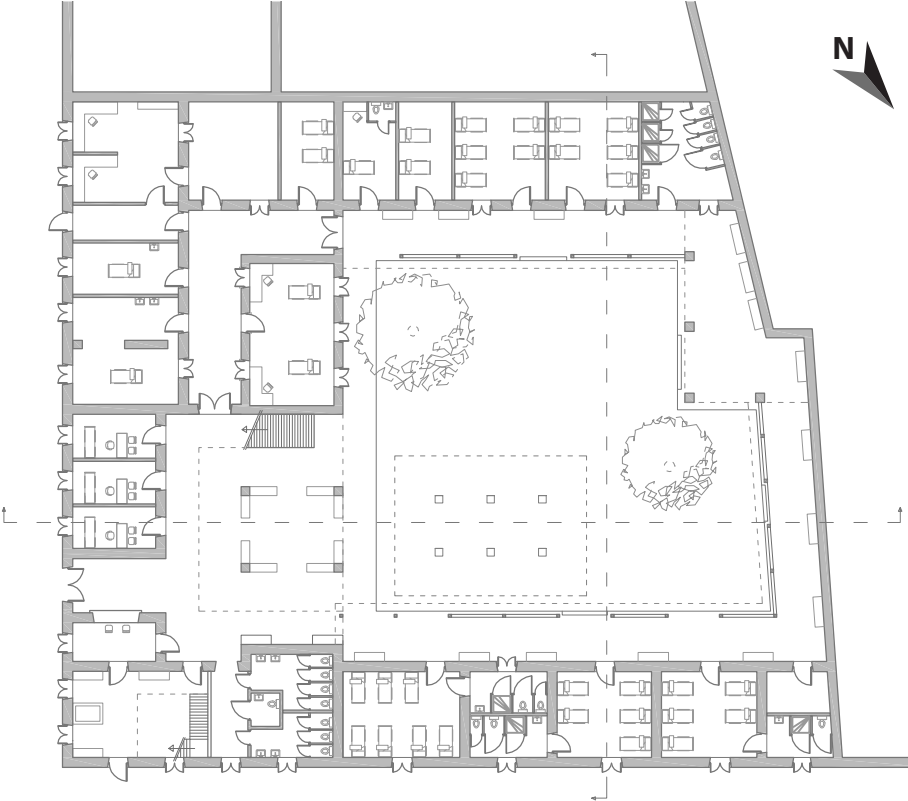
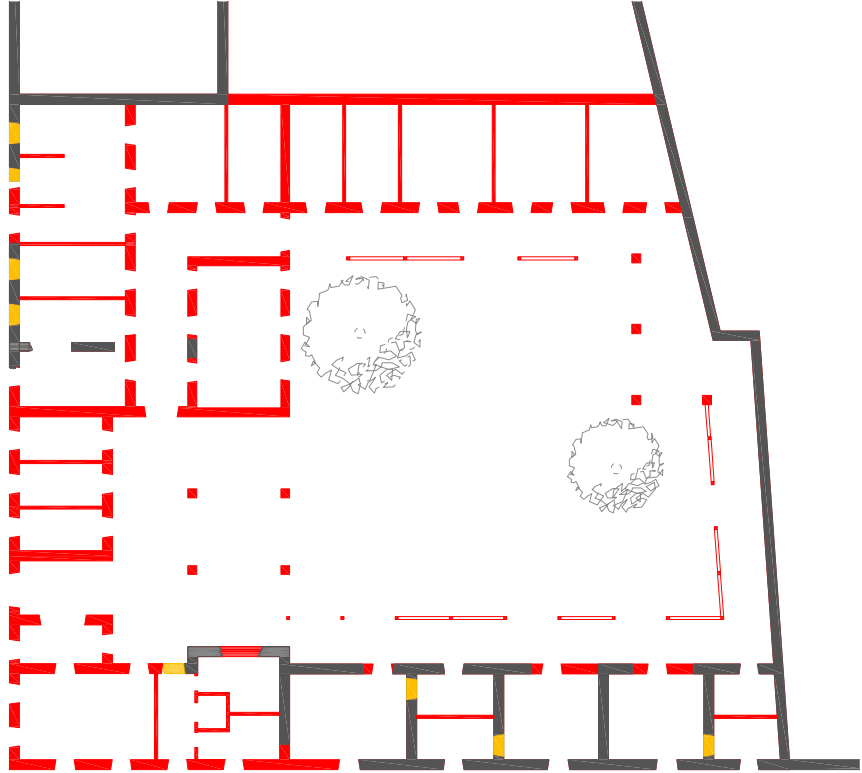


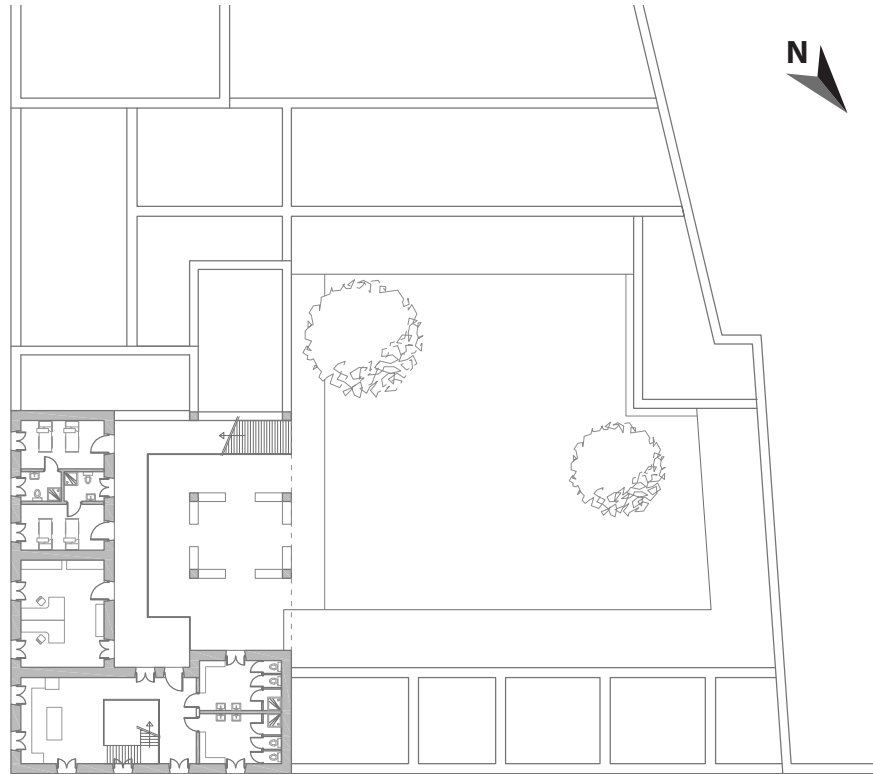
Image 33 - Technical drawing ground floor, scale 1:500



- No changes
- Addition
- Subtraction

Image 34 - 'Red and Yellows' ground floor, scale 1:500

3.6.2 CAD - Layout, first floor

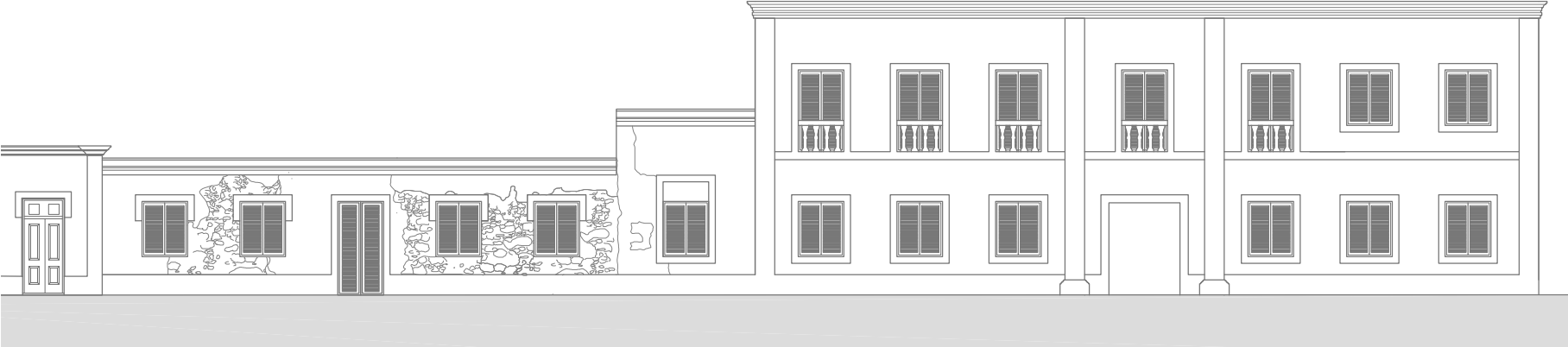


- No changes
- Addition
- Subtraction

Image 35 - Technical drawing first floor, scale 1:500

Image 36 - 'Red and Yellows' first floor, scale 1:500

3.6.3 CAD - South East facade

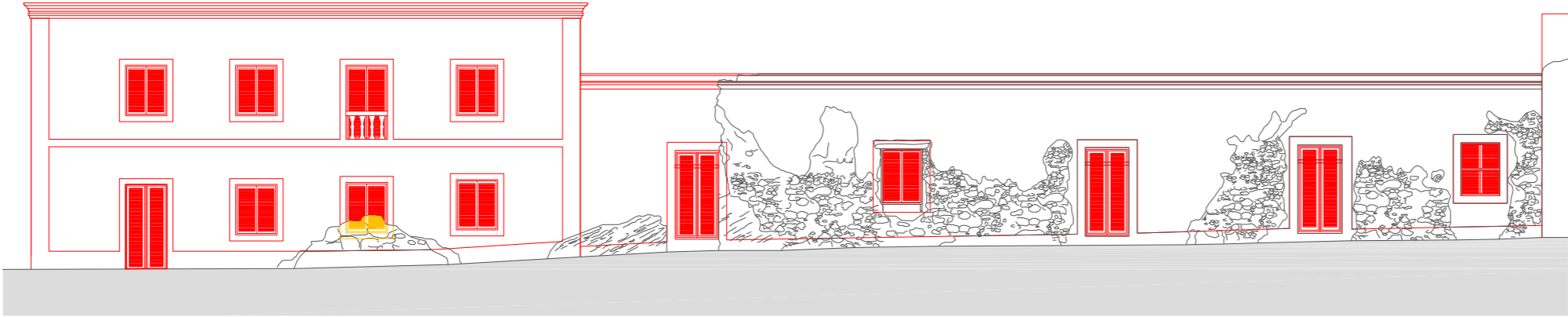
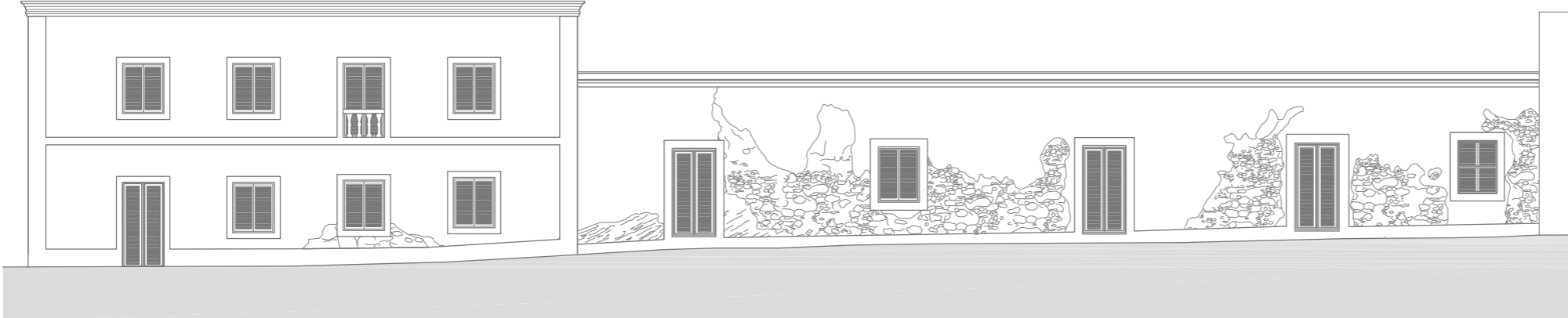


- No changes
- Addition
- Subtraction

Image 37 - Technical drawing South East facade, scale 1:200 (up)

Image 38 - 'Red and Yellows' South East facade, scale 1:200 (down)

3.6.4 CAD - North East facade

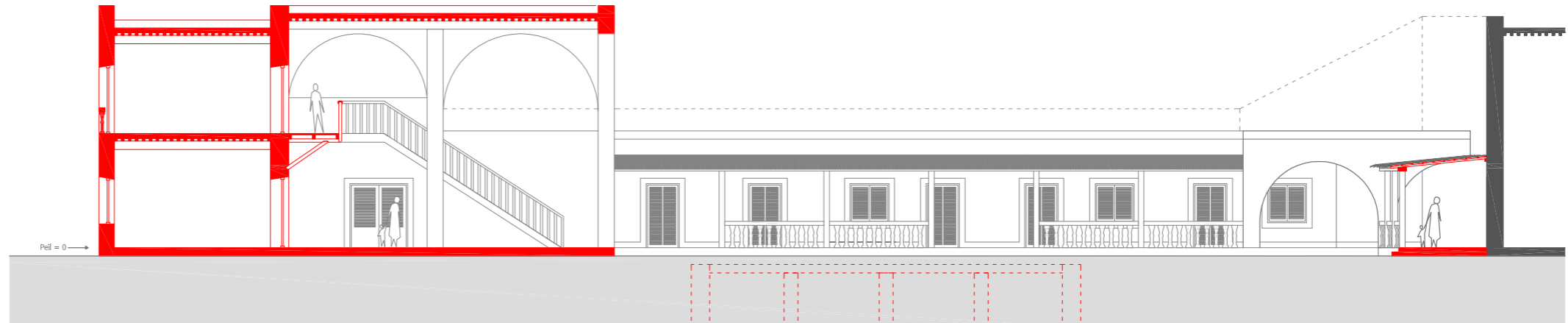
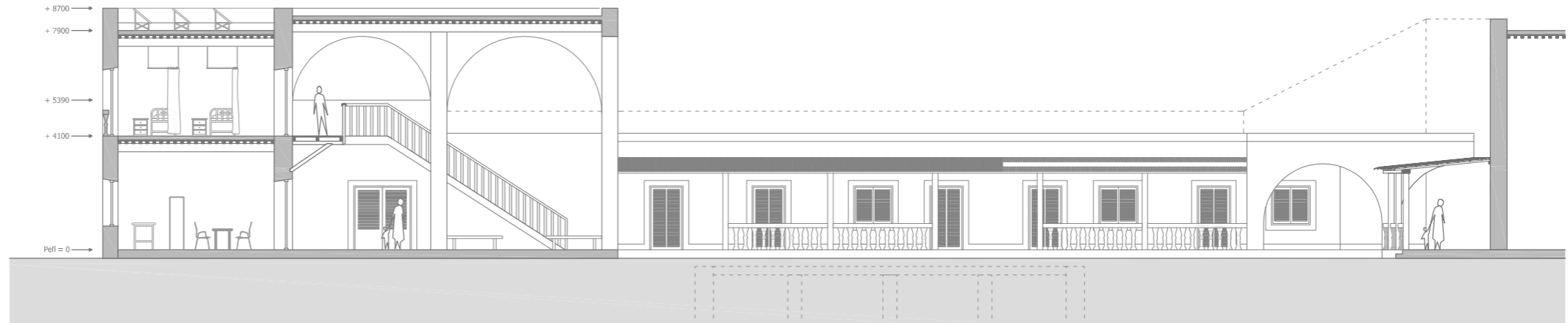
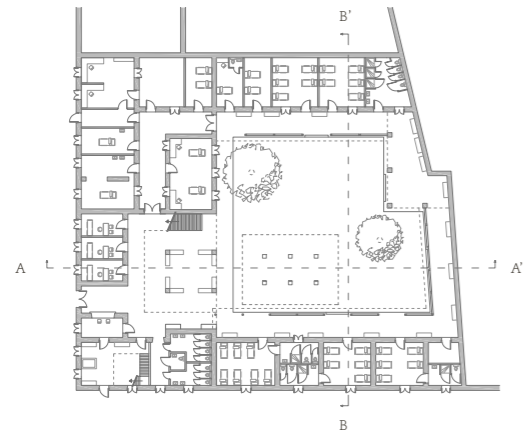


- No changes
- Addition
- Subtraction

Image 39 - Technical drawing North East facade, scale 1:200 (up)

Image 40 - 'Red and Yellows' North East facade, scale 1:200 (down)

3.6.5 CAD - Section AA'



- No changes
- Addition
- Subtraction

Image 41 - Technical drawing Section AA', scale 1:200 (up)

Image 42 - 'Red and Yellows' Section AA', scale 1:200 (down)

3.6.6 CAD - Section BB'



- No changes
- Addition
- Subtraction

Image 43 - Technical drawing Section BB', scale 1:200 (up)

Image 44 - 'Red and Yellows' Section BB', scale 1:200 (down)

3.7 Conclusion

The aim of this assignment was to design something as realistic as possible within the time span of seven months, to create a founded base for the new Health Centre on Mozambique Island. Because of this aimed level of practicability of the design, the pragmatic respectful approach was necessary. The approach had the intended result. In short, the approach taken could be described as 'to design a fully functional Health Centre, on a World Heritage Site in correspondence to local wishes and traditions.'

This approach taken had the intended result; a sophisticated design in which the demands entailed by the different points of view were brought together. The essence of this design is the way it manages to cope with these different influences. It has an exemplary function, it shows a way how new development can contribute to the integrity of the attributes on the island while keeping focus on the intended function of the building.

If more time was to be spent on further elaborating this project, the focus should be put on the technical side of the project. For example, the installations needed to maintain the self sufficient water supply and the self sufficient supply of electricity, since the functionality of these aspect are essential to a Health Centre.

To conclude, the goal set at the start was achieved, the result is an executable, pragmatic and realistic design. The design corresponds to a large part of the requirements of both GACIM and the Mozambique government which makes the design a great starting point on their way of reaching an agreement on the definitive design of the new Mozambique Island – Health Centre.

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Dr. M.H.M. Bender, personal communication - interview, March 18, 2012

Annex - Interview Dr. M.H.M. Bender, March 18th, 2012

Rob: Ja, ik wil dus een Health Centre maken, en dan gaat het er nu vooral om een beeld te schetsen voor mezelf hoe dat daar gaat. En even eerst de eerste vraag, waar zat jij in Tanzania?

Mart: Ik zat in Zuid-Tanzania, dichtbij de grens met Zambia en Malawi, in het Beija District, en daar zaten we in een ziekenhuis aan de rift valley van lake rukwa

Rob: Jij zat in dat derde niveau toch?

Mart: Ja, ik zat in het districtziekenhuis.

Rob: Maar jij werd soms uitgezonden naar die kleinere ziekenhuizen.

Mart: Daar gingen we regelmatig op bezoek bij de Health Centres om daar de aanwezige medical assistance, supervisie te geven en we gingen ook af en toe naar de dorpen om te kijken hoe het op de dispenseries ging.

Rob: En wat voor idee had je dan van die Health Centres, wat was daar de situatie? Was er goed personeel?

Mart: Nou het idee was dat de Health Centres in een relatief dichtbevolkt gebied waren, waarbij de afstand tot het ziekenhuis net wat te groot was. En dus om de mensen dichtbij hun huis goed te kunnen behandelen inclusief eventuele opname, en daar ook kleine verrichtingen te kunnen doen, is daar dat Health Centre gebouwd.

Rob: Hoeveel artsen waren daar aanwezig?

Mart: Normaal was daar één medical assistent aanwezig, en twee rural medical aids.

Rob: De schaal van zo'n Health Centre, hoe was dat. Hoeveel mensen konden

daar worden opgenomen?

Mart: Volgens mij hadden ze zestien bedden, één operatiekamer en één verloskamer.

Rob: En bij jullie ziekenhuis was dat anders, veel groter?

Mart: Ons ziekenhuis had 160 bedden, twee operatiekamers en drie verloskamers.

Rob: Nou dat dan even om een klein beeld te schetsen. Nou gaat het me er ook om wat er fout gaat, bij zo'n Health Centre, wat kan er verbeterd worden, of wat mist er. Dingen die ze niet konden door gebrek aan middelen, gebrek aan kennis?

Mart: Nou wat je merkte, is dat er in zo'n Health Centre, daar zat één medical assistent. Dat is iemand die ongeveer op HBO niveau geneeskunde heeft gedaan. In Afrika had je als laagste niveau, nursing attendant, dan had je de nurse midwife, dan de rural medical aid, dat was een soort plattelandsdokter, en dan had je de medical assistent. De medical assistent had ook leren opereren en dan kreeg je de medical officer.

Rob: En het niveau van hun was goed? Genoeg?

Mart: De medical assistants waren medisch gezien best sterk alleen waren ze operatief net niet sterk genoeg om zelfstandig te functioneren.

Rob: En daarvoor hadden ze jullie ook nodig?

Mart: Dat was eigenlijk niet, het idee was dat de medical assistent dat niveau wel zou moeten aankunnen. Maar in Tanzania heeft het nu veranderd en heeft voor Health Centres een arts als minimumniveau gekozen. Nu zijn alle medical assistants geüpgrade naar assistent medical officer en zijn alle medical officers geüpgrade naar arts door middel van een vervolgopleiding. En hebben ze de rural medical aids geüpgrade naar medical assistent. Nu worden de dispenseries dus

bemand door medical assistent niveau, en de Health Centres door artsen.

Rob: Wat betreft materieel, zijn daar tekortkomingen aan?

Mart: Nou je moet even bedenken welk niveau wil je bereiken met je Health Centre? Als je Health Centre in een heel afgelegen gebied ligt waar de tijd tot het bereiken van het echte district ziekenhuis te lang is, dan zit je natuurlijk met name met bevallingen waarbij een keizersnede nodig is...

Rob: Ja dat is dus wel het geval,

Mart: En spoedgevallen waarbij bijvoorbeeld de milt gescheurd is waarbij het dus onmogelijk is om die persoon nog levend naar het districts ziekenhuis te vervoeren, die zou je dus in je Health Centre moeten kunnen helpen. Dus eigenlijk minimaal een keizersnede of kleine operaties.

Rob: En daar heb je dus een operatiekamer voor nodig. Maar nu heb ik er drie maanden gewoond, en er zijn gewoon enkele issues waar je rekening mee moet houden. Bijvoorbeeld de electriciteit, die wil daar nog wel eens een keer drie dagen uitvallen. Hoe deden jullie dat?

Mart: Principieel in ziekenhuizen is natuurlijk het water, dat is probleem één. En het probleem twee is electriciteit. Electriciteit kun je oplossen door een zelfvoorzienend zonnepanelen te plaatsen danwel aan te sluiten op een generator maar dan zit je met je dieseltoevoer en je onderdelen, danwel aan te sluiten op het hoofdnet, electriciteitsnet en dat hangt er van af hoe perifeer je zit.

Rob: In ons geval was electriciteit echt heel slecht, die viel wekelijks weg, ja water ook dus dat was...

Mart: Ja wat het logisch is, om voor een goed electriciteitsnet te zorgen, voorzien in je eigen electriciteit, en dat je water daar ook op draait, dus je moet een eigen

put hebben met een eigen pomp die je dan elektrisch kan aansturen.

Rob: In ieder geval dus zelfvoorzienend.

Mart: En ja een zonne-installatie is dus heel duur, het alternatief is dieselpompen en dieselgeneratoren maar dan heb je problemen met je spares, deskundigheid in onderhoud en dieselaanvoer.

Rob: Daar moet ik gewoon een oplossing voor vinden is die zelfvoorzienend is, want je kunt daar niet afhankelijk zijn van anderen.

Mart: Zelf zou ik kiezen voor zonne-energie, het is een dure investering maar dat verdient zich zeker op de lange termijn terug. Moet behoorlijk full-proof systeem zijn. Bij ons ziekenhuis hadden we eerste dieselgeneratoren, dat werkte prima maar dat was veel te duur om die 24 uur per dag te laten draaien, dus die draaiden 's avonds tot 9 uur en dan gingen ze uit. En dan hadden we in de verloskamers drie zonnepanelen liggen die we 's nachts dan gebruikte voor licht. Maar op een gegeven moment vielen die zonnepanelen één voor één uit en dat heeft een jaar geduurd voordat ik uit Nederland te horen kreeg wat er was. De regelunit twee keer opgestuurd en twee keer terug gekregen maar ze deden het nog steeds niet. Toen bleek dat er gewoon achterop het paneel een diode te zitten die doorgebrand was, maar dan had niemand mij verteld dat die er zat, en dat die door kon branden.

Rob: Maar jij had ook dus de taak van onderhoud, jij was technisch het beste?

Mart: Ja ik was medical officer, en later medical officer in charge, dus dan ben je medisch directeur. Maar omdat het geen zin heeft om een ziekenhuis te runnen als je geen water hebt en niet kunt opereren als je geen stroom bent, was je als medical officer dus altijd bezig, heb ik water, heb ik stroom, heb ik medicijnen. Dus je bent bezig met zowel personeelsmanagement als wel bezig met installaties. Maar ja er waren wel technicians, maar als die een kapotte dieselpomp heeft en hij heeft geen reserve dan komt die toch bij jou om te vragen, 'hoe gaan we dat

oplossen?’ (Time - 7:31)

Rob: Hier in Nederland heb je heel veel dingen voor klimaatbeheersing, hoe zat dat in Afrika? Hoe opereer je? Ik neem aan dat je geen steriele kamers had, of was dat daar wel?

Mart: Nou we hadden natuurlijk wel ‘schone’ ruimtes die goed gewired waren tegen insecten, en daar kwam je alleen maar binnen met schone kleding, schoon schoeisel en je draagt je steriele spullen natuurlijk ook alleen maar tijdens operaties. Niet heel de kamer is steriel.

Rob: Maar ventilatie bijvoorbeeld, was dat gewoon natuurlijk?

Mart: Ja we hadden natuurlijke ventilatie.

Rob: En was dat voldoende?

Mart: Ja dat werkte in principe goed, volgens de Nederlandse normen is dat natuurlijk niet voldoende. Zeker niet als je materialen, kunststof inbrengt, maar in een Health Centre breng je geen materialen in.

Rob: Ja dat soort operaties doen ze dan in het district ziekenhuis?

Mart: Ja, als je bijvoorbeeld een botbreuk met een pen of een plaat wil repareren dan moet je dat wel onder sterielere omstandigheden doen waarbij je gefilterde lucht hebt. Dat hadden wij niet, en dat zul je in een district ziekenhuis of een Health Centre ook niet makkelijk kunnen bereiken. Dat zijn hele kostbare installaties.

Rob: Ja dat denk ik dus ook en om dat constant te houden is niet te doen.

Mart: Ja je hebt daar ook gewoon heel veel stof, en al die laminar flow units

werken met uitgebreide filters. Die filters moeten zeer regelmatig schoongemaakt worden en dat is al onderhoud wat voor een gemiddeld Afrikaans ziekenhuis teveel gevraagd is.

Rob: Verschillen met Nederland, als ik hier ga zoeken naar standaarden, zijn die toe te passen daar?

Mart: Dat kun je daar ook wel toepassen ja,

Rob: Relaties tussen binnenkomst, wards, operatieskamers etc. Die relaties werken hetzelfde volgens hun tradities?

Mart: Ja je moet denken dat de geneeskunde die daar in ziekenhuizen gedaan wordt, is natuurlijk westerse geneeskunde dat is niet de traditionele geneeskunde. Aan de hand van het Westerse voorbeeld. De ziekenhuizen zijn daar opgebouwd naar westerse ideeën. Het enige is dat in het Westen ziekenhuizen zijn opgebouwd uit paviljoens verbonden met gesloten gangen terwijl daar je losse paviljoens izet die verbonden zijn met paden, die alleen overdekt zijn. Je hoeft je alleen maar te beschermen tegen de regen. Er is geen kou waartegen je je hoeft te beschermen. De ziekenhuizen zijn wat dat betreft daar dus een beetje hetzelfde opgebouwd. Je hebt een zogenaamd outpatient departement, en een polikliniek waar mensen die komen en weer weggaan. Dan heb je een soort van eerste hulp opvang en een admission department waar mensen opgenomen worden. En dan heb je de verloskamers, en de zeg maar de kraamvrouwen-afdeling, de kinderafdeling, de volwassenafdeling. Vaak heb je nog een tbc-unit.

Rob: Wat betreft cholera, wat voor dingen leiden er tot problemen in zo'n Health Centre? Wat doen ze om epidemien te voorkomen.

Mart: Cholera is natuurlijk een echte epidemische ziekte. Die komen en gaan weer. Tuberculose is er natuurlijk constant, een soort longontsteking. Cholera gaat typisch via water en poep-mond contact. Het grootste logistieke probleem is

water en ontlasting. De mensen hun ontlasting moet worden afgevoerd, en water moet aangevoerd worden. Overal moet natuurlijk water uit de kraan komen, dus je hebt een waterput nodig en een waternet met kranen die dichtdraaien want anders gaat je watertank leeg. Maar nog veel lastiger is de toiletten, wij denken natuurlijk aan doorspoeltoiletten, maar daar heb je de hoeveelheid water niet voor. Daar heb je pilatricines, een soort gaten met een hokje erop. En als dat gat vol is moet je een nieuw gat graven en dan moet je wat met het oude gat. Maar dat schoon en fris houden is een grote uitdaging. Hoe hou je je wc's schoon. Zeker als er veel diaree is, en hoe krijg je mensen zo gek ook die schone wc's te gebruiken en niet om het hoekje te gaan en daar te gaan poepen waar vervolgens het kind wat herstellende is in gaat spelen.

Rob: Ja hoe het bij ons ging, sommige huizen hadden wel doorspoel-toiletten. Maar de meeste deden het in de zee. Maar inderdaad water is een probleem, het is op een eilandje. Waardoor water uit de grond allemaal zout is.

Mart: Ja je zult wel moeten, want de grond, waar haal je het anders vandaan?

Rob: Ja hoe ze het traditioneel doen, is ze vangen met alle daken al het regenwater op, en ze hebben een waterleiding die soms werkt. Deze komt van het vasteland, maar die werkt sporadisch.

Mart: Bij het plannen van een Health Centre hoort het er ook bij dat je je watertoevoer regelt. En ik ken één ziekenhuis wat alleen op regenwater rekent, dat is echt een ramp. Vooral voor je hygiëne is dat zo verschrikkelijk lastig.

Mart: Het meest logische lijkt mij die waterleiding vanuit het vasteland goed regelen. Waarschijnlijk tapt die zijn water gewoon af uit de rivier, en gaat het gewoon om het onderhouden van de intake. Dat die verstopt raakt

Rob: Volgens mij zit er ook een mate van schaarste in, ze zetten hem namelijk maar enkele keren per week aan en dan laadt iedereen zijn voorraad vol.

Mart: Ja, wat je natuurlijk kunt doen is zout water gebruiken voor al het andere dan drink water, dit is namelijk prima geschikt voor hygiëne doeleinden

Rob: Ja, daar zou ik zeker over na kunnen denken, daar is er genoeg van.

Rob: Ik zat nog even te denken over bepaalde combinaties, bijvoorbeeld dat het gecombineerd wordt met voorlichting om bepaalde dingen te voorkomen. Zou daar ruimte voor zijn in zo'n Health Centre, ook wat betreft beschikbaar personeel?

Mart: Er moet natuurlijk een X aantal mensen gewoon kunnen komen die ziek zijn. Maar er moet ook een plek zijn waar zwangere vrouwen kunnen komen, waar kinderen gewogen kunnen worden. Dat is preventief werk, dat kun je combineren.

Rob: Ja maar bijvoorbeeld ook seksuele voorlichting, of uitleg over cholera... Een soort educatie

Mart: Wat ik me zou voorstellen is dat je een gebouw hebt waar patiënten binnen kunnen komen, waar ze langs een registratie komen met een grote wachtruimte, en vanuit daar een behandelruimte ingaan. In dat zelfde gebouw zit moeder-kind zorg, met vaccinatie. En dat je dan die wachtruimte kunt combineren met voorlichting.

Rob: Hoe zit het daar met afspraken maken?

Mart: Mensen komen gewoon, en wachten dan gewoon tot ze aan de beurt zijn. Bij vaccinatie bijvoorbeeld komen ze allemaal om 9 uur, dan zette ik ze in de rij en werden ze om de beurt gevaccineerd. Dat is in Nederland natuurlijk ondenkbaar. Als je om 10:00 komt dan wil je gewoon om 10:00 gevaccineerd worden.

Rob: Ja het is goed om te realiseren dat het daar anders werkt.

Mart: Ja nou mensen hebben er best wat voor over, ze hebben het er voor over om er afstanden af te leggen en om lang te wachten.

Rob: Kijken ze op tegen Westerse geneeskunde?

Mart: Ja, ze hebben absoluut respect voor onze geneeskunde. Ze gingen wel altijd ook naar de medicijnman maar ze kwamen ook naar jou. Ze waren ook dankbaar als je ze hielp, ook als het fout ging. Zo was het soms, dan kwam een vrouw met haar kind, en dat kind ging dood, dan zeiden ze toch dankjewel.

Rob: In hoeveel verschillende Health Centres heb jij gewerkt?

Mart: In mijn district was ik het enige ziekenhuis, dan had je een Health Centre daar kwam ik nooit want daar zat een andere medical officer. Dan had je nog een ander Health Centres en daar kwam ik heel vaak. Dan had je ook nog de dorpen, en daar kwamen we ook vaak. Al hadden we daar niet heel veel te doen, want het werk dat gedaan werd, werd gewoon gedaan door de zusters.

Rob: Logistiek gezien een paar vragen, zo'n Health Centre heeft een bevoorrading nodig.

Mart: Nou allereerst natuurlijk weer stroom, als je stroom en water uit diesel haalt heb je dieselbevoorrading nodig. Dan heb je medicijnen nodig,

Rob: Hoe regel je dat, komt dat uit het Westen?

Mart: In alle landen heb je medical stores, die zitten vaak in de hoofdstad met soms ook nog zonal medical stores. Daar ging je dan regelmatig je medicijnen halen. Het grote probleem was dat de medicijnen er vaak niet waren. Tegenwoordig is dat wel beter, maar kun je dat soms niet betalen.

Rob: Hoe werkt dat eigenlijk, krijgen ze gratis gezondheidszorg?

Mart: Toen wij er waren kregen ze dat gratis, tegenwoordig moeten ze betalen voor hun gezondheidszorg. Dat maakt het veel rustigere in het ziekenhuis. Vroeger kwamen mensen gewoon altijd naar het ziekenhuis, op ieder paard wedden. Terwijl nu komen ze als ze echt iets hebben. Maar ja betaling is echt een serieus probleem, want ja, soms kan de familie het gewoon niet opbrengen en vaak moeten de mensen zelf hun medicijnen gaan kopen. Dan moesten ze naar de lokale apotheek, en dan kwam ze bijvoorbeeld terug met antibiotica, en dan gaf je ze dat. Of hetzelfde men een infuus, die gingen ze ook zelf kopen.

Mart: Kijk hier hebben we het solidariteitsprincipe, jij betaalt voor mij als ik in het ziekenhuis lig. Maar dat is daar niet zo. Al gaat die solidariteit natuurlijk maar tot onze landsgrenzen.

Mart: Waar je ook aan moet denken is dat je een plek hebt om doden op te bergen.

Rob: Ja inderdaad, in het PvE, staat inderdaad een mortuarium. Daar is het natuurlijk ook belangrijk dat je klimaatbeheersing daarop aangepast is.

Mart: Ja dat betekent eigenlijk dus dat een mortuarium is om NU het lijk op te slaan, maar dan ook morgenochtend door de familie wordt meegenomen. Kijk koeling zou ideaal zijn, maar vaak niet haalbaar. Als je een goed budget hebt, dan moet je zeker een mortuarium met koeling organiseren. Maar als je een cholera-epidemie hebt heb je tien keer meer lijken dan je ooit in je mortuarium kwijt kunt. Dus het beste is gewoon zo snel mogelijk begraven. Je moet er wel ook een sectie kunnen doen. Voor de rest moet je daar gewoon, het is een afvoer van je mensen. Koeling is niet logisch, tenzij je geld overhoudt.

Rob: Ik wil het wel realistisch houden, ik weet niet wat het budget is. Maar het is een reeele opdracht, want ze hebben al ooit een ontwerp gemaakt, en ze hebben een PvE opgesteld.

Mart: het mortuarium van niveau Health Centre is waarschijnlijk zonder koeling. Als je koelkasten hebt voor je medicijnen en voor je laboratorium spullen kun je al blij zijn. Want je hebt waarschijnlijk al niet eens een bloedbank, dus lijken gaan koelen...

Rob: Maar de operaties die uitgevoerd zouden moeten worden zijn de keizersnedes...

Mart: Ja het zijn dus echte spoedoperaties, kleine ingrepen zoals liesbreuken en bultjes wegsnijden en dergelijken. In een operatiekamer, kun je ook eerste hulp-dingetjes doen.

Rob: Wat betreft eerste hulp, hoe werkt dat daar? Hier kon je er gewoon heen gaan, maar dat is tegenwoordig ook veranderd. Werkt dat daar nog zo?

Mart: Hier kom je bij de huisarts, met een wond of een snee, die zegt ga maar naar de wachtkamer, en dan roept hij je binnen wanneer hij tijd heeft. En dan hecht hij het wondje in zijn kamer. Alles in één eenheid. In een ziekenhuis heb je verschillende kamers, eerst een ontvangst daar kom je binnen, als je behandeld moet worden ga je naar de behandelkamer, vaak is dat hetzelfde als de operatiekamer, of je gaat naar de dokterskamer, maar is vaak niet veel tussen de spreek/onderzoekskamer van de dokter en de operatiekamer. Soms heb je een operatiekamer die echt schoon is, met een aparte tussensluis waar je kleren wisselt, en dan heb je een aparte behandelkamer waar je met je gewone kleren kunt hechten. Maar dan heb je het al heel chique. Het ligt er een beetje aan hoe groot je het Health Centre maakt.

Mart: Je hebt altijd spreek/onderzoek kamers, en altijd behandelkamers, en afhankelijk van het niveau is dat een operatiekamer of gewoon een eerste hulp kamer, en als het nog groter is dan heb je een operatiekamer, een behandelkamer en een spreek/onderzoek kamer. Een eerste hulpkamer is niks anders dan

een spreek/onderzoek kamer, behalve dat je er een bed hebt, waar je om heen kunt lopen, waar je goed licht hebt, en waar je opslag hebt van bandmateriaal, hechtmateriaal, spulletjes...

Rob: Dan was er nog één ding, wij hebben ook te maken met toeristen. Dan staat er in het PvE omschreven dat er een scheiding is tussen verpleegafdeling voor toeristen apart van de lokale bevolking. Hoe sta jij daartegenover, zou jij daarin meegaan?

Mart: Dat hangt helemaal af van je financieringsopbouw, je kunt toeristen veel meer geld vragen dan de lokale bevolking, en wil je ze dus graag in de watten leggen. Daar wil je dus een chique kamer voor hebben. Dan moet je dus zorgen dat er een spreek/behandelkamer is die er echt goed en netjes uitziet, dat je behandelkamer er netjes uitziet, en dat je verpleegafdeling is afgeschermd, met extra verpleging, extra netjes, geen zes bedden maar twee bedden op een kamer. Die mensen betalen daarvoor, zij betalen tien keer wat ze opmaken, dus ja, dat is gewoon een melkkoe. Daar mag je best iets apart voor organiseren want dat betaalt zich 10 keer terug en daar kun je de rest ook mee financieren.

Rob: Zijn er nog andere dingen waarvan je zegt, denk daar nog aan?

Mart: Beveiliging moet je aan denken, zeker je operatiekamers en je magazijn. Je hebt de medical stores, die moeten goed afsluitbaar zijn, heel je terrein moet goed afsluitbaar zijn want als je in een arm gebied zit heb je veel waardevolle spullen in je gebouw. Van matrassen tot dekens, medicijnen je klamboes, alles... Dus het moet goed afgesloten zijn. Je moet nadenken over wat je met eten doet, laat je de mensen zelf koken? Als je de mensen zelf, of de familie laat koken, dan moet je een kookgelegenheid maken. En eventueel ook een soort gastverblijf waar de familie kan verblijven. Want je zult ook na moeten denken, hoeveel familieleden wil ik in mijn ziekenhuis hebben. En als je zegt de familie kookt voor de patiënt, dan moet er kookgelegenheid hebben. Of je zegt, jij kookt, maar dan heb je een ruime keuken nodig. Wij kookten voor de patiënten, waar de ziekenhuis kok 's

ochtends beschuit met melk klaarmaakte en 's middags een warme maaltijd bereidde.

Rob: Het vreemde in dit geval is eigenlijk, dat in Mozambique Eiland, dit Health Centre buiten de structuur van de andere Health Centres staat. Dus eigenlijk iedereen die ernaar toe komt, die komt van het eiland dus vanuit maximaal 2 kilometer afstand. Dus ik denk dat ze dan net zo goed thuis kunnen slapen, maar kookgelegenheid...

Mart: Oh dan koken ze gewoon ook thuis, en nemen het eten mee voor de patient. Wij hadden een gastverblijf omdat er mensen van grote afstanden kwamen.

Rob: Wat deden jullie als er een tekort aan bedden was? Hadden jullie iets van een flexibel noodverblijf?

Mart: Nee, gewoon op de grond. Zeker op maandagochtend, lag er tussen ieder bed een patiënt op de grond. Iedereen die zei, hoe gaat het met jou? Ja ik heb nog steeds last van mijn buik, en van mijn ontlasting dan zeiden we 'naar huis'. Want als ze zeurden over ontlasting dan waren ze beter. Dan gingen ze naar huis.

Mart: Ik zou in ieder geval de maternity wards bij de verloskamers doen, maar ook dicht bij bij de operatiekamers. Dat als één unit. Terwijl de behandelkamer natuurlijk ook vanuit de polikliniek benaderbaar moet zijn voor eerste-hulp gevallen. Dan kunnen de normale verpleegafdelingen wat verder liggen, want dat heeft nooit echt haast. Daar liggen mensen gewoon ziek te zijn.

Mart: Mannen en vrouwen moeten wel sterk gescheiden op de verpleegafdeling, vanwege geloofsovertuigingen. Soms zelfs in de wachtkamers.

Rob: Bij ons is het gedeeltelijk moslim, gedeeltelijk christen, enkele hindoes. Dus het is wel van toepassing inderdaad. Al heb ik het bij andere gebouwen niet veel gezien dat wachtkamers of iets dergelijks gescheiden waren.

Rob: Maar om even te concluderen, denk ik dat het heel belangrijk is wat je aangeeft over water en elektriciteit. Dat ik daar goede oplossingen voor moet zoeken. En over ontlasting.

Mart: En infectieziekten natuurlijk. Misschien gescheiden afdelingen voor besmette mensen.

Rob: Ja dat is natuurlijk lastig om die helemaal af te schermen want het wordt een redelijk kleinschalig gebouw.

Mart: Hoe groot mag het worden?

Rob: Het plot is 40 bij 40. Het is World Heritage, ik zit dus ook gebonden aan een aantal dingen die uit het onderzoek komen. We hebben drie maanden onderzoek gedaan op dat eiland waar een aantal uitgangspunten naar voren zijn gekomen. Het wordt dus een combinatie van functionaliteit en World Heritage.

Mart: Waar je trouwens ook over na moet denken is hitte, wat voor dak leg je er op, plaatmateriaal neem ik aan?

Rob: Nee, het is een hele typische bouwstijl, een soort Arabisch plat dak, wat water opvangt en deze zijn redelijk geïsoleerd. De traditionele huizen zijn redelijk koel. Maar wat betreft golfplaten, dat wordt natuurlijk warm.

Mart: Ja daar moet je een soort onderplaat onderleggen. Maar ja, daarboven kwamen allerlei ongedierte, en vleurmuizen. Dus dat was niet ideaal.

(Time - 45:12)

Gaan video's kijken van zijn tijd in Tanzania, we zien verschillende ziekenhuizen en Health Centres

(Time - 1:01:50)

Mart: Je moet natuurlijk zorgen dat je logistieke verhaal klopt, dat patiënten niet eerst hierheen moeten, dan weer daarheen en dan weer terug hierheen. Dat wordt natuurlijk belangrijker naarmate je ziekenhuis/Health Centre groter is, maar alsnog het moet wel kloppen.

(Time - 1:12)

Slot