



EARTH IN ARCHITECTURE

An Exploration of Malawian Vernacular and Healing

Lumbani Ngwira

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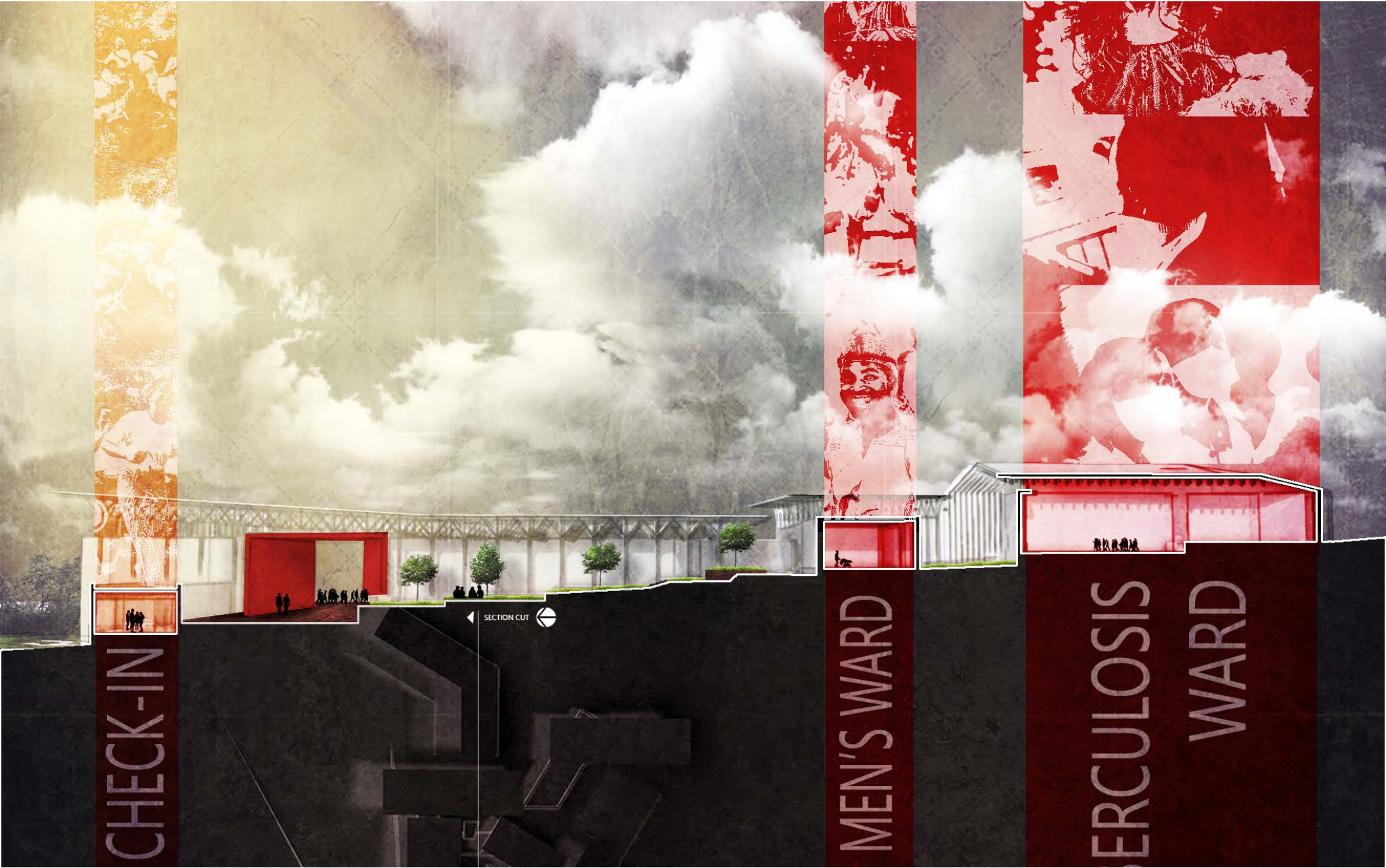
Thesis is submitted to the faculty of Virginia Polytechnic Institute and State University in
partial fulfilment of the requirements for the degree of

Master of Architecture
in Architecture

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Susan Piedmont-Palladino
Marcia F. Feuerstein

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Alexandria, VA

Health, Garden, Materiality, Light, Passivity



CHECK-IN



MEN'S WARD



TUBERCULOSIS
WARD

EARTH IN ARCHITECTURE

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ABSTRACT

Can a hospital be more than a center for treatment? Can it initiate a sense of healing in the individual as well as the community?

The hospital in its earliest form was a facility meant to house the sick in ancient Egyptian temples. Prayers, sacrifices and dream interpretations were used in the healing process as well as quintessential medical procedures such as opium for pain and stitching of wounds. Monasteries were later established to accommodate travelers, the indigent and the sick. Hospitals were constructed next to Religious institutions but also utilized house calls for the wealthy class. Monasteries were also organized in cloisters which were places of retreats from the mundane.

The idea of hospitals today is to diagnose, treat and heal patients which has proven to be effective with most diseases being prevented and eradicated entirely from our day to day lives. However, these conditions aren't as similar in Malawi. The origin of the word hospital is derived from the Latin word "hospitalia" meaning a place of refuge for guests and strangers. The need for effectively functioning hospital in Malawi is apparent, but the need to create a hospital that heals and creates a sense of community and tranquility for both the guest and wondering traveler is paramount.

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GENERAL AUDIENCE ABSTRACT

Explorations of the thesis included delving into what it means to live in a communal village to designing a healing hospital from the outside inward to inform the design to its fruition. Research entailed looking at perspectives of rural living in Malawi and reflecting those elements in the built environment to create a hospital with gardens of healing and roofs that reflect rural architecture and natural materials.

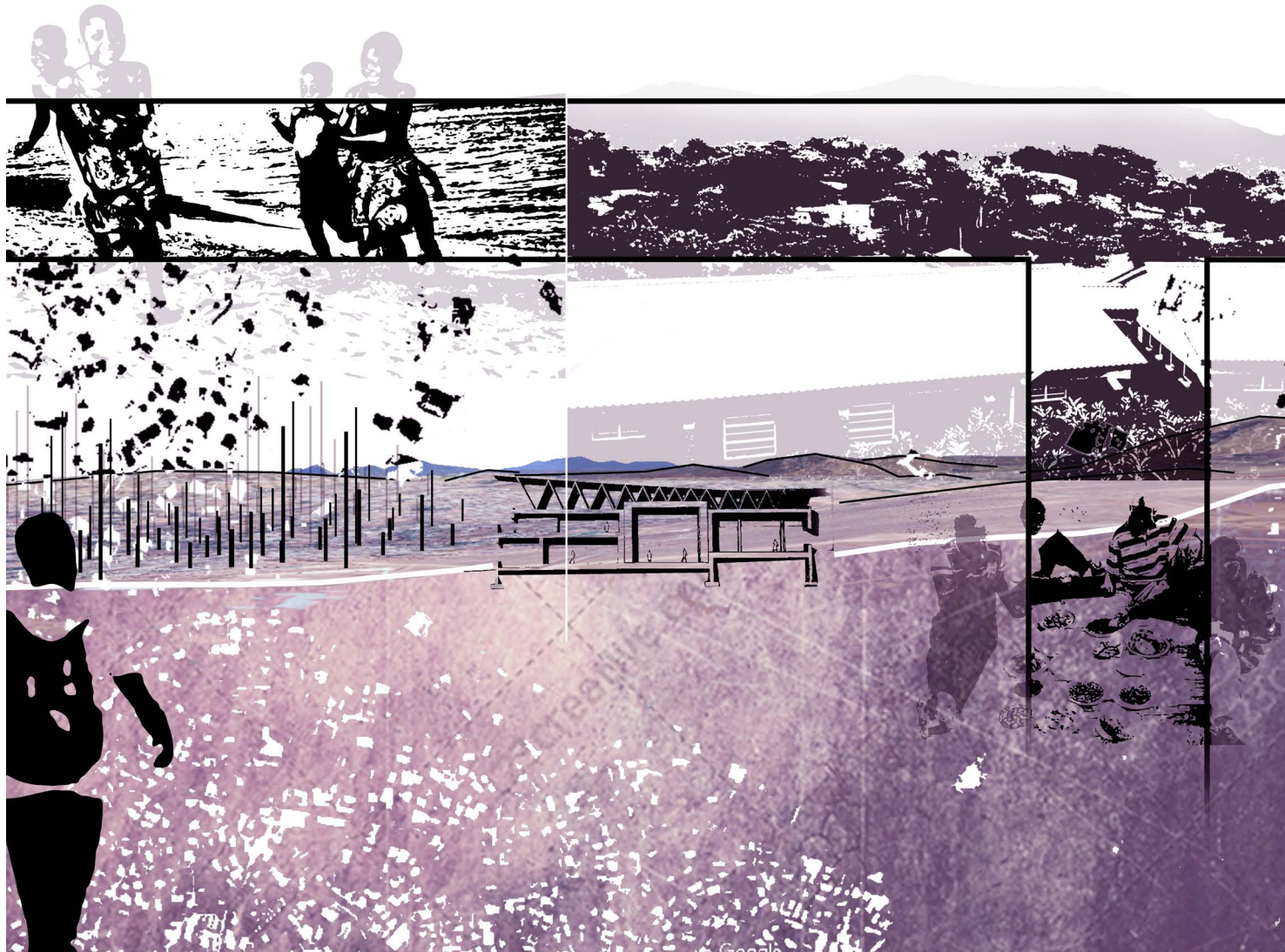
Research began with exploring the cultural influences of community and expressing it through graphic representation and data analysis which informed the location of the site in Blantyre, Malawi. The idea of creating a hospital that can heal through gardens of community or "Khonde" that are synonymous with the people of Malawi.

The concept of the hospital is based on the organization of a rural village composed of a center point at the driveway entrance which unfurls out to allow for possible future expansion of the campus. The curvature of the maternity breaks the linear organization to help guide the gardens and circulation of pedestrian paths and patients to and from the hospital departments whilst keeping a certain amount of public access and private ownership.

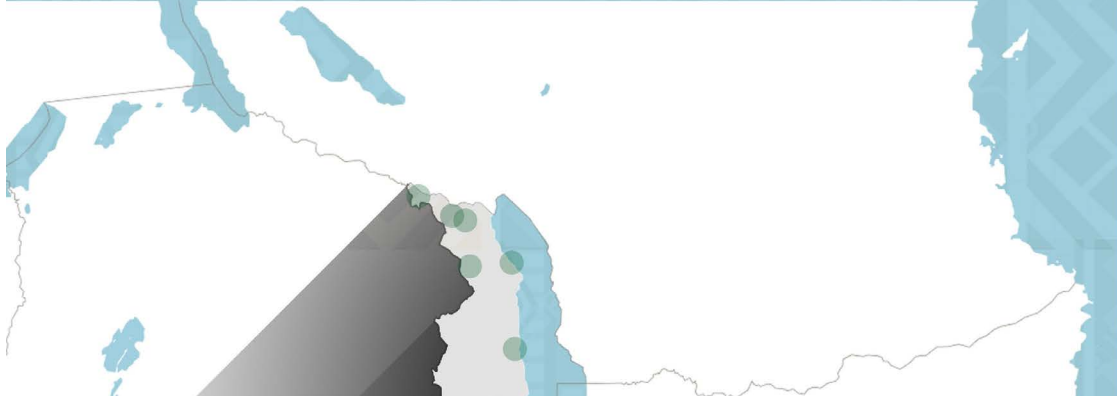
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Early parti image of Hospital concept

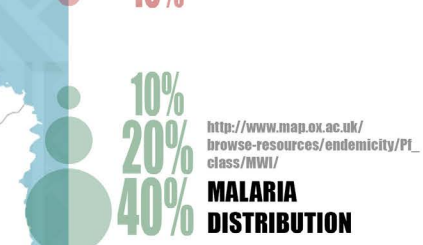
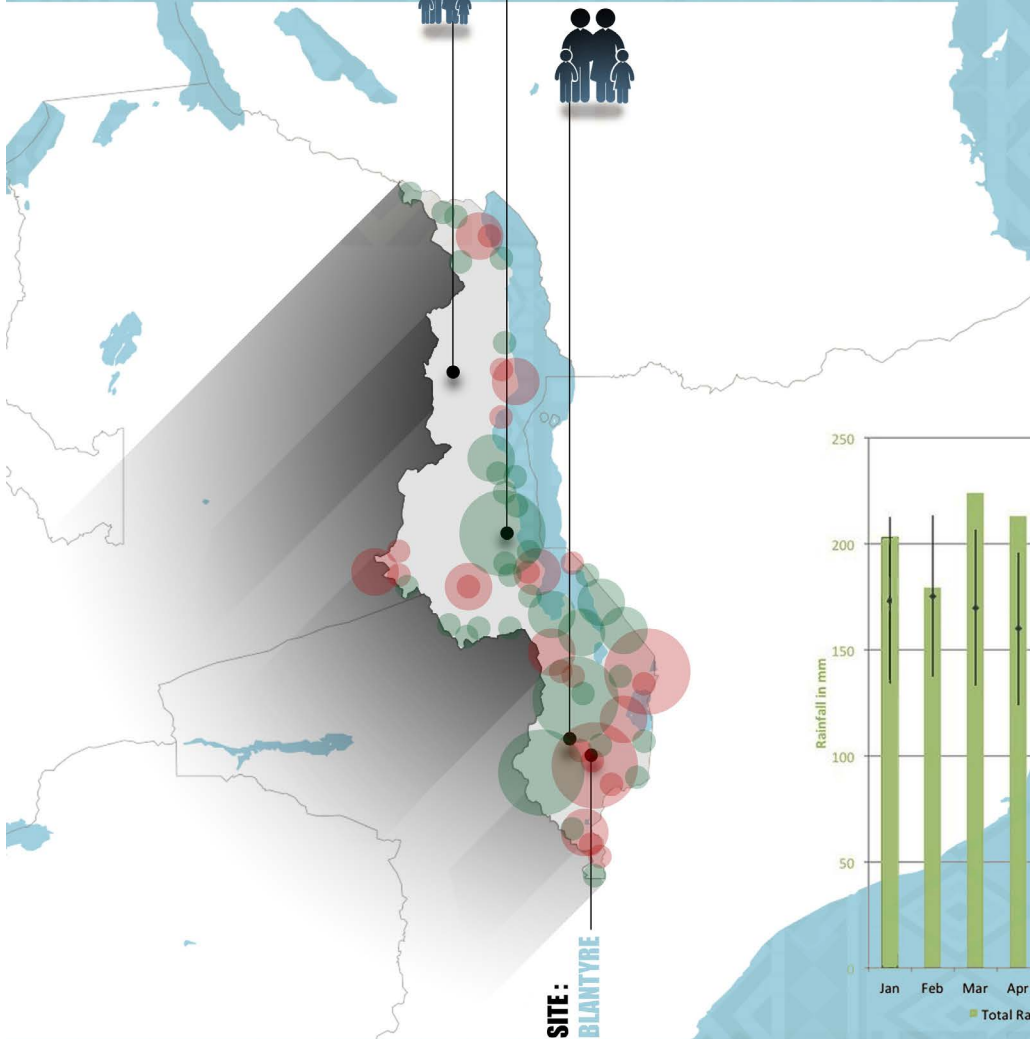


SITE - THE LANGUAGE OF VERNACULAR

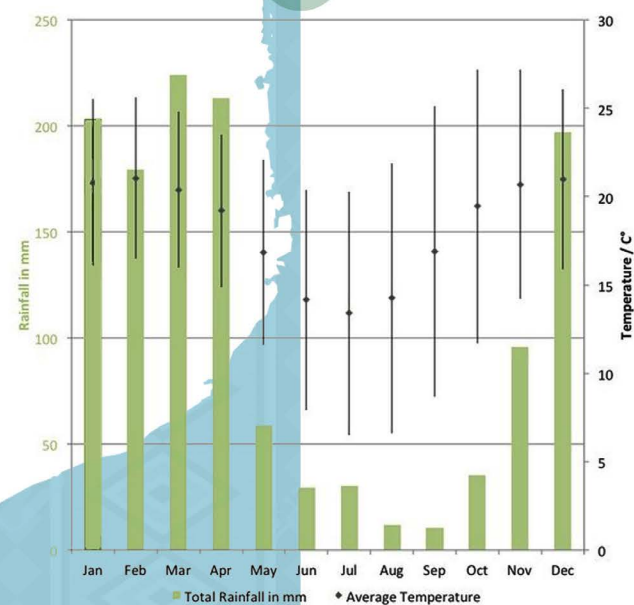
Africa has long been a symbolism of a unified people regardless of the countries and plethora of cultures embedded in each particular location. Malawi, a country located in the southern region of Africa, is one that radiates in its sense of community. Often known as the warm heart of Africa, Malawi houses a population of families that creates a hierarchy from the rural organization of the village to the urban configuration of the typical home.

Growing up in Malawi gave me a sense of what community and family was in our culture, Neighbors were extended family and the typology of house became an extension of hospitality from the entrance to the veranda as though greeting the visitor with open arms.

Malawi is afflicted by a number of diseases that cause distraught in the country. Being a developing country, the location of the site was based on the data collected to administer a form of healthcare that engaged the public the same way the host welcomed the guest and stranger. It also took into account the methods of construction and social norms of the community as well as limited resources available to inform the parti of the hospital.

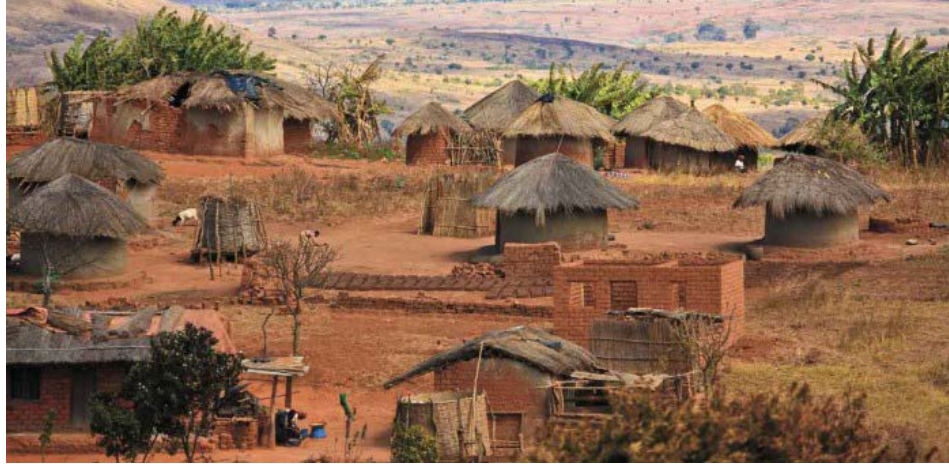


SITE:
BLANTYRE



Data provided revealed the main causes of death in Malawi were respiratory, malaria and HIV. A graphic location showed the main areas affected would determine the location of the hospital and its contextual approach. The climate and solar orientation were both taken into consideration and an approach was formulated based on the numerous times the site had rainfall throughout the year. The solar angles and passive methods of heating and cooling were also taken into account to formulate a respective response to the site.

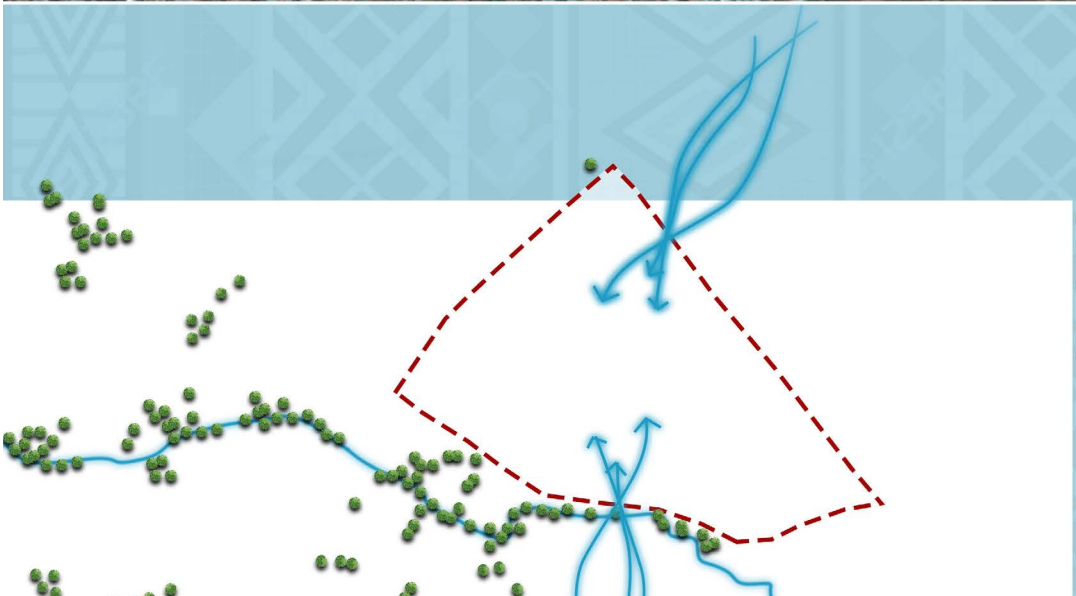




(1) Rural village in Southern Malawi

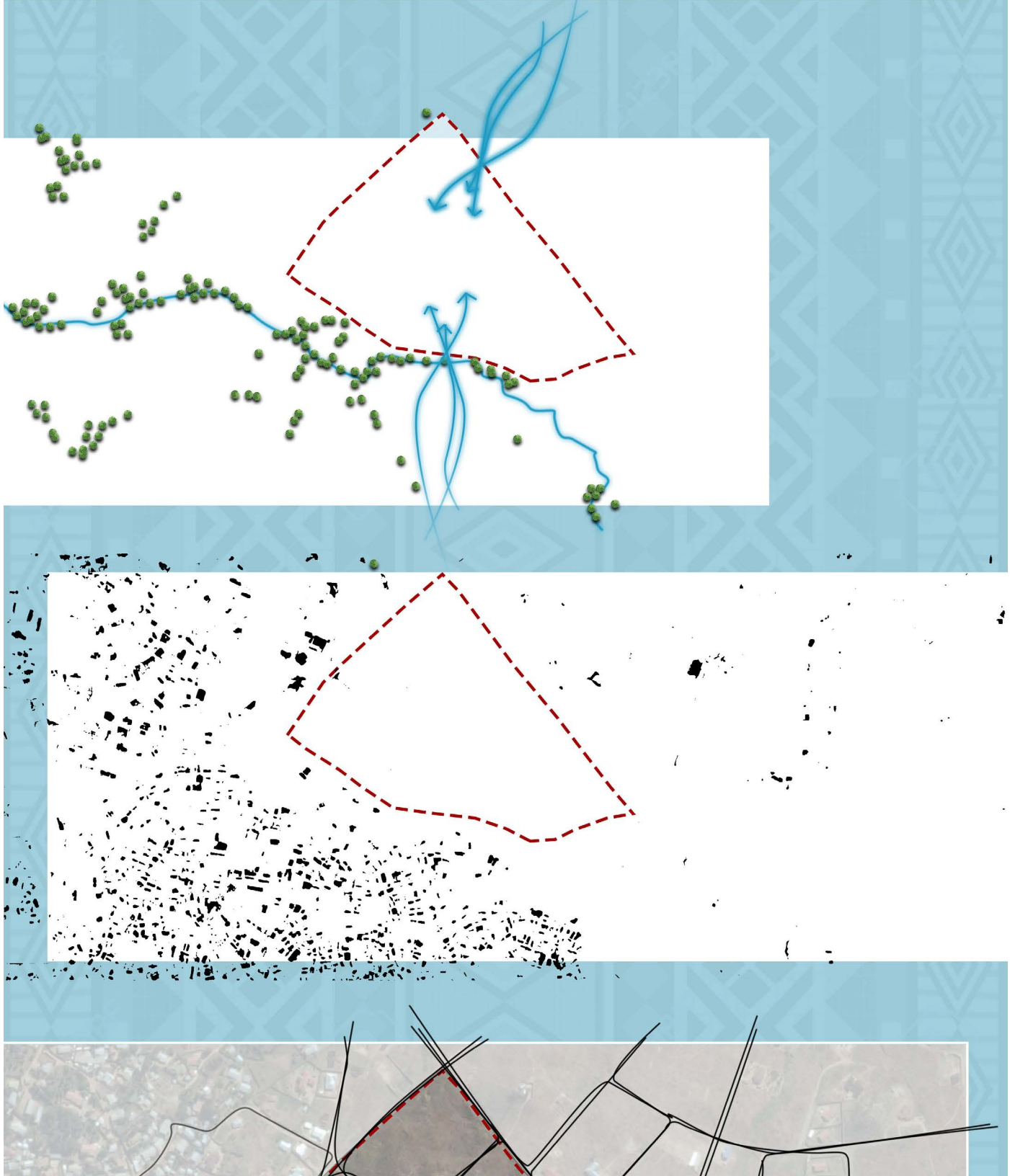


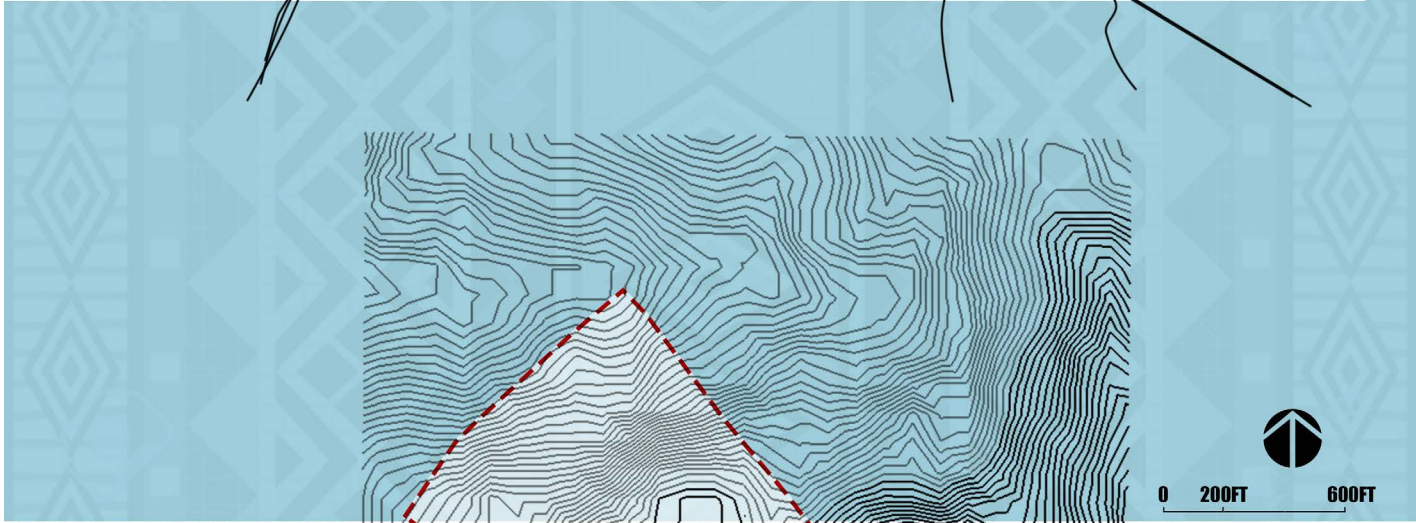
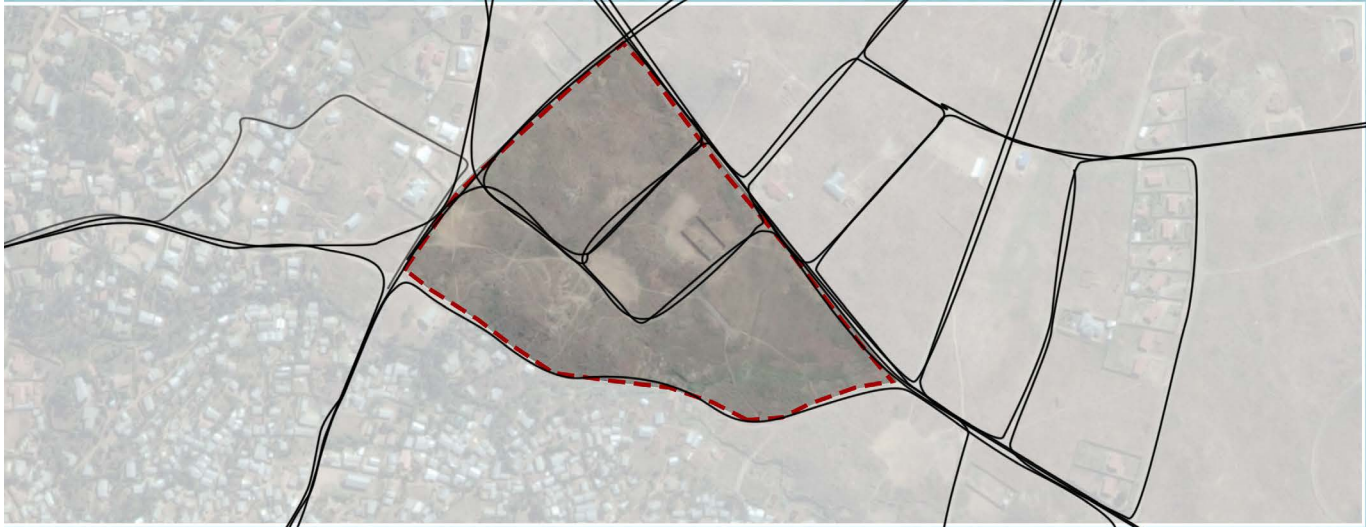
(2) The city of Blantyre



The site is located in the Namiwawa which is a district located north of the city of Blantyre. Access and wind direction were analyzed to inform the design's parti. The site was also chosen in accordance with the primary users of the site who would be traveling to the hospital primarily by walking or bicycle.

The site is within the vicinity of the city and rural village to accommodate the pedestrian and still provide access to the primary road leading up to the site and emergency services. Population density and terrain were also taken into account which presented the opportunity for the architecture to either react with or against the landscape.





...MUSUNG' TENDERE GONJETSANI ADANI ONSE NJALA NTHENDA NSANJE LUNZITSANI MITIMA YATHU KUTI TISA
...LOKOK' LA CHONDE NDI UFULU NYANJA NDI MPHEPO YA M'MAPIRI NDITHUDI TADALA ZIGWA MAPIRI NTHAKA
...WOKO' MAWI O UFULU TIGWIRIZANE KUKWEZA MALAWI NDI CHIKONDI KHAMA KUMVERATIMUTUMIKI
...ZIP... KWEZA MALAWI MLUNGU DALITSANI MALAWI MUMSUNGE M'MTENDERE GONJETSANI ADANI
...KUTI TISA... SOLERI NAFE NDI MAYI MALAWI MALAWI NDZIKO LOKONGOLA LA CHONDE NDI UFULU NYANJA
...NTHAKA DZIN... GO ZAULERE NKHALANGO MADAMBO ABWINO NGWOKOMA MALAWI O UFULU TIGWIRIZANE KUP
...TADALA... MTENDERE CHOLINGA N'CHIMODZI MAYI BAMBO TIDZIPEREKE POKWEZA MALAWI MLUNGU DALI
...NDI M... ANI MITIMA YATHU KUTI TISA OPE MDALITSE MariaITSOG NAFE NDI MAYI MALAWI
...LA... WWA MAPIRI NTHAKA DZINTHU N'MPHATSO ZA NKHALANGO MADAMBO ABWINO NGWOKOMA
...LAW' MUM... IMIKIRE PA NKHONDO NKANA PA MTENDERE GONJETSANI ADANI ONSE NJALA NTHENDA NSANJE LUNZ
...DZIK' LO... ONDE NDI UFULU NYANJA NDI MPHEPO YA M'MAPIRI NDITHUDI TADALA ZIGWA MAPIRI NTHAKA
...GWOKO'... VEZA MALAWI NDI CHIKONDI KHAMA KUMVERATIMUTUMIKIRE PA NKHONDO NKANA PA MTENDERE
...EK... WI MLUNGU DALITSANI MALAWI MUMSUNGE M'MTENDERE GONJETSANI ADANI ONSE NJALA NTHENDA NSANJE LUNZ
...S' SOLERI N... LAWI NDI ZIKO LOKONGOLA LA CHONDE NDI UFULU NYANJA NDI MPHEPO YA M'MAPIRI
...PHA... D ZAULERE NKHALANGO MADAMBO ABWINO NGWOKOMA MALAWI O UFULU TIGWIRIZANE KUPWEZA MALAWI NDI
...MTEN... ER... G... MAYI BAMBO TIDZIPEREKE POKWEZA MALAWI MLUNGU DALITSANI MALAWI MUMSUNGE
...LUP... T... Y... TISA... MDALITSE MTSOGOLERI NAFE NDI MAYI MALAWI MALAWI NDZIKO LOKONGOLA
...DI... D... LA DZINTHU N'MPHATSO ZAULERE NKHALANGO MADAMBO ABWINO NGWOKOMA MALAWI O UFULU
...AMA... M... TUMIKIRE PA NKHONDO NKANA PA MTENDERE CHOLINGA N'CHIMODZI MAYI BAMBO TIDZIPEREKE
...DERE... G... ADANI ONSE NJALA NTHENDA NSANJE LUNZITSANI MITIMA YATHU KUTI TISA OPE MDALITSE MTSOGOLER
...DE... M... N... N... MPHEPO YA M'MAPIRI NDITHUDI TADALA ZIGWA MAPIRI NTHAKA DZINTHU N'MPHATSO ZAULERE NKHALANG
...M... K... MALAWI NDI CHIKONDI KHAMA KUMVERATIMUTUMIKIRE PA NKHONDO NKANA PA MTENDERE CHOLINGA N'CHIMOD
...NGU... DA... MALAWI MUMSUNGE M'MTENDERE GONJETSANI ADANI ONSE NJALA NTHENDA NSANJE LUNZITSANI MITIMA YATHU
...MALAWI... MALAWI NDI CHIKONDI KHAMA KUMVERATIMUTUMIKIRE PA NKHONDO NKANA PA MTENDERE CHOLINGA N'CHIMOD
...N'CHIM... D... MAYI BAMBO TIDZIPEREKE POKWEZA MALAWI MLUNGU DALITSANI MALAWI MUMSUNGE M'MTENDERE GONJETSANI ADANI
...A YATHU... TISA... NDI UFULU NYANJA NDI MPHEPO YA M'MAPIRI NDITHUDI TADALA ZIGWA MAPIRI NTHAKA DZINTHU N'
...MAPIRI... KA... T... T... REN... GO MA... IO... ON... MALAWI MLUNGU DALITSANI MALAWI MUMSUNGE M'MTENDERE
...LA... N... A... ITE... CHOLI... HIMCI... AY... IO... T... D... Z... REI... V... MALAWI MLUNGU DALITSANI MALAWI MUMSUNGE
...LA... T... AN... N... LU... N... MI... THU... K... IS... IDALITSE MTSOGOLERI NAFE NDI MAYI MALAWI MALAWI NDZIKO
...YA... REN... THUDI... ZIGWA... REN... NTH... DZI... N'MPHATSO ZAULERE NKHALANGO MADAMBO ABWINO NGWOKOMA
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...LA... CHONDE NDI UFULU NYANJA NDI MPHEPO YA M'MAPIRI NDITHUDI TADALA ZIGWA MAPIRI NTHAKA DZINTHU N'
...NO... DI... MAYI BAMBO TIDZIPEREKE POKWEZA MALAWI MLUNGU DALITSANI MALAWI MUMSUNGE M'MTENDERE GONJETSANI ADANI
...NO... DI... YE... ZA MALAWI MLUNGU DALITSANI MALAWI MUMSUNGE M'MTENDERE GONJETSANI ADANI ONSE NJALA NTHENDA NSANJE
...N... N... NAFE NDI MAYI MALAWI MALAWI NDZIKO LOKONGOLA LA CHONDE NDI UFULU NYANJA NDI MPHEPO YA M'MAPIRI
...N... N... NKHALANGO MADAMBO ABWINO NGWOKOMA MALAWI O UFULU TIGWIRIZANE KUPWEZA MALAWI MLUNGU DALITSANI MALAWI MUMSUNGE
...N... N... LINGA N'CHIMODZI MAYI BAMBO TIDZIPEREKE POKWEZA MALAWI MLUNGU DALITSANI MALAWI MUMSUNGE M'MTENDERE
...N... N... MITIMA YATHU KUTI TISA OPE MDALITSE MTSOGOLERI NAFE NDI MAYI MALAWI MALAWI NDZIKO LOKONGOLA LA CHONDE NDI UFULU NYANJA



PE MDALITSE MTSOGOLEKI 7
ZINTHU N'MPHATSO ZAULI
ONDO NKANA PA MTENDERE
NTHENDA NSANJE LUMBITA
A M'MAPIRI NDITHUNDA
DI CHIKONDI KHAMA KU
MSUNGE M'MTENDERE
LOKONGOLA LA CHIKONDI
TOMA MALAWI CHIKONDI
REKE POKWEZA MALAWI
MTSOGOLERI NAFENDI
TZO ZAULERE NKHALA
ENDERE CHOTINGA
UNZITSANI M'TI
TADALA ZIGWA
VERATIMU
TSANI ADA
NYANJA
KUKIWEZ
LITSANI
LMA AV
ABVIN
ZI MAYI BAMBO
KUTI TISAOP
YAKA DZIN
MHOLO NTA
N JALANTHE ID
DO A M'AFIE
I CHIKO
M ISUI
LO ONG
KONTA NI
KETE
TZO



PARTI - HEALING FROM THE EXTERIOR

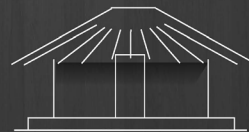
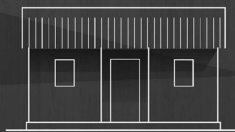
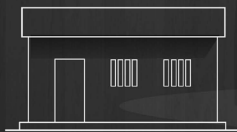
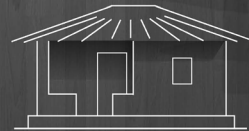
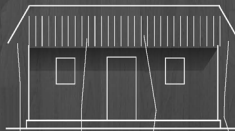
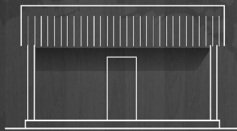
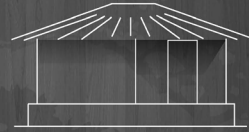
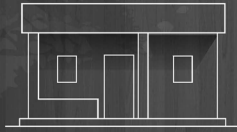
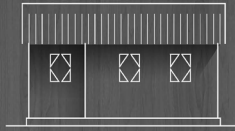
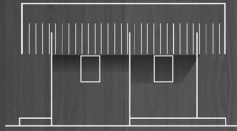
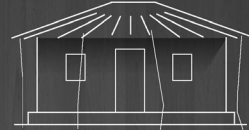
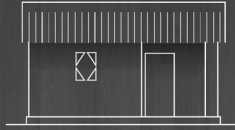
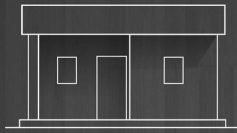
The parti of the hospital is based on the quintessential definition of the hospital. A place of recluse that allowed for healing by juxtaposing the concept of path and garden shown in the cloisters of ancient times. The cloister here is created from the National anthem of Malawi to build a parallel between garden the users and create a sense of Nationality and belonging for the people.

The contribution of Malawian culture is also included in the Site analysis to help inform the materiality and form as the hospital starts to takes it shape. Having been raised in Malawi, the culture was heavily based upon the inclusion of all guests as extended family. This meant the guests would eat together from one bowl and perform other activities as though they were all one inclusive family.

Other rituals to celebrate culture would also include the Gule Wamkulu which consisted of a mythical creature with a mask that performed tribal dances during ritualized celebrations such as the ascension from boyhood to manhood. The identity of the masked man would only be know to the chief of the village creating a sense of mystery around the figure.









(3) Village Homes constructed of compressed earth



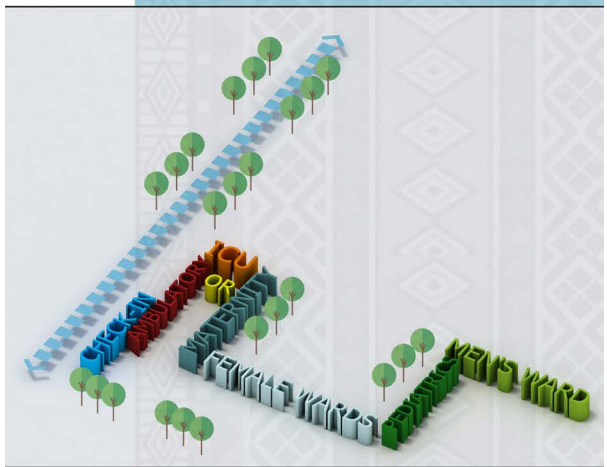
(5) Vernacular forms of construction



(4) Artisan items



(6) Village Community

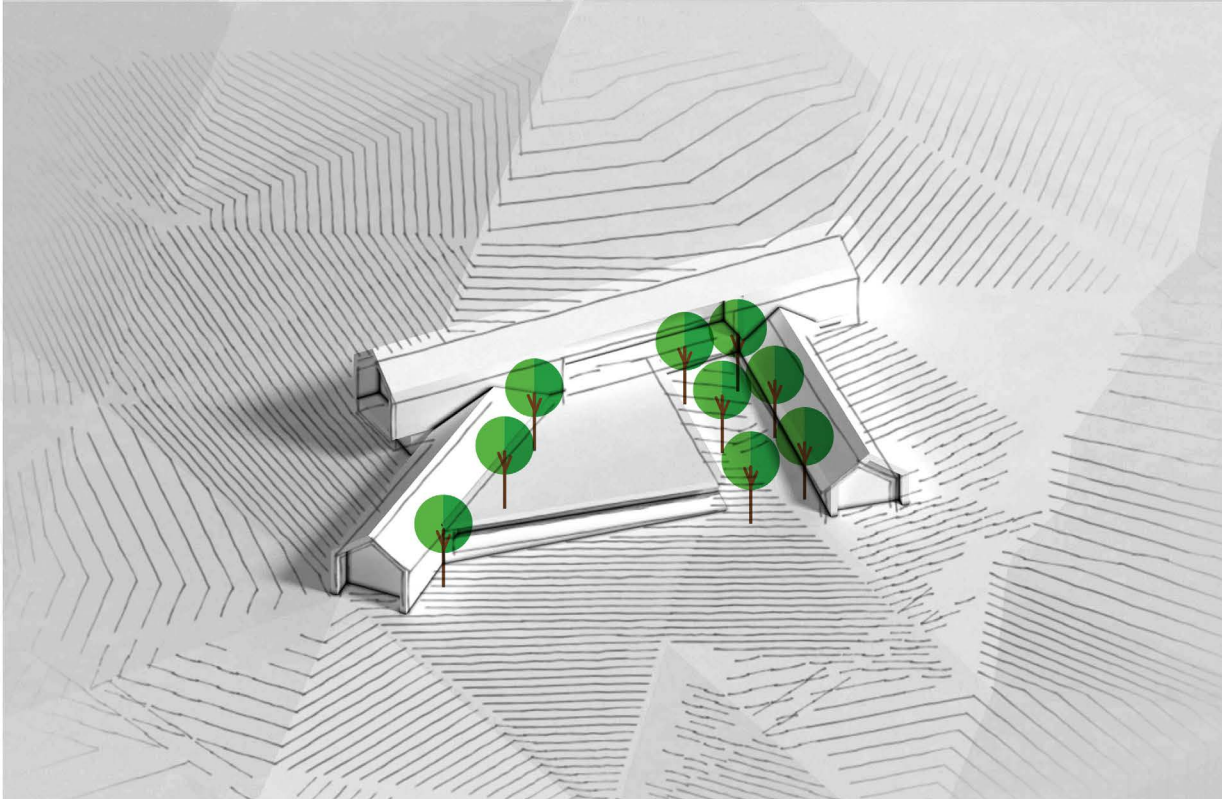
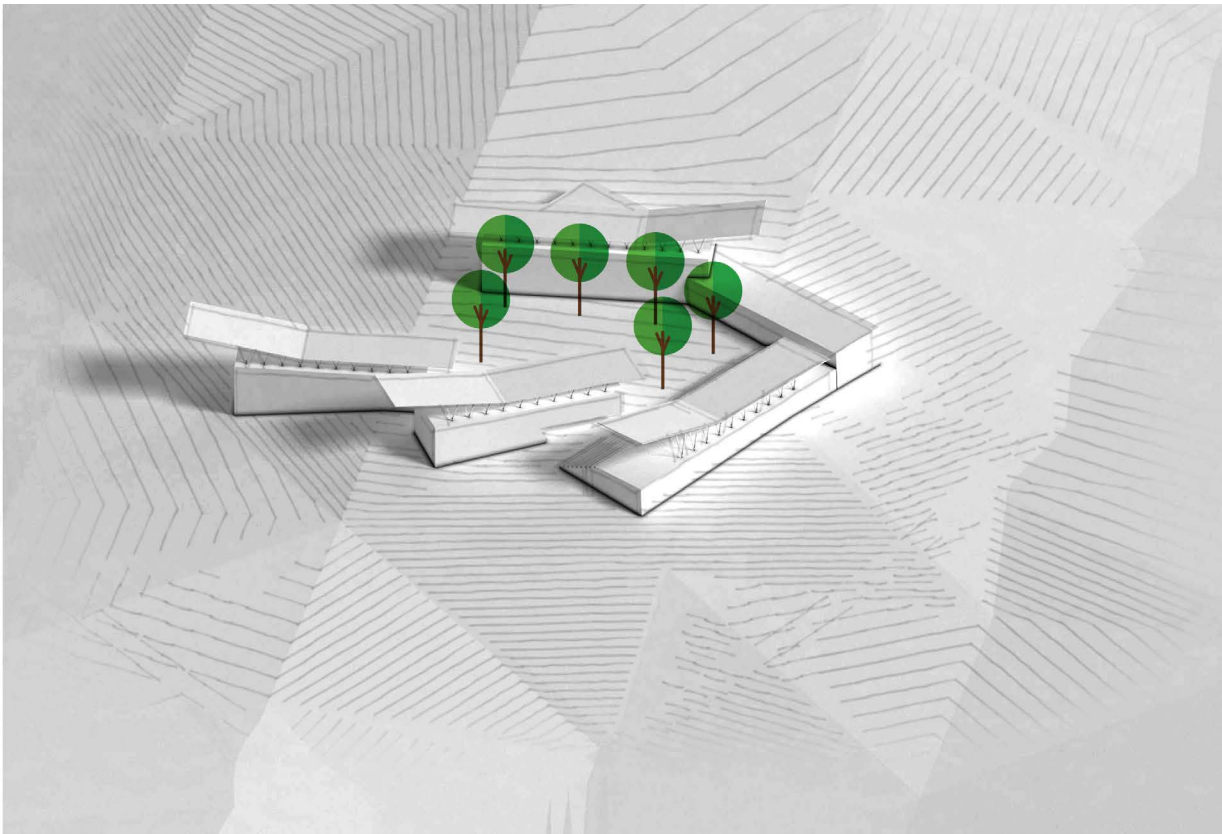


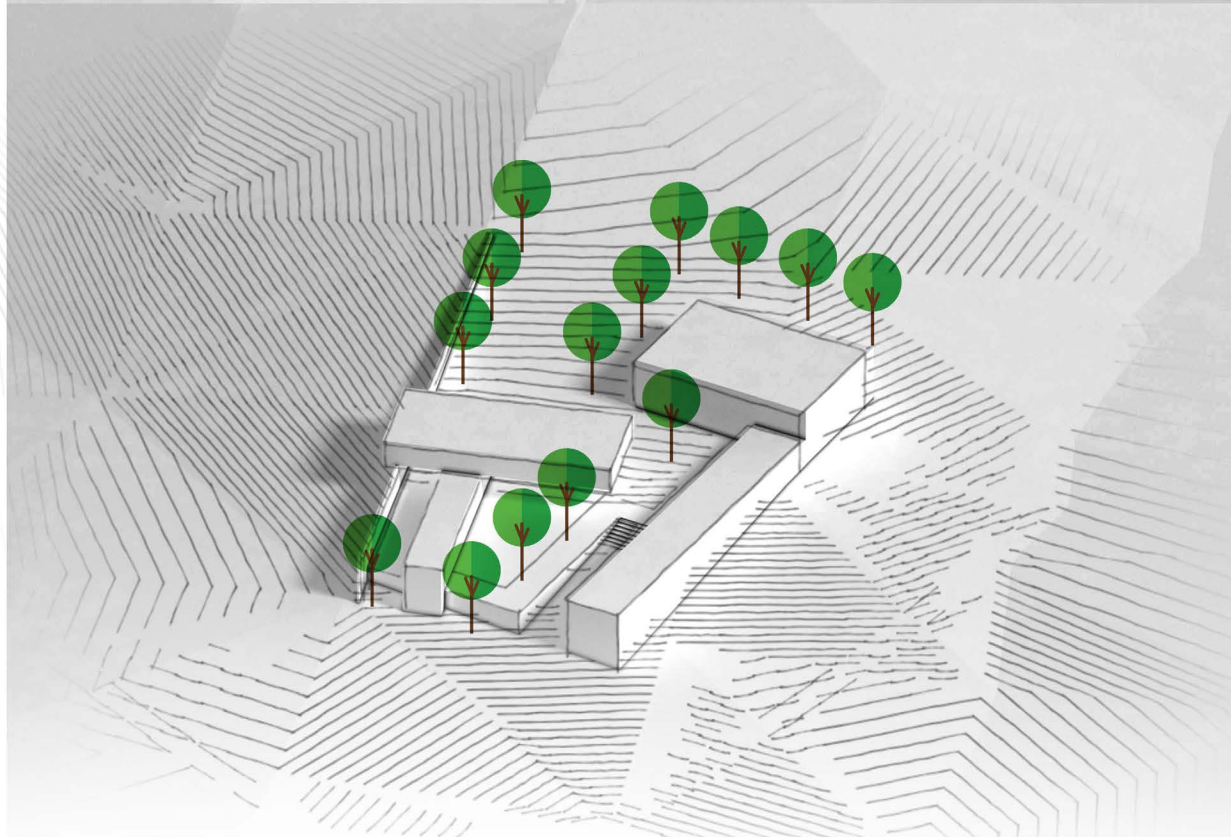
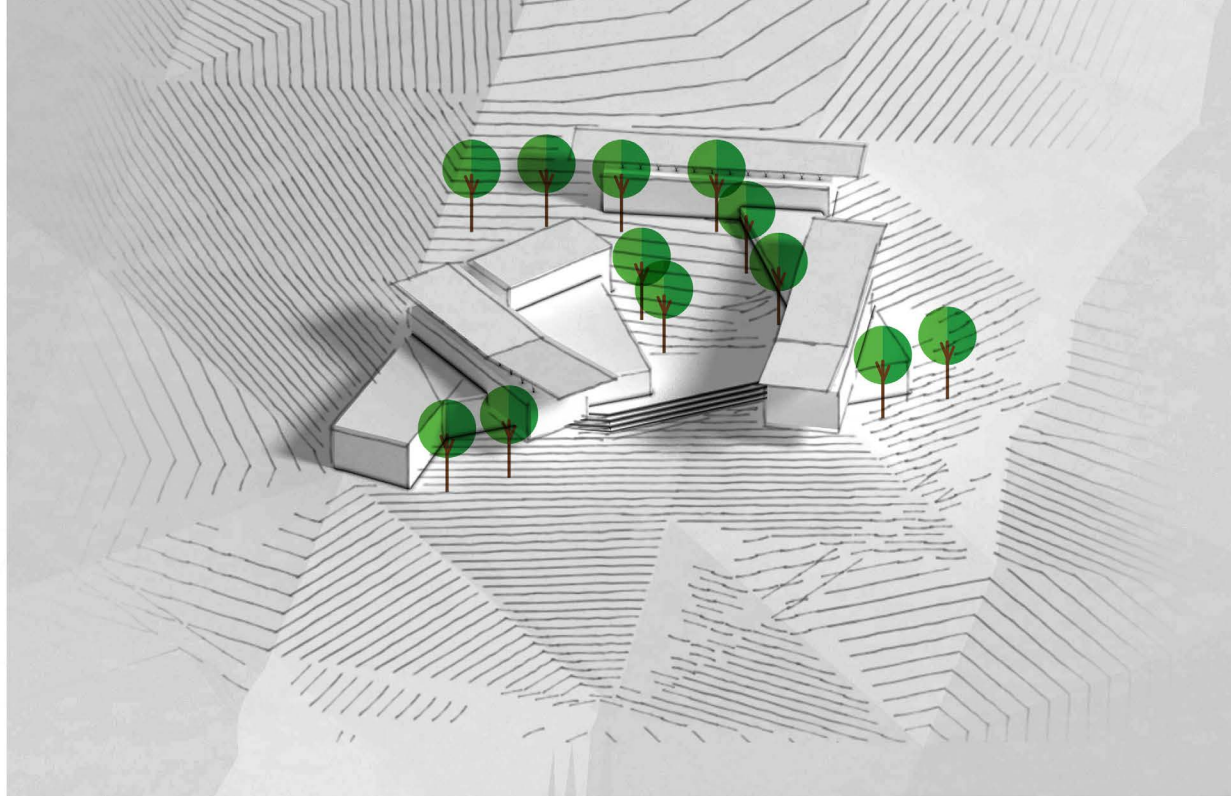
PROCESS - VERNACULAR

Several different typologies of the home were studied and put together to form a language of engaging the outside through several different uses. The homes are typically placed on a base that allows the facade of the home to be lifted away from the street. This also allows the home to stay protected from water as it rains throughout most of the year.

The facade typically consists of a patio or veranda to greet the user and become part of the street life and community whilst still keeping a sense of privacy by recessing it into the home. The thatched roof acts as the apex of the home and keeps the home cool by allowing partial ventilation. The vernacular architecture shown here is super-imposed into the hospital to allow the hospital to engage and heal the community as well.

The materiality of the homes consists mostly of sun-dried or kiln dried bricks which is a ubiquitous form of construction in the rural areas. So much so that it becomes ritualistic to repair the compacted clay and brick homes as a community and incorporate elements of personalization through graphical motifs and arrangements.



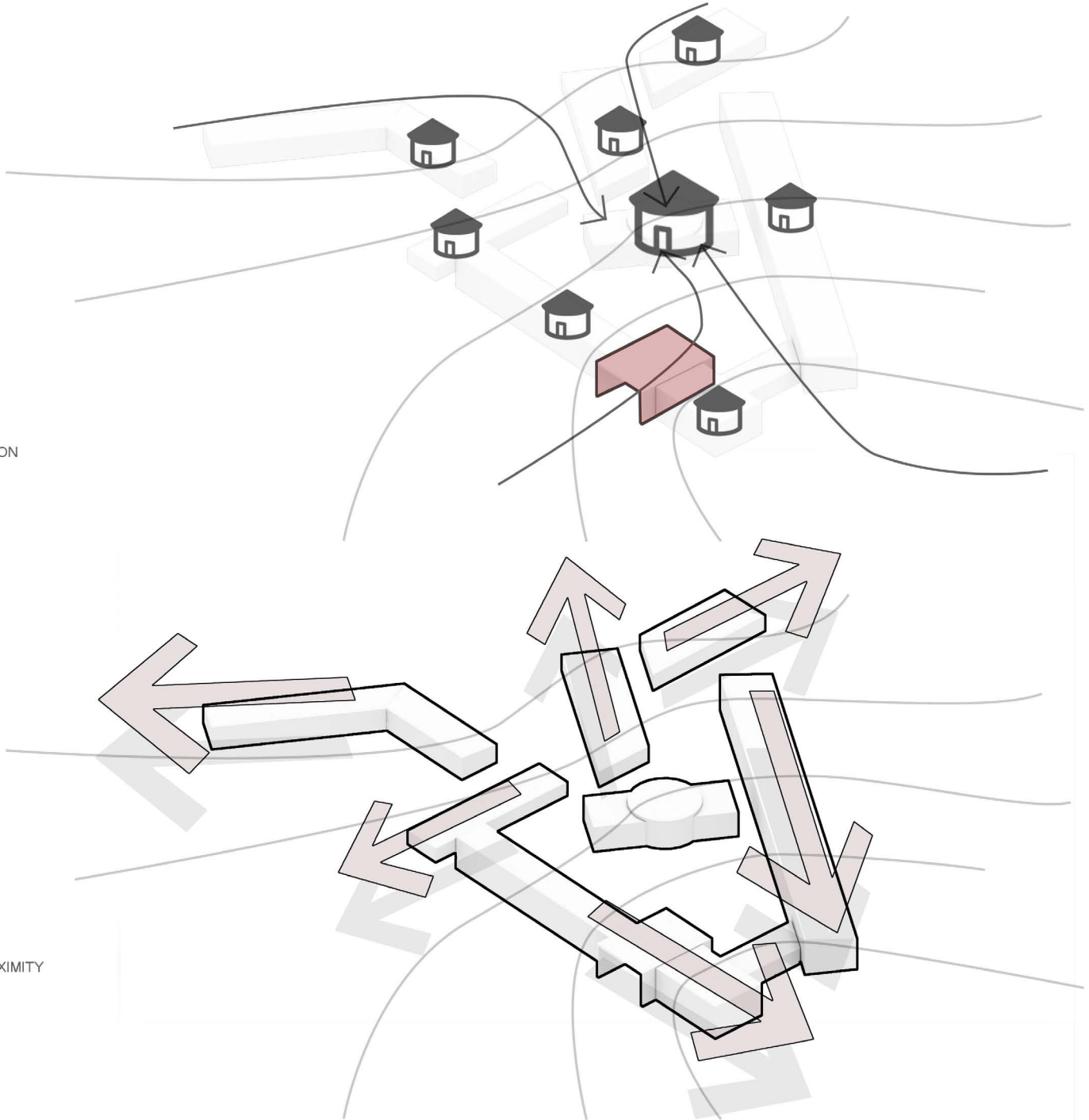




The parti was derived from the elements of a cloister to create a series of gardens to engage the different users. The hospital programming was based on proximity to the adjacent services and allowing for proper sunlight and ventilation whilst still creating a sense of fortitude.

The roof elements would replicate the thatched roof and cool the users passively by creating a secondary shading element whilst still communicating the language of the vernacular. The hospital form becomes part of the landscape but as an iconic entrance to allow the pedestrian to be drawn into the hospital.

The public spaces help define these gardens as elements in a small village which is centered by the maternity building which is known in our culture that the mother is the center of a home.

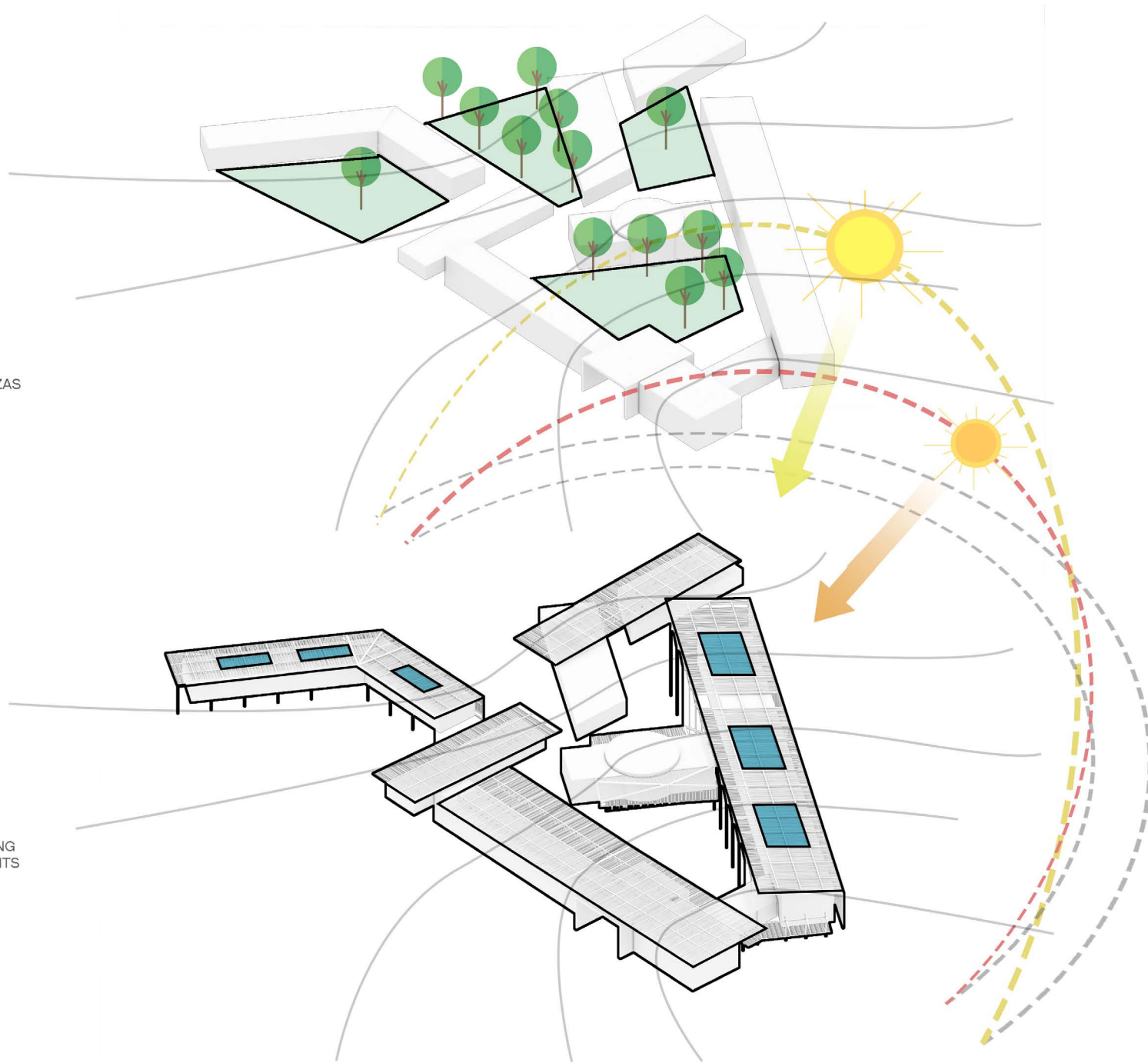


VILLAGE ORIENTATION

PROGRAM & PROXIMITY

GARDENS & PLAZAS

SOLAR SHADING
ROOF ELEMENTS





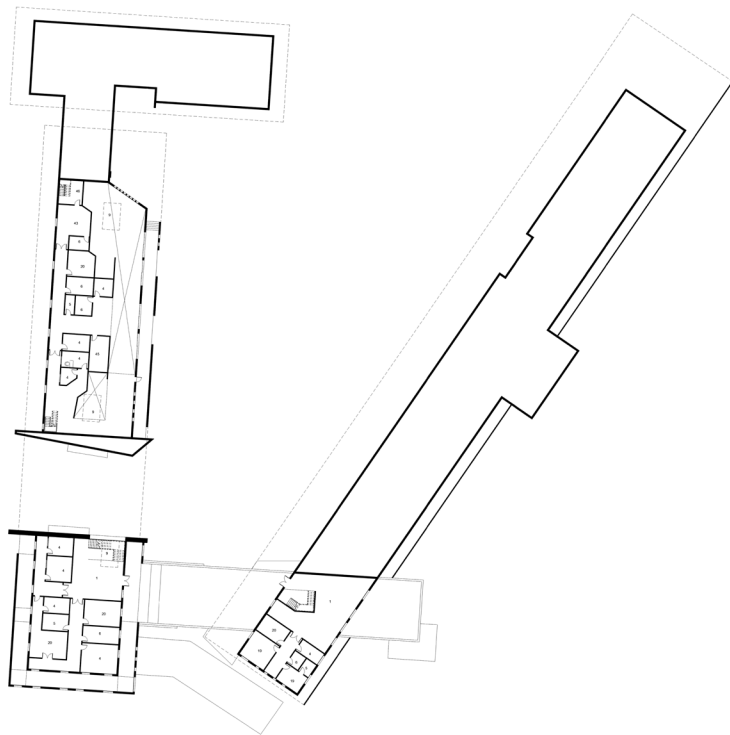
PRODUCTION - VISUALIZING GARDENS OF HEALING

The materiality consist of compressed clay with a thatched roof to juxtapose the vernacular elements of a typical home. These elements seen as for the indigent hold a lot of narrative because they reflect an architecture born out of necessity that steadily matures with several different articulations.

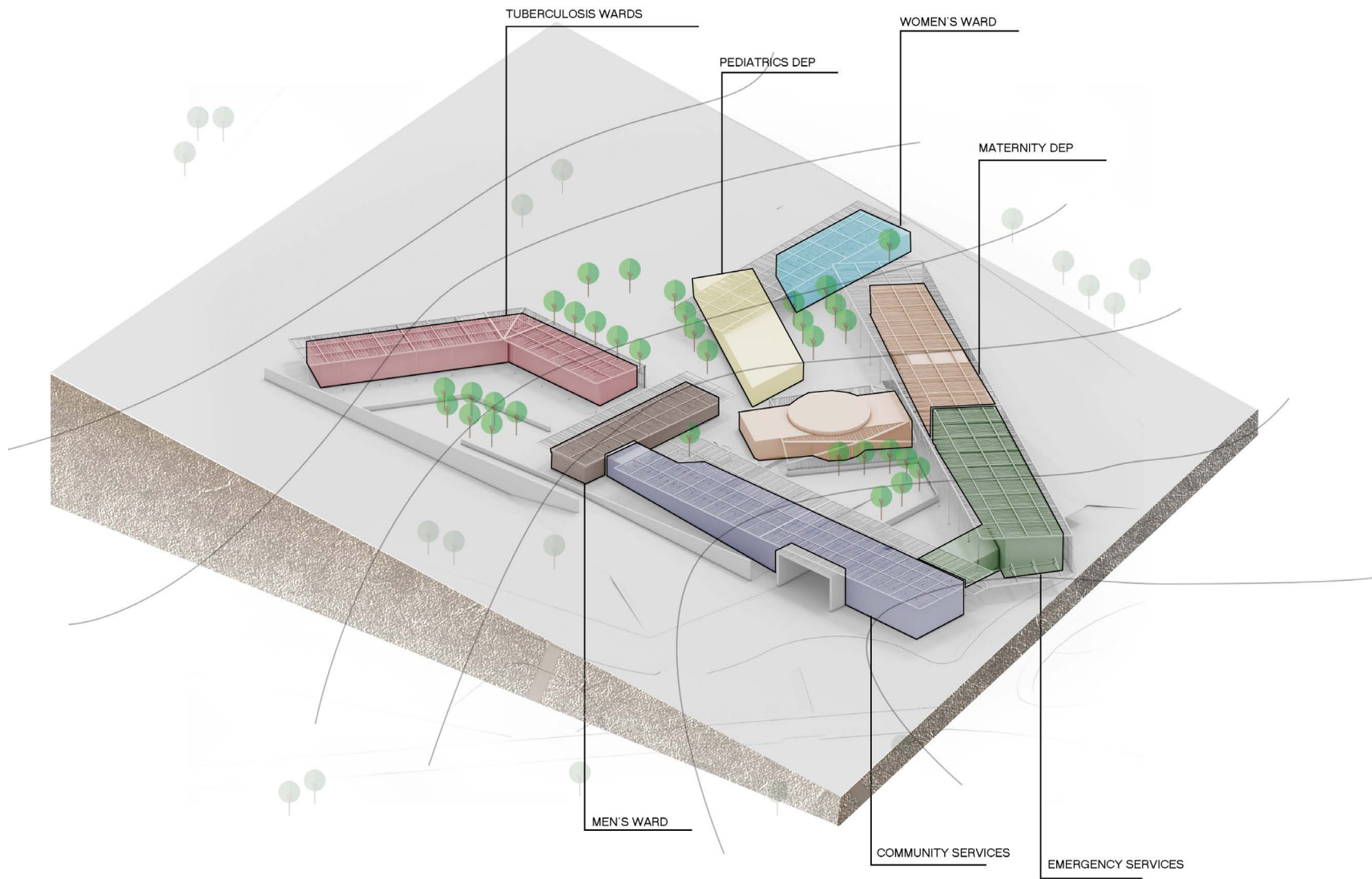
The walls constructed entirely out of compressed earth would be repaired often which would be become part of the annual ritual. These walls include the circular wall in the maternity building and the meditation room which can allow for room to grow and for the users to engage one another.

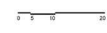
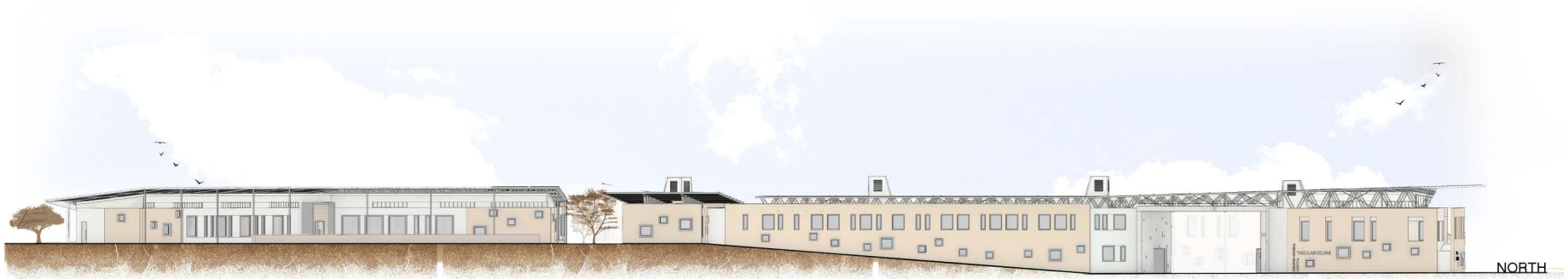
The glazing openings would include a selection of different heights in formal spaces to allow patients sitting on hospital beds to see through to the outside but keep the size and height of the punched opening lower, or higher, than the person walking on the outside to create a sense of privacy for the patient and frame a vista for help with the healing process





- | | |
|-------------------------|------------------------|
| 1. LOBBY | 26. OBGYN LOBBY |
| 2. RECEPTION | 27. EXAM |
| 3. TRIAGE | 28. RECOVERY |
| 4. OFFICE | 29. DELIVERY |
| 5. STORAGE | 30. MATERNITY OR |
| 6. BATHROOM | 31. MEDITATION |
| 7. EVS | 32. POST-DELIVERY WARD |
| 8. VESTIBULE | 33. SKYLIGHT |
| 9. COOLING TOWER | 34. WOMEN'S WARD |
| 10. RECORDS | 35. SCRUB AREA |
| 11. PHARMACY | 36. PEDIATRICS WARD |
| 12. PHARMACY WAITING | 37. PED LOBBY |
| 13. PATIENT BEDS | 38. MEN'S TB WARD |
| 14. TRAUMA | 39. WOMEN'S TB WARD |
| 15. NURSE STATION | 40. MEN'S WARD |
| 16. ISOLATION | 41. MARKETPLACE |
| 17. EMERGENCY WAITING | 42. CAFE |
| 18. RECOVERY | 43. BREAKROOM |
| 19. LABORATORY | 44. LOCERK ROOMS |
| 20. WORKROOM | 45. CONFERENCE |
| 21. CHANGE ROOM | 46. STAIRWELL |
| 22. EMERGENCY RECEPTION | 47. NICU |
| 23. ICU | 48. PREDELIVERY WARD |
| 24. OPERATING THEATER | |
| 25. DECONTAMINATION | |









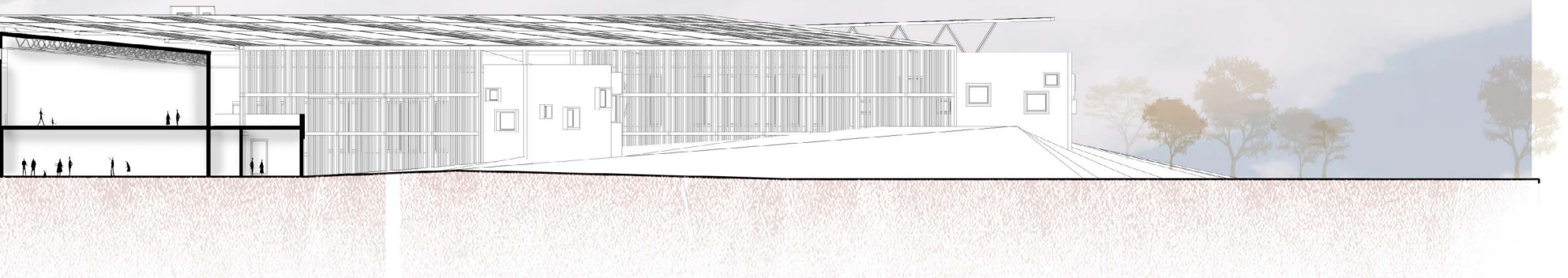


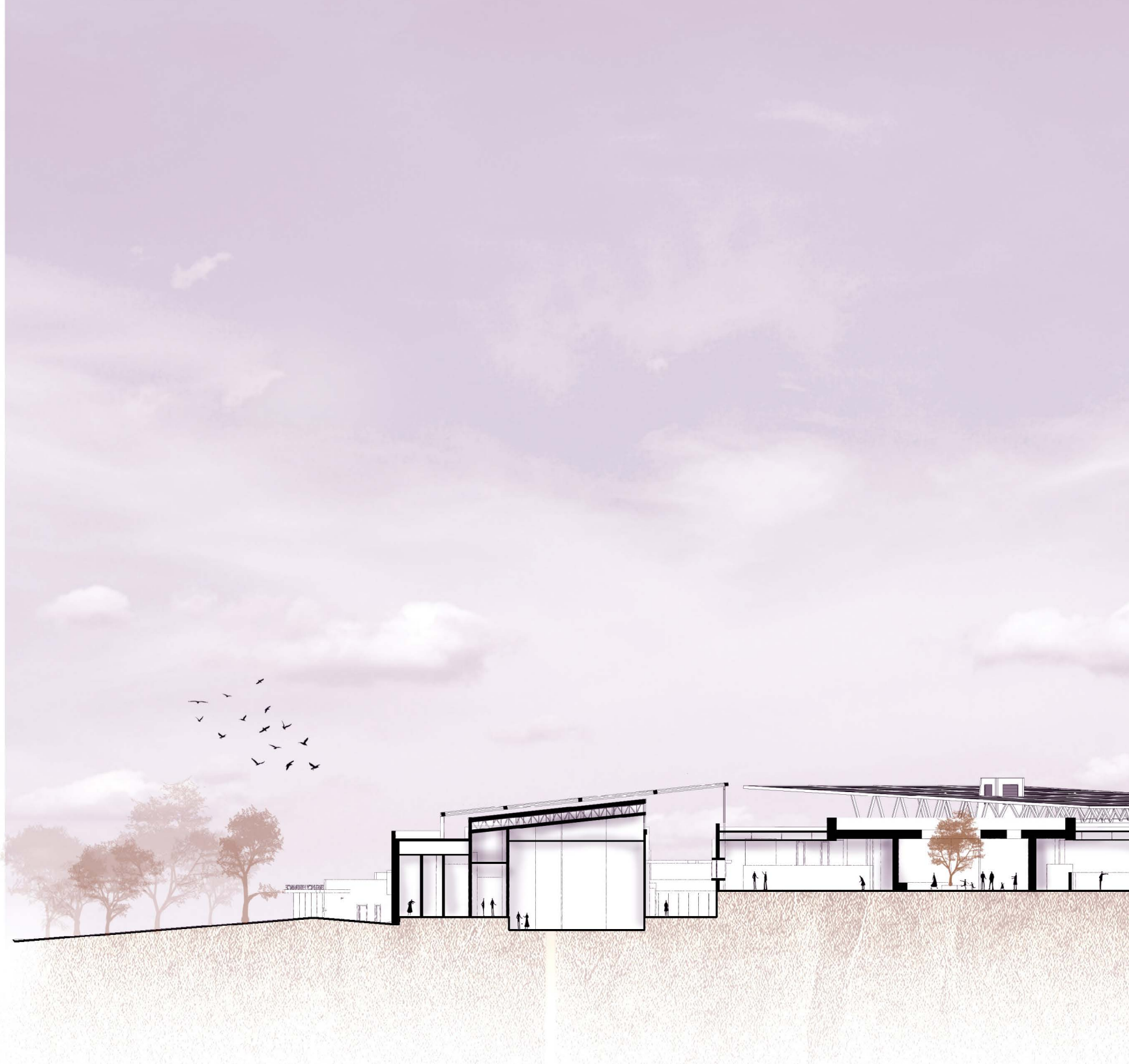




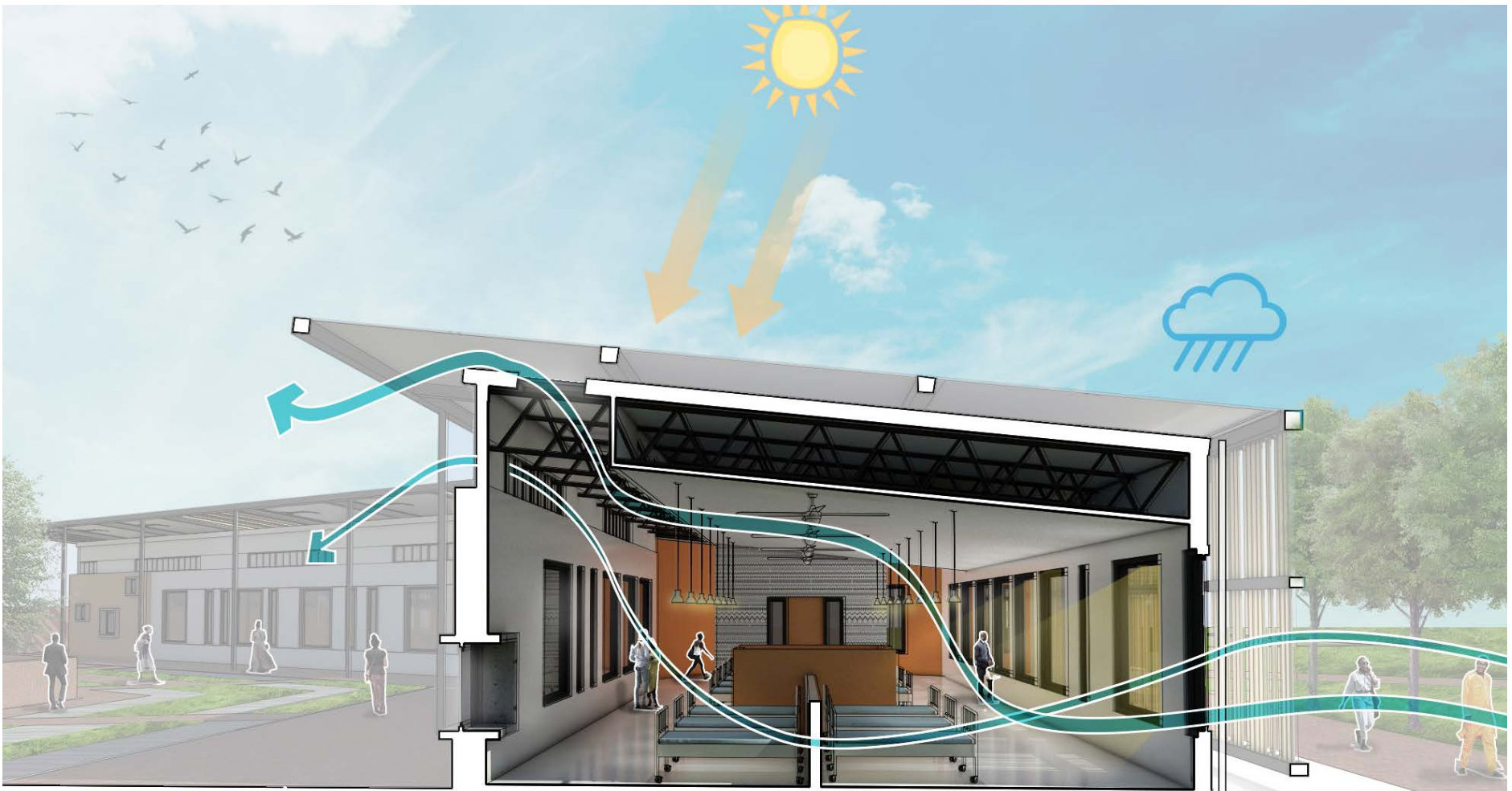








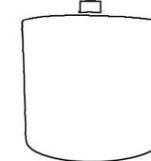




Section thought TB ward

The passive methods of cooling and heating the building shown in the diagram on the left help mitigate the use of highly electrical and mechanical components. The shaded south facing wall helps keep the patients cool whilst allowing for cross ventilation and the use of a sloped roof help the warm air to rise up to the ceiling.

Solar panels are placed on some of the roofs to generate energy passively and water collection systems help collect water that can be used as gray water in the buildings. The low punched glazing is also shown to allow the resting patient some privacy as well.

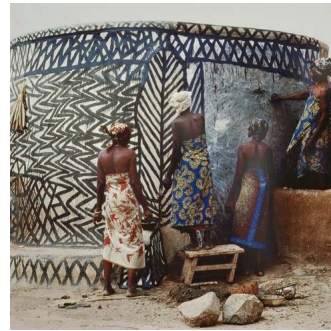




(8) Constructing compressed earth wall



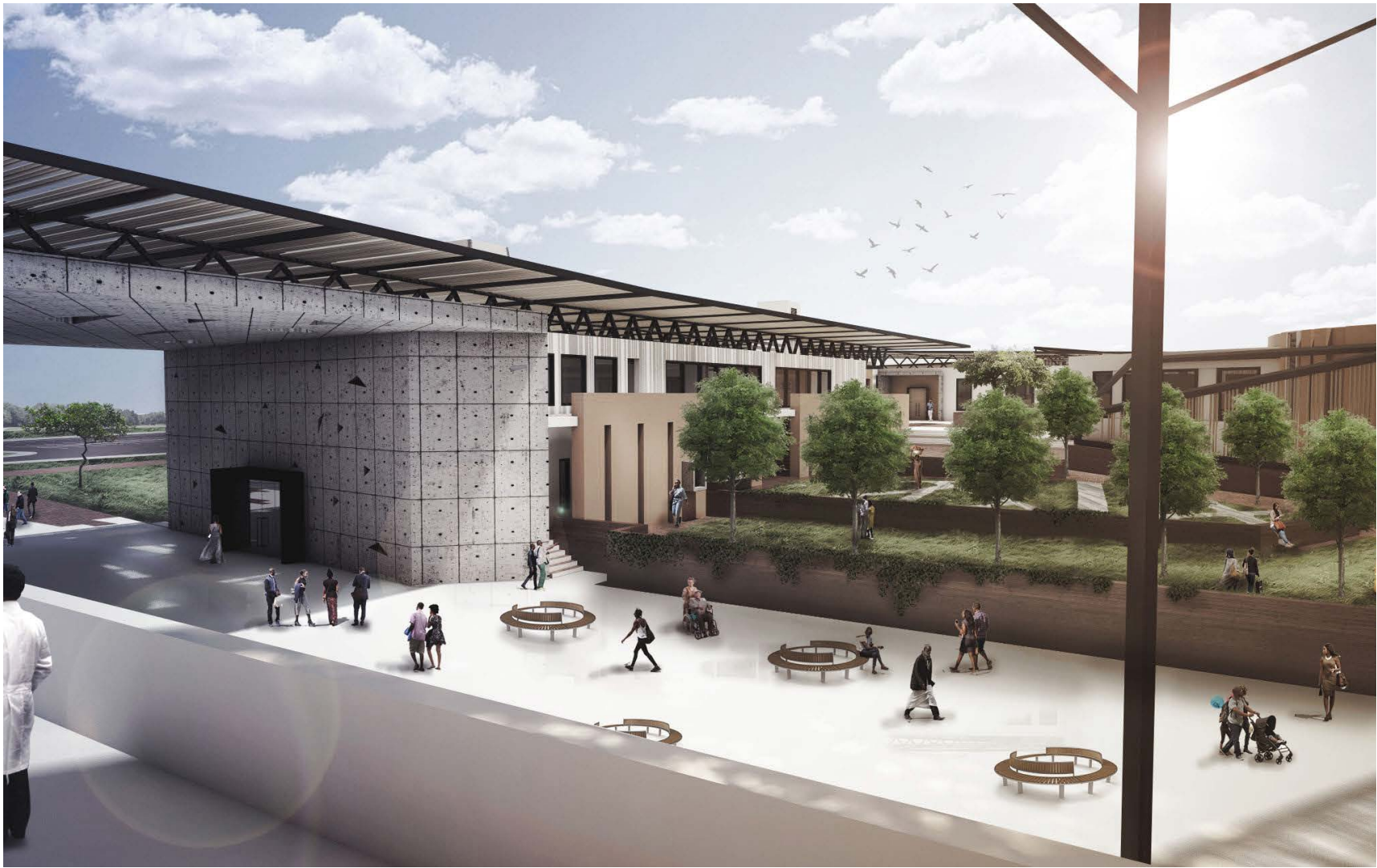
(7) Creating framing reinforcement for compressed earth



(9) Personalizing walls with motifs



Perspective of hospital towards TB and Pediatrics



View of hospital gates into the community garden



View of Men's Ward



Perspective of Pediatrics and Maternity



Lobby of Community Engagement



Maternity Waiting

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- (2) The city of Blantyre. (Digital Image) <http://www.siyabona.com/malawi-cities.html>
- P.16 (3) Village homes constructed of compressed earth. (Digital Image) <https://www.pinterest.com/pin/440086194812576616/>
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