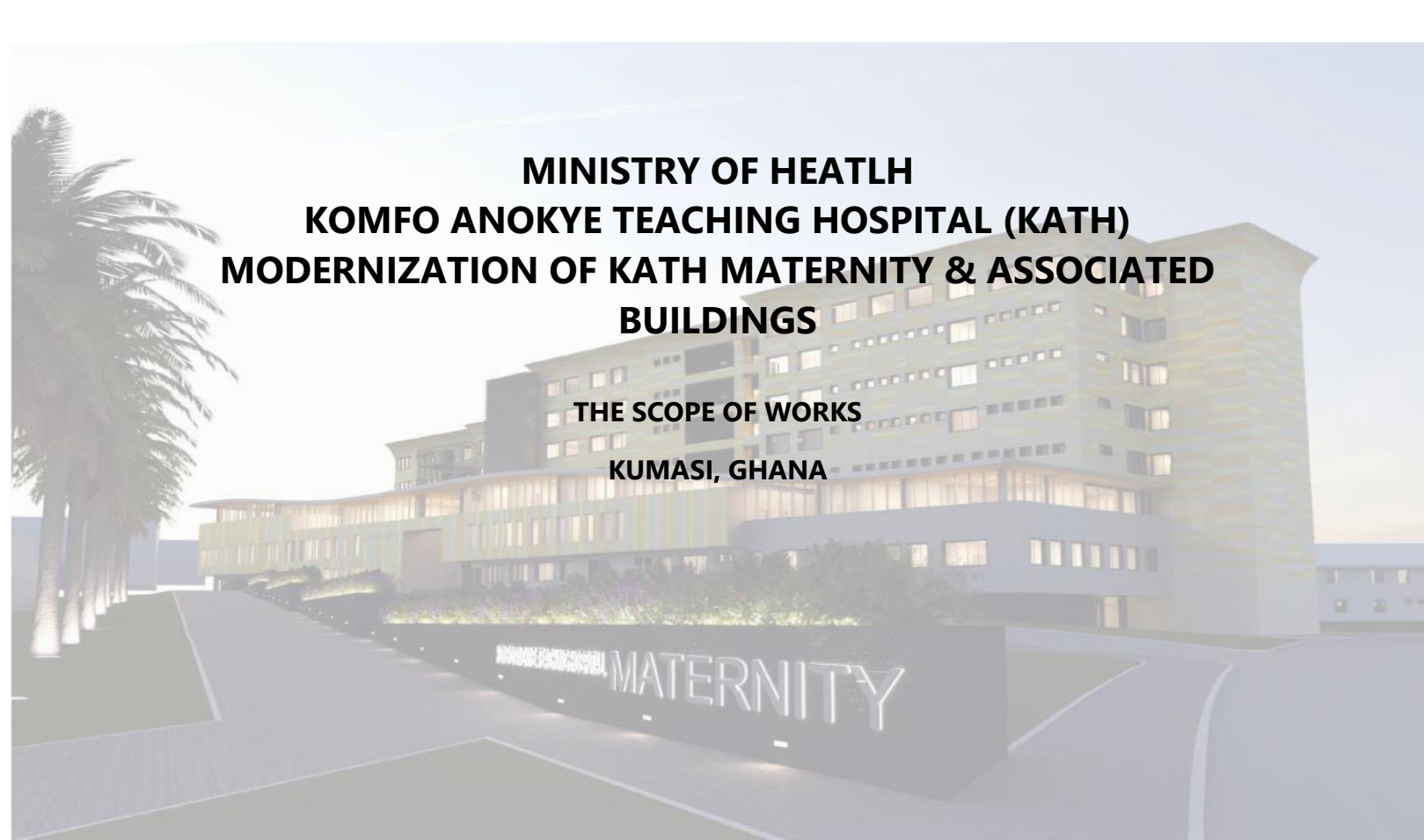


**MINISTRY OF HEALTH
KOMFO ANOKYE TEACHING HOSPITAL (KATH)
MODERNIZATION OF KATH MATERNITY & ASSOCIATED
BUILDINGS**

**THE SCOPE OF WORKS
KUMASI, GHANA**



INTRODUCTION

The MODERNIZATION OF KATH MATERNITY & ASSOCIATED BUILDINGS project places the strongest emphasis on quality in the provision of healthcare services, direct interactions with a new approach to care education and training of medical professionals.

GHANA AND ASHANTI REGION MORTALITY RATES

Infant and child mortality rates are basic indicators of a country's socioeconomic situation and quality of life (UNDP, 2007). Estimates of childhood mortality are based on information collected in the birth history section of the questionnaire administered to women, which includes questions about women's aggregate childbearing experience (i.e., the number of sons and daughters who live with their mother, the number who live elsewhere, and the number who have died). Table below presents estimates for three successive five-year periods prior to the 2014 GDHS (Ghana Demographic and Health Survey). The rates are estimated directly from the information in the birth records on a child's birth date, survivorship status, and age at death for children who died. This information is used to directly estimate the following five mortality rates:

- Neonatal mortality: the probability of dying within the first month of life;
- Post neonatal mortality: the difference between infant and neonatal mortality;
- Infant mortality: the probability of dying before the first birthday;
- Child mortality: the probability of dying between the first and the fifth birthday;
- Under-5 mortality: the probability of dying between birth and the fifth birthday.

All rates are expressed per 1,000 live births, except for child mortality, which is expressed per 1,000 children surviving to age 12 months.

Early childhood mortality rates					
Neonatal, postneonatal, infant, child, and under-5 mortality rates for five-year periods preceding the survey, Ghana 2014					
Mortality rates					
Years preceding the survey	Neonatal mortality (NN)	Postneonatal mortality (PNN)	Infant mortality	Child mortality	Under-5 mortality
0-4	29	13	41	19	60
5-9	33	21	54	28	81
10-14	30	22	52	37	87

Figure 1 - Early childhood mortality rates table

PRIORITIES AND MAIN OBJECTIVES

The priorities of the improvement of the selected facilities in KATH aims the following goals:

- Decrease index of maternal mortality according the MDG (Millennium Development Goals);
- Improvement of Staff and Management capacity through leadership and regular in-service training;
- Improvement of staff motivation;
- Ensure staff performance measurement;
- Strengthen health information system;
- Improvement of customer care.

ABOUT KOMFO ANOKYE TEACHING HOSPITAL (KATH)

Komfo Anokye Teaching Hospital (KATH) is in Kumasi, the regional capital of Ashanti Region with a total population of 5,406,209 as at 2016 (Ghana Statistical Service)). It is the second-largest hospital in Ghana, and the only tertiary health institution in the Ashanti Region.

The Komfo Anokye Teaching Hospital is strategically located close to the main trunk routes that pass through the Ashanti Region making it very accessible for both the inhabitants of the region and those living further away.

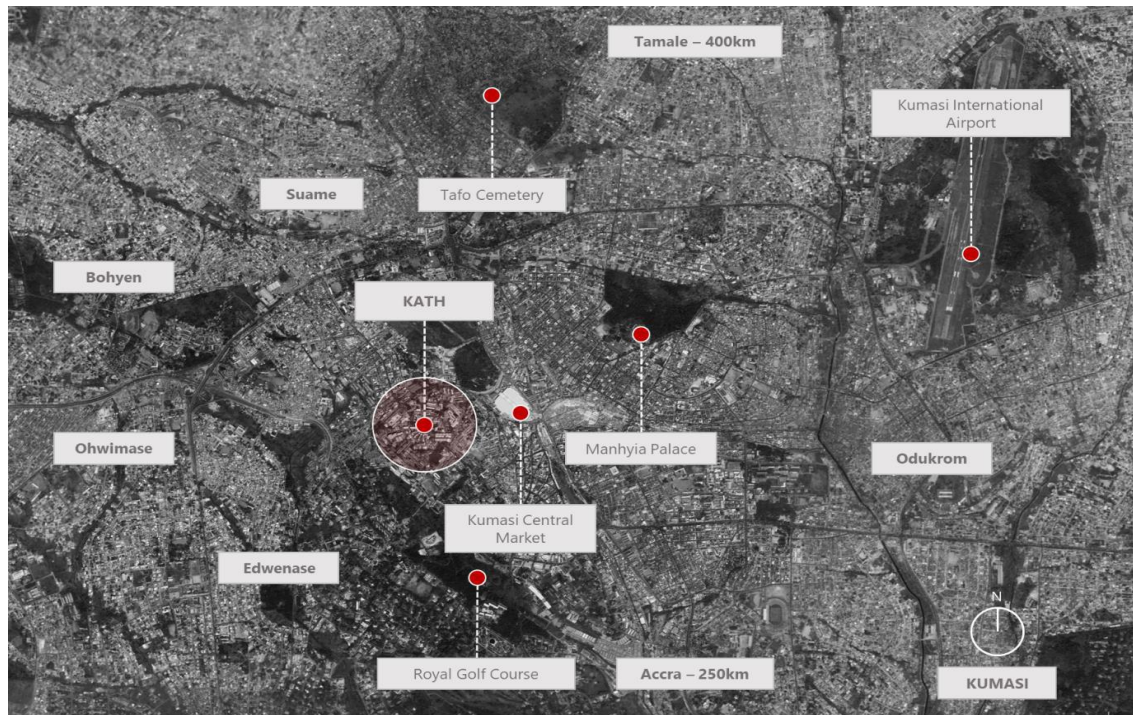


Figure 2 - KATH LOCATION IN KUMASI



Figure 3 KATH COMPLEX BOUNDARIES

KEY CONSIDERATIONS

In undertaking a project in a built environment, particularly one that will continue to operate during the construction period, it is important to consider the additional health & safety risks involved and the constraints imposed on the project that may involve different and more expensive construction methodology, including choice of technology, sequence of construction and possibly construction of temporary facilities in an enhanced enabling works package. The following are some of the initial considerations:

1. Health & Safety – Noting that this is an operational hospital, it is important to consider extra costs imposed by restricted access, noise generation, simultaneous operations, and noise and dust control.
2. Environmental Issues – Higher IFC rules and costs in respect of environmental protection, controls and monitoring.
3. Compatibility – Although training will be offered for new technology and equipment that staff may not be familiar with, it is crucial that specified mechanical, electrical and computer software is compatible with systems already in use at KATH.
4. Ensuring compatibility of new with existing systems and services sometimes may require modifications to standard products. ‘Non-standard’ items are generally more expensive.
5. SIMOPS – Ensuring a robust and comprehensive Simultaneous Operations Management Procedures (SIMOPS) to avoid or mitigate impact on hospital operations during the works is quite challenging and expensive. It may include the construction of temporary structures for relocation of staff, isolation and dust-free protection of certain occupied rooms, temporary safe access route etc.
6. Quality control – Ensuring that design detailing, materials specified and workmanship adhere to European standards unless there is an equivalent or higher standard within the country.
7. Specifications – While ensuring that specified equipment is suitable and appropriate, it is also important to ensure that as much as possible, there are companies and engineers in the country able to maintain the specified items at a reasonable cost.
8. Cost-in-Use - Robust construction and material specification to ensure longevity of the key components so as to reduce cost-in-use (maintenance cost) and thus save the MoH money over the medium to long term.
9. Appropriate level of infrastructure and ancillary support facility to each project. NOTE: The infrastructure is generally shared by other facilities within the KATH complex, except where it is limited to the area of the facility.

KATH BUILDING’S MODERNIZATION PROJECT – FULL SCOPE OF ACTIVITIES

After studying the current situation of the health system in Ghana and the Ashanti region, visiting the KATH complex and knowing the capacity of the local units, it is understood that there is an opportunity to assist the district in combating and mitigating problems related to neonatal mortality, post neonatal mortality, infant and maternal mortality, providing better care in the maternal sector, enhancing quality of care, providing a better hospitality and environment for the population, training for professionals for the health sector, increasing the quality and conditions of work atmosphere and, therefore, care and organization.

All this can be achieved by remodeling and modernizing unfinished buildings and performing occasional interventions by demolishing and constructing strategic buildings in the complex, bringing quality infrastructure, service atmosphere with up-to-date equipment and innovating the complex following international standards.

Below, scope of full interventions that could be done and its location within the KATH site complex.

A. Maternity and Children’s Block (rehabilitation and modernization);

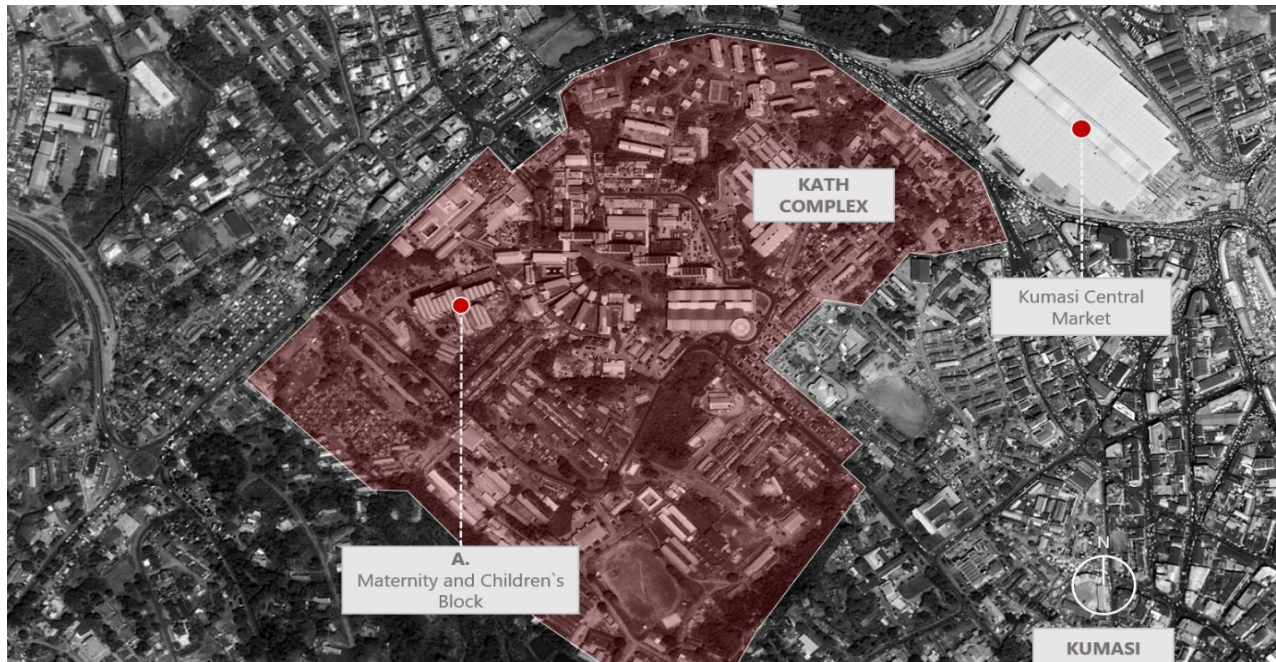


Figure 4 - PROPOSED INTERVENTIONS IN KATH SITE COMPLEX

KATH MATERNITY AND CHILDREN'S BLOCK

The construction of maternity and children's block at Komfo Anokye Teaching Hospital was awarded in 1976 as part of the extension to Komfo Anokye Teaching Hospital, Kumasi, by the Central Tender Board, Accra. The project was suspended in 1979.

In 1999, the project was reactivated and included in the Public Investment Programme of the Ministry of Health. The amount voted over the years could however not complete the project.

In 2004, the Ministry Of Health entered into negotiations with the Ministry Of Defense for part of The Uaddarra barracks land to be released for the expansion of the Maternity and Children's Block. The architectural and engineering services limited was then tasked after a series of discussions and meetings to modify the designs.

The project remained stopped. The construction of the structural framework of the building progressed whilst discussion on the spatial distribution and functional arrangement of the facilities continued.



Figure 5 - UNCOMPLETED MATERNITY AND CHILDREN'S BLOCK



Figure 6 - UNCOMPLETED MATERNITY AND CHILDREN'S BLOCK

BRIEF

The board and management board of KATH seeks to build a modern hospital fit for the 21st century. It wishes to create 1,000bed facility as is practical to achieve utilizing the partially constructed structure. For cost saving considerations, it seeks to do this with as little modification to the existing structure as possible while requiring that support and ancillary facilities are not compromised but be appropriate and proportional to the number of beds achieved in the proposed design.

Currently, the existing building is at an early stage of shell works, with about 80% of the concrete frame complete, but very limited M&E installation in evidence. The building structure is reinforced concrete structural framework with concrete block infill forming the external and internal walls. There are cast-in ducts for services, but no cable trunking installed. Generally, the structure appears sound with only a few hairline cracks and small areas of exposed reinforcement. A structural investigation will be required to determine whether there is deterioration in the structure. The roof has curved aluminum sheet panels.

KATH MATERNITY AND CHILDREN'S BLOCK PROJECT OBJECTIVE

The objectives of the project regarding the Maternity and children's Block are:

- Have a functional operating maternity that meets international standards of reference;
- To create a modern Maternity Center providing the most conducive environment, state-of-the-art techniques and specialists to facilitate a natural & gentle experience of Pregnancy & Birth;
- Increase maternal health services through an specialized European standards maternity, well equipped, proper designed, bringing innovation and modernization in the sector;
- Strengthen people-centered health systems and public health capacity, including preparedness and response capacity for dealing with emergencies;
- Create supportive environments and resilient communities.
- To have effective strategy to ensure sustainability in terms of maintenance and management of the facilities provided;

NOTE: Ghana's Building Regulations and standards are based on British standards, therefore travel distances, Means of Escape requirements, fire prevention and firefighting systems, building specifications for civil works, M&E and IT must be based on relevant British standards/equivalents.

The main scope of the work is;

- Conduct in situ tests to analyze the existing structural conditions of the facility;
- Demolish the majority of non-structural walls to match with the proposed project concept;
- Withdraw the roof panels
- Build new wall partitions to meet new concept idea;
- Install MEP infrastructures in the building;
- Install oxygen gas system in the maternity;
- Install centralized air condition system (pre-determined areas);
- Install Ventilation / Exhausting system (pre-determined areas)
- Install ventilated façade system with thermal insulation inside and outside
- Supply and install medical and non-medical equipment.
- Post-construction operations - 3 years post-maintenance programme for Medical equipment with training and technical assistance and a three years post warranty period for equipment.

BENEFITS FOR THE POPULATION

The main benefit is to have a comfortable environment in which the woman and the family remain together throughout the labor, preserving the privacy and security conditions for the pregnant woman and the child, without the need of relocation.

Some others benefits for the population are:

- Reduction of infant and maternal morbidity and mortality and increasing of life expectancy;

DESIGN GUIDANCE

Some of the key project requirements regarding the concept are:

1. There are 3 separate blocks forming the maternity building. There are two main departments of the maternity (Paediatrics, Obstetrics) and the Theatre area serves this two. Each block is to be the focus of one of the departments, there could be sharing of some facilities for the sake of creating efficiencies, but this has to be limited, as each department needs to be self-sufficient;
2. The new proposed concept shall aim to achieve as close to 1000 beds as possible, but in any case not less than 750 beds.
3. There must be a mix of general wards (up to 18 persons or more), and side wards from 2 to 6 persons sharing;
4. Provide ward space in accordance with KATH predetermined space standards (as per attached schematic sketches);
5. VIP-wards of 1 to 2-bed occupancy are to be placed on the top floors;
6. Provide minimum 40 Consulting Rooms and a similar number of Counselling Rooms. The average size is to be around 25m², depending on configuration and the availability of space. Note that doctors would often have a nurse and one or six medical students with them during the examination of patients (for training purposes);
7. Provide single occupancy offices for use by senior doctors and larger shared offices for other doctors, senior nurses and administrative staff;
8. Provide one meeting room on each floor;
9. Provide designated Intensive Care Rooms and Special Care Rooms;
10. The relationship between preparation, theatre and recovery (post-op) is crucial, the designer is to keep them close and on the same floor.
11. Provide a dispensary compartments on each floor of the building. A main central pharmacy is to be located on a lower floor accessible also to out-patients;
12. Provide a minimum of 10 compartmented and dedicated Delivery Rooms with average size that ranges from 20-25m²;

13. Provide sample collection points on each floor;
14. Provide dedicated Utility and Sluice Rooms, as would be required in modern hospital facility
15. Provide waiting areas spread and lounges on different blocks and different locations, as necessary. They are to be adjusted in size according to the anticipated patient numbers;
16. Provide "Body holding areas" on each floor, located as far as possible from the wards; Two in each floor, one in the Maternity wing and the other on the children's wing, with capability to receive two bodies.
17. Provide a designated wheelchair and trolley storage area near the Accident & Emergency entrance area.
18. Provide different categories and types of secure storage as may be required in a hospital. Dedicated storage areas shall exist in all of the floors.
19. Provide a kitchenette in every floor of the building to prepare fresh food and also act holding area for food supplied from elsewhere.
20. Within the wards flexibility is to be created to allow number of beds to be varied to suit the requirements of KATH and patients levels.
21. Provide a temporary lab/production area in the maternity and children's block.
22. Provide a VIP customer care service at the entrance for intramural service.

The designer is to present information in the best way that fully communicates and expresses the design intent, including layout drawings, schedules, illustrations, documentation and 3-dimensional representations, as necessary.

As a basic minimum, the client requires the following to be included in the package of information:

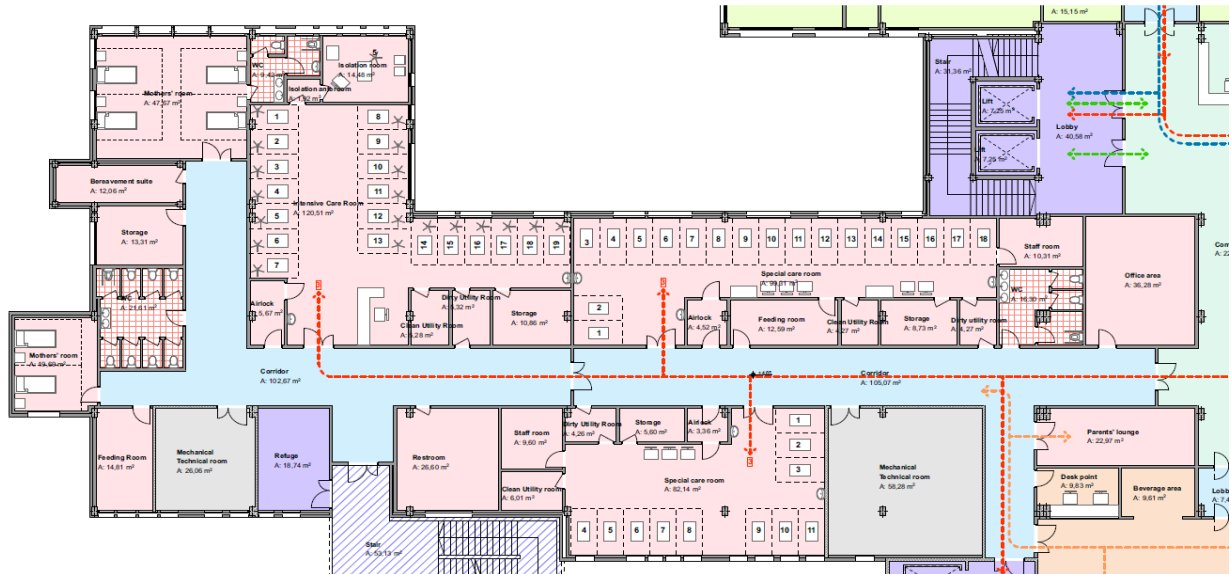
- The concept design must be presented as a colour coded drawing that easily and clearly shows various activity areas, including functionally related areas.
- Circulation flow diagrams are required that shows the flow of staff, patients and visitors to various departments. It is intended to show the efficiency of the design, closeness of related and interdependent activity areas and avoidance of conflict.

PROJECT CONCEPT



Figure 7 - PROPOSED ARCHITECTURE FOR MATERNITY AND CHILDREN'S BLOCK

THE NEONATAL UNIT



DELIVERY AND OBSTETRIC SURGERY UNIT AND MIDWIFERY-LED UNIT

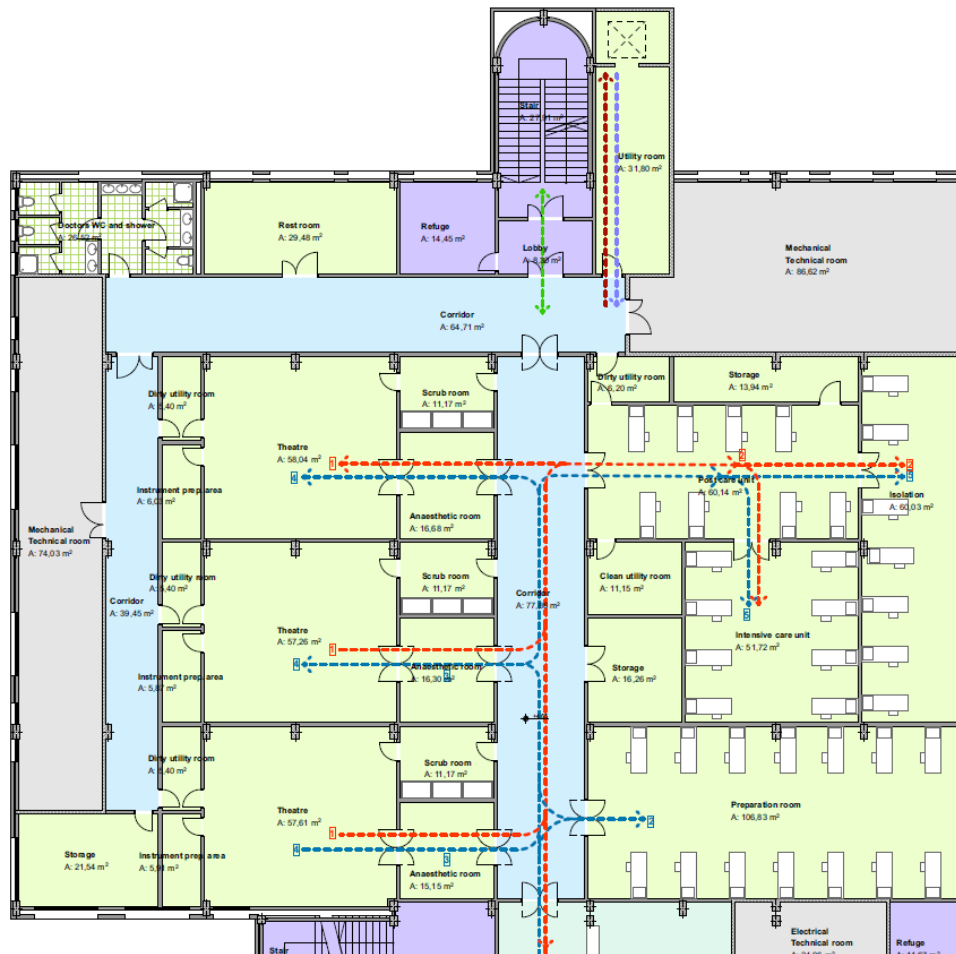


Figure 8 - DELIVERY AND OBSTETRIC SURGERY UNIT

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CIVIL WORKS

New buildings will be built in concrete with pillars and drop beams.

The foundation typology will be defined only after geological Investigation (deep, raft, spread).

Floors will be finished with a PVC foil in most areas, except wet areas which shall be covered with tiles.

As to false-ceilings, they will be in gypsum boards except where otherwise required for acoustic and/or hygienic reasons.

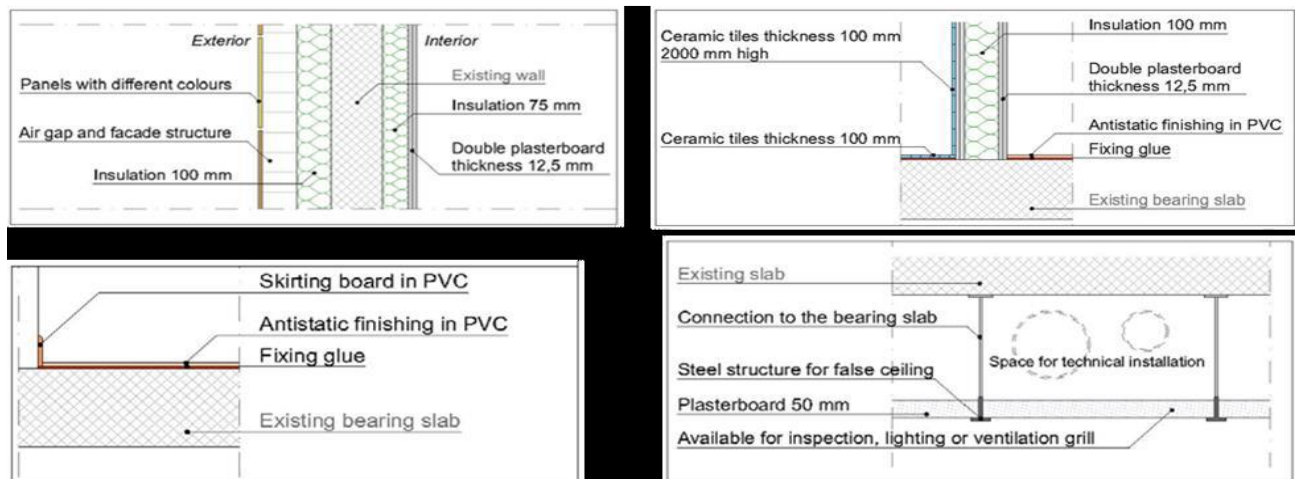


Figure 10 - PROPOSED FINISHES DESIGN

STANDARDS

From 2010 worldwide applied British Standards has been replaced or strongly upgraded by Euro code. For this reason, design will primarily follow Euro codes, with integration of BS or other recognized Standards (ACI, ASCE, UBC etc...) when needed.

CONSTRUCTION SCHEDULE

The estimated time of construction for the MODERNIZATION OF KATH MATERNITY & ASSOCIATED BUILDINGS is 30 months.

Find below, a preliminary chronogram of activities.

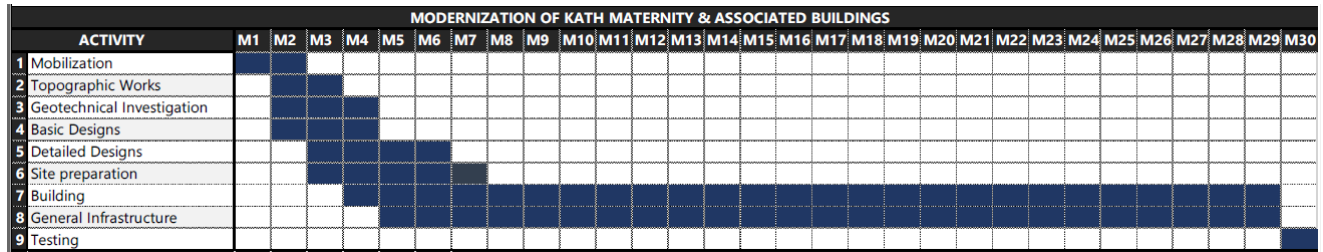


Figure 11 - CHRONOGRAM OF ACTIVITIES