ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT PROJECT REPORT

PROPOSED HOLO PLAZA HEALTH CENTRE

LOCATED ON PLOT Nº. KISUMU/KIT MIKAYI/ 3385 IN HOLO MARKET, KISUMU COUNTY

PROPONENT

Awuor Christine Yuko

T/A' Holo Plaza Health Centre

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Kisumu- Kenya

Tel:0731846260

LEAD EXPERT

DR. MOSES O. KOLA

(EIA/EA Eg. No. 2102)

P.O.BOX 3384-40100

KISUMU

DECLARATION

This project report has been prepared in accordance with NEMA regulations under the guidance and supervision of a registered Lead Expert. It meets statutory provisions stipulated in Environmental Management and Coordination (Amendment) Act 2015 and the Environmental Impact Assessment and Audit (Amendment) Regulations 2019.

REPORT TITLE: THE PROPOSED HEALTH CENTRE PLOT NO. KISUMU/KIT MIKAYI/3385 OFF KISUMU-BONDO ROAD, IN HOLO MARKET, KISUMU COUNTY

LEAD EXPERT: MOSES O. KOLA

(EIA/EA Expert Reg. No. 2102)

Signature……Date……..

For the proponent

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'T/A' Holo Plaza Health Centre

Mobile Phone Number: (+254731846260)

Signature: Date:

LIST OF ABBREVIATIONS

PPE:	Personal Protective Equipment
EMP:	Environmental Management Plan
NEAP:	National Environment Action Plan
EIA.	Environmental Impact Assessment
NEMA:	National Environment Management Authority
EMCA:	Environmental Management and Coordination Act
EA:	Environmental Audit
OSHA:	Occupational Safety and Health Act
NCA:	National Construction Authority
KIWASCO:	Kisumu County Water and Sanitation Company
KEBS:	Kenya Bureau of Standards
KFS:	Kenya Forest Services
KWS:	Kenya Wildlife Services

DEFINITION OF OPERATIONAL TERMS

Decommissioning: This is the permanent withdrawal from a site or closing down of a facility for restoration.

Developer/ Proponent: The person proposing or executing a project which is subjected to an EIA. In this report the "proponent" is Awuor Christine Yuko 'T/A' Holo Plaza Health Centre.

Environment: The total biophysical and social surrounding in which man, plants, and other animals live.

Environmental Audit (EA): The systematic, documented, periodic and objective evaluation of how well environmental organization, management and equipment are performing in conservation or preservation of the environment.

Environmental Impact Assessment (EIA): This is a systematic evaluation of environmental and social impacts of a proposed project in order to determine whether its activities conform to sound environmental management practices and to enhance its positive impacts while mitigating the negative ones.

Environmental Management Plan (EMP): Refers to all details of project activities, impacts, mitigation measure, time, schedule, costs, impact or activities including monitoring and environmental audit during implementation and decommissioning phase of a project.

Mitigation: Measures which are put in place to minimize negative aspects suffered by communities and individuals, whilst enhancing positive aspects of the project.

Project: Means any undertaking that may have an impact on the environment. In this report, the 'project" refers to the proposed construction of Holo Plaza Health Centre.

Scoping: This is the process of identifying the issues that are likely to be of most importance during the EIA process, by establishing the boundaries of processes and setting the basis for the analyses to be conducted at every stage of the EIA process.

Screening: This is the process of initial quick analysis of the possible environmental impacts of a project in order to make a decision as to whether to conduct a full assessment if the impacts are significant, or not to conduct the assessment in case no such impacts are present

Standards: Means the limit of discharge or emission established under the Act or under Regulations.

Treatment: When used in reference to waste management, it means, any method, technique or process designed to change the biological character or composition of healthcare waste so as to reduce or eliminate its potential for causing harm

Waste: Includes any matter whether liquid, solid, gaseous or radioactive, which is discharged or disposed into the environment in such a manner likely to cause an alteration of the environment.

EXECUTIVE SUMMARY

This project report has been prepared in compliance with the requirements of the Environmental Management and Coordination Act (1999). Sections 67 and 138 of the said Act requires all projects listed under the second schedule of the Act to undertake environmental impact assessments and submit the accompanying report to NEMA for approval and licensing before commencement of a project. The aim in doing this assessment is to identify potential positive and negative environmental impacts associated with a proposed project with a view to mitigating the negative environmental impacts that emanate from the construction and operation of the proposed development while at the same time enhancing the positive impacts.

Accordingly, Holo Plaza Health Centre, herein referred to as the proponent, consulted National Environment Management Authority (NEMA) registered expert to conduct an Environmental and Social Impact Assessment (EIA) study for the proposed project and to prepare a project report for submission to the Authority for its consideration. The proponent proposes to construct a Health Centre on Plot Number Kisumu/Kitmikayi/3385. The proposed project site is situated in Kolago 'A' area of Holo Market, Kisumu County. The site measures approximately 0.35 Hectares and is registered for agricultural use. However, the client had already done change of user and the change of user was approved by the County Government of Kisumu on September 2020. The building plans for the development had already been approved on September 2020. All approval was done as per the Physical Planning and Land Use Act 2019 and its regulations. The site is bordered by agricultural land and residential users. There is also a hotel facility south of the project site, while a community school lies north of the proposed development.

The proposed facility is designed to comprise a receiving bay, consultation and examination rooms, radiology section, accidents and emergencies section, an intensive care unit (ICU), laboratories, theatre rooms, men's and women's wards, maternity section, a cafeteria, and a parking lot.

The Health Centre will offer general medical services, for both in- and out-patients when complete. The services will range from maternity, radiology, accident and emergency to intensive care. These will be extended to the people of its immediate neighbourhood and the wider population of East Seme. The facility will be implemented in phases and is expected to occupy a total area 0.35 Ha.

when complete. It is projected to handle between 200 and 300 outpatients in the first phase, while the complete facility should handle up to 1,000 outpatients and 50 inpatients at any one given time. As already mentioned, the development will be implemented through phased construction, with the first phase expected to cost KSh. 30 million. The complete project is expected to cost about KSh. 100 million when complete. The facility will be constructed using the most appropriate materials and technology that conform not only to the standards stipulated by the Kenya Bureau of Standards (KEBS) and National Construction Authority but also to international best practices.

In carrying out the assessment, the EIA team of experts adopted a combination of methods. These methods mainly included ground survey and interviews with the neighbours and members of the local community. We also interviewed the project's proponent and other interested persons. In addition, we carried out reviews of existing literature on statutory provisions and the prevailing physical development policy as stipulated in the physical development plans of the locality. This ESIA project report therefore makes a deliberate effort to comply not only with the requirements of EMCA (1999) but also the physical development policies and legislations that guide spatial development in Kisumu County. The ESIA team paid particular attention to the results of the interviews with the members of the public—neighbours and members of the local community resident in Kolago 'A' in East Seme Ward. These interviews revealed that there was a great need for a medical facility of the proposed type in the area, thereby generating great public support for the proposed project. According to members of the local community, they are currently forced to travel either to the Kombewa Sub-County Hospital (11 km away) or to Port Florence Hospital, Otonglo (16 km away) in case of medical emergencies. While these distances might not seem great, accessibility is a major problem, especially at night when local public transport is not operational. The proposed facility, according to members of the local community, would also help decongest the Kombewa Sub-County Hospital and avoid unnecessary travel to Kisumu City in search of specialised medical care. The community also expressed optimism that the proposed development would create jobs for local youths both during the construction and operations of the facility. General security and accessibility within the locality would also improve as the facility would open up access roads and operate round the clock in a well-lit environment. These positive impacts notwithstanding, immediate neighbours expressed concerns about the possibility of improper liquid and solid waste disposal once the facility starts to operate. In order to assess these impacts, the ESIA team undertook a Cost-Benefit Analysis of the alternatives to the proposed

project, its site, the technologies and construction materials to be used. These facets of the proposed development were also analysed for their social acceptability, biophysical environmental impacts, and economic impacts. The design feasibility was also analysed to assess the impacts of non-action, alternative land-users and proposed development alternatives. By and large, the EIA team believes that these were genuine concerns that the project design needed to integrate by way of enhancing the positive impacts while mitigating the negative ones.

Table 1 below summarises the potential impacts that are expected from the project. Concurrently, the table also summarises the proposed mitigation measures against these impacts. An Environmental Management and Monitoring Plan (EMP), which ensures that environmental impacts are identified and mitigated during all phases of the proposed project is provided on page 46.

Table 1 Summary of potential environmental impacts and mitigation strategies

Environmental/social Impact	**Proposed Mitigation Measures**
Air pollution (dust)	▪ This is likely to occur mainly during the construction phase. Spray water on excavated areas. ▪ Site workers should be provided with face masks while on duty. ▪ Restrict unnecessary access to the site for non-essential staff ▪ Partner with the Public Health Department and the County Government to maintain high standards of hygiene in accordance with the legal provisions.
Noise pollution	▪ Surround the health centre with a perimeter wall of reasonable height in order to screen off activities within the facility away from neighbouring land uses. ▪ Construction works should be carried out only during day time. ▪ Workers should wear ear muffs if working in noisy areas ▪ Utilize appropriate hoarding material to screen off the construction site. ▪ Restrict the use of noisy equipment during construction. ▪ Construct a power house for the proposed stand-by power generator to reduce the amount of noise from it during use. Also install the low-noise generator type to minimise noise.
Ecological considerations (flora and fauna)	▪ Upon completion of construction, the proponent shall rehabilitate the land by planting ornamental plants and flowers on the disturbed areas.

	▪ Vegetation, especially mature trees, that do not interfere with the siting of the project will be left intact and integrated into the overall design.
Solid waste	▪ Construction debris should be collected and disposed of by a privately contracted waste collection company. ▪ Excavation waste shall be re-used or back filled as part of the landscape design. ▪ Solid waste from the facility shall be collected by either a privately contracted waste collection company or the County Government, as may be most appropriate ▪ The proponent shall ensure the construction of a central waste collection facility with a bulk storage capacity ▪ During operation phase the proponent shall ensure that waste is collected and disposed of appropriately and regularly, in accordance with the Kisumu County (by-) laws and the Public Health Act.
Medical waste	▪ The proponent shall liaise with the Public Health Department and the County Government of Kisumu to collect and dispose of medical waste safely. An on-site incinerator shall be installed to facilitate this process.
Effluent disposal	▪ The proponent shall ensure general cleanliness of the facility at all times. ▪ The proponent shall construct a septic tank to collect the broken down effluent and a soak pit for draining off harmless fluids.
Waste water	▪ The proponent shall construct well-maintained drains to effectively manage liquids used for disinfection. ▪ There shall be constructed well-maintained sanitary facilities for workers and visitors to the site during the construction phase. ▪ Drainage channels should be installed in all areas that generate or receive surface water such as along the building block-edges of the roof. ▪ Paving of the sidewalks, driveways and other open area shall be done using pervious materials to encourage percolation and ground recharge, thus reducing water runoff volumes. Landscaped grass lawns as part of landscape design shall also aid in limiting surface runoff on and off-site.

Fire	▪ The proponent shall install lightning arrestors on all buildings on site. ▪ The proponent shall clearly provide a clearly-marked 'ASSEMBLY POINT' at an appropriate outdoor space within the site. ▪ The proponent shall clearly mark the exit routes within the buildings 'FIRE EXIT' to help guide people outside the building in case of a fire outbreak. ▪ Firefighting drills shall be carried out regularly to sensitise both staff, patients and visitors to the facility. ▪ The management shall adopt an appropriate firefighting emergency response plan. ▪ The developer shall install firefighting equipment at strategic places and ensure that they are regularly inspected, serviced, and maintained in good working condition. ▪ The Management shall ensure that workers are well trained on basic firefighting skills. ▪ Fire hazard signs and directions to emergency exits, route to follow and assembly point in case of any fire incidence shall be well displayed and posted at appropriate locations within the buildings. ▪ The developer shall Insulate and regularly maintain all electricity cables and fittings to ensure no contact with water.
Effects on human health	▪ Keep all unused areas on the project site free from bushes to eliminate mosquito breeding grounds and hiding areas for vermin.
Occupational health and safety	▪ All workers shall be provided with full protective gear. These shall include working boots, overalls, helmets, goggles, earmuffs, masks and gloves. ▪ Workers shall wear protective gear while on duty. ▪ Workers shall also wear protective gear to avoid infections from formaldehyde, disinfectants, fixatives and solvents during the examination and general treating and cleaning processes within the facility. ▪ Construction crew at the site will be sensitized on social issues such as alcohol and drug abuse.

	▪ A first aid kit should be provided within the site at all times during the construction phase. This should be fully equipped at all times and should be managed by qualified personnel. ▪ The contractor should comply with the Occupational Health and Safety Act (OSHA), 2007, as well as ordinances, regulations and union agreements. ▪ Food handlers preparing food to the workers at the site should be controlled and monitored to ensure that food is hygienically prepared. ▪ Equip the offices with adjustable seats to ensure good sitting posture. ▪ Design all the rooms and working areas to have sufficient natural lighting where this is practically achievable. ▪ Equip the facility with adjustable handling aids such as trolleys to protect staff from developing musculoskeletal disorders.
Security	▪ Provide security guards and facilities during construction and operational phases. ▪ Control of secondary businesses that might compromise security on site and in the surrounding. ▪ The developer shall ensure adequate lighting and an alarm system is installed at strategic points within and around the site.
Project integrity / design	▪ Provide a sign board depicting particulars of all the consultants involved.

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1. INTRODUCTION

1.1. Background to the proposed project

This ESIA project report has been prepared to aid the National Environment Management Authority (NEMA) and other concerned agencies in making informed decisions with regard to the approval of the proposed development of a Health Centre located on Plot No. Kisumu/Kitmikayi/3385. The subject parcel of land is located in Kolago 'A' Village of East Seme Ward, in Holo Market, within Kisumu County. The proponent, Holo Plaza Health Centre, would like to put up a Health Centre to cater for the increasing demand for healthcare services in Seme Sub-County in general and the residents of East Seme Ward and Holo Market in particular.

The preparation of this report is done in compliance with the requirements of the Environment Management and Coordination Act (EMCA of 1999). EMCA is an Act of Parliament that provides for the establishment of an appropriate legal and institutional framework for the management of the environment and for matters connected with and incidental thereto. The Act recognises that every person in Kenya is entitled to a clean and healthy environment and that every person has a duty to protect and enhance the environment. In an effort to safeguard this right, Part VI of the Act (Section 58 – 67) guides the preparation of Environmental and Social Impact Assessment and approvals, ahead of the commencement of proposed development.

Section 58 of the EMCA Act particularly stipulates that a proponent of a project shall submit a project report in the prescribed form, providing the prescribed information to the National Environment Management Authority before financing, commencing, proceeding with, carrying out, executing or conducting or causing to be financed, commenced, proceeded with, carried out, executed or conducted by another person, any development specified in the Second Schedule of the Act. The Authority may direct that an EIA study be carried out where it is convinced that the proposed development may or is likely to have or will have significant environmental impacts. This condition notwithstanding, Section 10 (2) and (3) of the Environmental (Impact Assessment and Audit) Regulations, 2003 allows the Authority to issue a license to a proposed project if the Authority deems the project report to have adequately disclosed mitigation measures to the likely environmental impacts therefrom. Section 58 (7) of the Act, together with the Environmental (Impact Assessment and Audit) Regulations, 2003 further underscore the need to conduct

environmental impact assessment according to the regulations, guidelines and procedures that are stipulated in the Act.

In this particular application, the proponent proposes to put up a comprehensive Health Centre that will comprise a receiving bay, consultation and examination rooms, radiology section, accidents and emergencies section, an intensive care unit (ICU), laboratories, theatre rooms, men's and women's wards, maternity section, a cafeteria, and a parking lot. Table 1-1 summarises the proposed project.

Table 1- 1 Summary of the proposed project

ITEM	**DESCRIPTION**
Project name	Proposed Holo Plaza Health Centre
Property owner	Awuor Christine Yuko 'T/A' Holo Plaza Health Centre P.o Box 19280-4023, KISUMU, KENYA
PIN NUMBER	A002517613Z
Contac person	David Ndinya Yuko
Contacts	0722846260, 0731846260, dnyuko@yahoo.com
Nature of Development	A Health Centre
Objective	To develop a Health Centre for the provision of basic medical services.
Location	Off Kisumu – Bondo Road in Kolago 'A' Village, Holo Market, Seme Sub-County, Kisumu County (coordinates: -0.098830, 34.592328)
Plot NO.	**KISUMU/KIT MIKAYI/ 3385**
Plot size	0.35 Ha.
Nature of land ownership	Freehold
Estimated Project Cost	KSh. 105,951,089.40
Neighbourhood	A mix of agricultural and residential land uses

1.2. Rationale for the Environmental Impact Assessment process

1.2.1. Purpose of the Environmental and Social Impact Assessment

The proposed development is classified under Comprehensive Health Centre, category level 3B according to Kenya Medical Practitioners and Dentist Council(KMPDC). In line with Legal Notice No. 31 of 1999 which amended the Second Schedule of the Environmental Management and Coordination Act, health centers, along with dispensaries and clinics, are classified as low-risk projects. Similarly, pursuant to Environmental (Impact Assessment and Audit) (Amendment) Regulations, 2019 (Legal Notice No. 32 of 1999), **every proponent undertaking a low-risk project must submit to NEMA a summary project report of the likely environmental effects of the proposed project.**

The proposed project therefore requires an ESIA to be carried out before its implementation in order to identify the potential environmental impacts that it is likely to pose, and to mitigate these impacts. The impacts must not necessarily only be negative ones; positive impacts are also envisaged from the project. An Environmental Impact Assessment is supposed to identify both positive and negative impacts and addresses mitigation options for the potential impacts. It therefore helps in midwifing the optimal decisions that ensure that a proposed project delivers the most socio-economic benefits at the least environmental cost.

1.2.2. Objectives of the Environmental and Social Impact Assessment

The objectives of this Environmental and Social Impact Assessment are five-fold:

i) To comply with the provisions of the Environmental Management and Coordination Act, 1999 and its relevant subsidiary regulations;
ii) To analyse the baseline biophysical and social environment that define the project site and location;
iii) To identify and assess both the negative and positive environmental impacts that are likely to emanate from the proposed project;
iv) To identify, formulate and plan for measures that would enhance the positive impacts identified impacts identified in '*iii'* above while at the same time mitigating the negative ones;
v) To document the results of the undertakings described in '*i*' to '*iv*' above in a report that helps all stakeholders involved in decision making.

1.2.3. Terms of Reference for the Environmental and Social Impact Assessment

The Terms of Reference for the current Environmental and Social Impact Assessment was developed after an initial scoping exercise and consultation with the proponent. These processes were guided by the Environmental (Impact Assessment and Audit) (Amendment) Regulations, 2019. By and large, the TORs were developed to aid in the achievement of the overall objective of the ESIA process, which is to achieve sustainable development and to safeguard the right of every individual to a clean environment. The TORs comprised the following:

i. Document and analyse the environmental baseline conditions of the proposed project site and location;
ii. Describe the proposed project in terms of location, design, operations and all likely environmental impacts in all phases;
iii. Carry out a detailed description of the proposed project in terms of its location, design, activities involved in its construction and operation, materials to be used during construction and operations, products and by-products of its operations, and waste generation and disposal methods;
iv. Stakeholder consultation and engagement to understand their concerns, fears, and expectations with regard to the proposed project. These stakeholders included leaders, neighbours and residents in the neighbourhood of the proposed project;
v. Review the all the legislations and regulations that are relevant to the proposed project;
vi. Describe the project alternatives with regards to its siting, design, technologies, processes;
vii. Document and analyse the key environmental, health, and safety concerns paying attention to both their positive and negative impacts on the biophysical, social and economic environment;
viii. Carry out an impact analysis and recommend mitigation measures in the case of the negative impacts and enhancement measures in the case of the positive impacts of the proposed project. This analysis was carried out for all the phases of the proposed project;
ix. Develop a comprehensive environmental management and monitoring plans that cover all the phases of the proposed project. These plans form the basis upon which all mitigation and enhancement measures will be carried out. They as well identify the responsible parties for the implementation of the mitigation and enhancement measures that are proposed in

this study. Further the plans specify the parameters that are to be monitored, the frequency of monitoring, the performance indicators, and an estimate of the cost associated with implementing the recommendations; and

x. Generate a comprehensive ESIA report filled in an EIA study report submission form, submitted in both soft and hard copies at a fee to the relevant authority.

1.2.4. Assessment methodology

The ESIA process followed the guidelines stipulated in the Third Schedule of the Environmental (Impact Assessment and Audit) Regulations, 2003. These were further buttresses by the NEMA Guidelines on the Conduct of Public Consultations for EIA, EA and SEA During the Period of the Corona Virus (Covid-19) Pandemic. The assessment was carried in the month of July 2020 and review of the assessment done July 2022 due to change in site status. The assessment and review included the following activities:

i) A physical inspection of the site to document the existing facilities therein and to understand the project activities, the possible areas of impact on the natural and man-made environment, and the sources of these impacts, as well as to figure out the possible mitigation and enhancement measures to these impacts;
ii) Environmental screening to determine the most critical issues that the assessment needed to focus on;
iii) Stakeholder consultation and engagement. These stakeholders included immediate neighbours, local community leaders and local residents that operated or lived in the vicinity of the proposed project;
iv) Prediction and mitigation studies;
v) Desktop studies to understand the social, cultural, biophysical setting of the project area; the project design; project materials; the policy and legislative frameworks that guide the physical development of the project location as well as environmental development of the area.
vi) Re-visit to the site to take note of changes in site Environment and the surroundings
vii) Documentation of the environmental and social changes.

The above procedures culminated in a project report that documents all the stages of the ESIA process. The gist of the assessment is the Environmental Management Plan and Environmental Monitoring and Auditing elucidated in Section 9 of this Report.

1.2.5. Limitations

The main limitation during this study ware those related to restrictions on public gatherings and other directives to contain the spread of the Corona virus, which limited the amount of time field-based consultations with stakeholders could take. Nevertheless, the study team ensured participants kept appropriate social distancing and wore face masts during the consultations. We also limited the consultations to one hour.

2. BASELINE INFORMATION OF THE PROPOSED PROJECT AREA

2.1. Introduction

This Chapter describes the physical, biological and socio-economic environment of the proposed project area and its neighbourhood. It is organised in three sections that focus on describing the physical environment, the biological environment and finally the socio-economic environment. In doing presenting this baseline situation, the chapter provides the baseline information that is to be used to predict the potential impacts of the proposed project.

2.2. Physical Environment

2.2.1. Geographical location

The proposed project is located in approximately 140m off Kisumu – Bondo road in Kolago 'A' Village of East Seme Ward, Seme Sub-County, Kisumu County. The general area lies approximately 34°35'32.46" (34.592328) East of the Prime Meridian and 0°5'55.93"(-0.098830) south of the Equator and within the area of jurisdiction on the County Government of Kisumu. The average altitude of the proposed project site is about 1,264 m above sea level.

2.2.2. Climate

The climate of the area identifies with that of the larger Kisumu County. The climate of the County can be classified as tropical climate with generally warm with minimal monthly variation in temperatures between 23^0C and 33^0C throughout the year. The rainfall is determined by a modified equatorial climate characterized by long rains (March to May) and short rains (September to November). The average annual rainfall varies from 1000-1800mm during the long rains and 450-600mm during the short rains. This amount of rainfall is good for aquifer recharge. The implication for the proposed development is that adequate care must be taken to avoid contaminating waters from the aquifer.

The above climatic conditions make the area suitable for and compatible with human habitation and other related activities. The proposed development can be implemented in the area without any need to artificially manipulate the climatic conditions to suit normal human habitation and use.

2.2.3. Air quality and noise levels

The neighbourhood of the proposed project enjoys a good quality of ambient air that is free from smoke, dust, gases, fumes, aerosols, and other odorous substances. However, the changing land-use pattern in the area means that deliberate efforts have to be put in place in future to maintain this ambience. By and large, this change involves human settlement activities, which include not only residential development but also its attendant activities. For instance, a hotel has been developed on the plot that neighbours the subject plot to the south. This hotel operations increases the volume of vehicles in the area – with the attendant increase in air pollution. It should be recalled that emissions from vehicles constitutes one of the biggest emitters of particulate matter, carbon dioxide and other gases that compromise the air quality. The proposed development will add to these factors that are likely to compromise the air quality of the area if not well mitigated.

2.2.4. Soils, geology and land formation

Soils around Holo area are is within the larger Seme is dominated by lake sediments, commonly sand and clay soils The area is averagely sloping about 7.8% with vegetation, which helps prevent soil erosion and loss of soil nutrients, while other areas have over-hanging huge granite rocks. The proposed project must therefore make deliberate effort to avoid exposing this soil to the agents of erosion. The site is characterised with rocks and murram soil type. The Lake Victoria basin has been forming within Precambrian basement under the tensional tectonics of the Kavirondo Rift since the Miocene age. Thick piles of Quaternary fluviatile and lake deposits infill the basin area and they are covered with black-cotton soil. This rock type weathers to form soils that are good for agriculture as attested by the rich soils already described in the previous paragraph. There is therefore a need to strike a balance between urban development that is currently coming up in the project area as Holo Market expands, and peasant agriculture that still constitutes the economic mainstay of the local community.

2.2.5. Water resources and water quality

In general, the Lake Victoria basin receives high amount of precipitation throughout the year. The project location is no exemption in this regard. The combination of this high amount of rainfall and good soils that retain the rain waters means that there is a high potential for underground water. On the other hand, surface water potential is fairly adequate. There is a spring and river flowing to the west of the proposed site from which villagers draw their water for domestic use. To meet the

needs of the proposed development, the proponent will sink a large capacity borehole (itself subject to a separate EIA process). It is proposed that provisions be made to avail part of this water to the local community at a nominal fee as part of Holo Plaza Health Centre's corporate social responsibility.

2.2.6. Site condition

Currently as at June 2022, the proponent had started developing the land. The development had gone up to first floor. It also has building materials, temporary structures housing site caretaker, store for materials, site office and Live fence with a gate.

Figure 2- 1: Current Development on site

2.3. Biological environment

Vegetation cover provides significant environmental goods and services such as preventing soil erosion, carbon sequestration and climate regulation and is a habitat for birds and other fauna in the project area and its surroundings. Hence, clearance of the vegetation would lead to the loss of these benefits and creation of loose soils that are susceptible to erosion and potentially contribute to sedimentation of the river and wetland west of the project site. Nevertheless, there is currently not much vegetation cover on the project site. Thus, biologically, the vegetation present in the area is unlikely to be severely affected. The terrestrial vegetation cover is comprised of grass and a few tree species. The later include *Mangifera indica, Eryobotria japonica, Markhamia lutea, Pinus* sp, *Cupressus lusitanica, Bischofia javonica, Spathodea nilotica, Croton megalocarpus, Persea*

Americana, and *Eucalyptus spp*. Shrubs that include *Lantana camara*, *Solanum incanum*, and *Tethonia diversifolia* are also to be found in the area. The few mature trees on site will be accommodate in the design to minimize their felling. The soil should be compacted and the appropriate vegetation planted to limit chances of erosion and silting of the water sources, which could ultimately contribute to flooding downstream.

The above vegetation is interspersed with urban development activities that have characterised the project area in the recent past as Holo Market expands, especially along the Kisian-Bondo Road. In many homesteads surrounding the project site, households have grown the above trees and use them as shade, fencing and boundary demarcation, fruit tree, timber, and also as source of fuel. **Error! Reference source not found.** shows some of the trees to be found within the location of t he proposed project site. Increasing urbanisation has reduced the natural habitat for wildlife. Consequently, the population of animals is quite insignificant in the area. Nevertheless, the site is still a habitat to micro-organisms, insects and occasional birds.

Figure 2- 2: Some types of trees within the project location

2.4. Socio-economic environment

2.4.1. Population

Holo Market has generally experienced a high population growth especially under the new constitutional dispensation and given its commercial and administrative function within Kisumu County. As the Market center expands, the bulk of the population has been absorbed by the peri-urban areas, which are experiencing rapid conversion of land use from agriculture to urban uses. Although the immediate area surrounding the proposed project site is not densely populated, this density is likely to increase if the prevailing development conditions prevail. A visual

interpretation of the aerial photo of the area estimates that the immediate neighbourhood of the project location currently has no less than 500 households. This above population presents both a demand for the services of the proposed development and a supply of labour that will be needed during its development and operation.

2.4,2 Land use patterns

Land in most parts of this area is used majorly for settlement and agricultural activities. Although the area is formally agricultural, it has witnessed land use conversion from agriculture to urban development over the recent years as the nucleus of Holo Market expands along the length of Kisian-Bondo Road. Immediately to the north of the site is a school development, while to the south is a hotel. About one 1km from the site is a water bottling plant. These changing trends in land use call for the need to put the area under controlled land use regime.

The current comprehensive urban development policy for Holo Market is spelt in the Kisumu County Spatial Development Plan currently under preparation. The draft plan recognises the need to revitalise the nucleus of Holo Market by stimulating growth there. The proposed project offers one way of stimulating this growth in the periphery through activities that complement the existing residential developments there.

The plan also envisages improved quality of life for the residents of Kisumu County. The plan recognises that Kisumu is currently struggling with issues of weak social cohesion and environmental sustainability, social inequality, crime, and environmental degradation. Deliberate efforts are being to be made to address these challenges. The proposed project will contribute a part to finding the solutions sought under this objective by bringing medical service closer to the people. The facility will also create the much-needed jobs in the area during its construction and subsequent operations.

2.4.2. Agriculture

The area of the project location is mainly under subsistence farming where peasant agriculture is practiced. The crops grown are mostly, maize, beans, cassava, bananas, and vegetables. Livestock like cattle, goats, sheep and poultry are also kept. Farmers here also practise agroforestry as a way of conserving their soil by preventing soil erosion.

2.4.3. Business activities and employment in the area

The area is close to the Holo Market, making it an easy node for lower order goods and services so residents do not necessarily have to travel to Kisumu to obtain. The Market Centre is small commercial node that offers a range of these services. These services include retail kiosks, salons, water vending, motor vehicle garages, music stores, transport services among others. These enterprises provide employment opportunities to many residents in the area.

Physical and social infrastructure

The area is well connected with electricity and mobile communication networks are all excellent. There is no piped water supply that is connected to the site, but rather a 60 feet deep borehole that had been sunk by the initial proprietor of the parcel of land. A higher capacity bore hole will be developed later as a source of water supply. The area is easily accessible from the main KIsian-Bondo Road. The nearest hospital to this area is the Kombewa Sub-County Hospital, located in Kombewa Township. Solid waste in the area is mostly burnt while the organic type is reused or recycled. Most of the homesteads are fenced with live fences.

Figure 2- 3: Accessibility to Kisian- Bondo road, electric power connection in the area

3. METHODOLOGY

This Environmental Impact Assessment project report has been prepared through a multidisciplinary process that involved multiple approaches to data acquisition and analysis of the same. By and large, this process included consultation with the proponent, transect walk through the area, public participation and consultation, as well as reference to secondary materials.

All these approaches aimed to understand the proposed project, its design, the environment in which it was to be implemented and the views of the locals regarding the project. This chapter details the use of these methods.

i) Preliminary meeting

The whole process started with a preliminary meeting between the proponent, a medical doctor (cardiologist), a social development/disaster management expert, a physical planner and the Environmental Impact Assessment expert. This meeting was instrumental in establishing the need for the EIA together with the procedures to follow, the responsibilities, the logistics, and the timeframe. The Terms of Reference for the exercise was also developed during this meeting.

ii) Questionnaires

The EIA team developed a questionnaire, which aimed to capture the opinions of the local residents regarding the proposed project. This questionnaire specifically sought to investigate the level of understanding of the locals of the possible socio-economic and environmental impacts of the proposed project. Besides investigating their understanding of the impacts of the project, the tool also sought their opinions as to how these impacts could be mitigated if they were negative and how they could be enhanced in case they were positive ones. Appendix 2 gives a copy of this questionnaire. The questionnaires were administered randomly on the locals to seek the opinions explained earlier. The responses to the questions contained in the questionnaires were recorded by the interviewers.

iii) Field observation

Objective field observation was undertaken to appreciate the physical characteristic of the site of the proposed project and that of its neighbourhood. These characteristics included the land use of the area, infrastructure and service availability, development patterns, economic activities,

vegetation cover, and the density of development among other physical characteristics. The outcome of this observation was documented through photography. This outcome has been used in various sections of this report to buttress the message contained in those sections.

iv) Reference to published materials

The ESIA process also consulted various written materials in order to understand the project area within the context of Holo Market and sometimes even the County as a whole. In addition, relevant government development policies and statutes were also consulted to help the study understand the baseline conditions that would later help in the impact studies.

v) Impact identification and evaluation

Data collected through community consultations, field observations, discussions with the proponent, the physical planner and a medical doctor enabled the study to identify the possible impacts of the proposed development. These impacts were then discussed by the EIA team and the proponent. It was agreed that the report should propose mitigation measures for all the impacts in order to enable the facility to be set up to the highest standards. Besides, the impacts identified were not many. Neither were they adjudged quite adverse, thus necessitating much need to prioritise them and only focus on the most urgent ones.

vi) Draft report preparation

A draft report was prepared, which was then discussed with the proponent before it was finally submitted to the National Environment Management Authority for consideration as stipulated by the EMCA Act of 1999.

vii) Final report preparation and submission for consideration

The final Report was then prepared and presented to the proponent for endorsement before it was submitted to NEMA for consideration. The report has been submitted though the prescribed form and with all the materials stipulated therein.

4. DESCRIPTION OF THE PROPOSED PROJECT

4.1. Projects design and components

The proposed project involves the development of a Health Centre, which will involve the excavation of the compound on which the building which will house the main activities will be erected. Figure 2- 4 illustrates the functional allocation of the rooms in the health centre building. By and large, the rooms in the building will be allocated to include the following:

a) The whole building will be divided into three wings, namely;
   i. Wing A
   ii. Wing B and;
   iii. Wing C

The plinth of the building will be U-shaped, with wing 'A' occupying the northern stretch of the site while wing 'C' will occupy the southern stretch of the site, with wing 'B' situated in between the two stretches.

Table 4- 1 Functional allocation of the rooms in the health centre building.

	Wing A	**Wing B**	**Wing C**
Ground floor	• Waiting lounge • Doctors' private parking lot • Pharmacy • Drug store • Laboratory • Consultation room • Radiology section consisting of; - A CT scanner room, control room - MRI room and; - Radiologist's office.	• Accidents & emergencies section consisting of; - Reception & information desk - Nursing station - Isolation cubicle - Blood bank & store - Examination room and; - Treatment room • General parking lot	• Parking lot
First floor	• Radiology section consisting of;	• ICU section consisting of; - Nursing station	• Cafeteria section consisting of;

	- Reception - X-Ray screening room - MRI scanning room - CT scanner - Theatre - Server room - Two Control rooms - Radiologist's office - Ultra sound room and; - Work room	- Three isolation rooms - Twelve Cubicles - Monitoring room - Central oxygen suction room - Resuscitation cubicle	- Open kitchen - Dining area - Pantry - Cleaners' store and; - Men's and ladies' restrooms
Second floor	• Consultation and examination rooms • Waiting bay and; • A theatre	• ICU section consisting of; - Nursing station - Three isolation rooms - Twelve Cubicles - Monitoring room - Central oxygen suction room - Resuscitation cubicle	• Training halls • Men and ladies restrooms and; • Cleaners' store
Third floor	• Women's ward consisting of; - Nurse station - Examination room - Utility room - Restrooms - Laundry room - Wards and; - Maternity room	• New born babies section • Restrooms	• Training halls • Men's and ladies' restrooms and; • Cleaners' store
Fourth floor	• Men's ward consisting of; - Nurse station - Examination room - Utility room	• Private wards	• Roof top

	- Restrooms - Laundry room - Wards and; • Maternity room		

The proponent will liaise with the Public Health Department to dislodge the septic tank and dispose of its waste properly. There will be a perimeter wall to separate the compound from its neighbours.

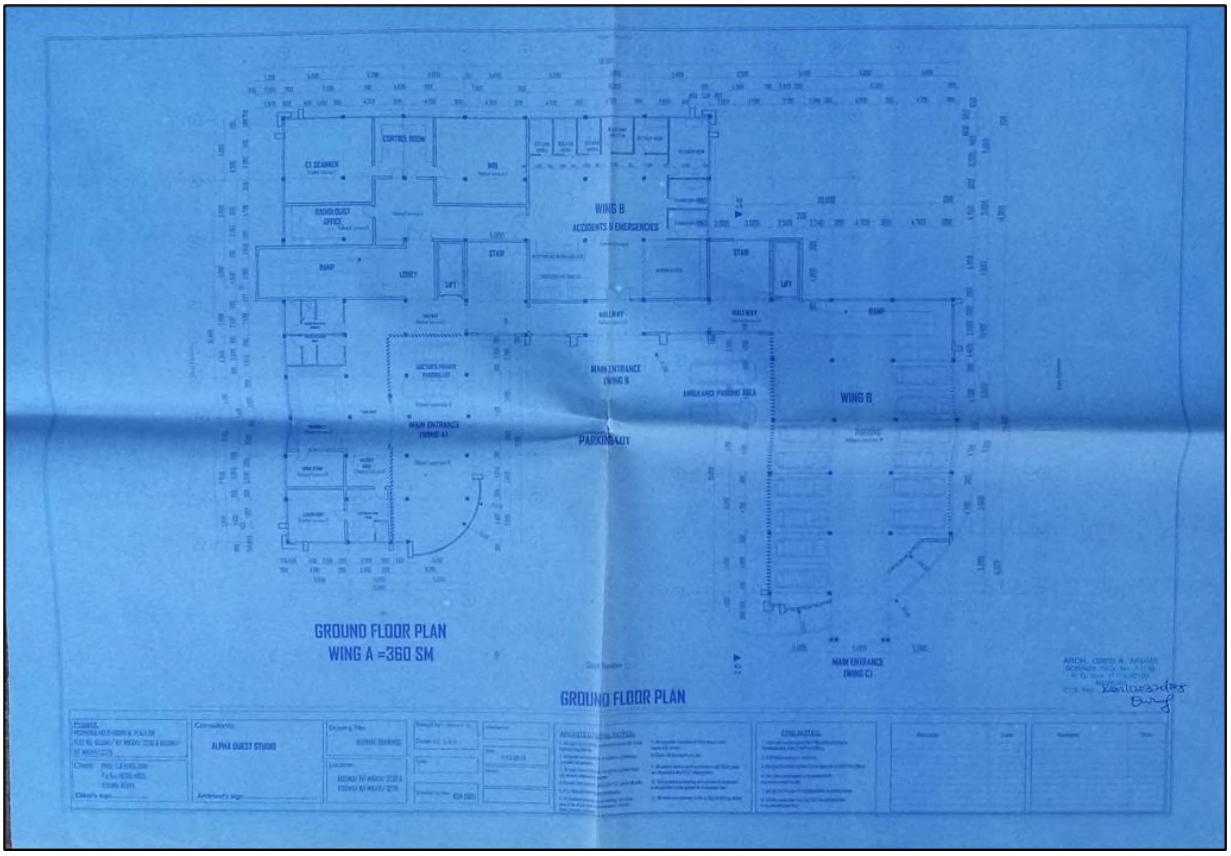

Figure 2- 4: Copy of architectural plan of space allocation in ground floor of the main building.

The floor of the building will comprise of terrazzo floor finish to maximize grip during mobility within the building. All the external walls will be of neatly keyed stones, while the partitioning walls will be plastered and painted on both sides to proponent's preference. The roof will comprise of profiled IT5 roofing sheets while some sections will have roof slabs. The ramps will be gentle enough for comfortable ascending and descending either by foot or on wheelchair or a stretcher.

Other utilities and services that will serve the proposed project are:

a) A rainwater harvesting system to act as back up for the borehole water.
b) A perimeter wall with lockable gates to ensure privacy and security is enhanced
c) A backup generator for electricity generation in case of power outages
d) Solid wastes will be collected and disposed safely in liaison with the Public Health Department. Ultimately, the proponent will construct an incinerator to manage waste that cannot be disposed of together with the other normal municipal waste
e) Landscaping will be done once necessary construction is over

4.2. Description of the proposed project activities

The proposed project will have three major phases upon approval and licencing. These phases are: construction, operation, and decommissioning. The Proponent is advised not to continue with any construction works relating to the proposed project until the current report is reviewed and the EIA license issued. A summary of the main activities under each phase is shown in Table 2.

Table 2: Summary of main activities in each phase

Phase	**Main activities**
Construction	• Procurement of construction materials from approved dealers • Storage of construction materials • Construction labour force of both skilled and non-skilled workers be on site • Required kinds of works be done by registered experts such as: - Masonry, concrete work and related works - Structural steel works - Electrical work - Landscaping • Debris and excavated materials will be dumped on sites approved by council engineer.
Operation	• Commissioning of the proposed project as a Health Centre • Admission, treating and discharging of patients • Referring of patients with acute cases • General repairs and maintenance • Health, hygiene, safety and environmental management and monitoring
Decommissioning	• Demolition or change of use • Dismantling of equipment and fixtures • Rehabilitation and/or restoration

4.3. Technology and machines to be used

The contractor will employ modern building technologies during the construction works with tools such as: concrete mixers, power vibrators, welding machines, and terrazzo-polishers as well as hand tools.

4.4. Construction material input

The building materials to be used at the site have to conform to KEBS standards for quality. A store will have to be put up at the site to keep materials that can easily be destroyed by rain or sunlight and are vulnerable to theft. Handling of all hazardous chemicals will be done in accordance with the manufacturers' material safety data sheets. Sourcing of the building materials depend on the contractual agreement between the proponent and the contractors, their availability and availability of the person sourcing the material.

Table 4- 2 Summary of the main construction material input into the proposed project

Materials	**Uses**
Sand	Preparation of concrete for joining masonry stones and aggregate
Soil	Levelling, refilling and landscaping works
Stones	Reinforcement of the floor
Cement	Preparation of concrete for joinery purposes and making ballast for reinforcement concrete
Ballast and/or hard-core	Preparation of aggregate for making slabs and reinforcement concrete
Timber	Roofing and making doors
Murram	Reinforcing foundation slab
Steel bars	Reinforcement and casement
Glass	Glazing windows
PVC materials	For plumbing purposes
Iron sheets	Roofing
Nails	Carpentry purposes and roofing
Paint	For colourful external and internal finishes
Water	Preparation of concrete and cleaning purposes

5. LEGISLATIVE AND REGULATORY FRAMEWORK

5.1. Introduction

A number of policies and legislations exist to govern the protection, conservation, and exploitation of natural resources and by extension ensure sound environmental management. These policies cover forestry, agriculture, water, infrastructure, health, and also the interrelation between land-use activities among other areas. The National Environment Action Plan offers the main policy direction with regards to the integration of environmental concerns including Environmental Impact Assessment into the development planning process. This chapter discusses some of the key laws and policies that govern the management of environmental resources in the country. It should be pointed out from the onset that the Environmental Management and Co-ordination Act of 1999 prevails wherever there exists conflict between any two or more laws in the management of environmental resources and the environment itself.

5.2. Kenyan policy and legislative framework

5.2.1. The Constitution of Kenya, 2010

The Constitution of Kenya forms the supreme law in Kenya. With regards to the environment, the Constitution offers the basic principles around which the environment is to be managed. It ensures the preservation of the environment which is our heritage. It also points the need to sustain the environment for the benefit of generations to come. These principles are realised through the following chapters of the Constitution:

- Chapter 4 on Rights and Fundamental Freedoms
- Chapter 5 on Environment and Natural Resources
- Chapter 10 on Judicial Authority and legal System

The proponent shall ensure that the proposed development does not adversely curtail the enjoyment of the rights defined by the Constitution by putting in place sufficient mitigation measures to any negative impacts that may arise from the project.

5.2.2. Environmental Management and Coordination Act (EMCA), 1999

This Act of Parliament provides for the establishment of an appropriate legal and institutional framework for the management of the environment and for matters connected therewith and incidental thereto. The Act establishes the National Environment Management Authority, which is tasked with *inter alia* the co-ordination of various environmental management activities being undertaken by the lead agencies and the promotion of the integration of environmental considerations into development policies, plans, programmes and projects with a view to ensuring the proper management and rational utilisation of environmental resources on a sustainable yield basis for the improvement of the quality of human life in Kenya.

Section 58 of the Act requires that any person, being a proponent of a project, shall before for financing, commencing, proceeding with, carrying out, executing or conducting or causing to be financed, commenced, proceeded with, carried out, executed or conducted by another person any undertaking specified in the Second Schedule to the Act, submit a project report to the Authority, in the prescribed form, giving the prescribed information.

The authority will then direct the proponent of the project to undertake or cause to be undertaken at his own expense an environmental impact assessment study and prepare a report thereof where it (the authority) is convinced, after studying the report, that the proposed project may or is likely to have or will have significant impact on the environment. The Environmental Impact Assessment study shall be conducted in accordance with the environmental impact assessment regulations, guidelines and procedures issued under the Act.

In compliance, the proponent through a registered expert has prepared and Submitted EIA report for review and licensing of the project

5.2.3. Public Health Act, 1986 (Cap. 242)

Section 28 of the Act states that; Any person who—

(a) While suffering from any infectious disease, willfully exposes himself without proper precautions against spreading the said disease in any street, public place, shop, inn or public conveyance, or enters any public conveyance without previously notifying the owner, conductor or driver thereof that he is so suffering; or

(b) Being in charge of any person so suffering, so exposes such sufferer; or

(c) Gives, lends, sells, transmits or exposes, without previous disinfection, any bedding, clothing, rags or other things which have been exposed to infection from any such disease,

shall be guilty of an offence and liable to a fine not exceeding thirty thousand shillings or to imprisonment for a term not exceeding three years or to both; and a person who, while suffering from any such disease, enters any public conveyance without previously notifying the owner or driver that he is so suffering shall in addition be ordered by the court to pay such owner and driver the amount of any loss and expenses they may incur in carrying into effect the provisions of this Act with respect to disinfection of the conveyance:

Part IX, section 115, of the Act states that no person/institution shall cause nuisance or condition liable to be injurious or dangerous to human health. Section 116 requires that Local Authorities take all lawful, necessary and reasonably practicable measures to maintain their jurisdiction clean and sanitary to prevent occurrence of nuisance or condition liable to be injurious or dangerous to human health.

Such nuisance or conditions are defined under section 118 as waste pipes, sewers, drainers or refuse pits in such state, situated or constructed as in the opinion of the medical officer of health to be offensive or injurious to health. Any noxious matter or waste water flowing or discharged from any premises into the public street or into the gutter or side channel or watercourse, irrigation channel, or bed not approved for discharge is also deemed as nuisance. Other nuisances are accumulation of materials or refuse which in the opinion of the medical officer of health is likely to harbor rats or other vermin.

On responsibility of the Local Authorities Part XI, section 129, of the Act states in part “It shall be the duty of every local authority to take all lawful, necessary and reasonably practicable measures for preventing any pollution dangerous to health of any supply of water which the public within its district has a right to use and does use for drinking or domestic purposes

Section 130 provides for making and imposing regulations by the local authorities and others the duty of enforcing rules in respect of prohibiting use of water supply or erection of structures draining filth or noxious matter into water supply as mentioned in section 129.

This provision is supplemented by section 126A that requires local authorities to develop by laws for controlling and regulating among others private sewers, communication between drains and sewers and between sewers as well as regulating sanitary conveniences in connection to buildings, drainage, cesspools, etc. for reception or disposal of foul matter.

Part XII, Section 136, states that all collections of water, sewage, rubbish, refuse and other fluids which permits or facilitates the breeding or multiplication of pests shall be deemed nuisances and are liable to be dealt with in the matter provided by this Act.

The proponent will comply with this legislation by ensuring that the contractor and the construction team adhere to the WHO and MoH guidelines on the management of the spread of COVID-19. A Licensed private waste collector will also be contracted to collect and dispose of the solid waste from the development on a regular basis. The collected waste will be disposed of at the CGK's waste disposal site.

5.2.4. Occupational Safety and Health Act, 2007

The law contains regulations concerned with the health and safety of workers and their affairs and sets the responsibilities of the employer to protect workers against hazards and diseases, including providing workers with the necessary equipment, information regarding potential occupational diseases and precautionary measures before taking up the job. In addition, this law sets the duties to be fulfilled by the Ministry of Labour regarding the issuance of instructions regarding precautions to be taken by establishments to protect workers, as well as the equipment, conditions and standards to be met in order to provide a safe environment in accordance to the adopted international standards. The Act applies to all workplaces where any person is at work, whether temporarily or permanently.

In compliance, The developer together with the main contractor will ensure that all construction workmen and visitors are provided with appropriate personal protective equipment (PPE) to guard against exposure to dust, excessive noise and any harmful fumes.

5.2.5. National Construction Authority Act, 2011

The National Construction Authority (NCA) was formed in order to oversee the construction industry and coordinate its development. The Act specifically states that construction work is not conducted unless a contractor registered by the Board is on site. The NCA Ensures quality assurance at the construction level, Competence of the contractor, Registering, training building contractors, Registering building projects, Certifying and accrediting skilled workers and construction site supervisors.

In compliance, the proponent will pick NCA, licensed contractor with accredited skilled staff and ensure that the project is registered and licensed given before proceeding with construction .

5.2.6. Physical and Land Use Planning Act, 2019

This is an Act of Parliament that makes provision for the planning, use, regulation and development of land and for connected purposes. Section 56 of the Act empowers the county governments to control the use and development of land and buildings in the interest of proper and orderly development of their areas of jurisdiction.

The above powers are exercised by the County Government of Kisumu with regard to the subject application in this report. Specifically, the County Government has powers to consider and approve all development applications and grant permissions within its area of jurisdiction. Suffice it to mention that the site of the proposed development lies within the area of jurisdiction of the County Government of Kisumu. Section 57 (1) of the Physical and Land-use Planning Act provides that no person shall carry out development within a county without a development permission granted by the county executive committee member responsible for matters relating to physical and land use planning in that county.

A person requiring development permission shall make an application, in the prescribed form and after paying the prescribed fee, to the county executive committee member responsible for matters relating to physical and land use planning in that county (Section 58(1)). Such an application will be accompanied by documents, plans and particulars as may be required by the respective county executive committee member to indicate the purposes of the proposed development. In this regard, this application for a change of user shall be accompanied by duly filled PPA1 forms, which shall be considered by the approving authority.

To ensure public participation in the development process, Section 58 (7) of the Act makes it a requirement that an application for development permission be accompanied with a notification to the public of the proposed development project. The objective of this notification is to invite members of the public to submit any objections on the proposed development project to the relevant county executive committee member for consideration (Section 58(8)). A separate process has been initiated by the proponent to ensure adherence to the requirements of the Physical and Land-Use Planning Act (2019).

The proponent has already complied with this act. The building plans and change of user report have been approved by the county government of Kisumu.

5.2.7. County Governments Act, 2012

This Act gives effect to Chapter Eleven of the Constitution; to provide for county governments' powers, functions and responsibilities to deliver services and for connected purposes. Section 5 of the Act defines the functions of the county governments while Section 107 on the other hand recognises that County Governments must guide, harmonise and facilitate development in their areas of jurisdiction.

In compliance, the proponent shall ensure that all developments on site are processed in accordance with the requirements of the County Government Act.

5.2.8. Medical Practitioners & Dentists Act, 1977

An Act of Parliament to consolidate and amend the law to make provision for the registration of medical practitioners and dentists and for purposes connected therewith and incidental thereto. This act should act as guidance to the proponent on the requirements of hiring medical practitioners to carry out and supervise specialized operation at the health Centre.

In compliance, the proponent shall ensure that the all-medical practitioners are specialized and licensed in the areas of expertise

5.2.9. Food, Drugs and Chemical Substances Act (Cap. 254)

Section 24 of this Act warns against disposal or use of chemical substances in such a manner likely to cause contamination of food or water for human consumption or in a manner liable to be injurious or dangerous to the health of any person. All chemicals shall be used in accordance with their manufacturers' instructions.

5.2.10. Traffic Act (Cap. 403)

This Act consolidates the laws relating to traffic on the roads. The health centre management shall control traffic at the site and at the access roads to the site in order to prevent interference with other road users.

5.2.11. Building Code 2022

The main objective of the Building Code is to promote order, safety, and health of persons in or about construction works. It seeks to improve control of and encourage better practices in building design, construction, and maintenance to provide greater assurance to the users.

In compliance, the proponent, contractor and managers of the hospital will ensure prevention of harmful effects on human health resulting from the application of building methods, products, design, construction, and maintenance,

5.2.12. Environmental Management and Coordination (Noise and Excessive Vibration, and Pollution Control) Regulations, 2008

Section 3 (1) prohibits the causing of loud, unreasonable, unnecessary or unusual noise which annoys, disturbs, injures or endangers the comfort, repose, health or safety of others and the environment. The Proponent together with the contractor and health centre management will put measures in place to manage impacts of noise, vibration and pollution.

In compliance, the proponent and contractor will ensure that all noise produced at the proposed sites in all phases shall be managed in accordance with the guidelines in this report or from other authorities in control of noise.

5.2.13. Environmental Management and Coordination (Waste Management) Regulations, 2006

Part II of the regulations provides that a generator of waste should:

a) Not dispose of waste on a public highway, street, road, recreational area or any public place except in a designated waste receptacle
b) Collect , segregate and dispose or cause to be disposed of such waste in the manner provided for under these regulations and
c) Ensure that the waste is transferred to a person who is licensed to transport and dispose of such waste appropriately

In line with the aforementioned regulations, the contractor, proponent, and the health centre management will have to provide appropriate solid and liquid waste handling facilities. In addition, all waste from the site will be managed in accordance with the advice given by the Public Health Officer and other pertinent authorities, the recommendations of the subsequent EA reports.

5.2.14. National Environmental Policy, 2012

The policy paper provides for integration of environmental and economic activities in the development process.

In compliance, the proponent will ensure the environment is adequately conserved in all the phases of the project by strictly follow the prepared EMP.

5.2.15. Sessional Paper No. 6 of 1999 on Environment and Development

This paper stipulates that EIA must be undertaken by the developers as an integral part of the project and so should periodic environmental auditing to investigate if the developer is fully mitigating the impacts identified in the assessment report.

The current assessment is itself an attempt to comply with the provisions of the Sessional Paper.

5.2.16. E-Waste Management Guidelines, July 2011.

These guidelines provide vital information in ensuring the development of a management framework which is needed to enable proper collection and recycling and to 'set the standards' therein. It seeks to ensure that health and safety aspects of the people involved in the operations are protected, along with issues of emissions and waste emerging from such operations

In compliant, the client will seek the services of E-waste Collectors and recyclers whenever necessary.

5.2.17. The Standards Act, Cap 496 (Revised 2013)

This Act promotes the standardization of the specification of commodities and provides for the standardization of commodities and codes of practice to ensure public health and safety. It establishes the Kenya Bureau of Standards (KBS) and defines its functions as related to:

• Promotion of standardization in industry and commerce; and

• Making arrangements or provision of facilities for the testing and calibration of precision instruments, gauges and scientific apparatus, for the determination of their degree of accuracy by comparison with standards approved by the Minister on the recommendation of the Council and for the issue of certificates in regard thereto.

In compliance the Proponent has to ensure all materials and equipment in use during construction as well as operation of the facilities adhere to the highest standards and do not pose any human health and/or safety risk.

5.2.18. Safety and Health Committees Rules, 2004.

These rules state that any employer/proponent/occupier who employs more than twenty persons must establish a committee to address the health, safety and welfare of workers. The employer must also cause to be carried out a health and safety audit of all his operations on an annual basis by a registered health and safety advisor who should forward such a report to the Director of Occupational Health and Safety Services.

In compliance, the proponent shall ensure a workplace safety and health committee is formed and regularly trained during the construction and operation phase of the project.

5.2.19. First Aid Rules, 1977

These have details on first aid requirements in terms of facilities and capacity building among non- medical workers.

In compliance, the contractor should avail at the site an adequate number of well-stocked first aid kits during the construction phase of the project.

5.3. International Framework

5.3.1. Rio Declaration on Environment and Development (1992)

The Principle No.10 of the declaration provides that "environmental issues are best handled with participation of all concerned citizens at all the relevant levels." This declaration is buttressed by the local provisions of the Kenya Constitution, 2010, which requires that the members of the public must participate in the formulation of policies that are public interest. It is in compliance with the requirements of the Rio Declaration and its local emphasis in the Kenya Constitution that the study made deliberate efforts to ensure that members of the public were part and parcel of the EIA process.

In Compliance, the proponent through the lead expert conducted public participation in July 2020 before submission of EIA report to NEMA.

5.3.2. World Commission on Environment and Development (1987)

The Brundtland Commission focuses on environmental aspects of development with particular emphasis on sustainable development that produces no lasting damage to the biosphere and to particular ecosystems.

EIA that is reported in this report is in compliance with the focus of this Commission to the extent that it seeks to ensure the sustainable development of the area.

5.3.3. World Bank (WB) Performance Standards on Environmental and Social Sustainability

This policy's objective is to prevent and mitigate undue harm to the people and their environment in the development process.

The Proponent conducted this EIA in accordance with safeguard policy 4.01 that deals with environmental assessment.

6. ANALYSIS OF PROPOSED PROJECT ALTERNATIVES

6.1. Introduction

The purpose of checking on various alternatives is to ensure that the most optimal social, environmental and capital benefits for all the stakeholders is realised. The idea in evaluating these alternatives is to enable the ideal development that causes minimal environmental disturbance to be sought. The purpose of this section is therefore to examine feasible alternatives to the proposed project with a view to finding this ideal situation. In doing so, the benefits of the proposed project are considered against any potential environmental cost.

6.2. 'No-action' alternative

This alternative implies that the status quo is maintained. This option is the most suitable alternative from an extreme environmental perspective as it ensures non-interference with the existing conditions. This option will however, involve several losses both to the project proponent, the land owner and local community and the Government due to the lost opportunities that would be brought about by the proposed development. More fundamentally, it will mean that local residents continue to travel long distances to seek medical services that the proposed development will avail on site. The 'No-action' alternative is therefore the least preferred from the socio-economic and partly environmental perspectives.

6.3. Relocation Alternative

Relocation to a different site is an option available for the project proponent. At the moment, there is no alternative site for the proposed development. If the relocation alternative is proposed, it would take a long period of time for the design and approval of the plans by relevant authorities and the proponent would incur extra costs in addition to those already met in purchasing and preparing the proposed site for the envisaged development. In consideration of the above concerns and assessment of the current proposed site, relocation of the project would not be a viable option.

6.4. Alternative land uses

This option allows the developer to explore putting the land to an alternative use other than the proposed project. This option would require application for change or extension of use to allow for the alternative development. Besides, the proponent has already made financial commitments in designing and planning for the proposed project. This, in addition to engaging a Physical Planner to undertake the change of use, engaging an EIA expert to undertake an environmental impact

assessment, paying the statutory fees, incurring cost in making the necessary public notices among other commitments.

6.5. Analyses of Alternative Construction Materials and Technology

The proposed project will be constructed using modern, locally and internationally accepted materials to achieve public health safety, security and environmental aesthetic requirements. Equipment that save energy and water will be given first priority without compromising on cost or availability factors. Heavy use of timber during construction is discouraged because of massive destruction of forests. The exotic species would be preferred to indigenous species in the construction where need may arise. However, this will require very little timber. The proponent should consider installing solar panels so that solar energy is also used as an alternative.

6.6. Medical Waste disposal alternatives

6.6.1. Analysis of Alternatives to hazardous waste disposal

1 Open uncontrolled, non-engineered dump sites

i. Open dumps are probably the most common land disposal method in developing countries, Kenya included.

ii. Untreated waste discharged into an uncontrolled, non-engineered, open dump does not protect the local environment and should not be used. Discharging waste in open dumps either within the healthcare institutions or in the municipal facilities is insufficient solution and may lead to environmental pollution.

iii.As a last resort where other methods of disposal are not available the healthcare waste if disposed of on open dump must be covered immediately with inert material such as soil.

This method could not be considered because it does not protect the environment.

2 Sanitary landfills

i. Properly constructed and operated land fill sites offer a relatively safe disposal route for municipal solid waste including healthcare wastes.

ii. The priority is protection of the water aquifers and each day's waste is compacted and covered with soil to maintain sanitary conditions.

This method could not also be considered because it requires a larger space for compaction of each day's waste. The proponent has no such space for disposal.

3 Incineration

i. Incineration is a high-temperature dry oxidation process that reduces organic and combustible waste to inorganic, incombustible matter and result in very significant reduction of waste volume and weight.

ii. This process is usually selected to treat waste that cannot be recycled, reused or directly disposed off in sanitary landfill. Medium temperature incineration

i. In many developing countries, Kenya included, there are no high temperature double chamber incinerators designed to handle hazardous waste. Such incinerators meet strict emission control standards such as those set by the European Union.

ii. All types of incinerators if operated properly eliminate pathogens from the waste and reduce waste to ashes.

iii. However certain types of healthcare waste e.g. pharmaceutical waste or chemical waste require higher temperatures for complete destruction.

Higher operating temperatures and cleaning of exhaust gases limit the atmospheric pollution and odours produced by the incineration process.

Advantages of incineration include:

a) Accept the greatest variety of waste,
b) Treated waste is unrecognizable as ash,
c) Significant volume reduction,
d) Energy recovery,
e) Waste totally sterilized.
f) Trained personnel readily available,
g) Existing guidelines in place,
h) Cheaper to install and maintain compared to other methods like autoclaves.

Disadvantages include:

a) Acid gases in air emissions,
b) Heavy metals in ash residues,

c) Convert biological problem into potential air quality emission problems,
d) Major source of dioxin and furan emissions.

Because of the many advantages of incinerators including that they accept the greatest variety of waste, significant volume is reduced, trained personnel are readily available and that they are cheaper to install and maintain, this method is considered provided the mitigation measures provided in this ESIA report are considered.

4.Crude burning

i. Burning healthcare waste at low temperatures in the open should be discouraged because this may release toxic pollutants into the air. This method is *discouraged and could not even try to consider it.*

5. Microwaving

Microwave technology of clinical waste in the healthcare waste sector is considered an alternative technology of the incinerator and is a steam-based process, and electromagnetic waves with frequencies between radio and infrared waves that use wet inside the wastes or by additional steam to sterilize wastes and destroy infectious agents and pathogenic organisms in the waste. So it includes the use of high-intensity radiation to heat the moisture inside the waste. The types of waste generally treated in microwave systems are equal to those treated in autoclaves. Also, microwave methods cycle very rapidly between positive and negative and the very high frequency around 2.4 billion significant times per second that when receive the body of liquid or solid vibrate very quickly to result in friction to create significant amounts of heat.

Advantages of Microwaving include:

a) Technology is easy to use,
b) Reduce volume by 80%,
c) Environmentally sound,
d) No liquid effluents,
e) The emissions are minimal

Disadvantages include:

a) Cost is very high,

b) Not suitable for all types of wastes,
c) The shredder used is noisy,
d) Offensive odours

This method could not be considered given that it is not suitable for all types of waste and the cost of acquiring is high

6 Autoclaves

An autoclave consists of a metal chamber sealed by a charging door and surrounded by a steam jacket. Steam is introduced into both the outside jacket and the inside chamber which is designed to withstand elevated pressures. Heating the outside jacket reduces condensation in the inside chamber wall and allows the use of steam at lower temperatures. Because air is an effective insulator, the removal of air from the chamber is essential to ensure penetration of heat into the waste. This is done in two general ways: gravity displacement or pre-vacuuming. A gravity-displacement (or downward-displacement) autoclave takes advantage of the fact that 93 steam is lighter than air; steam is introduced under pressure into the chamber, forcing the air downward into an outlet port or drain line in the lower part of the chamber

Advantages of Autoclaves:

- Steam treatment is a proven technology with a long and successful track record,
- The technology is easily understood and may be readily accepted by proponent and the communities,
- It is approved or accepted as an alternative technology in Kenya especially in sterilization of medical equipments,
- The time-temperature parameters needed to achieve high levels of disinfection are well-established,
- Autoclaves are available in a wide range of sizes, capable of treating from a few kilos to several tons per hour,
- If proper precautions are taken to exclude hazardous materials, the emissions from autoclaves and retorts are minimal.

- Many autoclave manufacturers offer many features and options such as programmable computer control, tracks and lifts for carts, permanent recording of treatment parameters, autoclavable carts and cart washers, and shredders.

The disadvantages

- They are too expensive to install and maintain.
- The technology does not render waste unrecognizable and does not reduce the volume of treated waste unless a shredder or grinder is added,
- Any large, hard metal object in the waste can damage any shredder or grinder,
- Offensive odours can be generated but are minimized by proper air handling equipment,
- If hazardous chemicals such as formaldehyde, phenol, cytotoxic agents, or mercury are in the waste, these toxic contaminants are released into the air, wastewater, or remain in the waste to contaminate the landfill,
- If the technology does not include a way of drying the waste, the resulting treated waste will be heavier that when it was first put in because of condensed steam,
- Barriers to direct steam exposure or heat transfer (such as inefficient air evacuation; excessive waste mass; bulky waste materials with low thermal conductivities; or waste loads with multiple bags, air pockets, sealed heat-resistant containers, etc.) may compromise the effectiveness of the system to decontaminate waste. Examples of waste that may need to be collected separately and treated using another technology include evacuated containers endopleura machines.
- They require trained personnel to implement.

Though modern, this method was found to be too expensive to install and maintain, they are not common, and that they require trained personnel to implement who are hard to find. This, in addition to the above disadvantages rendered the technology not considerable.

7 Plasma Pyrolysis

Plasma pyrolysis is a modern technology for safe disposal of healthcare waste. Also, it is an environmentally friendly technology that transforms organic waste into useful products, and it is another type of thermal parsing of carbonaceous materials in oxygen. Plasma pyrolysis technology needs two chambers installed so that the primary chamber takes place at a high temperature of 1,100ºC and secondary chamber ignition takes place at 950 to 1,000ºC. In addition, due to the severe heat generated by the plasma, it can dispose of all types of waste, including municipal solid waste, biomedical waste, and hazardous waste in a safe and reliable manner.

Advantages include:

- Suitable for all types of wastes
- Consumes less space,
- Environmentally sound,
- Not require chimney,
- Toxic residuals are much below,
- Not require segregation,
- Energy recovery,
- Reduce volume more than 99%

Disadvantages include:

- Requires technical persons,
- Cost is very expensive.
- They are not common.
- Large initial investment costs relative to that of alternatives, including landfill and incineration.
- Operational costs are high relative to that of incineration.
- Little or even negative net energy production.
- Wet feed stock results in less syngas production and higher energy consumption.
- Frequent maintenance and limited plant availability.

This technology could not be considered because of the high cost involved including other disadvantages highlighted above.

6.6.2. Wastewater (Effluent) Management Alternatives

Five locally available technologies are discussed below:

1. Wastewater treatment plant: This involves the construction of a plant and use of chemicals to treat the effluents to locally accepted environmental standards before it is discharged into the environment. A lot of wastewaters will be discharged from the hospital as a result of the proposed project during the operation phase. However, a wastewater treatment plant will not be appropriate it require large space for setup and installation cost is high.

2. Use of stabilization ponds/lagoons: This refers to the use of a series of ponds/lagoons which allow several biological processes to take place, before the water is released back to the river. The lagoons can be used for aquaculture purposes and irrigation. However, they occupy a lot of space but are less costly. No chemicals are used/heavy metals sink and decomposition processes take place. They are usually a nuisance to the public because of smell from the lagoons/ponds.

This option is not preferable in the area because the required space is not only available, and the surrounding community is not likely to accept the option.

3. Use of Constructed/Artificial wetland: This is one of the powerful tools/methods used in raising the quality of life and health standards of local communities in developing countries. Constructed wetland plants act as filters for toxins. The advantages of the system are the simple technology, low capital and maintenance costs required.

However, they require space and a longer time to function. Long-term studies on plant species on the site will also be required to avoid weed biological behavioral problems. Hence it is not the best alternative for this kind of project.

4. Connection to the existing sewer system: Connection to a sewer line will solve the effluent management issue at a very minimal cost and in environmentally efficient manner. This method is not suitable for the proposed project since the area is not served by a public sewer line. It could have been the cheapest and easiest way to depose wastewater

5. Use of septic tanks: This involves the construction of underground concrete-made tanks to store the sludge with soak pits. It is expensive to construct and requires regular emptying. But require less space and it is can be easily maintained. This alternative is preferred since the area has

no public sewer. It must be well constructed and monitored closely to avoid blockages and leaks to the underground water.

6.6.3. Solid Waste Management

The proposed project will generate considerable amounts of solid wastes both during construction and operational phases. An integrated solid waste management system is recommended. The proponent will give priority to reduction of the materials at source. This option will demand a solid waste management awareness program in to be effected by the management and the entire workforce. In addition to that, recycling, reuse and composting of waste will be an alternative in priority. This issue calls for a source separation program to be put in place-the proponent/hospital management should introduce separate and adequately marked skips/ dustbins for sorting the recyclable wastes, organic matter and the other waste.

The recyclable waste will be sold to waste buyers within Kisumu and surrounding areas, organic matter will be sold for use as compost while the rest will be taken to an approved dump-site/ sanitary landfill i.e., ash that will be generated by the incinerator. The third priority in the hierarchy of options is combustion of the waste that is not recyclable in order to produce energy. Finally, sanitary land filling will be the last option for the proponent to consider.

The County Government of Kisumu has an overall responsibility of collection of waste and therefore will ensure the ash from the incinerator will be disposed appropriately.

6.7. Comparison of alternatives

The proposed project is the best alternative since it will provide medical services to the local community and its surroundings. In addition to this, the facility will lead to revenue for the proponent and the government, improvement in service delivery and will create employment opportunities for more people. According to Maryam, K. G and Rosnah B. M. Y (2015) Advantages and Disadvantages of Healthcare Waste Treatment and Disposal Alternatives, studies on healthcare waste treatment show that among many methods for health care waste treatment, about 59-60% are treated via incineration, 37-20% by steam sterilization, and 4-5% by other treatment technologies. Incineration methods are most used among the technologies for healthcare waste treatment in most countries including Kenya. Therefore, the proponent will opt for incineration against the other waste treatment options.

7. POTENTIAL ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

7.1. Introduction

The impacts to be expected during the three phases of the project could be both positive and negative, direct or indirect or long-term, temporary or permanent. All these depend on the area of coverage and their duration in the environment. This varying impact is occasioned by the nature of activities that will be executed by the project as well as the mitigation measures that are likely to be put in place against these impacts. Once these impacts have been identified, mitigation measures are then prescribed and subsequently, an EMP is formulated for the project.

7.2. Potential adverse impacts during the construction phase

7.2.1. Positive Impacts

7.2.1.1 Creation of Job opportunities

The proposed project will create employment for both skilled and unskilled individuals in the country; the social and economic status of those involved in the project will be raised. All the money set aside for the payment of labor will be spent on Kenyans working on the project. During the entire construction period, all the people involved in labor provision will be compensated at reasonable rates.

7.2.1.2 Improvement in business opportunities

Being a multimillion development, all the money spent during construction will be absorbed by local business and labor force. The construction of the project will also involve use of some of the locally available materials which will be obtained from quarries and firms located mostly within Kisumu County. This will help in the growth of these quarries, Jua Kali shops and other firms that deal in quarry products and construction materials.

7.2.1.3 Improved security

The site will need a store keeper or a security guard who will man the area thus improving the state of security in the entire area.

7.2.2. Negative impacts

7.2.2.1 Impacts on vegetation, water and soil

Within the proposed site, the cutting down of two fully grown eucalyptus trees will take place to give room for setting out of the building. Impacts on soil will only be generated by machines during excavation and compaction. These, however, are short-term and thus of no major concern. Compaction however may reduce water penetration thereby enhancing surface run-off during the rainy seasons resulting into soil erosion and siltation.

Mitigation

i. Re-establish vegetation in some parts of the disturbed areas through implementation on a well-designed landscaping programme by planting appropriate plants.
ii. During the decommissioning stage, the contractor shall not cut down any other tree unnecessarily. Only those that might interfere with the actual proposed development area shall be decommissioned.
iii. Project construction will disturb as little area as possible in order to minimize potential impacts on biodiversity.
iv. Small seedlings will be uprooted and planted elsewhere.
v. The project should have appropriate demarcation for the area affected by the proposed project.
vi. No excavations should be done outside the demarcated area to minimize clearing of grass.
vii. The trees within the site should be incorporated into the project as much as possible. Cutting them should be avoided.

7.2.2.2 Extraction and/or usage of consumable materials

The proposed project involves bringing up of a 5-storey building. Fuel energy and other consumables will be used to ensure the smooth operation of the proposed project. Because most of the construction materials will be extracted from the natural resources, the effect is that the construction process will deplete these resources, leading to subsequent resource degradation at their sources.

Mitigation

i. The project should optimize the use of materials to ensure there is no misuse of materials.
ii. Materials such as building blocks/stones should be tested and be approved by the Public Works Department as per the building code 2022 before they are used for construction.
iii. Transportation of materials to the site should be planned properly to ensure fuel is not excessively consumed.
iv. Areas where soil or stones are to be extracted should be planted with trees to avoid degradation of the area.

7.2.2.3 Safety at the construction sites

During construction, there will be increased dust, noise and air pollution. The immediate neighbours and workforce involved would be more subjected to these environmental pollutants. Again, food for the construction workforce is usually provided by mobile vendors, who often operate without licenses issued by the Public Health Department. Buying food from such vendors can compromise health of the workers, especially if foodstuffs are prepared in unhygienic conditions. The proponent should be sure to contract licenced individuals to be in charge of specialized operations at the construction sites.

Mitigation:

i. All workers should be provided with protective gear. These include working boots, overalls, helmets, goggles, earmuffs, masks and gloves.
ii. Construction crew at the site will be sensitized on the use alcohol and other substances which might compromise their judgement and by extension their safety on site
iii. A first aid kit should be provided on site. This should be fully equipped at all times and should be managed by a qualified person
iv. The contractor should have workmen's compensation cover. It should comply with Workmen's Compensation Act, as well as other relevant ordinances, regulations and union agreements.
v. Adequate sanitary facilities should be provided and standard cleanliness maintained.
vi. Food handlers preparing food for the workers on the site should be controlled and monitored to ensure that food is hygienically prepared. They should also possess the relevant medical certificates given by the Ministry in charge of public health

vii. Regular maintenance of machinery on site.
viii. Rehabilitate areas that have been adversely affected by the construction through spillage of pollutants such as harmful chemicals
ix. All passages must be kept unobstructed at all the time
x. Proper working procedures should be strictly adhered to when working with chemicals, machines, and equipment
xi. Secure the construction areas with recommended materials by NCA to protect workers and passers-by from being hit by falling objects
xii. Sprinkle water on soil to reduce the amount of dust when working on the outer areas of the buildings

7.2.2.4 Noise

Any undesirable sound that affects job performance, safety and health can be considered noise. It can include a continuous or even intermittent sound. Psychologically, noise can cause annoyance and can also disrupt concentration. The physical effects of noise can include loss of hearing, pain, nausea and interference with communications when the exposure is severe. It is postulated that the proposed project will generate noise during the construction stage. The proponent and the contractor awarded the construction job are expected to abide by the set code from the relevant authorities in regard to noise pollution, and the types of machinery to be used. It is recommended that this aspect be given significant weight during the pre-construction process. Furthermore, the contractors are expected to use as much as manual labour as possible to reduce any noise that would be generated by machinery. The contractors is also expected to programme his work so as to take minimum possible time while undertaking the actual construction.

Mitigation:

i. Construction works should be carried out only during the day, i.e., between 8.00 o'clock in the morning and 5.00 o'clock in the evening.
ii. Machinery such as those used in welding and grinding should be maintained regularly to reduce noise resulting from friction.
iii. Provision of billboards at the construction site notifying of the construction activity and timings.
iv. Sensitize users/ operators of on-site machinery on effects of noise

v. Billboards will be suitably erected on the start of the project to psychologically prepare the people in the vicinity.
vi. Workers in the vicinity of high-level noise should be provided with safety and protective gears, which they have to use while on site.
vii. Provide barriers such as walls around site boundaries to provide some buffer against noise

7.2.2.5 Increased traffic flow

There will be vehicles bringing tools to be used in construction to the site as well as people coming to seek employment during and after construction. This kind of traffic is short-term but will cause congestion on the roads which may lead to road accidents. Traffic is expected to increase during the operation phase especially as patient stream in for medical services. However, it is expected that the traffic flow will be controlled as there is adequate access linking the facility to the main Kisian-Bondo Road.

Mitigation

i. Proper planning of transportation of construction materials to ensure that vehicle fills are increased in order to reduce the number of trips done.
ii. Clear signage will be put in place to alert drivers to be cautious of activities going on in the site.
iii. Create and designate parking spaces and provide for adequate space at the turning point at the gates to the proposed sites to give drivers enough room to manoeuvre in and out.
iv. Opening up of the narrow access roads along the sites.

7.2.2.6 Sewerage and waste water

There exists outside toilets and bathroom that are operational and will be used by contractors and visitors to the site. These facilities will be used during construction only.

Mitigation

i. All workers and visitors must use the latrines and bathrooms all the time whenever there is need.
ii. All liquid waste from construction site should channelled into the pit latrine
iii. Pit latrines and the septic tank will be regularly be exhausted by licensed entity whenever full.

7.2.2.7 Air Pollution

Digging trenches during dry season, mixing and delivery of construction materials, wall chiseling for installing pipes is some of the major sources of dust emission in a construction site. The dust emitted might interfere with the visibility in the region, cause respiratory problems to neighbors and workers and generally compromise the quality of the air around. Care should be taken in handling such activities,

Mitigation Measures

Air quality within the area can be maintained through:

i. Avoid excavation works in extremely dry Weathers
ii. Wet the areas to be excavated to reduce dust
iii. Use screens to prevent spread of dust
iv. Sensitize drivers to avoid unnecessary engine racing to reduce smoke emission.

7.2.2.8 Oil spillage

There might be instances of oil spillages within the site from the vehicles delivering materials to the site and the machines being used. Care should be taken in avoiding such instances.

Mitigation

i. The vehicles accessing the site should have enough fuel to avoid instances of fuelling on the site.
ii. All hazardous construction materials should be stored on appropriate containers.
iii. All the workers in the site will be trained on containing spillages.

7.2.2.9 Generation of Solid Waste

Construction activities results in generation of wastes such as pieces of timber, carrier bags, pieces of steel and iron sheets, broken tiles among others. Heaps of soils will also be realized. Careless handling of these might result in land degradation, health risks and interference with the area`s aesthetic beauty.

Mitigation

i. There should be no burning of materials on the site.
ii. The quantities of solid waste produced during construction of the project should be monitored and controlled to avoid unnecessary pollution.

iii. The project site should have waste storage containers on the site for temporary storage before disposal. These should be easily accessible to avoid instances of people having to carry waste over long distance.
iv. All construction waste which cannot be reused should be disposed of at the approved sites.
v. There will be arrangements for regular collection of litter from project site; in this case a licensed transporter will be contracted to provide this service.

7.2.2.10 Interference with flow of water

Surface water flowing through the site will be blocked by the construction activities. This will be in terms of heaps of soil placed on water way or erected walls.

Mitigation

i. Carefully siting areas where materials delivered are offloaded to ensure they don't block water ways.
ii. Connecting the drainage channels dug within the site to the major ones along the existing roads so as to ensure continuous flow of the surface water to the streams and rivers around.
iii. Opening up the water ways/drainage channels.

7.2.2.11 COVID-19

During the construction phase of the project, different kinds of people from different locations may get a chance to work at the site. This movement into and out of the site can lead to spread of the virus if the MoH guidelines are not adhered to. This may cause infection to the workmen, the residents of the plot as well as those in the immediate neighbourhood.

Mitigation Measures

During the construction phase, the developer together with the contractor will ensure that the guidelines provided by the WHO and MoH on the management of spread of the virus are adhered to. These measures include but are not limited to;

i. Screening of people coming into and out of the site
ii. Limiting the number of construction workmen on site to achieve proper social distancing
iii. Ensuring that all workmen wear PPE that must include masks at all time
iv. Putting in place hand washing stations to ensure proper hand sanitation
v. The developer will also erect a hoardin g fence around the construction area to ensure no contact happens between the residents and the workmen.

7.2.2.12Labour influx

Labor influx to the construction site will lead to increased demand and prices over social services and rental houses. This will also lead to increased demand on local resources especially water leading to social conflicts. It will also lead to social related infections associated with interactions including HIV/AIDS and other communicable diseases. The proposed development will be constructed on an individual land who is the investor. Hence, issues associated with land acquisition do not apply to this project.

Others include:

i. Potential risks to safety of intruders on project site.
ii. Dust emissions with potential effects to public health during transportation of building materials to site.
iii. Potential conflicts on employment opportunities may arise between the contractor and the local community.
iv. Accidents and death.
v. Transmission of sexually transmitted diseases and HIV/AIDS.
vi. Gender-based violence (GBV) and sexual exploitation and abuse (SEA)
vii. Conflicts between immigrants and local residents

Mitigation measures

i) The foreign laborers are encouraged to embrace local culture.
ii) Minimum resource requirements for the local communities to be maintained.
iii) Ensure at least 60% of the casual employment is drawn from the local communities,
iv) Consult with neighbourhoods on activities affecting them and collaborate mitigation;
v) The contractor to establish and manage initiatives on social mitigation measures.
vi) Incorporate HIV/AIDS and communicable diseases control program as part of the construction deliverables.
vii) Enforce occupational health, safety and hazard control on site
viii) Inform local communities of major activities in advance
ix) Undertake background checks of potential workers about any past involvement in any offenses.

x) Provide the workforce with access to primary healthcare on site, including prescriptions, prophylactics, condoms and basic testing for TB, temperature thermogun if possible, etc.

xi) Provide awareness training to the workforce, in particular regarding the transmission of STDs, and traffic safety awareness,

xii) Develop and enforce a strict code of conduct for workers to regulate behavior in the local communities,

xiii) Prepare local communities for any large influx of workers by developing community-policing systems.

xiv) xvi) Establish a functional grievance redress mechanism (GRM) on site as below (see Chapter 7.2.2.13.

7.2.2.13 Grievance Redress Mechanism (GRM)

During the construction phase, different people may be aggrieved on issues pertaining to undertaking of the proposed project. If such issues are not addressed properly, they may hinder the development of the proposed project.

Mitigation

The proponent together with the contractor will appoint a person to receive all the grievances from the aggrieved stakeholders and small committee to address any issues that arises from the project.

7.3. Potential impacts during operations phase

7.3.1. Positive impacts

7.3.1.1 Accessibility and improved health care services

The hospital will supplement existing health centres within the locality giving the residences variety of choices to choose from whenever there is health challenges. They will easily access quality and affordable healthcare near their homes. Hence the proposed development will improve the general health status of the community.

7.3.1.2 Employment opportunities

The hospital will provide employment opportunity for both skilled, semi-skilled and unskilled workers. The health centre will employ over 30 health care practitioners of different cadre such as doctors, nurses etc non healthcare professionals such as accountants, clerks, security personnel, IT Personnel public relation officers etc and varieties of support staffs such as groundsman, cocks, cleaners, etc. These opportunities will be on a long-term basis hence very beneficial to the locals.

7.3.1.3Revenue generation

County government and national government will both gain a lot revenue through licensing of the facility, taxation of various goods used in the hospital and services offered at the hospital.

7.3.1.4 Improved aesthetics

By constructing the project, the scenic beauty of the area will be improved thus giving it a facelift and acting as a land mark.

7.3.1.4 Improved security

The commencement of the hospital will contribute to the security of the neighbourhoods. The security light from the development will also help in lighting up areas that were initially dark. The security personnel employed to guard the property will also help in securing the neighbourhoods.

7.3.1.5 Value improvement

Construction of such multimillion residential apartments will improve the value of the surrounding area more so the land value.

7.3.2. Potential negative impacts

7.3.2.1 Health facility waste

Health care wastes can be harmful to the patient's hospital staff, visitors and the environment if not properly handled. There are two categories of Health facility wastes:

(i) General Waste which includes waste similar domestic waste such as food waste, food wrappings etc and administrative waste such as office paper, cardboard, plastic etc;

(ii) hazardous health care waste

sharp objects such as needles, infusion sets scalpels etc, *infectious waste* - includes pathological and anatomical material (e.g. tissues, organs, body parts, human foetuses, animal carcasses, blood, and other body fluids), clothes, dressings, equipment / instruments, and other items that may have come into contact with infectious materials. *Pharmaceutical waste* - Includes expired, unused, spoiled, and contaminated pharmaceutical products, drugs, vaccines, and sera that are no longer needed, including containers and other potentially contaminated materials (e.g., drug bottles vials, tubing etc.).

Pharmaceutical waste: Includes expired, unused, spoiled, and contaminated pharmaceutical products, drugs, vaccines, and sera that are no longer needed, including containers and other potentially contaminated materials (e.g., drug bottles vials, tubing etc.).

Genotoxic / cytotoxic waste are waste may have mutagenic, teratogenic, or carcinogenic properties, and typically arises from the faeces, urine, and vomit of patients receiving cytostatic drugs, and from treatment with chemicals and radioactive materials. Cytotoxic drugs are commonly used in oncology and radiology departments as part of cancer treatments.

Chemical waste: Waste may be hazardous depending on the toxic, corrosive, flammable, reactive, and genotoxic properties. Chemical waste may be in solid, liquid, or gaseous form and is generated through use of chemicals during diagnostic / experimental work, cleaning, housekeeping, and disinfection.

Pressurized containers: Includes containers / cartridges / cylinders for nitrous oxide, ethylene oxide, oxygen, nitrogen, carbon dioxide, compressed air and other gases.

Waste with high content of heavy metals: Batteries, broken thermometers, blood pressure gauges, (e.g. mercury and cadmium content)

This waste must be handled with a lot of care during storage, transportation and disposal.

Mitigation Measures

Treatment and disposal methods for categories of health care waste	
Potential Type of waste	**Treatment and disposal mechanism**
General Hospital waste	**Waste Segregation Strategy***: Black bag / container*. Halogenated plastics such as PVC should be separated from general health care facility waste to avoid disposal through incineration and associated hazardous air emissions from exhaust gases (e.g. hydrochloric acids and dioxins). **Treatment: Disposal** as part of domestic waste. Food waste should be segregated and composted or disposed by a licensed garbage waste collector. Component wastes (e.g., paper, cardboard, recyclable plastics [PET, PE, PP], glass) should be segregated and sent for recycling.
Infectious waste	**Waste Segregation Strategy:** *Yellow or red colored bag / container*, marked "infectious" with international infectious symbol. Strong, leak proof plastic bag, or container capable of being autoclaved. **Treatment:** Chemical disinfection; Wet thermal treatment; Microwave irradiation; Safe burial on hospital premises; Sanitary landfill; Incineration (Rotary kiln; pyrolytic incinerator; single-chamber incinerator; · Highly infectious waste, such as cultures from lab work, should be sterilized using wet thermal treatment, such as autoclaving. · Anatomical waste should be treated using Incineration (Rotary kiln; pyrolytic incinerator; single-chamber incinerator;)

Treatment and disposal methods for categories of health care waste	
Potential Type of waste	**Treatment and disposal mechanism**
Sharp objects wastes	**Waste Segregation Strategy:** *Yellow or red color code, marked "Sharps".* Rigid, impermeable, puncture-proof container (e.g. steel or hard plastic) with cover. Sharps containers should be placed in a sealed, yellow bag labeled "infectious waste". **Treatment:** Chemical disinfection; Wet thermal treatment; Microwave irradiation; Encapsulation; Safe burial on hospital premises; Incineration (Rotary kiln; pyrolytic incinerator) • Following incineration, residues should be landfilled. • Sharps disinfected with chlorinated solutions should not be incinerated due to risk of generating POPs. • Needles and syringes should undergo mechanical mutilation (e.g., milling or crushing) prior to wet thermal treatment
Pharmaceutical waste	**Waste Segregation Strategy:** *Brown bag / container. Leak-proof plastic bag or container*. **Treatment**: Sanitary landfill, Encapsulation, Discharge to sewer in small quantity, Return expired drugs to supplier; Incineration (Rotary kiln; pyrolytic incinerator); Safe burial on hospital premises in small quantity as a last resort. · **Small quantities**: Landfill disposal acceptable, however cytotoxic and narcotic drugs should not be landfilled. Discharge to sewer only for mild, liquid pharmaceuticals, not antibiotics or cytotoxic drugs, and into a large water flow. Incineration acceptable in pyrolytic or rotary kiln incinerators, provided pharmaceuticals do not exceed 1 percent of total waste to avoid hazardous air emissions. Intravenous fluids (e.g., salts, amino acids) should be landfilled or discharged to

	sewer. Ampoules should be crushed and disposed of with sharps. **<u>Large quantities:</u>** Incineration at temperatures exceeding 1200 °C. Encapsulation in metal drums. Landfilling not recommended unless encapsulated in metal drums and groundwater contamination risk is minimal
Genotoxic / cytotoxic waste	**Waste Segregation Strategy:** See above for "infectious waste". *Cytotoxic waste should be labelled "Cytotoxic waste"* ***Treatment***: Return expired drugs to supplier; Chemical degradation; Encapsulation (small quantity); Inertization; Incineration (Rotary kiln, pyrolytic incinerator); • Cytotoxic waste should not be landfilled or discharged to sewer systems. · • *Incineration is preferred disposal option*. • Waste should be returned to supplier where incineration is not an option. Incineration should be undertaken at specific temperatures and time specifications for particular drugs. • Open burning of waste is not acceptable. • Chemical degradation may be used for certain cytotoxic drugs· Encapsulation and inertization should be a last resort waste disposal option
Chemical waste	**Waste Segregation Strategy**: *Brown bag / container. Leak-proof plastic bag or container resistant to chemical corrosion effects*. **Treatment**: Return unused chemicals to supplier; Encapsulation (Small quantity), Safe burial on hospital premises (small quantity); Incineration (Pyrolytic incinerator small quantity); · ***Small hazardous quantities***: Pyrolytic incineration, encapsulation, or landfilling.

	· ***Large hazardous quantities***: Transported by a licensed to appropriate facilities for disposal. Large quantities of chemical waste should not be encapsulated or landfilled
Pressurized containers	**Waste Segregation Strategy**: *Pressurized containers should be separated from general health care waste*. **Treatment**: Recycling and reuse; Crushing followed by landfill · • Incineration is not an option due to explosion risks • Halogenated agents in liquid form should be disposed of as chemical waste, as above.

Table 7-1: types of hospital wastes and their mitigation measures

In order for the health facility and its immediate surroundings shall be kept free of litters, unrequired objects and odours, and tidy at all times, the following should be done:

i) Regular cleaning of hospital facility and maintenance of cleaning schedule record
ii) All waste to be disposed of at the designated waste disposal point on site.
iii) Avail dust bins at strategic places on site to encourage visitors and staff to throw in the waste they generate there.
iv) Provide public information that encourages visitors and staff not to litter the environment
v) Liaise with the Kisumu County Government to collect the general waste on a regular interval to avoid hipping of waste on site.
vi) Health-care waste should be transported by the quickest possible route, which should be planned before the journey begins
vii) Mobile garbage bins (MGBS) and trolleys should be used when transporting waste to decrease spills, minimize collector contact with waste and minimize manual handling.
viii) . All bins must be colour coded according to the categories of waste they carry as the table above.
ix) Careful segregation (separation) of waste matter into different categories helps to minimize the quantities of hazardous wate
x) No burning of open solid waste within the compound.

7.3.2.2 Waste water

Hospital waste water quality are in most cases similar to the urban waste water. The waste water may be contaminated from medical wards and operating theatres (e.g. body fluids and excreta,), laboratories (e.g. microbiological cultures, stocks of infectious agents), pharmaceutical and chemical stores; cleaning activities (e.g. waste storage rooms), and x-ray development facilities. Care should be taken at the source to channelling of hazardous waste water into drainage channels

The site is not connected to the KIWASCO sewer reticulation network. However, the client will use one of the following options to dispose off hospital waste water:

- advanced septic tank with soak-away or the aqua-privy
- use of Bio-digesters suitable for hospital waste water

mitigation measures

- Waste segregation measures should be employed to minimize entry of solid waste into the wastewater stream, including Procedures and mechanisms for separate collection of urine, faeces, blood, and vomit from patients treated with genotoxic drugs to avoid their entry into the wastewater stream
- Regular inspection and maintenance of the internal sewer system
- Workers should report any incidence of blockages in the internal sewer system immediately they occur.
- Contracting qualified personnel in installing and repairing the sewer system.
- Re-using water where possible to reduce the volume of liquid waste.

7.3.2.3 Fire

Fire occurrences are usually unpredicted and can occur at any phase of the project. Fire can be as a result of electric failure, leakages of gas or methane, flammable materials next to fire, arson etc. With appropriate measures in place, it can be easily controlled to avoid damages.

Mitigation

i. Install lighting arrestors on all buildings on site.
ii. Have a clearly marked ‘ASSEMBLY POINT’ at an outdoor space within the site.

iii. Clearly mark the exit routes 'FIRE EXIT' to help guide people outside the building in case of a fire outbreak.
iv. Install fire extinguishers at strategic points. For the kitchens, install fire blankets. This should be done by a licenced Fire Officer.
v. Inspect the fire equipment regularly as advised by the Fire Officer.
vi. Repair and maintain equipment regularly.
vii. Train staff concerning emergencies especially those involving fire hazards
viii. Fire hazard signs and directions to emergency exit, route to follow and assembly point in case of any fire incidence.
ix. Insulate and regularly maintain all electricity cables and fittings to ensure no contact with water.

7.3.2.4 Increased demand on water usage

An increase in population in an area result in an increase in water demand — hence exerting pressure on the existing water supply. Water is a major concern especially in construction sites and even during operations. The proposed development may cause some strain to the existing water supply since the activities involved in the operations of a health centre are known to be heavy water consumers.

The operational phase of the proposed development will bring about an increase in water consumption, which will have a direct impact to the main water supply especially if the supply diminishes; this calls for water harvesting and storage.

Mitigation:

i) Avoid wastage of water supplied to the site.
ii) Roof catchments should be provided with rain water harvesting systems to enhance collection and storage of rain water and to supplement the supply from the borehole that is to be sunk. This water can be used to water flower gardens and all kind of cleaning required on site.
iii) Provide notices and information signs on means and needs to conserve water resource to awaken the civic consciousness with regard to water usage and management.
iv) Promote recycling and reuse of water as much as possible.

v) Any water leaks through damaged pipes and faulty taps will be repaired promptly by qualified personnel

7.3.2.5 Increased demand for energy (electricity and fuel)

There will be high power consumption during occupation phase. The proposed development will connect to the existing power line and this might strain this resource. Measures will be put in place to conserve the energy and use of energy saving appliances as much as possible by e.g. switching off lights and equipment that are not in use, putting up signs and advisory statements on energy conservation etc. Energy conservation involves proper use of electrical appliances and lighting systems and this is a practice that the management and staff should adopt.

Mitigation

i) All non-essential electrical appliances should be switched off when not in use
ii) Use energy conserving electric lamps for generating lighting
iii) Utilize natural light inside buildings to avoid using electricity for lighting during the day.
iv) Use of alternative sources of energy such as solar energy
v) Use of automated sensor bulbs that only turns on when in use.
vi) Adoption of alternative energy sources such as solar panels.
vii) Use of backup generator in case of power failure

7.3.2.6 Traffic increase

The number of people seeking medical services will automatically increase in the area as will be the number of vehicles entering and leaving the area. These will include motorized and non-motorized traffic. There will be pressure on roads and even may cause traffic snarl up within the hospital and outside the hospital if not properly handled.

Mitigation

i. Proper parking of the vehicles supplying materials to the site and keeping road safety rules when branching to the site.
ii. Having signs indicating `heavy vehicles turning.
iii. Opening up the access road along the sites.

7.3.2.7 Occupational health and safety

Workers are also likely to get injured on site once the facility starts to operate due to bad sitting postures, bad lighting in the offices, and interactions with infected blood and skin contacts with patients or even the chemicals that are used in a day-to-day basis.

Mitigation

iv. Workers must wear protective clothes gear while in the health centre to avoid skin contacts especially exposure to infected blood and, body fluids.
v. A first aid kit should be provided within the site. This should be fully equipped at all times and should be managed by qualified person.
vi. Equip the offices with adjustable seats to ensure good sitting posture by staff.
vii. Design the rooms and working areas to have sufficient natural lighting where this is practically achievable.
viii. Equip the facility with adjustable handling aids such as trolleys to protect staff who handle patients from developing musculoskeletal disorders.
ix. Provide Mobile garbage bins (MGBS) and trolleys to cleaning staff to minimize handling of hazardous waste

7.4. The decommissioning phase

The decommissioning of the proposed project will take the duration agreed as per the agreement between the proponent and the concerned authorities (County government of Kisumu and NCA). Later on, should there be need for decommissioning the project after a decommissioning report has been submitted to NEMA at least three months before, the following will have to be considered;

7.4.1. Demolition works

Upon decommissioning, the project components including buildings, pavements, drainage systems, parking areas and perimeter fence if any will be demolished. This will produce a lot of solid waste, which will be reused for other construction works or if not reusable, disposed of appropriately by a licenced waste disposal company.

7.4.2. Dismantling of equipment and fixtures

All equipment including electrical installations, furniture, finishing fixtures partitions, pipe-work and sinks among others will be dismantled and removed from the site on decommissioning of the project. Priority will be given to reuse of this equipment in other projects. This will be achieved through resale of the equipment to other building owners or contractors or donation of these equipment.

7.4.3. Site Restoration

Once all the waste resulting from demolition and dismantling works is removed from the site, the site will be restored through replenishment of the topsoil and the necessary landscaping activities carried out to restore the land to its original condition.

7.4.4. Impacts related to occupational and public health and safety Assessment

Occupational health and safety hazards can be classified into 3 components; physical (noise and accidents), chemical (exposure to harmful substances e.g. gases and chemicals) and biological (exposure to pathogens causing diseases).

Mitigation

i. Avoid excavation in dry areas with loose materials to prevent dust.
ii. Fence the site for security and privacy to reduce trespass thereby avoiding conflict between the people at the site and those in the neighbourhood.
iii. Have a fully equipped First Aid Kit on site at all times and have at least one trained First Aid Personnel to handle emergencies.
iv. Ensure adequate water supply for high standards of sanitation thereby reducing risks of diseases.
v. Provide workers with appropriate PPE including masks, goggles, boots, and overalls among others as provided for by OSHA, 2007.
vi. Dispose wastes from the site regularly and ensure high standards of cleanliness.

vii. Have proper hazard notifications, signage and warnings to warn everyone on site of potential hazards that may exist.

viii. Clearly display emergency contacts at the site.

7.4.5. Potential beneficial impacts

7.4.5.1 Immediate impacts during the construction phase

i. Sourcing of raw materials boosting the economy of the locals and government through taxation.

ii. Improvement of the local livelihoods through provision of employment opportunities to experts like physical planners, environmental experts, disaster management experts and other skilled workers as well as non-skilled labour.

7.4.5.2 Long term impacts during the operation phase

i. Employment opportunities: those who are casually or permanently employed in the site will gain from the site. Others will gain indirectly through earning from tenders provided by the project.

ii. Reduction in transportation costs to visit other medical centres.

iii. Investment for the proponent thereby raising his/her income.

iv. Improving the aesthetics and development of the area.

v. Increased revenue generated from the site to the local and national government.

vi. Provision of health centre services as this will be the second in this area after the Kombewa Sub-County Hospital hence decongesting the latter.

7.4.5.3 Enhancement of socio-economic benefits

i. The project will improve the social status of the locals through employing the residents.

ii. Fencing of the site using a perimeter wall to secure it, prevent trespass and theft and to remove fear from the area residents.

8 PUBLIC PARTICIPATION

8.4 Introduction

The mutual relationship from the commitment, participation and involvement of the relevant stakeholders aimed at gathering information that would yield successful data and influence the decision makers. The consultation process included to a large extent public consultation through structured questionnaire administered on randomly sampled participants from around the neighbourhood of the proposed project. The consultants held two public participations in order to get enough information concerning the project.

8.5 Objective

i. To inform the people about the proposed project
ii. To seek views, concerns and opinion of the people in the area concerning the project
iii. To establish if the stakeholders foresee any positive or negative environmental effect from the project and if so, how they would wish the perceived impacts to be addressed

8.6 The questionnaire

The questionnaire as a tool was used to assist in gathering information and opinion relating to:

1. Awareness about the proposed development project.
2. Acceptance of the proposed project development by the respondent.
3. Whether the proposed construction development will cause negative impacts on the following:
    i. Natural ecology of the area.
    ii. The human environment
    iii. Public health and safety
    iv. Effect on road transport and drainage area and how best to mitigate them.
4. Any positive impacts that may arise from the project and how to enhance them.

8.7 Findings

Most of the locals rely on the Kombewa Sub-County Hospital (located 11 km away) and small clinics at Holo Market for medical services. Alternatively, they have to travel to the Port Florence Hospital at Otonglo (16 km away). While these distances might not seem great, accessibility is a major problem, especially at night when local public transport is not operational. The proposed facility, according to members of the local community, would also help decongest the Kombewa Sub-County Hospital and avoid unnecessary travel to Kisumu City in search of specialised medical care. The community members therefore welcomed the idea of developing the proposed facility as a way of bringing services closer to the people.

The neighbours and community members however stressed that there should be elaborate plans for the proper disposal of medical wastes that would otherwise end up in water springs around as attested by some of the locals. They also sought to know if the facility will incorporate a morgue within the site. The proponent affirmed that they intend to develop a health centre without a morgue and also promised to maintain high standards of cleanliness and put a proper waste management system to avoid both medical and non-medical wastes emanating from the facility. Community members also expressed optimism that the proponent should give priority to the locals during employment at both construction and operation stages and their remunerations be fair enough. They also urged that a perimeter fence be erected to prevent trespassing and also to improve privacy of the facility during construction and subsequent operations.

The community members expressed concern over the fact that they do not have a reliable source of clean water around and instead they have gone up to Holo Market where there are only three main borehole water providers, i.e., at DC's place, Ochok's place and Braso Villa borehole. They requested the proponent to sink a borehole deep enough to serve the immediate community members at a nominal fee and as part of Holo Plaza Health Centre's corporate social responsibility. Other modalities on how they could acquire the water shall be discussed later once the necessary infrastructure will be in place. They also requested that the main access to the facility be improved preferably to bitumen standard. It is proposed that provisions be made to avail part of this water to the local community at a nominal fee as part of Holo Plaza Health Centre's corporate social responsibility.

Figure 8- 1 Photo gallery during 2nd stakeholders meeting

stakeholders raising their concerns about the project

Area chief and Officer from the planning Dept addressing participants

Participants voting in favour of the proposed project

9 ENVIRONMENTAL MANAGEMENT AND MONITORING

9.4 Environmental management

This involves the management of an organization's environmental programs in a comprehensive, systematic, planned and documented manner. The ESMP is prepared to ensure that the components of proposed project are operated in accordance with the approved design.

The objectives of the Environmental Management Plan are:

i. To guide the project implementers in project planning.
ii. To guide the project implementers on the likely impacts of the project and when they are likely to occur.
iii. To give an assessment of the capacity requirements for the implementation of the EMP.
iv. To guide the project implementers to allocate adequate resources for the implementation of the mitigation measures.

9.5 Environmental monitoring and audits and record keeping

This is conducted to establish if project implementation has complied with ESMP standards. EAs are conducted annually from the date of commissioning the project to ensure all negative impacts identified are mitigated and the positive ones enhanced. For this auditing, some records need to be kept such as;

i. Emergency management procedures e.g., fire response and safety plans
ii. List of materials according to approved classification schedule.
iii. Staff health records.
iv. Staff training records in environmental issues.
v. Hospital management Information System
vi.

Table 9- 1 Summary of Environmental and Social Management Plan during construction phase

Environmental/ Social Impact	Proposed Mitigation Measures	Responsibility	Monitoring frequency
Air pollution	▪ Spray water on excavated areas ▪ Maintenance of all machinery and equipment to reduce gas emission ▪ Workers should be provided with dust masks if working in sensitive areas. ▪ Exposed stockpiles of e.g., sand, will be enclosed, covered, and watered daily. ▪ All personnel working on the project will be trained prior to starting construction on methods for minimizing air quality impacts during construction.	Proponent Contractor Workers	Daily inspection/ observation
Noise pollution	▪ Surround the health centre with a perimeter wall/hoard to help contain noise from disturbing the neighbours and institutions around. ▪ Construction should be carried out only during day time (8am -5pm).	Proponent Contractor Workers NEMA inspectors	Random inspection

	▪ Workers to wear ear muffs if working in noisy sections. ▪ Shield the site and avoid/reduce the use of very noisy equipment. ▪ Sensitize drivers of construction machinery to avoid unnecessary racing of engines and hooting		
Ecological considerations (flora and fauna)	▪ After completion of the project the proponent shall rehabilitate the land by planting ornamental flowers on the disturbed areas. ▪ Vegetation that does not interfere with the sitting of the project will be left intact.	Proponent contractor	Periodic checks
Solid waste	• Ensure proper disposal of construction waste in the contractor's yard (off the site) through segregation of waste e.g., pieces of wood and glass should be disposed separately. • Use of an integrated solid waste management system i.e., through a hierarchy of options: 1. Source reduction 2. Recycling 3. Reuse	Contractor Proponent Workers	Weekly checks

	4. Safe disposal		
Waste water	▪ Cleanliness of the construction site. ▪ Channelling surface runoff to the existing drainage. ▪ Presence of well-maintained sanitary facilities for the workers and visitors to the site.	Contractor Proponent Workers	Continuously
Increased water demand	• Employ services of water vendors to supplement water supply ▪ Reuse of water where possible	Contractor Proponent Workers	On need basis
Effect on human health	▪ Unused areas on the project site shall be kept free from bushes to prevent mosquito breeding grounds and hiding areas for vermin.	Contractor proponent	Monthly basis
Occupational health and safety	▪ All workers should be provided with full protective gear. These include working boots, overalls, helmets, goggles, earmuffs, masks and gloves. ▪ Construction crew at the site will be sensitized on social issues such as drugs, alcohol diseases ▪ A first aid kit should be provided within the site. This should be fully equipped at	Contractor County public health officer Construction Workers Proponent NEMA inspectors	Random inspection

	all times and should be managed by qualified person. ▪ The contractor should comply with the Work Injuries Act, No. 13 of 2007, as well as ordinances, regulations and union agreements. ▪ Food handlers preparing food to the workers at the site should be controlled and monitored to ensure that food is hygienically prepared.		
Security	▪ Provide security guards and facilities during construction and operational phases. ▪ The gate should always be controlled by the security guards recording movement in and out of the construction site. ▪ Adequate lighting and an alarm system installed at strategic points.	Contractor Proponent	Daily observation
Traffic management	• Ferry building materials during off-peak hours • Employ traffic marshals to control traffic in and out of site	Proponent Contractor NEMA inspectors Workers	Daily observation

	• Enforce speed limits for construction vehicles especially along the roads leading to the site • Provide bill boards at the site/entrance to notify motorists and general public about the development ▪ Employ well trained and experienced drivers		
Project integrity / design	▪ Provide a sign board depicting all the consultants involved	Contractor / proponent	At commencement

Table 9- 2 ESMP during the operation phase

Impact expected	Recommended mitigation measures	Responsibility	Monitoring frequency
Exposure to infections	▪ Staff to wear appropriate PPE. ▪ Disinfect contaminated equipment, environment and working surfaces. ▪ Handle contaminated PPE and clothing properly i.e. - Never wash contaminated PPE and clothing with personal laundry. - Place contaminated reusable PPE and clothing in to leak-resistant bags or containers. - Wash and dry reusable PPE and clothing according to instructions on their labels. -Brush and scrub contaminated boots and leather goods with soap and hot water. ▪ Maintain a cleaning schedule which requires the cleaning of work and equipment surfaces, waste containers at the end of a shift or after any spill. ▪ Clean up spills of potentially infectious materials immediately. ▪ Practice good personal hygiene. ▪ Never store food or beverages in an area where their containers may become contaminated with medical wastes. ▪ Follow Material Safety Data Sheets	Proponent Workers Management County public health officer	Continuous

	▪ Every category of hazardous waste must be labelled and stored in appropriate bag/container with correct colour code ▪ Each category of Waste should be collected and disposed off by NEMA licensed waste collector ▪ Do not procure what you do not need ▪ Procure latest version of the desired electronic or electrical equipment ▪ Always refer to National-Guidelines-for-Safe-management-of-health-care-waste		
Solid waste generation	▪ Ensure solid generated at the Health Centre is regularly collected by licensed waste handlers. ▪ Ensure that wastes generated are efficiently managed through recycling, reuse and proper disposal procedures ▪ Careful segregation (separation) of waste matter into different categories helps to minimize the quantities of hazardous wate ▪ Health-care waste should be transported by the quickest possible route, which should be planned before the journey begins ▪ Mobile garbage bins (MGBS) and trolleys to transport waste to minimize spills ▪ All bins must be colour coded according to the categories of waste they carry as the table above. ▪ Avail dust bins at strategic places on site ▪ maintenance of cleaning schedule record	Management Workers Proponent Public health officers	Continuous

	▪ avail information to the public not to litter environment		
Foul smell	▪ Dispose off each category of waste at designated places. ▪ Emptying of garbage bins daily ▪ Regular cleaning of hospital facility	Workers Management proponent	Continuous
High demand for water	▪ Create water conservation awareness. ▪ Install a discharge meter at water outlets to determine and monitor water usage where possible. ▪ Ensure water taps are not running when not in use. ▪ Promptly detect the repair of water pipes and tank leaks. • Harvest rain-water to supplement Borehole water • Install water conserving taps that turn off automatically when not in use • Encourage re-use of water especially to water grass ▪ Place notices at water taps e.g. 'TURN OFF TAP AFTER USE'	Management proponent	Routine inspection and maintenance
Insecurity	▪ Ensure the general safety and security at all times by providing day and night security guards and adequate security lighting within and around the premises. ▪ Put up a security wall to prevent trespass and the neighbouring communities from seeing what is happening within the premises to avoid traumatizing situations.	Management proponent	Periodic checks

	▪ Install CCTV cameras ▪ Place hotline numbers on strategic places		
Fire control	▪ Firefighting drills carried out regularly. ▪ Firefighting emergency response plan. ▪ Ensure firefighting equipment are in place and regularly maintained, serviced and inspected. ▪ Train workers on firefighting skills ▪ Fire hazard signs and directions to emergency exit, route to follow and assembly point in case of any fire incidence.	Management Proponent workers	Random inspection
High demand for electricity	▪ Switch off electrical appliances and lights when not in use. ▪ Monitor energy use during the operation of Health Centre and set targets for efficient use. ▪ Sensitize employees to use energy efficiently. ▪ Use energy conserving bulbs e.g. LED bulbs for general lighting. ▪ Make use of alternative source of energy such as solar power	Management Proponent	Daily inspection
Storm water drainage	• Proper maintenance of drainage structures ▪ Inspection and maintenance of water harvesting gutters and storage tanks	Proponent	Routine inspection and maintenance

Table 9-3: Environmental & Social Management Plan for the Decommissioning Phase

Environmental/ Social Impact	Proposed Mitigation Measures	Responsibility for Mitigation	Monitoring Frequency
Air pollution	• All personnel working on the project will be trained prior to commencing the demolition exercise on methods for minimizing negative impacts on air quality. • All active demolition areas will be watered at least twice a day to reduce dust. • All trucks hauling demolition debris/wastes shall be covered. • Careful screening to contain and arrest demolition related dust will be adopted. Exposed demolition debris of e.g. dust and sand, will be enclosed, covered, and watered daily before transported to disposal site. • All workers on the site will be required to wear protective gear while on duty i.e., gas masks.	Proponent Contractor	Continuous
Noise pollution	• Portable barriers will be installed to shield compressors • Use of equipment designed with noise control elements will be adopted where possible • Greasing of machines movable parts to reduce noise	Proponent NEMA inspector Contractor	On need basis
Solid waste	• Private licensed waste collector will be engaged to collect and dispose of demolition debris/wastes or other materials that can't be recycled or re-used	Proponent Contractor	Continuous

	• All debris/wastes to be collected regularly to control air pollution and injury etc. • All installed equipment, electronics or any other device that are in good use will be donated or sold • recyclable materials will be sold to scrape handlers for recycling		
Accidents/ Injuries	• All workers will be sensitized before the exercise begins, on how to control accidents related to the demolition exercise • A comprehensive contingency plan will be prepared before demolition begins, on accident response. • Adherence to safety procedures will be enforced at all stages of the exercise • All workers, pursuant to labor laws, shall be accordingly insured against accidents. • All workers will be provided and instructed to wear protective attire during demolition, including helmets.	Proponent NEMA inspectors Contractor Workers	Periodic checks

10 RECOMMENDATIONS AND CONCLUSION

10.4 Conclusions

The proposed project has numerous positive impacts as outlined in the report. For the few negative impacts identified, they can be mitigated as stated in the following sections. This Report concludes that if all the mitigation measures are put in place and the recommendations above as well as the EMP implemented, the proposed project will have little impact on the environment. It is clear that the neighbours' concerns have been addressed and that they can live in harmony with the proposed development.

10.5 Recommendations

- The proponent should follow the guidelines as set by the relevant departments to safeguard and envisage environmental management principles during construction and operations/ occupation phases of the proposed project.
- It is important that warning or informative sign (bill boards) be erected at the site. These should indicate the operation hours and when works are likely to be started and completed. The signs should be positioned in a way to be easily viewed by the public and mostly motorists.
- All solid waste materials and debris resulting from the site should be disposed of at approved dumpsites or collected by designated waste collectors.
- All liquid waste used for disinfection and embalmment should be neutralised at the septic tank before draining off to the soak pit.
- A fully equipped first aid kit should be provided within the site.
- Workers should get food that is hygienically prepared. The source of such food should be legalized or closely controlled.
- The contractor should comply with Work Injuries Act No.13 of 2007 as well as other relevant ordinances, regulations and Union Agreements.
- The contractor should provide adequate security through building a perimeter wall to prevent trespass and prevent outsiders from seeing the activities going on within.
- The contractor, proponent and Health Centre management be advised to live in harmony with the neighbours.
- Implement and follow the EMP to the letter.

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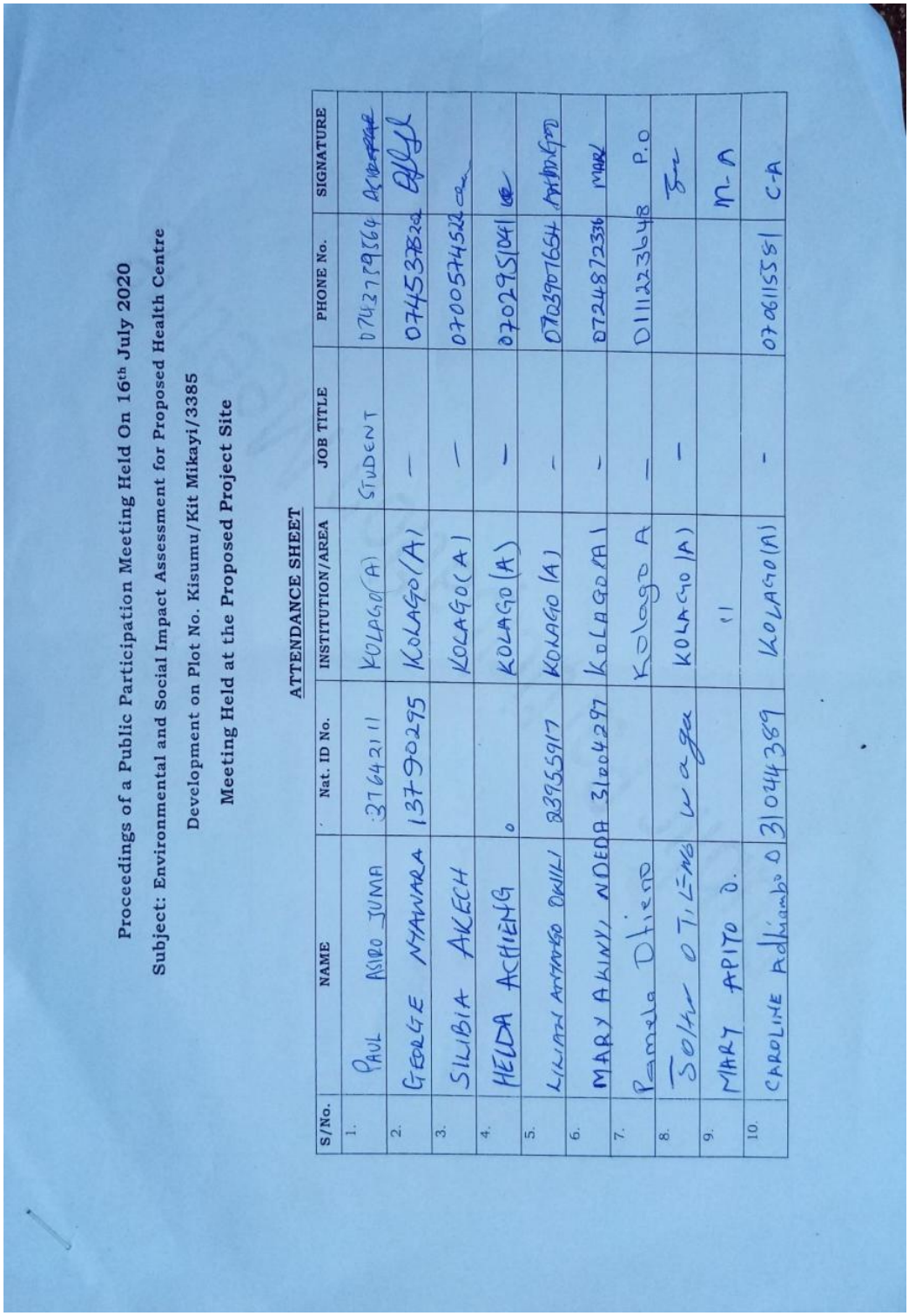
https://kmpdc.go.ke/resources/level3A.pdf.

Appendices

Appendix 1: Copy of list of in the participants for 1st public participation proceedings

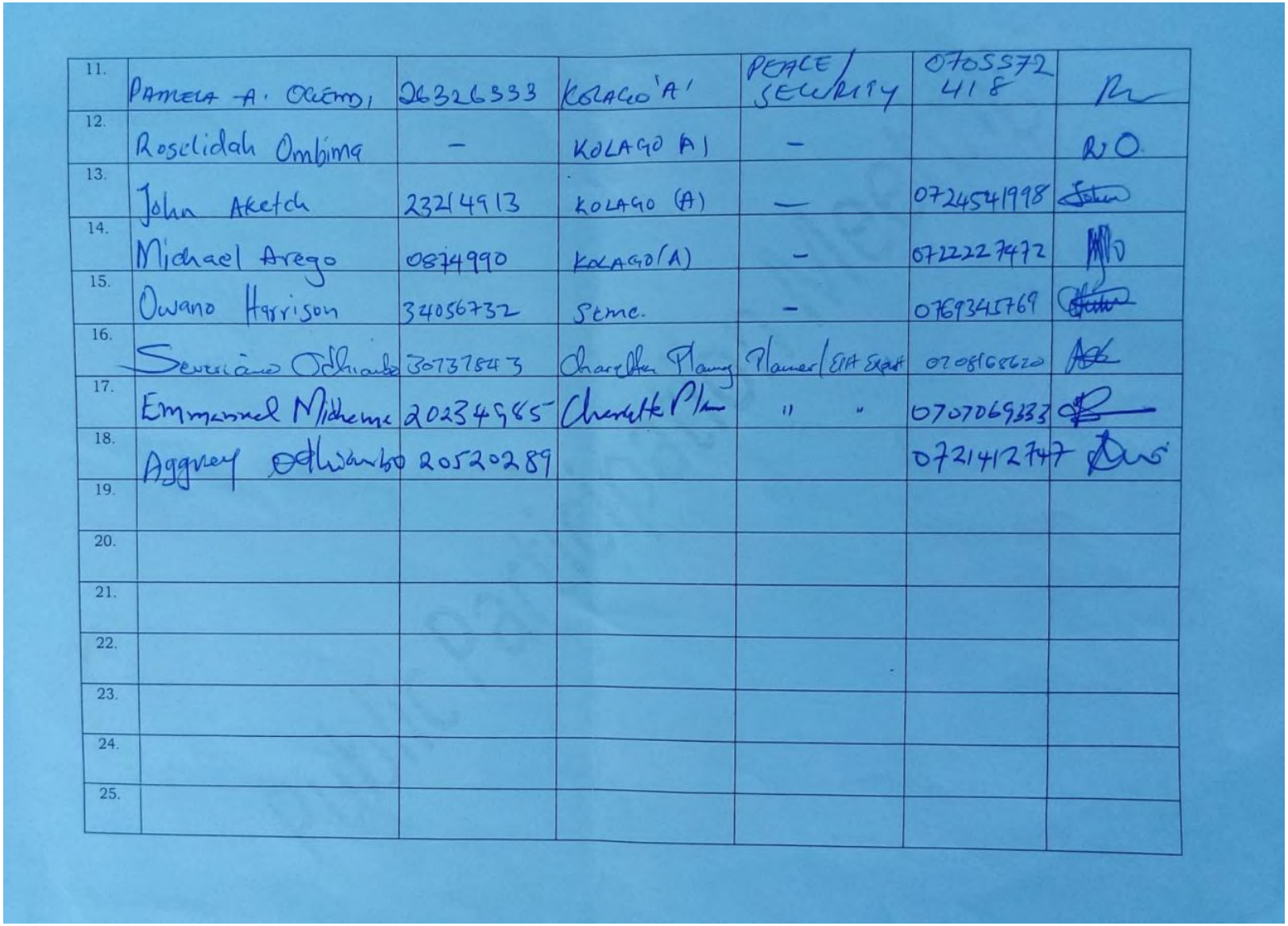


Proceedings of a Public Participation Meeting Held On 16th July 2020

Subject: Environmental and Social Impact Assessment for Proposed Health Centre Development on Plot No. Kisumu/Kit Mikayi/3385 Meeting Held at the Proposed Project Site

ATTENDANCE SHEET

S/No.	NAME	Nat. ID No.	INSTITUTION/AREA	JOB TITLE	PHONE No.	SIGNATURE
1.	PAUL ASIRO JUMA	37642111	KOLAGO(A)	STUDENT	0742789564	
2.	GEORGE NYAWARA	13790295	KOLAGO(A)	—	0745378202	
3.	SILIBIA AKECH		KOLAGO(A)	—	0700574522	
4.	HELDA ACHIENG	0	KOLAGO(A)	—	0702951041	
5.	LILIAN AYANGO OKILLI	23955917	KOLAGO (A)	-	0703907654	
6.	MARY AKINYI NDEDA	31004297	KOLAGO(A)	-	0724872336	
7.	Pamela Diang		Kolago A	—	0111223648	P.O
8.	Solan OTIENO	Wager	KOLAGO (A)	-		
9.	MARY APITO D.		"			M-A
10.	CAROLINE Adhiambo	31044369	KOLAGO(A)	-	0706115551	C-A



11.	PAMELA A. OKEMO	26326333	KOLAGO 'A'	PEACE/SECURITY	0705572418	
12.	Roselidah Ombima	-	KOLAGO A)	-		R.O.
13.	John Aketch	2321491 3	KOLAGO (A)	—	0724541998	
14.	Michael Arego	0874990	KOLAGO(A)	-	0722227472	
15.	Owano Harrison	34056732	Semc.	-	0769341769	
16.	Severiano Odhiambo	30737843	Charlotte Planning	Planner/EIA Expert	0708168620	
17.	Emmanuel Midheme	20234985	Charlotte Plan	" "	0707069333	
18.	Aggrey Odhiambo	20520289			0721412747	
19.						
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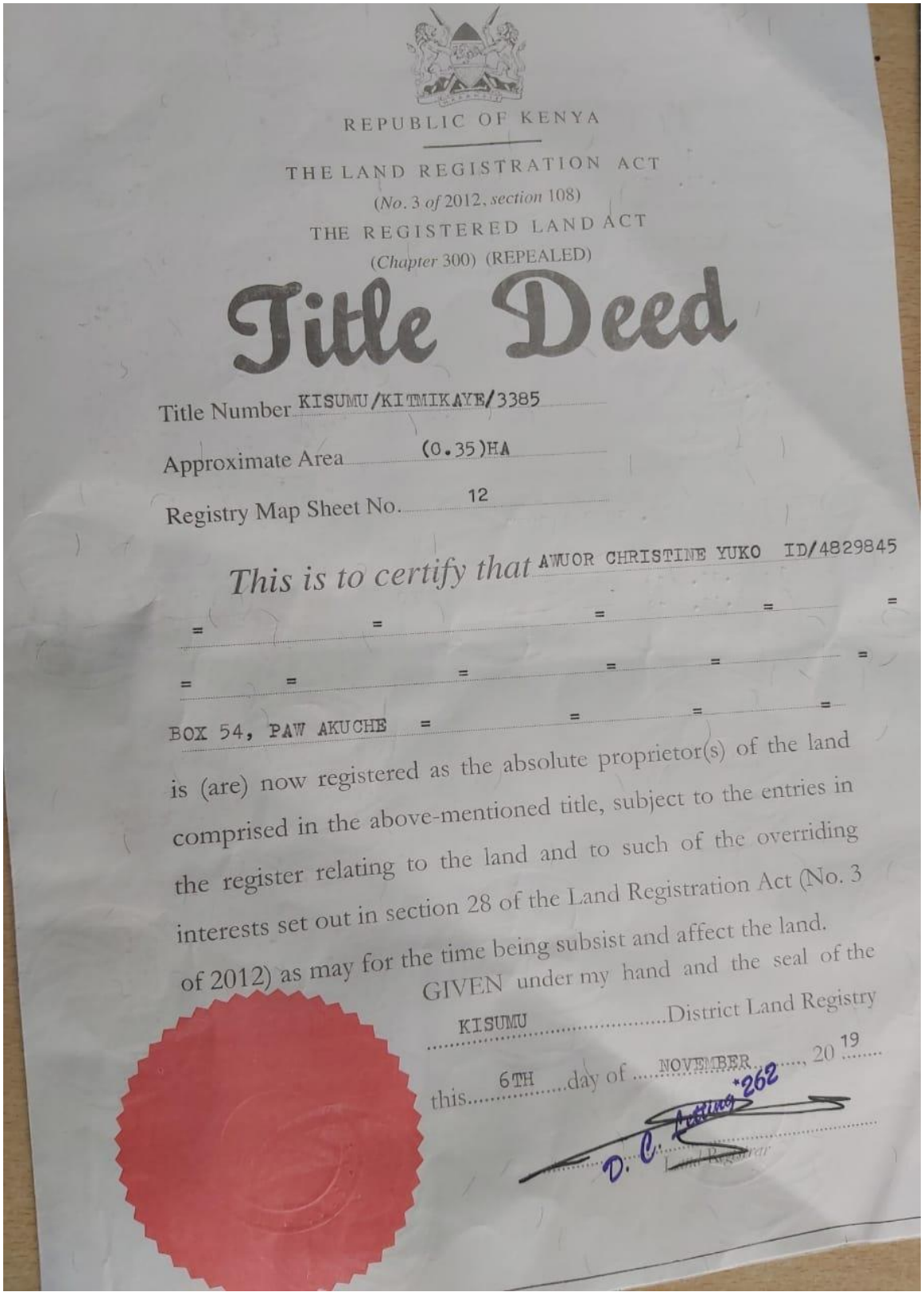
Appendix 2: Copy of title deed



REPUBLIC OF KENYA

THE LAND REGISTRATION ACT

(*No.* 3 *of* 2012, *section* 108)

THE REGISTERED LAND ACT

(*Chapter* 300) (REPEALED)

Title Deed

Title Number KISUMU/KITMIKAYE/3385

Approximate Area (0.35)HA

Registry Map Sheet No. 12

This is to certify that AWUOR CHRISTINE YUKO ID/4829845

BOX 54, PAW AKUCHE

is (are) now registered as the absolute proprietor(s) of the land comprised in the above-mentioned title, subject to the entries in the register relating to the land and to such of the overriding interests set out in section 28 of the Land Registration Act (No. 3 of 2012) as may for the time being subsist and affect the land.

GIVEN under my hand and the seal of the

KISUMU District Land Registry

this 6TH day of NOVEMBER, 20 19

262

D. C. [illegible]

Land Registrar

(To be completed only when the applicant has paid the fee of Sh. 125)

At the date stated on the front hereof, the following entries appeared in the register relating to the land:

EDITION: 1
OPENED: 6.11.2019

PART A—PROPERTY SECTION

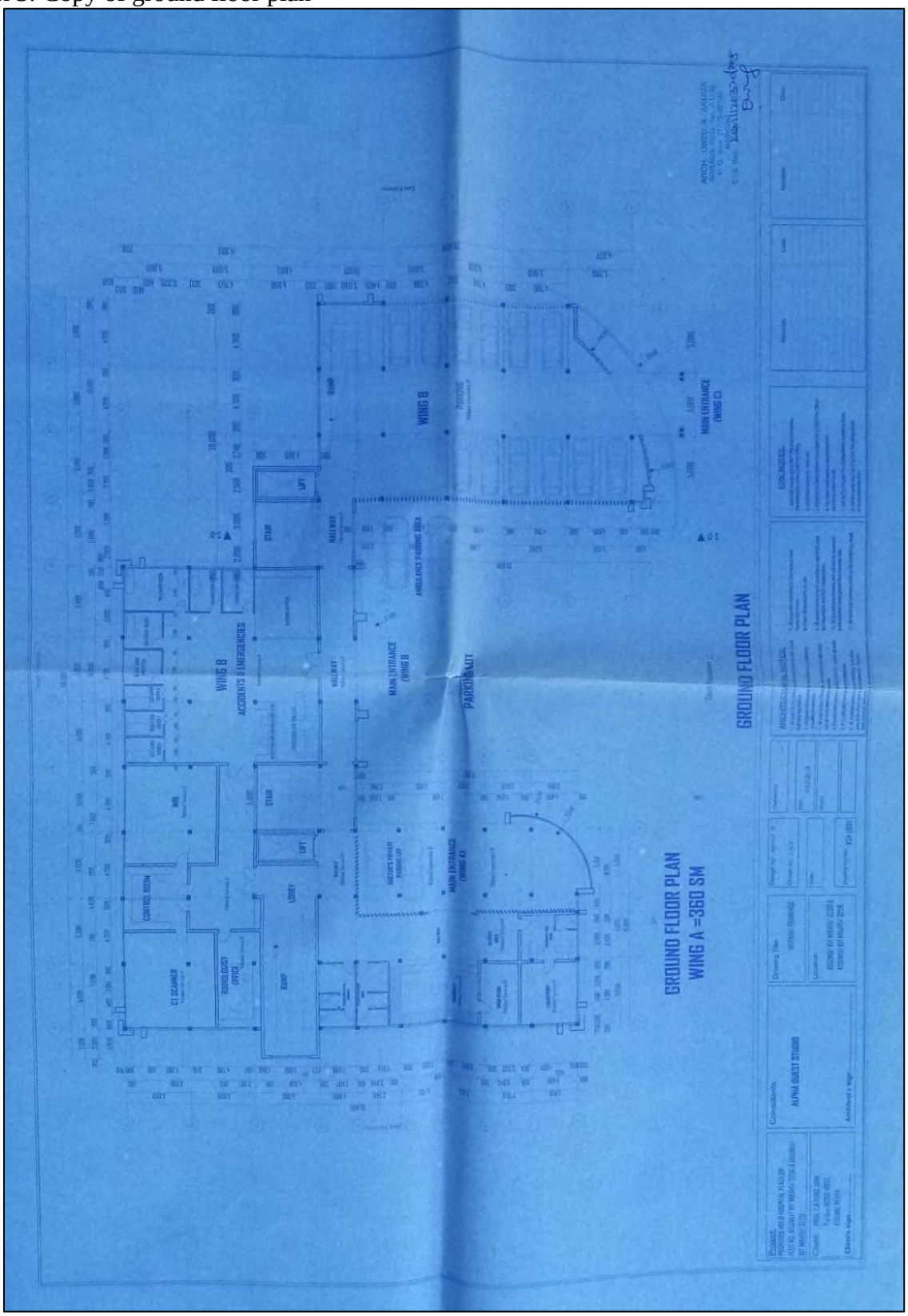
REGISTRATION SECTION	EASEMENTS, ETC.	NATURE OF TITLE
KISUMU/KITMIKAYE		
PARCEL NUMBER		
3385		
PPROXIMATE AREA (0.35) Ha.		ABSOLUTE
REGISTRY MAP SHEET No.		
12		

PART B—PROPRIETORSHIP SECTION

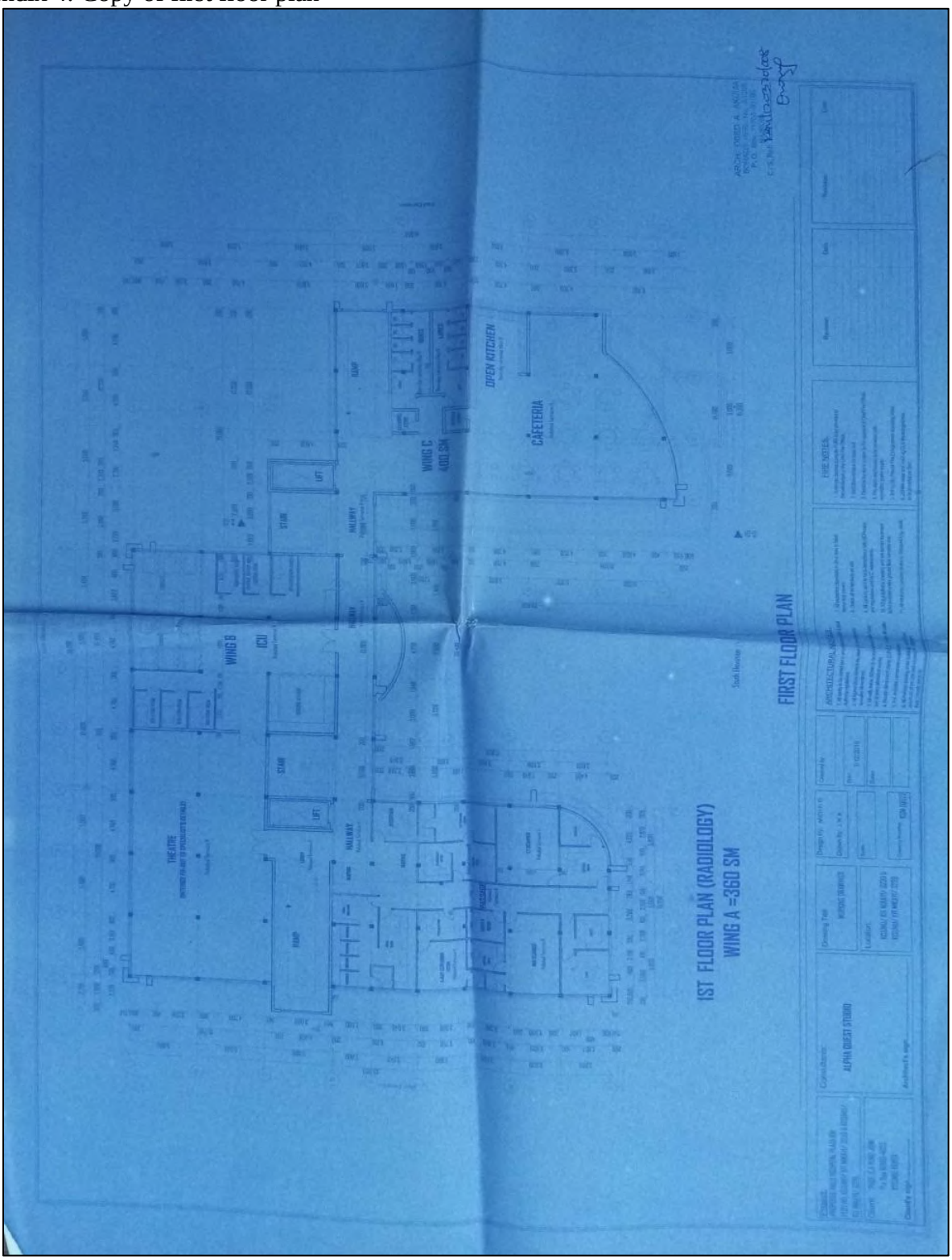
COMBINATION NOS. 3229 & 3230

ENTRY NO.	DATE	NAME OF REGISTERED PROPRIETOR	ADDRESS AND DESCRIPTION OF REGISTERED PROPRIETOR	CONSIDERATION AND REMARKS	SIGNATURE OF REGISTRAR
1	6.11.2019	AWUOR CHRISTINE YUKO		ISSUED	
2	6.11.2019	TITLE DEED			

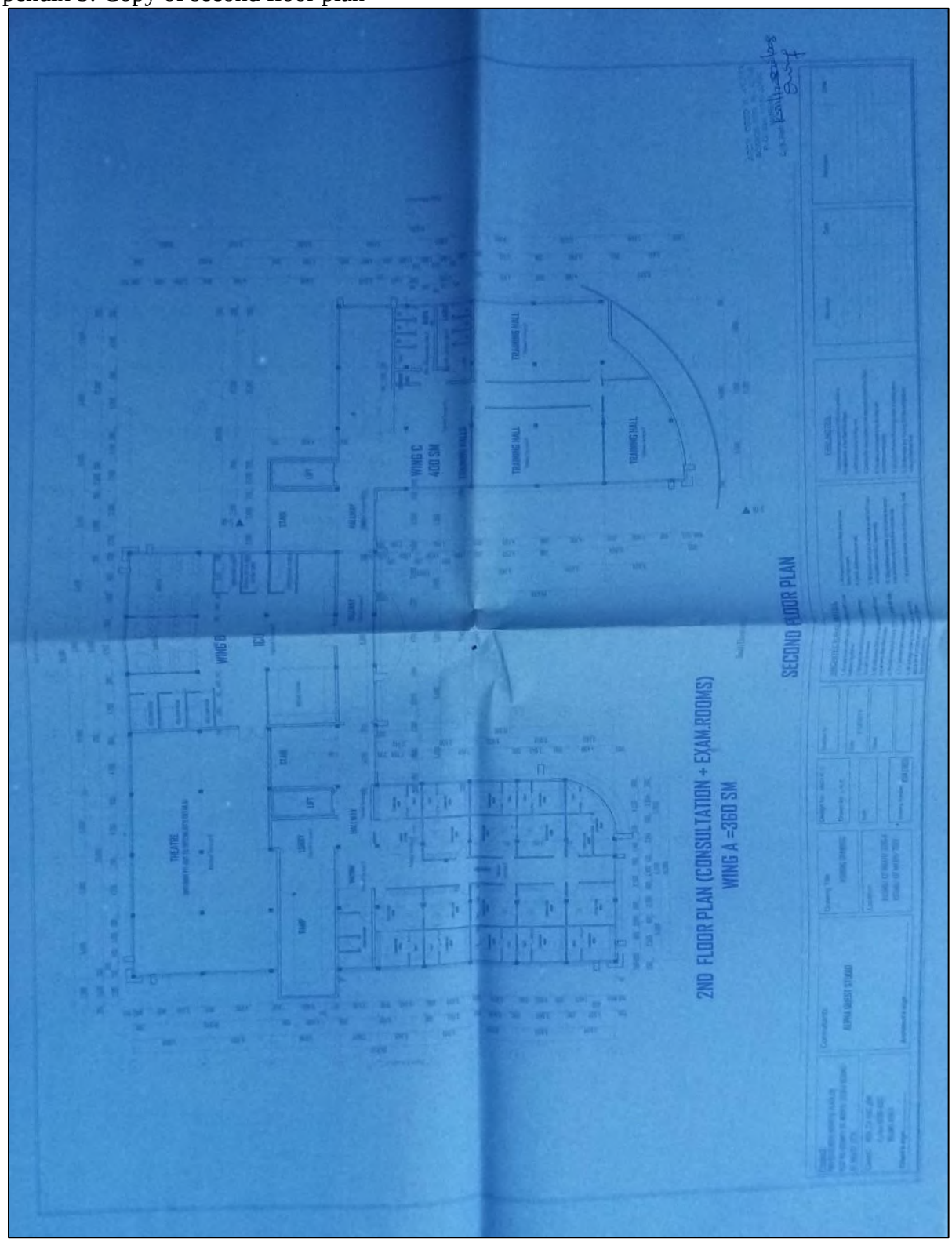
Appendix 3: Copy of ground floor plan



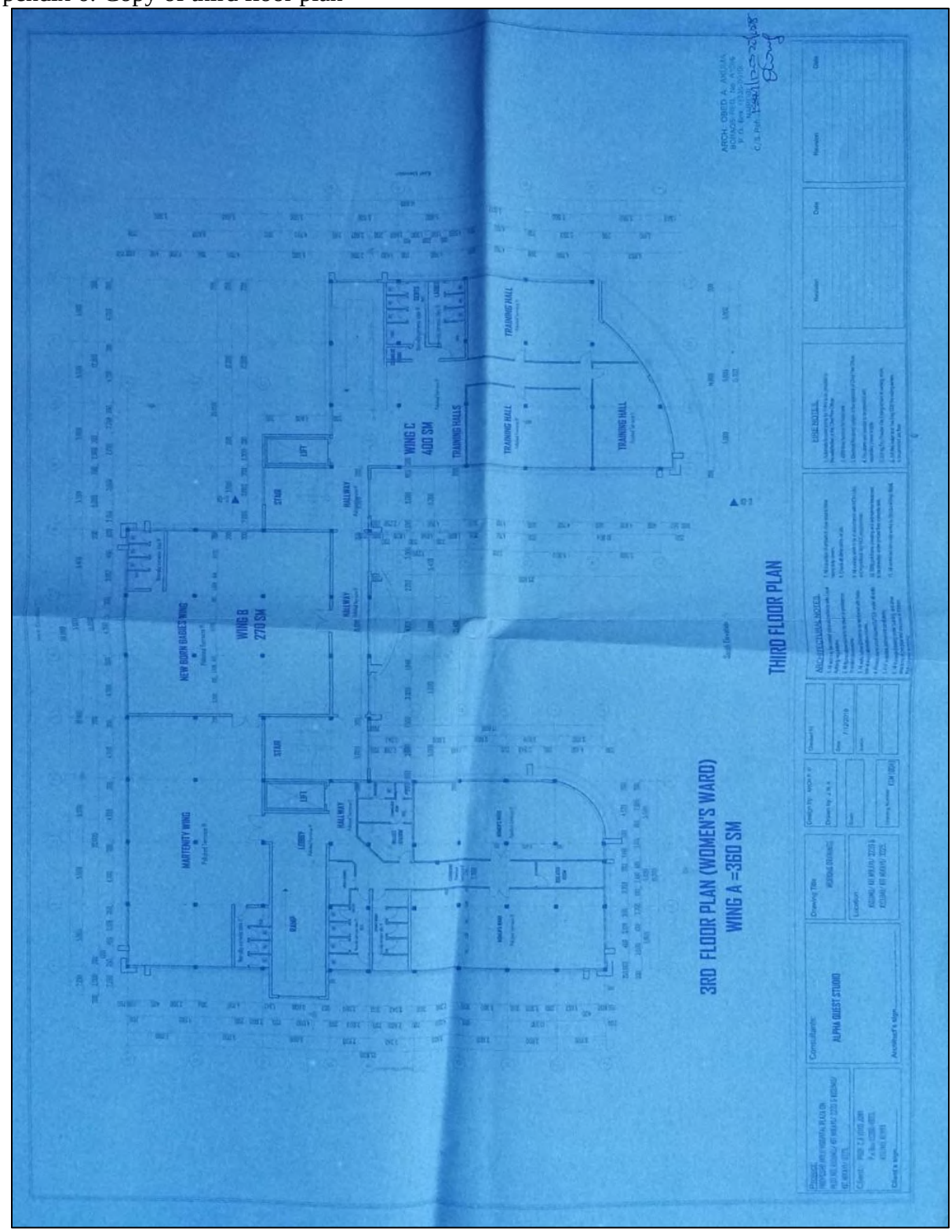
Appendix 4: Copy of first floor plan



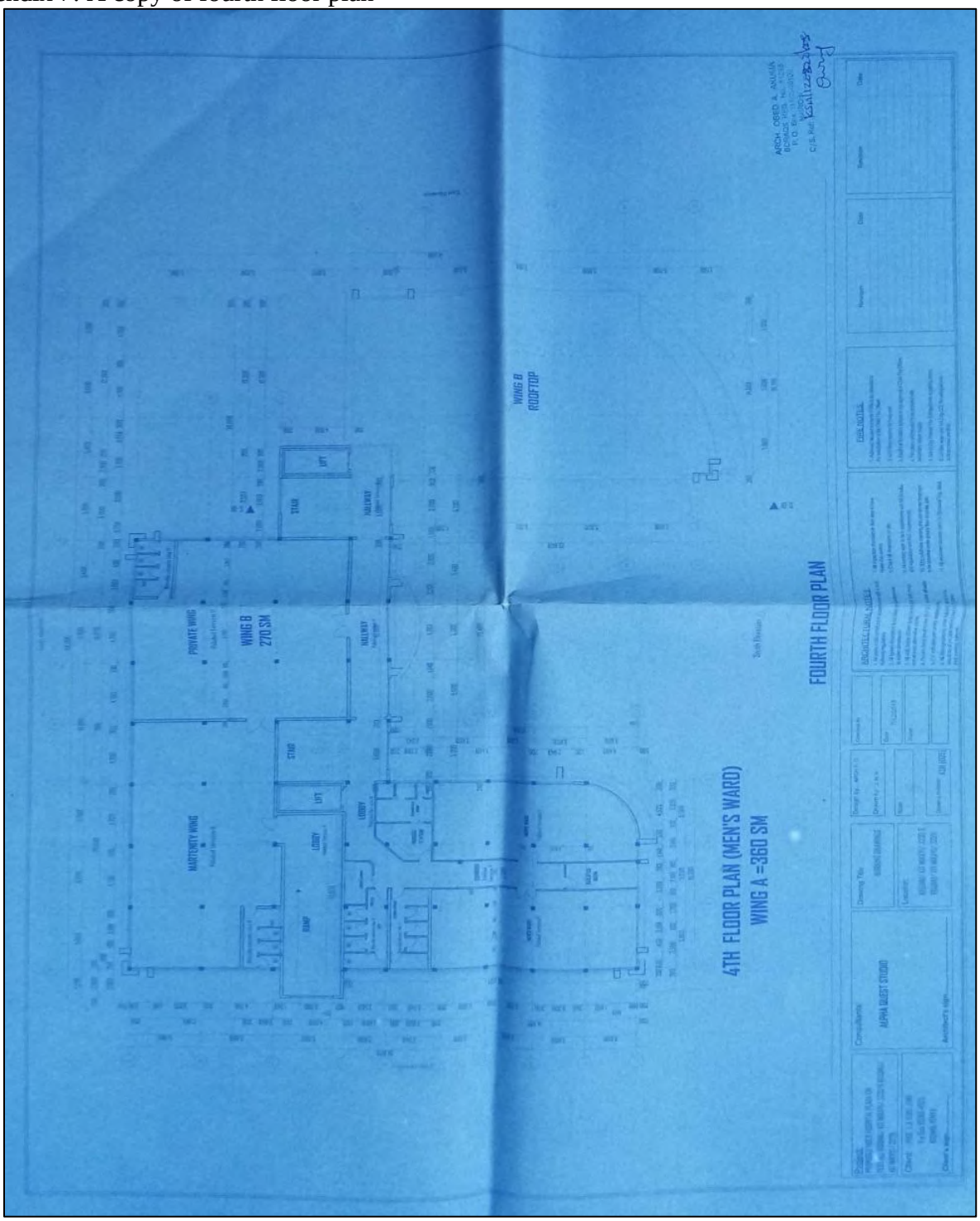
Appendix 5: Copy of second floor plan



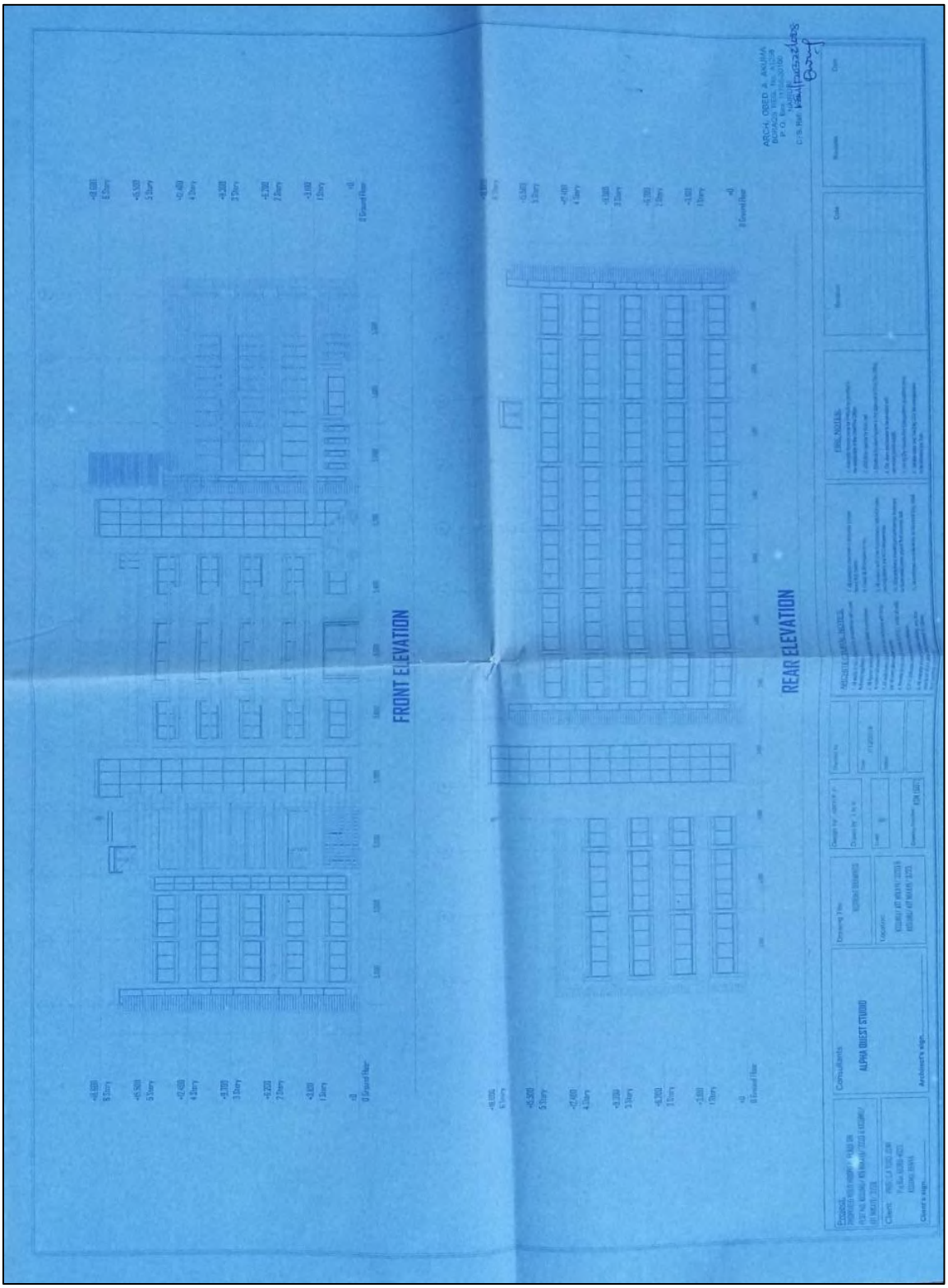
Appendix 6: Copy of third floor plan



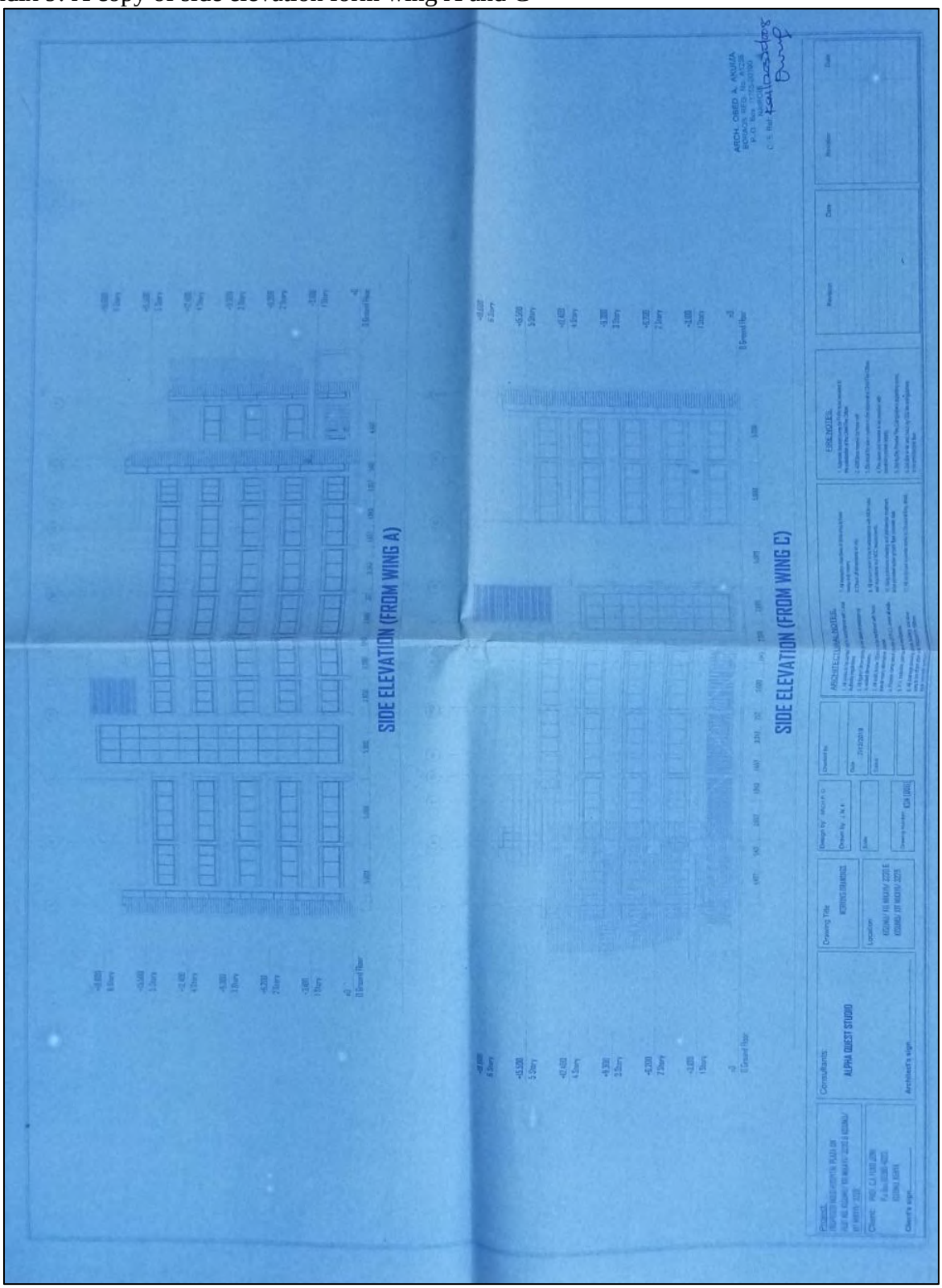
Appendix 7: A copy of fourth floor plan



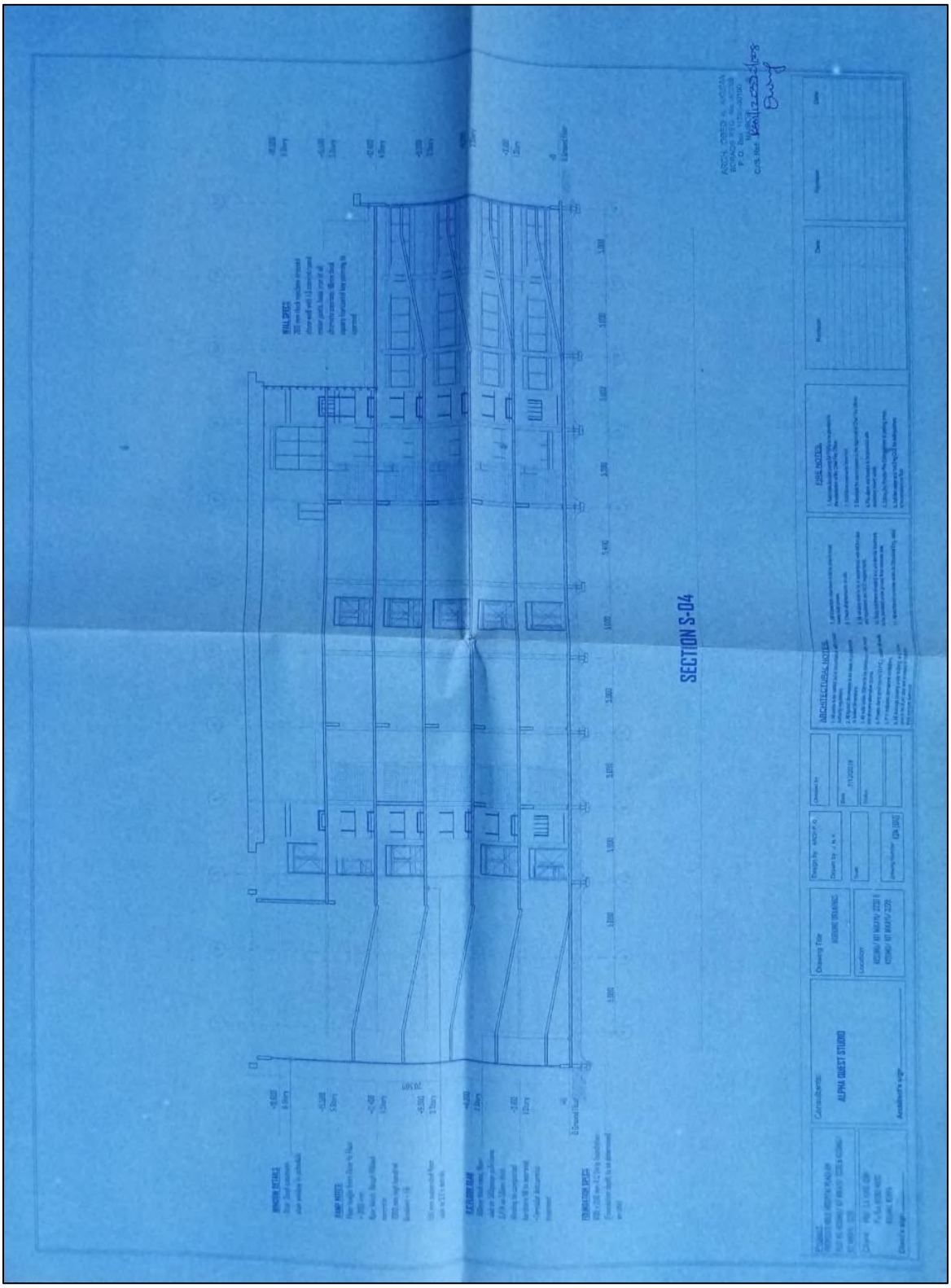
Appendix 8: A copy of front and rear elevation



Appendix 9: A copy of side elevation form wing A and C



appendix 10: Section of the building



Appendix 11: Minutes of 2nd public participation workshop

MINUTES OF 2ND STAKEHOLDERS MEETING
DATE: 5TH, JULY. 2022
VENUE: HOLO CENTRE- ON SITE

The stakeholders for the project of Prof. Achola Ndinya Hospital that is under construction met for a special session on Tuesday 5th, July. 2022 at 10:30am at Holo Centre on the site of construction.

A list of all the guests and stakeholders in attendance, list of interviewed stakeholders and the questionnaires were attached to this minute.

Call to order.

The facilitator Eng. Yuko called the meeting to order at 10:35am and appointed teacher Mrs. Joyce Midega to lead in a word of prayer. He then introduced the East Seme area Chief Mr. Charles O. Achola who welcomed and gave each attendant a chance to introduce themselves. It was pointed out that the main agenda of the meeting was Environmental Impact Assessment to clearify issues and to answer questions on matters arising at the stage of construction till it become functional.

Purpose of the meeting.

The Mr. Ochola said that there was the first meeting that was held with the local community. This Second meeting held to fine tune most key areas of concern with regard to the environment in liaison with various other key stakeholders such as such as religious leaders, NGOs, relevant governmental departments such as the department of health, department of physical planning and environmental department etc. to ensure the success of the project.

Description of the Hospital Plan.

The description of Holo health centre was laid out by Planner Mr. Bernard Okore to the stakeholders as follows;

It would be a storey building of four floors and would be "C" shaped with three wings namely Wing "A", "B" and "C.

On the ground floor.

Wing "A" ramp, stair, lift, CT scanner, control room, MRI, Radiology office, patient rest room, pharmacy, drug store, laboratory, laboratory consultation room, waiting area and director's private parking lot.

Wing "B" isolation cubicles, blood bank and store, treatment room, examination rooms, nursing station, reception and information desk and accident and emergency area.

Wing "C" stair, ramp lift and parking area.

In front of the building is the parking area for the ambulance.

On the 1st floor designated for radiology.

Wing "A" stair, ramp, lift, theater, hand dressing rooms, X-ray screening room, consultation room, server room, control room, MRI scanner, staff room, utility room, store, ultrasound room, radiologist office, waiting room and receptionist desk.

Wing "B" (ICU) isolation rooms, cubicles, monitoring room, central oxygen suction room, resuscitation cubicle and nursing station.

Wing “C” stair, lift, ramp, cleaners room, wash rooms, kitchen store, open kitchen and cafeteria.

On the 2nd floor designated for consultation and examination.

Wing “A” stair, ramp, lift, examination rooms, consultation rooms, toilets and nurse station.

Wing “B” (ICU) isolation rooms, cubicles, monitoring rooms, central oxygen suction room, resuscitation room and nursing station.

Wing “C” stair, lift ramp, cleaners store, wash rooms and training halls.

On the 3rd floor designated for women ward.

Wing “A” stair, lift, ramp, maternity wing, laboratory, wash rooms, women’s ward, isolated room, nurse station and consultation room.

Wing: B” new born babies wing.

Wing “C” stair, ramp, lift, clearners store, wash rooms and training halls.

On the 4th floor designated for men’s ward.

Wing “A” stair, ramp, lift, paternity wing, laboratory, wash rooms, men’s ward, nurse station examination room and utility rom.

Wing “B” private wing

Wing “C” roof top.

Above fourth floor’s wing “A” and “B” are roof tops.

Stakeholders Concerns

The stakeholders were given chance to point out how the project would impact physical environment, socioeconomics and their health either positively or negatively and the response were as follows;

During construction.

Positive impact	**Negative impact.**
There would be job opportunities for youths by providing human resource.	A lot of noise came from the construction site which caused inconvenience to the residence of its neighborhood.
Source of income to the women who bring food to sell in the site.	During rainy season a lot of water collects at the construction site and flowed with gravity to the nearby residence and schools.
Development in the area by electrical power of the area as well as building of modern rental dwellings.	Negligence of health concerns of the construction workers.
Increase revenue base of local hardware in Holo centre.	Delay of workers wedges.
Training of casual construction workers by sharpening their construction skills.	Theft of construction materials.
Improvement of security by clearing of bushes around.	Domestic violence.

Mitigation measures.

- Standardization of payment mode either on a daily basis or weekly basis and to be made consistent.
- Encouragement of workers to be self-disciplined in order to avoid social insecurity cases.
- Every worker to be responsible of the construction materials in order to eliminate material theft and wastage that would result from careless handling or storage of construction materials.
- Tasks that go over time should be assigned to male workers to help minimize domestic violence.
- Provision of protective gears and taking keen interest of the site workers in case of any accident or any unnecessary occurrence while on site.
- To minimize the amount of noise produced from the construction site especially at night by prioritizing construction jobs that do not produce a lot of noise to be done at night.

After completion and functioning.

Positive impacts	**Negative impacts.**
The hospital would give scholarships to needy students of the area to further their education.	There might be shortage of health workers.
Appreciation of land rates.	Poor disposal of hospital solid wastes.
Security would be improved by putting street lights.	Poor drainage to channel hospital waste water which could leading to pollution of the rivers.
Improved residential areas, markets and roads.	Residence living around the hospital would be exposed to greater risks of contracting infections.
Employment opportunities to the locals by being assigned casual jobs as well as professional jobs.	
Widening of roads in the locality to enhance accessibility to the hospital.	
Close proximity hence cutting on cost and time to access health facilities from outside the locality.	
Health indicators would be improved.	
Reduced mortality.	

Mitigation measures.

- Putting in place well defined procedures approved by health officers to minimize risks of infectious disease spread.
- Ensuring that there are enough service providers in the institution to balance patient to health provider ratio.
- Putting in place good sewerage system to aid in proper disposal of hospital waste waters.
- Putting in place strategic points to dump hospital solid wastes and have a routine program of the waste collection to be disposed of appropriately.

Presentation by representatives of various departments.

Mr. Anyona from Physical Plnanning Department mentioned that after the approval of the construction, he confirmed to the locals that institution would be made safe for their well-being and to avoid any unexpected outcomes during and after the completion of the project through cooperation of the departmental organizations and the stakeholders.

Mrs. Ogunde from MOH Seme Sub County remarked that the project would be of great advantage to the locals of Seme and neighboring sub counties and counties. She identified some areas that were not captured in the plan as IBU, mortuary. She added that there would be a team to inspect the building to give recommendations on where to improve. She also requested that the plan to be taken to the appropriate office for approval and to work hand in hand to ensure that its goal was successful.

Sub-county Health Office Mrs. Ojwang appreciated the people who championed the initiation of the project. She continued that it would be good to work hand in hand with all the stakeholders to ensure the safety of the hospital under construction. She encouraged that the regular site meeting should be invited to get the proceedings for them to get way forward for inspection procedures to ensure that everything was in their right order.

Mr. Odhiambo from the department of environment remarked that waste management issue should be of great concern in order to take care of the environment and properly managed drainage system.

Mr. Odhiambo from CBO put it forward that they would ensure that they work co-operatively proper water distribution to the site of hospital adequately.

Mrs. Yuko, private clinician, responded to the question on NHIF and said that the hospital would accept NHIF card and various health covers from various companies. The area MCA Mr. Seth also added that Kisumu County had their health cover that works in partnership with NHIF to aid during treatment of Kisumu County residents and they should take advantage of that.

All stakeholders approved and voted for the proposed development by raising their hands except one individual who raised concerns that the space could not accommodate the proposed development. He was answered that the design s considered all space requirements for the proposed development.

Proposals.

- It was proposed that the hospital name be changed to Prof. Achola Ndinya and was seconded by all the stakeholders.
- The hospital to be upgraded in the future to be a referral hospital.

Adjournment.

There being no other business, the meeting facilitator adjourned the meeting at 1340 hrs. by thanking all stakeholders for their time and called upon Mr. Joyce to lead in a word of prayer

Appendix 12: List of participants in the 2nd stakeholders meeting and questionnaires

PARTICIPANTS' LIST

VENUE: [redacted] **DATE:**

[redacted]

NO	NAME	DESIGNATION	CONTACT	SIGNATURE
1.	HON SETH OKUMU	MCA	0720409224	
2.	PETER GUMBA	SNR. ASST. CHIEF	0711238478	
3.	THOMAS OWUO	Kolego A MEMBA.	0715296057	
4.	JANE ONYANGO	Kolago A	0712670384	J.A
5.	Mourine Otieno	Kolago A.	0731403015	
6.	Christine Ogulk	Kolago A	0795685915	AWINO
7.	Pamela Oso	Kolago A		P.O
8.	MARY A NDEDA	Kolago A	0724872336	MAR
9.	Magren okello	Kolago A	1715691110	
10	Caroline Ochieng	Kolago A.	0706115581	
11	John Ochieng	Kolago A.	0724541998	GOA
12	John ONYANGO	KOLAGO A	0792410919	
13	JACKSON OMONDI	KOLAGO - A	0792627708	
14	BENARD OKELLO	KOLAGO-A	1719792993	
15	GEORGE NYANDA	KOLAGO A	0745378202	
16	JUDITH Jagongo	Kolago 'A'	0723354163	
17	Joyce Jagongo	Kolago 'A'	0710554029	
18	MILKA Jagongo	Kolago-A.	0793960929	
19	ELLY AMETCH	KOLAGO A.	0799997043	
20	EVANS OTHIAMBO	KOLAGO A	0726639f72	
21	George Ulgga	KOLAGO A VILLAGE ELDER	0725325982	
22	Moses Achieng	Kolago. A.	0729968918	
23	Midath Agingo	Kolago A	0767866	
24	Dickson odhiambo	Kolago A		

25	JOAB B ONYANGO	C.G.K Department of Environment	0720138541	
26	FRANCIS OMUHGO	C.G.K DEPARTMENT OF ENVIRONMENT	0711781914	
27	JOSPHINE ANYSO	KOLAGO (A)	0724607029	
28	LUCY Anyang	Kolago AO	0711966623	
29	MAXWELL OGALO	YOUTH REPRESENTATIVE	0704292952	
30	DALMAS OWINO	~~STAKE~~ S/ HOLDER.	0720332157	

31 Victor Odhiambo NACARE CBO 0728003092
32 Sarah Akinyi OMANJE CHW 0707795211
33 Bentar OMBIMA -
34. MARGIN OMANGO. 0723788512

BEN ONYANGO DUTA 0724159285

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Project: Proposed Holo Plaza Health Centreon Plot No.: Kisumu/Kit Mikayi/ 3385 In Holo Market, Seme Sub-County, Kisumu County

Client/Proponent: Awuor Christine Yuko

PARTICIPANTS' LIST

VENUE: HOLO CENTRE - ONSITE **DATE:** 5/07/2022

NO	NAME	DESIGNATION/ORGANIZATION	CONTACT	SIGNATURE
1.	CHARLES. O. ACHOLA	CECEF/NGAO	0720655259	
2.	IGOUNS ANDRE	VILLAGE ELDER	0714 764735	
3.	WILLIAM ONYANGO	ASSISTANT NGAO	0720413334	
4.	NICHOLAS ONDONGO	ASSISTANT	0726101380	
5.	MAURICE ONDORO	VILLAGE ELDER	0720227769	
6.	JAMES ANARA	P/SECURITY	0729317940	
7.	JACOB OVIA	P/ COMMEETY	0718676193	
8.	JOHN MADARA	CHIEF's SECRETARY	0725757691	
9.	PAMELA OCHIENG	P2 SECURITY	0705572418	
10.	MAURICES JUMA ALOKA. P & SECURITY		0713841855	
11.	OJIL JAMES	PUBLIC HEALTH OFFICER	0707164090	
12.	HELLEN OTWANG	SUB COUNTY PUBLIC HEALTH OFFICER	0722575273	
13.	NELLY OGUNDE	SEME - MOH REP.	0727722010	
14.	NABOTH OVIA	SEME REP	0720307971	

15.	Seth Oluoch Okumu	Clerk Geoplan.	0711744057	
16.	PHILIP O. OCHIENGE	Electrician	0711418200	
17.	JOHN -O·NYAMUNE	FOREMON·	0717375709	
18.	M· AGENGO·	ESTI SEME·	0724909042	
19.	Samwel Awino	ESTI SEME	0740945977	
20.	JOYCE MIDEGA	TEACHER	0706963392	
21.	FLORIAH YUKO	CLINICIAN/ PRIVATE	0722860375	
22.	Francis Omunga	C G K, Environment	0711781914	
23.	Lucy Anyang'	SEME RESIDENT	0711966623	
24.	Clara Achieng'	SEME RESIDENT	0795085611	
25.	Everline Oduambo	SEME RESIDENT	0710708915	
26.	Benter Anyango	SEME RESIDENT	0741219986	
27.	Margret Obiero	SEME RESIDENT	0791229153	
28.	JOSPHINE ANYISO	SEME RESCUE T	0724607029	
29.	MAXWELL OGALLO	SEME YOUTH REP.	0704292952	
30.	Elizabeth Obiero	SEME REP	0799375137	
31.	Mary Ouma	SEME REP	0114712802	
32.	GAUDESIA WADEGU	SEME REP	—	

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INTERVIEW ATTENDANTS LIST

Project: Proposed Holo Plaza Health Centre on **Plot No.:** Kisumu/Kit Mikayi/ 3385 In Holo Market, Seme Sub-County, Kisumu County

Client/Proponent: Awuor Christine Yuko

Venue: .....

Date of Interview	Name of the stakeholder	Institution & Contact Address	Signature
5/7/2022	Francis Omurayo	County Govt of Kisumu	
5/7/2022	Samuel Otieno Ariimo	Disabled representative	
5/7/22	Peter Gumba	National Admin	
5/7/22	Helen Ojwang	Ministry of Health	
5/7/22	MAXWEL OGALLO	Youth Rep. Seme	
5/7/22	Peter Ampona	Physical Planning	
5/7/22	Victor Odhiambo.	CBO	
5/7/22	NELLY OLUOCH	MOH - Seme	

STAKEHOLDER INVOLVEMENT QUESTIONNAIRE

The proponent, **Awuor Christine Yuko P. O. Box 19280-4023 Kisumu- Kenya,** proposes to put up a Health Centre that is aimed at providing health services in the area and beyond. The proposed development will be located on **Plot No Kisumu/Kit Mikayi/3385** off Kisumu-Bondo Road, in Holo Market, Kisumu County.

The proponent has engaged the expertise of the above-mentioned consulting firm to undertake the environmental impact assessment for the proposed development as envisaged in the Environmental Management and Coordination (Amendment) Act, of 2015 Section 58 that requires an Environmental Assessment and Public Participation be undertaken to enable NEMA make an informed decisions in either approving and/ or recommending remedial measures in the development of the project. As a key stakeholder, we are requesting for your invaluable contribution regarding the Environmental issues associated with the proposed project.

Name of the stakeholder	FRANCIS OTIENO OMUKO
Organization/Institution Represented & Contacts	COUNTY GOVERNMENT OF KISUMU ENVIRONMENT DEPARTMENT
Designation	ENFORCEMENT OFFICER
Signature & Official stamp	
Date	5/07/2022

1. Will the proposed development affect your current operations? Yes…….. No……..
   If yes, in what way? NO

2. Do you have any comment concerning the following issues in relation to the proposed project?

ISSUE	COMMENTS
Water supply	Accessible to the communities around.
Waste water and Solid waste management during operation of the hospital	Yes, Waste water & Solid waste should be channeled well & managed properly to avoid spill over & affecting clean water body.

Socioeconomic concerns	It will Improve the livelihood of the Community around, the business will Escalate
Energy /power supply	Accessible to the Communities around.
Noise generation	Noise Should be Controlled Since the hospital will be a home of the sick. This calls for Environmental Noise Control Management
Occupational health and safety during construction & operation stages	All the workers Should have the right gears & protective devices.
Traffic	Controlled traffic is important to avoid unnecessary accident.
Neighbours (Business in the nearby proposed Development)	It will Improve the business, Place more ~~with~~ Investment will Come up.

3. Should the project proceed?.....YES...✓..... NO.....
4. Do you have any other comments either positive or negative about the proposed project?

This is a nice ideas that will health wise benefit the communities around. Reduce the transportation Cost & Save lifes on time.

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Name of the stakeholder	SAMUAL OTIENO AMNO
Organization/Institution Represented & Contacts	ARTIST
Designation	MOULDING ARTIST
Signature & Official stamp	
Date	5th - 07 - 2022.

1. Will the proposed development affect your current operations? Yes..✓... No.....
   If yes, in what way?

   By offering me employment

2. Do you have any comment concerning the following issues in relation to the proposed project?

ISSUE	COMMENTS
Water supply	good supply of water
Waste water and Solid waste management during operation of the hospital	hopfully will be properly managed.

Socioeconomic concerns	Improvements of businesses especially the small businesses.
Energy /power supply	Stable supply of energy
Noise generation	
Occupational health and safety during construction & operation stages	Not implemented.
Traffic	
Neighbours (Business in the nearby proposed Development)	Improved

3. Should the project proceed?.....YES.....✓..... NO….

4. Do you have any other comments either positive or negative about the proposed project?

The project will be of advantage to the local people and the community at large either by offering job opportunities or by empowering students by making scholarships available to them.

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Name of the stakeholder	Peter Gumba
Organization/Institution Represented & Contacts	National Administration
Designation	Snr- Asst- Chief
Signature & Official stamp	
Date	05/07/2022

1. Will the proposed development affect your current operations? Yes..✓.. No.....
   If yes, in what way?
   - Employment
   - Security given the large number

2. Do you have any comment concerning the following issues in relation to the proposed project?

ISSUE	COMMENTS
Water supply	- Current water supply to the area is wanting - The project, as a C.S.R, provide water to Surrounding Community
Waste water and Solid waste management during operation of the hospital	- Must be appropriate

Socioeconomic concerns	- The project to give the locals a priority in employment so long as the requirements can met
Energy /power supply	- To extend to the surrounding area
Noise generation	- To be minimal
Occupational health and safety during construction & operation stages	
Traffic	Accessible
Neighbours (Business in the nearby proposed Development)	- Hardwares sell machandize - Food kiosk operators have business - Transporters benefit etc

3. Should the project proceed?.....YES..✓.....NO....

4. Do you have any other comments either positive or negative about the proposed project?

- Increased promiscuity and related S.T.Is
- Employment

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Name of the stakeholder	HELLEN OJWANG
Organization/Institution Represented & Contacts	HEALTH
Designation	PUBLIC HEALTH OFFICER
Signature & Official stamp	
Date	

1. Will the proposed development affect your current operations? Yes…….. No…..✓
   If yes, in what way?

_____

_____

_____

_____

2. Do you have any comment concerning the following issues in relation to the proposed project?

ISSUE	COMMENTS
Water supply	None
Waste water and Solid waste management during operation of the hospital	Plans for construction of Septic tank to manage the liquid waste & sewage.

Socioeconomic concerns	The hospital will offer employment to the residents
Energy /power supply	There are plans to install Electricity
Noise generation	Possibilities of noise generation but mitigations are in place
Occupational health and safety during construction & operation stages	The Owner advised to provide Personal protective equipments
Traffic	Avoidance of overcrowing has been advocated for.
Neighbours (Business in the nearby proposed Development)	no comment

3. Should the project proceed?.....YES..... ✓ NO....
4. Do you have any other comments either positive or negative about the proposed project?

The project has ~~now~~ met many Public health requirements hence no objection for its continuation and operation.

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STAKEHOLDER INVOLVEMENT QUESTIONNAIRE

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Name of the stakeholder	MAXWEL OGALLO
Organization/Institution Represented & Contacts	YOUTH
Designation	LEADER
Signature & Official stamp	Rodrigs
Date	5/07/022

1. Will the proposed development affect your current operations? Yes……. No……..

If yes, in what way?

Yes, positively. Will get employment opportunity

2. Do you have any comment concerning the following issues in relation to the proposed project?

ISSUE	COMMENTS
Water supply	Yes, water supply should be extended and expanded to benefit the neighbouring communities.
Waste water and Solid waste management during operation of the hospital	No comment coz I know all the operational procedures will legal and competent

Socioeconomic concerns	Yes, majority of the youth will get employment.
Energy /power supply	Yes, this gonna stabilize power supply.
Noise generation	NO
Occupational health and safety during construction & operation stages	Minor accidents should be put into consideration.
Traffic	NO concern for traffic
Neighbours (Business in the nearby proposed Development)	its gonna impact the businesses around in terms of economy.

3. Should the project proceed?.....YES..... ✓ NO....

4. Do you have any other comments either positive or negative about the proposed project?

The project should be implanted not at all coz its really boneficial to us as the community.

Geoplan Consultants Ltd.

Registered Planners, Valuers,
Surveyors, Engineers & E.I.A Lead Experts

STAKEHOLDER INVOLVEMENT QUESTIONNAIRE

The proponent, **Awuor Christine Yuko P. O. Box 19280-4023 Kisumu- Kenya,** proposes to put up a Health Centre that is aimed at providing health services in the area and beyond. The proposed development will be located on **Plot No Kisumu/Kit Mikayi/3385** off Kisumu-Bondo Road, in Holo Market, Kisumu County.

The proponent has engaged the expertise of the above-mentioned consulting firm to undertake the environmental impact assessment for the proposed development as envisaged in the Environmental Management and Coordination (Amendment) Act, of 2015 Section 58 that requires an Environmental Assessment and Public Participation be undertaken to enable NEMA make an informed decisions in either approving and/ or recommending remedial measures in the development of the project. As a key stakeholder, we are requesting for your invaluable contribution regarding the Environmental issues associated with the proposed project.

Name of the stakeholder	Peter Amolo
Organization/Institution Represented & Contacts	for Physical Planning.
Designation	DSPOU.
Signature & Official stamp	
Date	

1. Will the proposed development affect your current operations? Yes..... No...✓...
   If yes, in what way?

   _____

   _____

   _____

   _____

2. Do you have any comment concerning the following issues in relation to the proposed project?

ISSUE	COMMENTS
Water supply	None.
Waste water and Solid waste management during operation of the hospital	Avail Plans for Approval.

Socioeconomic concerns	None
Energy /power supply	None
Noise generation	All Buildings Operations Should meet The Set Of Obs
Occupational health and safety during construction & operation stages	- Avail the Required Protective Gears. - Report All Emergencies And Accidents. - Manage All Emergencies And Accidents.
Traffic	Avoid Overcrowding And Control All Human & Non Human Traffic.
Neighbours (Business in the nearby proposed Development)	Limit Or Control All Kinds Of Contaminants & Disturbances.

3. Should the project proceed?.....YES..✓..... NO....

4. Do you have any other comments either positive or negative about the proposed project?

No Objections On Planning Issues.

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STAKEHOLDER INVOLVEMENT QUESTIONNAIRE

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Name of the stakeholder	VICTOR ODIYAMBO
Organization/Institution Represented & Contacts	WECARE CBO
Designation	FIELD OFFICER
Signature & Official stamp	
Date	5/7/17

1. Will the proposed development affect your current operations? Yes..✓.. No.....
   If yes, in what way?

It will help improve the economic status of the community members their the work in.

2. Do you have any comment concerning the following issues in relation to the proposed project?

ISSUE	COMMENTS
Water supply	There is need for constant water supply while the project implemetation area and the surrounding for domestic use. This will enhance safe water
Waste water and Solid waste management during operation of the hospital	This is key because it will reduce water and environmental pollution.

Socioeconomic concerns	
Energy /power supply	Will improve and enhance the daily operation of the machines and lighting
Noise generation	May affect the surrounding community noise such as those of schools around
Occupational health and safety during construction & operation stages	This will help reduce accidents that may come during construction
Traffic	Enable timely transportation of required equipments, drugs etc.
Neighbours (Business in the nearby proposed Development)	Will improve the economic growth of neighbourhood in terms of business and general development

3. Should the project proceed?.....YES..... ✓ NO....

4. Do you have any other comments either positive or negative about the proposed project?

There will be extensive job creation.

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STAKEHOLDER INVOLVEMENT QUESTIONNAIRE

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Name of the stakeholder	NELLY OGUNDE
Organization/Institution Represented & Contacts	MOH - SCME SUBCOUNTY 0727722010
Designation	RCP MOH SCME
Signature & Official stamp	
Date	

1. Will the proposed development affect your current operations? Yes…….. No. ✓…..
   If yes, in what way?

   N/A

2. Do you have any comment concerning the following issues in relation to the proposed project?

ISSUE	COMMENTS
Water supply	- There is need for permanet source of water.
Waste water and Solid waste management during operation of the hospital	- This must be put in place ie Septic tank & Incinerator.

Socioeconomic concerns	- It will improve the Status of the community
Energy /power supply	- There is need for transformer to serve the Hospital and its environs and also a back-up for the hospital
Noise generation	- This should be minimized not to affect the Neighbour of the institution.
Occupational health and safety during construction & operation stages	- Office Incharge of occupational health and safety is needed to ensure that every steps of the Project.
Traffic	- There should be security officer to control the trafic in and out of the Hospital.
Neighbours (Business in the nearby proposed Development)	- Organised structures which are approved by the Office of the Public Health to operate.

3. Should the project proceed?.....YES...✓..... NO....

4. Do you have any other comments either positive or negative about the proposed project?

NO - Let the project continue for the betterment of this community.