PROPOSED ENVIRONMENTAL IMPACT ASSESSMENT STUDY REPORT FOR THE

DEVELOPMENT OF A ZIPLINE DRONE STATION AND ITS OPERATIONS AT KISUMU SIDHO EAST 2788,2902,2903 AND 1844 IN MUHORONI SUB-COUNTY KISUMU COUNTY.

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The site coordinates are 00°09'35.5"S 35°04'21.5"E

DOCUMENT AUTHENTIFICATION

This Environmental Impact Assessment Study report has been prepared by the Environmental consultants stated herein. We the undersigned, certify that the particulars in this project report are correct to the best of our knowledge.

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PROJECT PROPONENT

WINFRED NJERI MUIRURI
On behalf of Zipline Kenya Limited

Signature ……

Date ……

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Acronyms and Abbreviations Used in this Report.

EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
EMCA	Environmental Management And Coordination Act
NEMA	National Environment Management Authority
SOx	Sulphur Oxides
NOx	Nitrogen Oxides
PVC	Poly Vinyl Chloride
Sqm	Square Meters
GCS	Ground Control Stations

EXECUTIVE SUMMARY

PROPOSED ENVIRONMENTAL IMPACT ASSESSMENT STUDY REPORT FOR THE DEVELOPMENT OF A ZIPLINE DRONE STATION AND ITS OPERATIONS AT KISUMU SIDHO EAST 2788,2902,2903 AND 1844 IN MUHORONI SUB-COUNTY KISUMU COUNTY.

1. Overview

This report presents findings of an Environmental Impact Assessment Study for proposed construction and operation of a drone station with Ground Control Stations (GCS) with sets of ground-based hardware and software that allow Unmanned Aerial Vehicle operators to communicate with and control a drone and its payloads, either by setting parameters for autonomous operation or by allowing direct control of the UAV. The proposed project which is to be located at Sidho off Awasi-Chemelil Road within Muhoroni Sub-County in Kisumu County will be located on Land Parcel Numbers Kisumu Sidho East 2788, 2902,2903 And 1844 in Kisumu County. (currently being amalgamated to one land parcel number) The Project Proponents are WINFRED NJERI MUIRURI on behalf of Zipline Kenya Limited.
This site was considered suitable for the proposed drone station because: -

- ✓ The land is owned by WINFRED NJERI MUIRURI on behalf of Zipline Kenya effectively eliminating requirements of land acquisition and associated negotiations. (see attached sale agreement)
- ✓ The site landscape is characterized as flat, open and non-complex which makes its accessibility relatively convenient and movement of equipment during installation, service and maintenance relatively convenient.
- ✓ The very dominant direction of wind on this site is south, wind speeds are steady and occurrence of very high wind speeds is low, site wind speeds shows relatively small distribution, spread around the central and mean values are small.
- ✓ These site wind conditions favour the site for its drone launching and landing.

The proposed station will comprise a Warehouse for storing Medical and human blood components, animal genetic material and the logistics will be carried out by the drones. The main design components of the project include, but not limited to the following: Construction of

launching pads for drones and a recovery area for the drones, control office and flight operations for the drones, offices and a conference room. A generator room and a prayer room. Both male and female toilets connected to a septic tank.

2. Potential Environmental impacts and Mitigation Measures

The potential negative environmental impacts of the proposed development and their possible mitigation measures are summarized as below.

Potential negative impacts	**Possible mitigation measures**
-Disruption of existing natural environment and modification of micro climate: • Increased development density • Obstruction of ventilating wind • Increased surface run-off	-Development restricted to approved density, building line, plot coverage and plot ratio. - Careful layout and orientation of building to respect wind and sun direction
-Solid Waste	- Construction waste will be disposed off to the approved Kisumu county dumpsites. -Waste to be sorted, and disposed off in accordance to Legal Notice 120 of 2006; waste regulations. -Wastes generated during operational phase will be collected by a private contractor for final disposal.
-Architectural Incompatibility leading to distortion of neighbourhood aesthetic image	-Harmonize building scale with existing development in the neighbourhood. -Harmonize detail, material and finishes for roofs and walls with existing development in the neighbourhood.

Habitat destruction through excavation of land	-reuse of excavated soil for landscaping and planting trees and flowers to restore part of the biodiversity within the site.
Pollution and Health hazard -air pollution -noise pollution	-all machinery and equipment should be maintained in good working conditions to ensure minimum emission including carbon monoxide, oxides of nitrogen and Sulphur -masks should be provided to all personnel in dust generation areas throughout the period of construction - sound-attenuated equipment will be used as much as possible
Safety and accidents -fire and safety	-all site staff to be trained on the fire safety procedures, emergency response and use of firefighting equipment. - establish fire assembly points -install a fire alarm

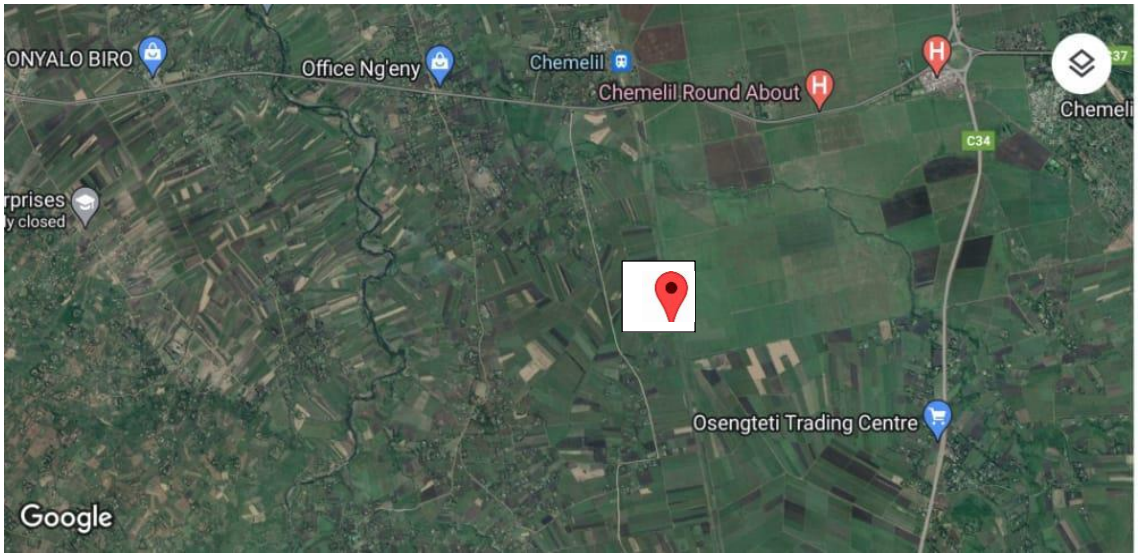
1-1 Terms of Reference (TOR)

The TOR of this Environment Impact assessment study report for proposed development of a zipline drone station and its operations address the following key issues of concerns:

- To review existing legal and institutional framework related to the proposed project.
- To collect and collate baseline information relevant to the proposed development.
- To identify and assess positive and negative impacts of the proposed project.
- To identify and analyze alternative options for the proposed project.
- To develop mitigation measures and cost estimates for the negative impacts of the project.
- To design an Environmental Management Plan and a monitoring framework for the environmental impact of the project.

1-2 Property Location

The site is located in Sidho off Awasi-Chemelil Road within Muhoroni Sub-County in Kisumu County will be located on Land Parcel Numbers Kisumu Sidho East 2788, 2902,2903 And 1844 in Kisumu County. The site coordinates are **00°09'35.5"S 35°04'21.5"E**



1-3 Project Proponent/Developer

WINFRED NJERI MUIRURI of P.O. Box 49393-00100 Nairobi is the said owner of the proposed development.

1-4 Land Tenure and Approved Development

The Plot L.R. No. is registered under the Registration of Titles Act Cap 281. The registered owner is WINFRED NJERI MUIRURI. A Copy of the title deeds have been attached. ***Appendix A.***

1-5 Plot Size

The property is on a site covering approximately 10.6ha.

1-6 Site Conditions

The property is on a site covering approximately 10.6h of land. Site drains into the existing storm water drainage. The site is on black cotton soil.

1-7 Economic Importance of the Proposed Project to the Construction Industry

The production industry plays a very important role in the economy. Indeed, the construction index is one of the indicators of overall economic performance. Construction plays an important role in the economy, in that it is a labour intensive activity that utilizes both skilled and unskilled labour.
It also makes use of locally available materials both from the formal industry. For that matter it creates a lot of forward and backward linkages. It also means that moneys spent in a construction project circulates in the local economy.

2-1 Institutional Framework

The Esia for the proposed development is bound to be influenced by the operational interests of several lead agencies, whether exclusively or concurrently. These include, but not limited to the following key institutions:

2-1.1 National Environmental Management Authority (NEMA)

NEMA is the supreme regulatory and advisory body on environmental management in Kenya. NEMA is required to coordinate and supervise the various environmental management activities being undertaken by statutory organs with a view to promoting their integration into development policies, programmes, plans and projects that provide sustainable development and a safe and healthy environment to all Kenyans. NEMA is equally mandated by the Environmental Management and Coordination Act to assess Environmental Impact Assessment reports and Environmental Audit and issue licenses of compliance/approval. formulation and direction for the purposes of the Act; setting national goals and objectives and determining policies and priorities for the protection of the environment; promotion of cooperation among public departments, local authorities, the private sector, non-governmental organizations and such other organizations engaged in environmental protection programmes; and perform such other functions as are assigned by the Act.
NEMA will remain in charge of coordinating all activities related to environmental management in the project area, such as enforcement of environmental impact assessments, as well as environmental audits.

2-1.2 Kisumu County Government

This is the principle lead agency in all matters pertaining to physical development and development control within the County. Kisumu County Government is empowered by two key Acts of Parliament to carry out physical planning and development control within its area of jurisdiction; The Physical Planning Act and the County Governments Act. The county government has by-laws that enable it to carry its day to day operations.

2-1.3 Director of Physical Planning

The Physical Planning and Land Use Act 2019 established the office of the Director of Physical Planning. The Physical Planning Act (Cap 286) defines the mandate of this institution relevance to this study is that it acknowledges the establishment of the office of the Director of Physical Planning, within the Ministry of Lands, who shall:

- Formulate national, regional and local physical development policies, guidelines and strategies.
- Be responsible for the preparation of all regional, local and national physical development plans.
- From time to time, initiate, undertake or direct studies and research into matters concerning physical planning.
- Advise the Commissioner of Lands and local authorities on the most appropriate use of land including land management such as change of user, extension of user, extension of leases, subdivision of land, and amalgamation of land, and
- Require local authorities to ensure proper execution of physical development control and preservation orders.

2-2 Legal and Policy Framework

Kenya's environmental policy and legislation are scattered in a multiplicity of resource and sector specific laws and policy papers. The institutions and departments that deal with environmental issues are equally numerous. Sector specific laws are deficient in that they are characterized by fragmented and uncoordinated sectoral legal regimes that are developed to facilitate resource allocation and to deal with environmentally adverse effects of resource exploitation. The sectoral institutions under these laws often find themselves in regulatory competition.

2-2.1 Constitution of Kenya

The Constitution of Kenya in spite of being the supreme law of the land does not contain specific provisions regarding the environment. Section 70 however lists the right to life as one of the fundamental rights an individual is entitled to. The right of life guaranteed by the Constitution can be interpreted to include the right to a clean and healthy environment.

2-2.2 The Physical Planning and Land Use Act 2019

This Act is aimed at enhancing and promoting integrated physical development of socio-economic activities. The act requires that any activity that constitute development need to be approved by the relevant authority. The Act has made specific provisions in respect to the mandate of authorities in development control and planning.

As concerns, city, municipal, town and urban boards:

- Section 24(1): the Director may prepare with reference to any Government land, trust land or private land within the area of authority of a city, municipal, town or urban council or with reference to any trading or marketing center, a local physical development plan.

- Section 24(3): the Director may prepare a local physical development plan for the general purpose of guiding and coordinating development of infrastructure facilities and services for an area referred to in subsection (1), and for the specific control of the use and development of land or for the provision of any land in such area for public purpose.
- Section 25(b): a local physical development plan shall consist of such maps and description as may be necessary to indicate the manner in which the land in the area may be used.

According to Section 33 of the Physical Planning (Building and Development Control) Regulations, the Director of Physical Planning shall refuse to recommend any new building or proposed development, or alteration or addition to any existing building if:

- The proposal is not in conformity with approved development plan
- Such plan discloses a contravention of the physical planning (Building and Development) rules.
- The plans are not correctly drawn or omit to show information required

- On such being required, a separate application accompanied by sets of plans has not been lodged in respect of buildings on separate plots or subplots
- The land or the proposed building or structure is not used for any purpose which might be calculated to depreciate the value of neighboring property or interfere with convenience or comfort of neighboring occupants
- The proposed building or land use is unsuitable, injurious to amenities or detrimental in respect of appearance or dignity or fails to comply with physical planning
- requirements in regard to siting, design, height, elevation, size, shape, structure or appearance
- The building is likely to become objectionable on environmental grounds
- Roads of access, parking bays, vehicular and pedestrian circulation spaces or other services to the plot or premises are inadequate
- The building is not sited in a satisfactory position
- The system of drainage, including soil, waste and surface water of the plot, or subplot upon which the building is to or stand, is not satisfactory
- Provision has not been made for adequate natural light and ventilation, or
- Any other physical planning issue

Section 36 of the Act (Cap. 286) further compels that if in connection with a development application, a local authority is of the opinion that proposals for industrial location, or any other development activities (such as building developments) will have injurious impact on environment, the applicant will be required to submit together with the application an environmental impact assessment report. The above provision compares well to Section 29 (a), which confers upon local authorities the powers to prohibit or control the use and development of land and buildings in the interests of proper and orderly development of its area.

2-2.3 The Public Health Act (Cap. 242)

This Act aims at achieving a clean environment free of any nuisance so as to promote public health and safety. For the interpretation of the Act, Section 15 (IX) indicates that any noxious matter or wastewater discharged from any premise, such as a building constitutes nuisance. The act equally stresses that no person shall cause a nuisance to exist on any land or premise occupied by him. Because of the above, the

Act acknowledge that it shall be the duty of all local authorities to take all lawful measures for maintaining its area of jurisdiction at all times in a clean and sanitary condition for remedy of any nuisance or condition liable to be injurious to health.
To safeguard against this, Part X of the Public Health Act states that where in the opinion of the Medical Officer of Health that food stuffs within a warehouse or a building are insufficiently protected, the owner shall be compelled to observe the required regulations, else he shall be guilty of an offense.

2-2.4 County Governments Act (No. 17 of 2012)

A county government shall be responsible for any function assigned to it under the Constitution or by an Act of Parliament. A county government shall be responsible for planning and development of its county in accordance with the principles and objectives set out in Part XI of this Act. Objectives include: facilitation of the development of a well-balanced system of settlements and ensuring productive use of scarce land,

water and other resources for economic, social, ecological and other functions across a county; and the achievement and maintenance of a tree cover of at least ten per cent of the land.

2-2.5 The Building Code

This gives general guidelines as to the construction of buildings and safety measures such as installation of firefighting appliances, fire escapes etc. It equally recognizes local authorities as lead planning agencies and requires every developer to submit building plans to the relevant local authority for approval.

In recognition of the role of local authorities as lead planning agencies, the adoptive by-law compels any potential developer to submit development application to relevant local authority for approval. The local authorities are empowered to disapprove any plan submitted if it is not correctly drawn or do not provide sufficient information that complies with the by-law. Any developer, who intends to erect a building such as a residential block, must give the concerned local authority a notice of inspection, before the erection of the structure.

After erecting the building, a notice of completion shall be issued to the local authority to facilitate final inspection/approval. No person shall therefore occupy a building whose certificate of completion has not been issued by the local authority. As a precaution against fire breakout, the by-law states that the walls of any premise shall be non-combustible throughout, similarly, in every building, other than a small house, which comprises more than one storey, shall have fire resistance.

The by-law, in Section 214 indicates that in any public building where floor is more than 20 feet above the ground level, the council may recommend the provision of firefighting equipment that may include one or more of the following: hydrants, hose reels and fire appliances, external conations, portable fire appliances, water storage tanks, dry risers, sprinkler, drencher and water spray spring protector system.

2-2.6 The Penal Code (Cap. 63)

The chapter on “Offences against Health and Conveniences” contained in the Penal Code enacted in 1930 strictly prohibits the release of foul air into the environment, which affects the health of other persons. Any person who voluntarily violates the atmosphere at any place, to make it noxious to health of persons in general dwelling or carrying out business in the neighborhood or passing along public ways is guilty of misdemeanor, i.e. imprisonment not exceeding two years with no option of fine.

2-2.7 The Environmental Management and Coordination Act No. 8 of 1999. (Amended 2015)

The Environmental Management and Coordination Act (EMCA) of 1999, and its attendant Environmental (Impact Assessment and Audit) Regulations of 2003 provides for the establishment of an appropriate legal and institutional framework for the management of environment in Kenya. Section 58 (I) has underscored that any person being a proponent of a project shall before financing, commencing or proceeding with construction submit an EIA report to the National Environment Management Authority (NEMA) of Kenya. Section 68 (I) gives NEMA the mandate for carrying out all environmental audits of all activities that are likely to have significant impacts on the environment. It authorizes environmental inspectors, as appointed by NEMA to enter in any premise and determine how far the activities carried out conform to statements in EIA study.

2-2.8 The National Environmental Action Plan (NEAP)

The NEAP for Kenya was prepared in 1994. It was a deliberate policy to integrate environmental considerations in to the country's social and economic development process. The integration was achieved through multi-sectoral approach to develop a comprehensive framework to ensure that environmental management and conservation of natural resources is an integral part of societal decision-making process.

2-2.9 The Factories and Other Places of Work Act (Cap. 514)

The Act aims at making provision for the health, safety and welfare of persons employed in factories and other places of work. Section 13 states that every factory shall be kept in a clean state and free from effluvia, arising from any drain, sanitary convenience or nuisance. Effective and suitable provisions is also proposed for securing, maintaining by circulation of fresh air in each workroom, the adequate ventilation of the room. Section 36 provides for precautions with respect to explosive inflammable dust or gas. The Section is specific that where in any building, if dust that could escape to work man's room and explode by ignition, steps must be taken to prevent such an explosion.

Section 41 compels that in every factory, there shall be maintained fire extinguishers, which shall be adequate and suitable in case of fire out-breaks. Similarly, it mandates every factory to provide adequate means of escape in case of fire outbreak for the employees. The Act further requires that if a factory worker is employed in any process involving exposure to wet or to any injurious or offensive substance, suitable protective clothing must be provided by the employer.

2-2.10 The World Commission on Environment and Development

The commission commonly referred to as "the Brutland Commission" focused on the environmental aspects of development, in particular, the emphasis on sustainable development that produces no lasting damage to biosphere, and to particular ecosystems. In addition, environmental sustainability there is the economic and social sustainability. Economic sustainable development is development for which progress towards environmental and social sustainability occurs within available financial resources. While social sustainable development maintains the cohesion of a society and its ability to help its members work together to achieve common goals, while at the same time meeting individual needs for health and well-being, adequate nutrition, and shelter, cultural expression and political involvement.

2-2.11 The Rio Declaration on Environment and Development

Agenda 21 – a programme of action for sustainable development worldwide, the Rio Declaration on Environment and Development was adopted by more than 178 governments at the United Nations Conference on Environment and Development, known as the Earth Summit, held in Rio de Janeiro, Brazil from 3rd to 14th June 1992. Principle No. 10 of the declaration underscored that environmental issues are best handled with participation of all concerned citizens at all the relevant levels. At the national level, each individual shall have appropriate access to information that is concerning environment that is held by public authorities. All states shall encourage and facilitate public participation by making information widely available. Effective access to judicial and administrative proceedings, including redress and remedy shall be provided.

The foregoing discussion is relevant to the proposed development because EMCA demands that public must be involved before any development project that is likely to have adverse impacts to the environment is initiated by a proponent. The Act has further established Public Complaints Committee (PCC) where the issues raised by the public in regard to any proposed development can be addressed.

2-3 Conclusions

The proposed project will be undertaken in adherence to the aforementioned relevant Laws and Legislation. The institutions guided by relevant policies and legislations must regulate urban development and planning projects. The above expression is envisioned as a basic principle component of coordinated and harmonious development in urban areas, and is one of the core pillars for attaining sustainable development. These provisions will therefore guide the proposed project.

3-1 Overview

The proposed project aims at developing a drone station with Ground Control Stations (GCS) with **sets of ground-based hardware and software that allow Unmanned Aerial Vehicle operators to communicate with and control a drone and its payloads**, either by setting parameters for autonomous operation or by allowing direct control of the UAV. The Ground Control Station is composed of a tablet PC running under windows 10, a GSC software and a control unit with joystick, connected on USB port. The software allows gimbal sensors management. The UAV ground control station is a very important part of the entire UAV system, and it is a channel for ground operators to directly interact with the UAV. It includes mission planning, mission playback, real-time monitoring, digital maps, and communication data links. It integrates control, communication, and data processing capabilities thus the ground control station is the nervous system of the operation. The GCS will control the launch, flight, and recovery of the UAV. It also processes the data from the internal and external sensors of the payload.

The drone station will be operated by Zipline Kenya, an affiliate of a California –based company called Zipline which main focus is delivering medical supplies in areas with poor infrastructure, it will build warehouses for storing Medical and human blood components, animal genetic materials and the logistics will be carried out by the drones and will be circulated within Kisumu County.

3-2 Existing Development in the Neighborhood.

The neighborhood where the project site is located is composed of industrial, commercial and residential uses but with industrial use being the predominant use. The proposed development will therefore easily blend with the existing character and development trend in the neighbourhood.

3-3 Construction and Completion of the Proposed Development

The proponent proposes to construct drone station with Ground Control Stations (GCS) with sets of ground-based hardware and software that allow Unmanned Aerial Vehicle operators to communicate with and control a drone and its payloads A structural engineer will inspect the proposed structures to ensure they are structurally sound. Architectural drawings will also be prepared to show the actual designs and layout of the proposed project. All drawings will be submitted to Kisumu County Government and other relevant agents for approval. The main works will involve: building works, plumbing works, interior finishes, electrical and mechanical works among others.

This will be an entirely new development starting from excavation, foundation, superstructures and other finishes. Detailed drawings of the proposed development.

3-4 Site Landscaping.

All soil will be excavated and carried away from the site and the site refilled with red soil and ballast. The site development involves landscaping with red soil and rock material. Excess material will be disposed off-site to a suitable site.

3-5 Driveway, Walkway and Parking Spaces

A paved driveway and walkway will be constructed to give motor vehicle and pedestrians a proper surface on which to move.

3-6 Utilities and Service

i) Water Supply

The proponent proposes to drill a borehole for water supply and utilities. In addition, there will be 2No. 1000L plastic water tank complete with ball valve and overflow dotted on 150mm thick RC slab

ii) Foul Water Drainage

Foul water from the property will be discharged into the proposed Sewer Treatment Plant within the site.

iii) Solid Waste Disposal

The waste generated during construction will be disposed off with approval from Kisumu County Government by the contractor. On occupation a private licensed contractor will be hired to dispose off the solid waste. An adequate number of dustbin cubicles protected from rain, cats and dogs will be provided next to the main entrance

iv) Electricity Supply

The property is connected to the Kenya Power Company main supply line, in addition, the proponent will install a standby generator.

3-7 Transformer, Generator, Switch room.

The proposed development will have a Switch room, generator room and transformer room. The generator will be used to cater for unseen power failure and for development of common services such as street lighting, fire pump and borehole.

Site photos

Wind measuring equipments

Access to the site

CHAPTER FOUR: PROJECT ACTIVITIES

4-1 Overview

The activities of the proposed project include: -

- Clearing the site and excavation
- Site landscaping
- Development of drone station with Ground Control Stations (GCS) with sets of ground-based hardware and software that allow Unmanned Aerial Vehicle operators to communicate with and control a drone and its payloads
- Plumbing and drainage works
- Electrical works among others
- Final inspection
- Decommissioning

4-2 Site Preparation

i) Site Clearance and excavation

The site clearance entails removal of any obstructions on the way of the intended construction activity. The clearing process will not involve the use of heavy machinery or explosives.

- In order to develop the proposed **drone station with Ground Control Stations (GCS) with** sets of ground-based hardware and software that allow Unmanned Aerial Vehicle operators to communicate with and control a drone and its payloads, excavation and earth works will be involved. The main method of excavation to be used is trenching in order to accommodate the building foundation / footing.

ii) Laying Out the Site

- The site will then be laid out to identify the location of the **drone station with Ground Control Stations (GCS) with** sets of ground-based hardware and software that allow Unmanned Aerial Vehicle operators to communicate with and control a drone and its payloads on the site. The corner points and edges of the proposed building units will be established accordingly. The marking out will use sticks and strings as well as chalk lines.

4-3 Construction of the Foundation

The foundation is that part of the building structure that is beneath the ground floor level. The foundation includes the footing and foundation wall of a building. The depth of the foundation is to be determined on site but not less than 1200 deep. Strip concrete foundation will be to structural engineer's detail

RC foundation walls to be water proofed with approved water proofing agent to structural engineer's detail. All RC foundations will be to structural engineers' details. The area enclosed by the foundation walls is to be backfilled with compacted hardcore. Foundation shall not encroach on neighboring

plots or road reserves. Approved water proofing membrane DPM and anti-termite treatment to be provided under the ground floor concrete slab.

4-4 Construction of Super Structure

i) Ground Floor Plan

Ground floor slabs level to be determined on site by the Architect.

Water tank slab is cement screed, and mezzanine storage to be grano finish, stairs floor is granito treads and risers.

ii) Walls

All walls to be reinforced with hoop iron at every alternate course. Provide 2.1m high colored SAJ ceramic wall tiles on all bathroom walls

iii) Doors

All internal timber door to be double hinged door overall size of 4.7x5.4m in 1.5mm thick ms sheet and ms RHS frames complete with wicket door, rubber door stopper, approved lock, heavy duty bearing stainless steel hinges to all doors and towel hooks to bathroom doors.

iv) Windows

All windows will be steel casement windows with 6mm clear or translucent glass to schedule, with hardwood window board, ms grille in 16x16mm to approved pattern and pelmet.

4-5 Clearing of Site

The site will be given a general cleaning, and any leftover material and debris will be carried away. Similarly, any tools and equipment still on site will be removed.

4-6 Final Inspection

Final inspection is undertaken to ensure that the project has been done properly and according to the terms of the contract. The inspection team will normally include the project proponent / client, the architect, the engineer and the contractor or their representatives. The inspection will normally start at the beginning of the construction to the end and look at every detail of construction, functioning of mechanical and electrical installations etc.

4-7 Decommissioning

Decommissioning is an important phase in the project cycle and comes last to wind up the operational activities of a particular project. It refers to the final disposal of the project and associated material at expiry date of projects life span. If such a stage is reached, the proponent needs to remove all materials resulting from the demolition from the site.

The following should be undertaken to restore the environment.

- ❖ remove all underground facilities from the site
- ❖ the site should be well landscaped by flattening the mounds of soil
- ❖ all the equipment should be removed from the site
- ❖ fence and signpost unsafe areas until natural stabilization occurs

CHAPTER FIVE: MATERIALS, PRODUCTS AND BY PRODUCTS

This section will look into the materials to be used, products and by products including waste to be generated by the project and the method of disposal. Table 5-1 gives a summary.

Table 5.1: Materials Waste generated and disposal methods.

Project phase	Materials to be used	Waste/by-products generated	Disposal Method
Excavation/Earthwork	-Excavating equipment	-soil and fragmented rocks. -black cotton soil will be removed from site	-disposed off the project site.
Building works	-Machine cut stones -Steel -Cement -Paving slabs -Timber -Nails, Galvanized Iron sheets -Gravel, sand -Tiles -Glass e.t.c	-Building debris -Used timber -broken tiles	-Reused for landscaping & Filling. -Timber used for firewood etc.
Electrical & mechanical installations	-Electrical gadgets (Pipes, switches, electrical-wire, Lamps etc) -Plumbing gadgets, Storage tanks.	-Accidental breakage's and usable parts	-Contractors to dispose off site.
Occupation.	-furniture -waste paper -Water	- office files and other stationery. - Waste water	-Collected by a private contractor for final disposal. -drained to onsite sewer system

CHAPTER SIX: THE POTENTIAL ENVIRONMENTAL IMPACTS

6-1 Impacts during Construction Process

The proposed development is likely to have the following impacts during the construction phase: -

6-1.1 Positive Impacts

The development of the project will create business opportunities by providing market to suppliers during the construction process. It will also lead to creation of employment both directly and indirectly during the construction phase. Casual laborers, semi-skilled and professionals such as town planners, supervising engineer, contractor staff and architects among others.

The implementation of this project will create and promote income generating activities for both small and medium enterprises. Food vendors are likely to get new market for their supplies during the construction phase.

Land in this area is very expensive and its nearness to the road makes it very attractive. The construction of the project will promote local economy and inter linkages. Construction materials and operating of the project have associated fees levied. The fees are paid to different parties like the local government and individuals and in return it is used to boost the local economy.

The various payments for permits, licenses and approvals for the project are direct revenue to the government.

6-1.2 Negative Impacts

i) Pollution and Health Hazards

There is likely to be pollution in terms of noise and dust during the projects' construction phase. There are also high chances of littering during loading of refuse and uncontrolled human waste from workers on site.

v) Mushrooming of Food Kiosks

Usually, such development projects during construction stage have the potential of attracting unplanned commercial activities; that come to take the advantage of the increased trade prospects. This often leads to mushrooming of kiosks, which are attracted by the prospects of doing business especially selling food. Some have a potential to pollute the environment owing to lack of sanitation infrastructure. The proposed project intends to provide room for onsite provision of such support services.

6-2 Impacts during Operational Phase

6-2.1 Positive impacts

i) Employment Generation

The project will result in the generation of employment opportunities during the operational phase. This will involve security personnel, solid waste management staff, managers and administrative staff among others.

ii) Increase in Revenue

The various payments for permits, licenses and approvals for the project are direct revenue to the government.

iii) Increase in Industrial Parks

The project will add to the industrial investments in the Area. The proposed development will realize an improvement in Manufacturing industry since the products being packaged will require specialized packaging materilas.

iv) Improved aesthetics

The completion of the project will improve aesthetics of the area and boost security hence attracting more investments in the area.

6-2.2 Negative Impacts

i) Pressure on Existing Facilities

The proposed development will lead to an increased demand on commensurate services and facilities in the area.

The proposed building development is also likely to increase pressure on existing infrastructure such as roads. This would be due to increased human and vehicular traffic along the fronting 15m access road.

ii) Soil Disruption

Since the proposed project development involves digging up of trenches (earthwork) for laying out the foundation and hard landscaping, this is likely to disrupt the soil compaction and layout leading to poor water infiltration and seepage. It might also lead to poor drainage.

iii) Visual Intrusion

During construction, the main visual impacts would occur during earthworks for the building foundation. This impact would be generally confined to the site.

The following mitigation measures should be undertaken: -

- Once earthworks have been done, restoration of the worked area should be carried out immediately by backfilling.
- Construction debris should be cleared as and when specified tasks are completed.
- Finishing the project as provided by the designer.

iv) Air Pollution

There is likely to be pollution in terms of Air, noise and dust during the project's operational phase. Air pollution is likely to be from vehicle exhausts during transportation of materials to the site. The production of the concrete electric poles is likely to produce a lot of dust.

vi) Proliferation of Uncollected Solid Waste.

The proposed development is likely to contribute to an increased generation of solid waste. This has a potential of attracting disease vectors such as rats, flies, and cockroaches.

vii) Noise pollution

This will mainly be from the common construction machinery used at the site. Continuous exposure to noise levels above 85db can cause damage to hearing leading to occupation deafness.

However, the level of noise from common construction machineries is expected to be low in this threshold. The noise produced during implementation period of the project will not disturb the surrounding populace since the construction is carried out during the day and sound-attenuated equipment will be used

iii) Flora and Fauna

During earthworks, there will be disturbances and displacement of small animals and birds that have inhibited the vegetation in the property.

6-3 Impacts during Decommissioning Phase

The wastes produced during the construction phase if not well disposed off, can pose a threat to the environment and can be hazardous to both the people and kill the aesthetic nature of the area. These wastes include but not limited to:

- Paint
- Sand, gravel and cement
- Crashed stones and ballast
- cement and soil
- glass
- concrete tiles and slabs

The above wastes will be adequately cleared from the site to mitigate against any negative impacts.

6-4 Summary of impacts

Environmental impacts can be positive or negative, direct or indirect. The magnitude of each impact is described in terms of being significant, minor or negligible, temporary or permanent, long –term or short-term, specific (localized) or widespread, reversible or irreversible. Some impact mitigation have already been addressed in the proactive design and other mitigation can only be guaranteed through active, responsible management, helped by following the guidelines in the project environmental management plan.

These qualities are indicated in the assessment tables as follows:

Key	Type of Impact	Key	Type of Impact
++	Major positive impact	+	Minor positive impact
--	Major negative impact	-	Minor negative impact
0	Negligible/zero impact	NC	No change
SP	Specific/localized	W	Widespread
R	Reversible	ir	Irreversible
sh	Short Term	L	Long term
T	Temporary	P	Permanent

On the basis of the information gathered during the field study, potential environmental impacts of the project are tabulated below.

Table 6 -1: Anticipated Environmental Impacts.

Impacts on or due to	Construction	Occupation	Remarks
Pollution: Air/dust noise	T ir T ir	0 0	During construction air, dust and noise pollution will increase as a result of construction activities. After construction, noise from traffic is not likely to significantly affect the current neighbourhood.
Site drainage	0	++	Storm water from the site will drain into the city council storm water drain
Flora and Fauna	-	0	There will be minor destruction to flora and fauna habitat during excavation and landscaping.
Public Health	-t ir	-	During construction increased dust, noise and air pollution levels could impact on public health, particularly in the direct impact zone. During occupation health and safety guidelines setup will be adhered to.
Disturbance to the public	-t ir	-	Disturbance to the public would occur due to noise and dust during construction and traffic movement. After construction, noise from traffic is not likely to significantly affect the public.
Sites of Cultural, historic or traditional significance.	0	0	There are no sites of cultural, historic or traditional significance.
Visual Intrusion and Aesthetics of the Area.	-t/p	+P	During construction, visual intrusion is attributed to construction works including construction traffic.

			After construction the situation visual intrusion will be permanent. However this will be positive as the building will improve the aesthetic value of the neighborhood.
Income generating Opportunities.	+t	++	During construction, there will be employment opportunities available to contractors and consultants. A significant amount of employees will also be employed during occupation e.g. solid waste management staff, guards, caretakers etc.
Construction Materials	+/-	0	Building stone will be required for construction. Other materials will include steel, tiles, pipes, etc. All materials must be sourced from bonafide commercial suppliers, and undesirable, hazardous or otherwise banned materials should not be used.
Solid Wastes	-sh sp	-	Construction waste will be disposed off at approved Kisumu County government dump site. During occupation, the generated solid wastes will be collected by a private contractor.
Clean up on completion	-sp	0	The contractor should ensure that when works are completed, the site is left clean and tidy.

6-5 Stakeholder Consultation

During the field survey for the proposed development, public consultation formed the integral part of project development. This was done in pursuant of the provisions of the Environmental Management and Coordination Act (EMCA) of 1999.

Questionnaires/interview and public baraza schedules were randomly distributed/ administered to the residents within the neighborhood. The following sections present the results of the public consultation: -

6-5.1 Public Consultation in the Neighborhood

During the survey, respondents welcomed the proposed development. Stakeholders confirmed that the proposed project site for construction is easily accessible to the potential customers to be.

This confirms that the project is suitable for the local area.

6-6 Conclusion

From the foregoing, it is clear that: -

- The proposed project has actively involved the key neighborhood stakeholders who did not object the development.
- The project has sufficient public support.
- The proposed project does not pose adverse environmental impacts.

CHAPTER SEVEN: HEALTH, SAFETY AND ACCIDENT PREVENTION PLAN

7-1: Overview

There are no major peculiar anticipated accidents during the project cycle but the common accidents that can occur in any activity of this kind.

Table 7-1: Summary of anticipated accidents and the action plans.

TYPE OF POSSIBLE ACCIDENTS	ACTION PLAN
Workers injury during construction	First aid provision Maintenance of all machineries in good condition at all times. Workers compensation Wearing of protective gear by the workers
Fire outbreak (electrical e.t.c) during construction and occupation	Train staff on safety and precaution measures of fire Avail Firefighting equipment
Robbery	Install alarm systems Contract security firm to keep guard Avail electric security fence after construction
Road Accidents	First aid provision Insurance cover Avail the necessary signs
Drainage blockages	Proper maintenance of drainage systems Responsible disposal of waste

7-2: Plans to ensure the health and safety of workers and the General Public

7-2.1 Noise

During the construction phase, noise will be produced by construction machines such as concrete mixers, grinders, excavators and the movement of construction vehicles to and from the site.

Mitigation measures:

- Sound-attenuated equipment will be used as much as possible
- People participating in the construction activities should be provided with Personal Protective Equipment (PPE) such as ear muffs for ear protection and their use thereof should be enforced.
- The consultants and contractors are requested to guarantee that the works are carried out in a proper manner and planning so as to minimize the impact of the construction in terms of noise.

7-2.2 Air Quality

The proposed development is not expected to emit fumes, dust or odour that it would affect the current air quality of the area.

However fumes Nitrogen Oxides {NOx} and Sulphur Oxides {SOx} generated from vehicles could be a major source of air pollutants, although it is not likely to cause any significant impact on the local air quality. It is however likely that during the construction phase, both the infrastructure and the building works might induce fumes and dust.

Mitigation measures:

- All equipment on site should be properly maintained and in good operating condition so as to emit minimal air pollution.
- Masks to be provided to all personnel in dust generated areas throughout the period of construction.
- The consultants and contractors are requested to guarantee that the works are carried out in a proper manner so as to minimize the impact of the construction on the air quality.
- Proper maintenance of construction vehicles to minimize on air pollution.

7-2.3 Road Safety

Traffic will need to be controlled during construction especially with heavy vehicles turning and by enforcing speed limits for construction vehicles. Warning / caution signs should be erected at the site.

7-2.4 Disturbance to the Public

Noise disturbance to the public would occur during construction works including construction traffic. After construction the impact noise will be insignificant.

- Warning / information signs should be erected when construction works are about to begin.
- Construction activities should not be carried out at night.
- Liaise closely with the local community.

7-2.5 Public Health and Occupation Safety

During construction there will be increased dust, noise and air pollution levels, which are considered to be negative impacts, although for the public at large this would be minor. The workforce would be more exposed to these hazards.

- Emergency Response Plans (ERPs) should be well understood and communicated to all concerned parties including the local inhabitants of the area.
- Workmen should be provided with suitable protective gear (such as nose masks, ear plugs/muffs, helmets, overalls, industrial boots, etc), and there should be a fully equipped first aid kit on site.
- The project proponent will avail sanitary facilities to the construction workers
- Information and education on the operation and management of the facility, including all the environmental aspects should be offered to all concerned for purpose of project responsibility as well as safety.

7-3 Site Organization

To ensure health and safety conditions and prevent accidents on site, efforts will be made to have a clear site organization plan. These include:

- Developing a clear site organization plan and construction schedule
- Delivery and storage of material at appropriate locations
- Right size of staff/workers with clear work schedule and appropriate dress gear
- Control staff and vehicle movement on site and keep out unwanted persons
- Site office with safety kit
- Site toilet
- Adequate water supply for both construction work and worker use.

7-4 Project Team

In order to ensure proper organization of activities during plan, design and construction of the project, there must be appropriate project team. These include;

- Town / physical planner
- Environmental Impact Assessment Expert
- Project Architect
- Structural / Civil Engineer
- Service Engineers
- Quantity Surveyor
- Land Surveyor

7-5 Enforcement of Standards and Legal Requirement

The project must ensure that appropriate standards and legal requirements are met. These include:

- That the building work are in accordance to approved County drawings and plans
- That building operations to meet the building code specifications
- That requirements of the Factory Workers Act are followed
- That requirements of the Public Health Act are followed
- Those requirements as outlined in the Environmental Action Plan are observed.

7-6 Activities of Workers

The following activities by workers are clearly identified and must be closely monitored and organized to ensure health, safety and accident standards on site:

- Pushing of wheel barrows
- Hand packing of stones on road surface
- Lifting and laying of building material – stone, concrete etc.
- Plastering of walls
- Bending, cutting and laying of reinforcement steel
- Other general building work activities.

7-7 Activities by Machinery and Light Equipment

The activities of machinery and plant must also be properly organized and monitored in order to ensure health and safety conditions and prevents accidents. The machinery and plant to be used on site include –

- Compacting machine
- Vibrators
- Concrete mixer
- Small size hoist machine
- Goods truck
- Tipper

7-8 Insurance

The project proponent and building contractor will take appropriate insurance cover for the various project activities and personnel and/or workers.

CHAPTER EIGHT: ENVIRONMENTAL and SOCIAL MANAGEMENT/MONITORING PLAN

8-1 Introduction

Environmental management and monitoring involves, among others, the putting in place of sustainable environmental mitigation measures and monitoring plans. It is essential that the project is both environmentally friendly and appreciated by local residents. As already noted in chapter six of the report, the implementation of this project will have a lot of positive impacts to the local community, which may include creation of employment direct or indirectly.

8-2. Environmental Monitoring and Evaluation

Environmental monitoring and evaluation are essential in the project's lifespan as they are conducted to establish if the project implementation has complied with the set environmental management standards as articulated in the Environmental Management and Coordination Act (EMCA) No. 8 of 1999, amended 2015, and its attendant Environmental (Impact Assessment and Audit) Regulations, 2003.

Section 68 (2) of EMCA empowers NEMA to appoint an inspector who may enter any land/premises to determine adherence to EMP and any other conditions that may have been issued with an EIA license. Section 68 (3) requires the proponent to keep accurate records on the project and make annual audits which should be submitted to NEMA. To this effect the project proponent is hereby advised to make an environmental audit and submit to NEMA once the project is completed. The Lead EIA/EA expert is equally charged with a responsibility to ensure that the EMP is fully implemented and that any unforeseen impacts are mitigated and advice the proponent accordingly.

TABLE 8-1: ENVIRONMENTAL MANAGEMENT AND MONITORING PLAN

Project Phase	Project Activities	Potential Impacts	Mitigation Measures
Construction Phase	-Procurement and Transportation of construction materials	-Oil Spillage -Material spillage -Littering the site -Soil compaction -Heavy vehicle traffic	-Ensure NO spillage occurs -Ensure the use of serviceable vehicles -ensure no littering of the open spaces -ensure safe storage of materials. -Construction vehicle drivers will be under strict instructions to minimize unnecessary trips. -All trucks hauling soil, sand and other loose materials shall be covered. -Traffic speed of construction/other vehicles will be restricted to not more than 15 mph.
	-Construction of the proposed drone project	-Air Pollution -Noise Pollution	-Exposed stockpiles of e.g. dust and sand, will be enclosed, covered, and watered daily, or treated with non-toxic soil binders. - All workers on the site will be required to wear protective clothing while on duty. - All personnel working on the project will be trained prior to starting construction on methods for minimizing air quality impacts.

Construction Phase	-Construction of the Foundation.	-Oil Spillage -Noise -Dust -Soil destruction	-Ensure use of serviceable vehicles -ensure removal of all materials brought in during construction.
	-Construction of the Superstructure.	-Oil spillage. -Noise -Soil destruction	-Ensure NO oil spillage occurs. -Ensure use of manual labour and hand tools.
	-Worker accidents and health infection.	-Dust -Noise	- Employ skilled and trained workers, and provide protective clothing. -Prepare clear work schedule. -Have adequate worker insurance cover. -Provide sanitation facilities and clean drinking water. -Enforce occupational health and safety standards. -Adequate collection and storage of waste will be provided on site, and safe transportation to, and display methods at designated areas.
	-storm water discharge into the City Council storm drain.	-if not well managed could lead to flooding and property destruction	-ensure the storm water drains are connected to the City Council storm drains and regularly cleaned to remove debris.

Operational Phase	-Annual environmental Audit	-Noncompliance with the EMCA 1999 could result in closure of the facility.	-undertake initial environmental audit after completion. -undertake annual environmental audit of the project in compliance with the EMCA 1999.
	-proliferation of solid wastes. -Generation of foul water	-bad odour -Destruction of the aesthetic value of the property.	-Wastes to be collected regularly to control air pollution and vermin/insects etc. -Resource recovery will be encouraged once the project takes off so as to shrink waste stream and recover non-recyclables. -availability of dustbin cubicles protected from rain and animals -Wastes will be collected by a licensed operator to avoid illegal final dumping at unauthorized sites. -All persons involved in refuse collection shall be in protective gear.
	-Public Health and Occupation Safety.	-Accidents -Spillage	- Ensure proper solid waste disposal and collection facilities. -Provide suitable safety gear for all personnel. -Ensure all hazardous areas are marked -Provide safety regulations and first aid kits in visible accessible areas. -Ensure only skilled and experienced workers are involved in the construction of the drone station and allied infrastructure -Ensure suitable, appropriate, well serviced and maintained equipment are availed to the workers.

	-Waste Water Disposal	-If not properly managed could compromise sanitary hygiene of the building	- The proposed development will incorporate a waste water treatment plant. .-The treatment plant will be checked regularly for any leaks and repaired to avoid any damage and to maintain good and clean sanitation.
	- Water wastage	-leaking taps and hose reels.	-Management of water usage. -change all water valves that are leaking - Avoid unnecessary wastage of water. -ensure all firefighting equipment are in good working condition.
	-Demolition activities.	-flora and fauna disturbance	-Implement an appropriate re-vegetation programme to restore the site to its original status. -appropriate surface water run off controls will be taken to prevent surface erosion. -Monitoring and inspection of the area for indications of erosion will be conducted and appropriate measures taken to correct any occurrences

CHAPTER NINE: APPRAISAL OF ALTERNATIVE DEVELOPMENT OPTIONS

9-1 Overview

A thorough assessment shows that the negative impacts likely to be caused by the project can be mitigated with success. Various alternatives of the proposed development are appraised in this chapter.

9-1.1 No Development Investment

The Nil Intervention describes a situation in which the proponent does not undertake the proposed building development. This option would imply economic loss to the proponent, local and national economics. The proponent will continue paying land rent and rates for a piece of land that is not earning income. The locals would lose in terms of employment generation as this would be foregone if the site is not developed. The central government would also lose the tax income that would be generated by the project if implemented.

9-1.2 Relocation Option

The other option available for the project implementation is for the proponent to relocate it to an alternative site either within or outside Kisumu County. At the moment, the proponent does not have an alternative site. This implies that he has to buy another piece of land elsewhere. Looking for land of the similar size and market location and completing official transactions might take over one year, with no guarantee that the land would be available, and if such land is available, its cost might be beyond affordable for the proponent. The proponent will have to restart the planning, design, and approval of the project afresh. The proponent will need to re-engage professionals like EIA lead/audit experts and physical planners to assess the viability of the new site.

In a year's time, the cost of labour and construction materials would have increased tremendously given the current high inflation rate in the country. This could lead to a situation like zero option and the project may no longer be viable leading to eventual abandonment. The standoff will discourage local and international investors from investing in industrial and/or construction industry.

9-2 Exploration of Alternative Land uses

The developer could explore other uses for the site such as commercial, recreational, residential or institutional. From the field survey it was established that recreational user cannot be compatible with the existing land uses in the area. The developer could explore commercial or institutional use after applying for change of user to allow for such development. However, these would meet competition from the existing commercial establishments in addition, the necessary procedural requirements will take a lot of time and money making the current proposal to be more viable.

9-3 Conclusion

All the alternative options analyzed have implications, which make the current design option proposed by the proponent to be more viable. It is concluded that:

- The alternatives are likely to reduce the returns to investment that the proponent would have realized if the current proposed design were to be approved.
- There are several developed establishments in the neighborhood whose construction in Kisumu County have been approved. The proposed development will therefore blend easily with the current development trend in the Area.

9-4 Potential Negative Impacts and Mitigation Measures

The potential negative impacts and possible mitigation measures for the proposed building development are summarized below:

Table 9-1: Potential Negative Impacts and Mitigation Measures

Potential negative impacts	Mitigation measures
-Disruption of existing natural environment and modification of micro climate: • Increased development density • Obstruction of ventilating wind • Increased surface run-off	-Development restricted to approved density, building line, and plot coverage and ratio. - Careful layout and orientation of building to respect wind and sun direction
Solid Waste	- Construction waste will be disposed off to the approved Kisumu County dumpsites. -Waste to be sorted, and disposed off in accordance to Legal Notice 120 of 2006; waste regulations. -Wastes generated during operational phase will be collected by a private contractor for final disposal.
-Architectural Incompatibility leading to distortion of neighbourhood aesthetic image	-Harmonize building scale with existing development in the neighbourhood. -Harmonize detail, material and finishes for roofs and walls with existing development in the neighbourhood.

Habitat destruction -excavation of land	-reuse of excavated soil for landscaping and planting trees and flowers to restore part of the biodiversity within the site.
Pollution and Health hazard -air pollution -dust pollution	-all machinery and equipment should be maintained in good working conditions to ensure minimum emission including carbon monoxide, oxides of nitrogen and Sulphur -masks should be provided to all personnel in dust generation areas throughout the period of construction -sprinkling water regularly on dust prone areas - sound-attenuated equipment will be used as much as possible
Safety and accidents -fire and safety	-all site staff to be trained on the fire safety procedures, emergency response and use of firefighting equipment. - establish fire assembly points on site and on the drone cargo landing sites -install fire alarms

Visual impacts.	-Thorough stakeholder engagement, including prior consultation, participatory decision-making, and information disclosure and dissemination. -Avoiding prop flickering issues by adjusting flight directions in such a manner that the drone is not going to face sun -Appropriate site selection to avoid areas used for tourism and recreation. -Adjusting the location of launching pads to reduce perceived visual impacts. -Choose launching pads and drone outer body covers with aesthetics in mind

	-Stakeholder engagement with potentially affected households and businesses. -Designing of drone station according to the peculiarities of the site and with sensitivity to the surrounding landscape.
	-Locate the drone station at least reasonable distance from dwellings. -Selection of station design (tower, colour) according to landscape characteristics; -Selection of neutral colour and anti-reflective paint for towers -Lights for the exposed launching towers.
Noise disturbance – (both mechanical noise and aerodynamic noise)	-Careful flight path selection to have an adequate distance from human dwellings. -Use Planning Tools—standard industry software that predicts specific noise impacts on nearby buildings. -Stakeholder engagement with potentially affected households and businesses. -Improved design to reduce the aerodynamic noise of a drone in motion.

Impacts on avifauna and bats	-Careful Flight path selection to avoid important bird habitats and bird migration routes. -Bird flight activities within the flight path and the station should be recorded and analysed. Flight heights, directions, species, and behaviours of birds should be studied systematically. -Restrict construction activities to non-breeding periods for avifauna to help reduce the negative effects of bird disturbance. -Pattern paint the drones and the station pads to increase the visual acuity of raptors.

	-Provide night illumination by lighting the launch tower to improve the visibility at night to reduce bird and bat collision with any towers at night -Short-term shutdowns (in which the drones do not turn during peak migration events) to minimise bird mortality - The station layout should be properly designed to reduce the effects on bird migration
Reception of radio waves and weather radar electromagnetic interferences	• Careful site selection to avoid installing the station within the line-of-sight of radar or telecommunications facilities. • Consider using materials made from synthetic materials, which produced less electromagnetic interference compared to steel materials. • Install deflectors or repeaters to overcome the problem of already existing station and drones induced electromagnetic interference.

Local climate change	• Drones generated turbulences to be reduced through improved drone carrier designs and a proper operations spacing. • afforestation of the vegetation which might be destroyed. • Enhanced use of green energy for operations eg solar power
Increasing Insecurity/Fear-	-Thorough stakeholder engagement, including prior consultation, participatory decision-making, and information disclosure and dissemination. -Proper maintenance of the drones especially the parachutes which engage its gears and opens if a drone stalls on its way -Appropriate agencies to be incorporated to ensure there is some level of oversight or transparency
Loss of privacy	Thorough stakeholder engagement, including prior consultation, participatory decision-making, and information disclosure and dissemination.

	The appropriate agencies to be incorporated to ensure there is some level of oversight or transparency Government agencies can ensure the public there is no intrusion through technology via use of effective surveillance methods
Airspace Traffic	-Running a preflight checklist with the all drone operators and KCAA. - Confirming the drone's flight plan with KCAA to reduce any collision - Coordinating with the Kenya Civil Aviation Authority in order to request flight clearance. - Maintaining the permitted flight altitude. - Tracking the drone when airborne and redirect it when necessary. - Proper maintenance of data relying equipments to reduce false information and storage of the flight data to enhance proper recording and documentation

CHAPTER TEN: PROJECT BUDGET

10-1 Overview

The total project cost is estimated at KShs. 48,000,000.00

10-2 Capital Investment Costs

The main capital investment costs relate to: Site Preparation, excavation, Building Structure, External works and finishes.

10-3 Professional Fees and Labour Costs

The project involves lawyers, town/physical planners, environmentalists, architects, engineers, quantity surveyors etc. It is estimated that 30% of the project development cost will be allotted for labor charges. A labour force of 10-15 persons will also be employed. The total professional fees and labor costs is estimated at KShs. 4,000,000.00

10-4 Cost of Materials

Cost of construction materials is estimated to take 70% of the total development cost. This can be therefore approximated at about Kshs. 33,000,000.00

10-5 Project Time Schedule

The whole project cycle from inception, planning and design, and construction is estimated to take 2 No. Years. The construction period is estimated to take 18 months.

10-6 Financing

The proposed project will be financed from both investment returns/savings and loan facility.

CHAPTER ELEVEN: RECOMMENDATION

11-1 Overview

The project is an entirely new development starting from excavation to construction of superstructure. Completion of the project will have very high positive social and economic impact on the area and the city as a whole.
The project will inject a substantial amount (in cash) to the economy. The project will equally translate to increased property value hence increased rates and taxes to the Kisumu County Government.

11-2 Recommendations

That the National Environment Management Authority do consider, approve and grant required License to the proponent for the proposed construction of **drone station and its operations**

That the Kisumu County Government do support this application for Eia study Report License by the proponent for the proposed construction of **drone station with Ground Control Stations (GCS) with** sets of ground-based hardware and software that allow Unmanned Aerial Vehicle operators to communicate with and control a drone and its payloads.

That the Director of Physical Planning do support this application for the Eia study report License by the proponent for the proposed construction of **drone station** with Ground Control Stations (GCS) with sets of ground-based hardware and software that allow Unmanned Aerial Vehicle operators to communicate with and control a drone and its operations.

REFERENCE:

1. Republic of Kenya (1999); The Environmental Management and Coordination Act

2. Republic of Kenya (1996); The Physical Planning Act (Cap 286)

3. Republic of Kenya (1996); The Physical Planners Registration Act (No. 3 of 1996)

4. Republic of Kenya (1986); The Local Government Act (Cap 265)

5. Republic of Kenya (1968), Building Code

6. Republic of Kenya (2007), Vision 2030

7. R.S Ambasht, P.K Ambasht 1999; Environmental and pollution (An ecological Approach)