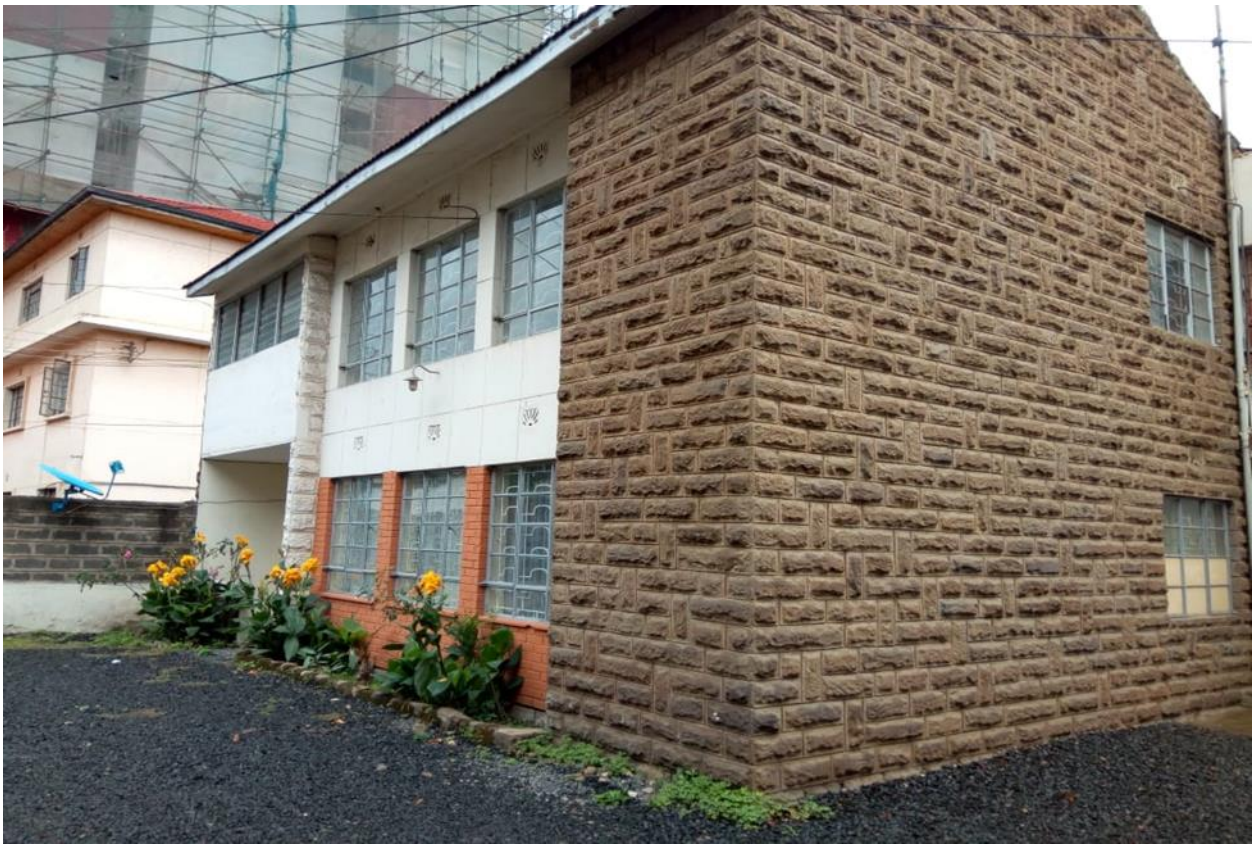
ENVIRONMENTAL IMPACT ASSESSMENT

STUDY REPORT

FOR

PROPOSED APARTMENTS ON PLOT L.R. NO. 37/254/12 ALONG KISAUNI ROAD IN NAIROBI WEST AREA OF NAIROBI CITY COUNTY.



This Environmental Impact Assessment (EIA) Study Report is submitted to the National Environment Management Authority (NEMA) in conformity with the requirements of the Environmental Management and Coordination Act, CAP 387 and the Environmental (Impact Assessment and Audit) Regulations, 2003

Project Proponent:

Laser Freight Limited,

P.O. Box 12291-00400

Nairobi, Kenya.

The following expert(s) conducted the assessment and prepared this Report

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Signed: ……. Date: ……

Name: ……

Designation: ……..

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Acronyms

PAP	Project Affected Persons
CCTV	Closed-circuit Television
CPP	Consultations and Public Participation
DRSRS	Department of Resource Surveys and Remote Sensing
EIA	Environmental Impact Assessment
EMCA	Environmental Management and Coordination Act
EMP	Environmental Management Plan
ERC	Electricity Regulatory Commission
Ha	Hectares
KPLC	Kenya Power and Lighting Company
L. R. No.	Land Reference Number
NCA	National Construction Authority
NCC	Nairobi City County
NCWSCo	Nairobi City Water & Sewerage Company
NEAP	National Environment Action Plan
NEMA	National Environmental Management Authority
NET	National Environmental Tribunal
OHS	Occupational Health and Safety
PPE	Personal Protective Equipment
SDG	Sustainable Development Goals
TOR	Terms of Reference
WRMA	Water Resources Management Authority

EXECUTIVE SUMMARY

Introduction

The Kenyan population records an annual rise of about one million and Nairobi City being the capital is no exception. It is approximated that the population increase of the Kenyan Capital is about 4% annually (United Nations World Population Prospects, 2017). This has had the effect of exerting pressure on sustainable urban environment due to the need for adequate infrastructure and a conducive living environment and the increased demand for housing which has far outweighed the supply. An immediate obvious impact of limited housing in urban areas has led to a trend that has seen the sustainability of the urban areas in terms of adequate facilities, environmental conservation and infrastructure services dwindle.

It is in a bid to contribute towards alleviating this menacing shortage of housing facilities that the project proponent has proposed to construct a **12 level block of 143 studio apartments, 15 packing bays** and other auxiliary facilities in Nairobi West Area, of Lang'ata Sub County, Nairobi County**.** However, the proponent being an environmentally conscious person is fully aware of the impacts this development will impose both negative and positive on its immediate environment and has thus engaged the environmental experts to carry out the EIA for the proposed development and prepare an EIA study report as stipulated in the Environmental Management and Coordination Act (EMCA), CAP 387.

Scope

The study covered the physical extent of the project site and its immediate environs recording all the baseline information, legal and regulatory frame work in line with project, analysis of the project alternatives, assessment of the environmental impacts and development of mitigation measures for the negative impacts including designing an Environmental Management and Monitoring Plan (EMP) for the project.

The objectives of the project

The objectives of the proposed development are:

i. To construct **143 studio apartments, 15 packing bays** and other auxiliary facilities on the subject plot

ii. To put the current land into more productive and economic use while conserving the environment

iii. To meet the economic desires of the proponent.

Objectives of the EIA

The objectives of undertaking the EIA were as follows;

i. To identify potential environmental impacts of proposed project and assess the significance of these impacts.

ii. To assess the relative importance of the various project alternatives.

iii. To propose mitigation measures for the significant negative impacts of the project on the environment.

iv. To seek the views and concerns of all the Project Affected Persons (PAPs) in regards to the proposed project.

v. To generate baseline data for monitoring and evaluation of how well the mitigation measures are being implemented during the project cycle.

vi. To develop comprehensive Environmental Management Plan (EMP) for the project cycle with mechanisms for monitoring and evaluating the compliance and environmental performance which shall include the cost of mitigation measures and the time frame of implementing the measures.

vii. To present the results of the EIA in such a way that they can guide informed decision making.

Methodology

The methodology of this study included: mobilization and planning, desk review of documents, field visits to the project area to collect baseline data, project data synthesis, public consultation and participation. A number of stakeholders were consulted for their inputs to the study through public meeting (baraza), key informant interviews and completion of qualitative questionnaires.

Environmental Impacts and Mitigation Measures

The potential negative environmental impacts of the proposed project and possible mitigation measures are summarized below:

Table 1: Anticipated impacts and proposed mitigation measures

Anticipated Impacts	Mitigation Measures
Increased Traffic	▪ Ferry building materials during off-peak hours. ▪ Employ traffic marshals to control traffic in and out of site. ▪ Provide traffic control signs at the site/entrance to notify motorists and general public about the proposed project. ▪ Enforce speed limits for construction vehicles especially along the roads leading to the site. ▪ Develop a traffic management plan to ensure the smooth flow of traffic along the access roads.
Solid waste	▪ Engage the services of registered waste handler to transport the waste to the designated areas. ▪ Covering of trucks when transporting building materials and waste. ▪ Use of an integrated solid waste management system through a hierarchy of options: source reduction, recycling and reuse. ▪ Provision of waste management room at a strategic place within the apartments for segregation and disposal of the waste.. ▪ Monitor waste in line with the waste management regulations
Liquid waste	▪ Channel all liquid waste to the existing sewer line along the road. ▪ Conduct routine inspection and monitoring of the internal drains to identify and repair any leakages and blockages. ▪ Provision of sanitary facilities to the workers during the construction and proper decommissioning of the facilities once construction is complete. ▪ All waste pipes will have rodding eyes accessible from outside i.e. free to every part of the system for inspection, cleaning and repair. ▪ Regular inspection and maintenance of the internal sewer system. ▪ Residents should report any incidence of blockages in their units immediately they occur for prompt maintenance
Increased water demand	▪ Drill a borehole to supplement the existing water supply. ▪ Connect to the existing water supply after acquisition of the relevant permits. ▪ The contractor will engage the services of water vendors to supplement the water supply. ▪ Use of water efficient appliances and fixtures for plumbing products and white goods. ▪ Provision of adequate underground and roof water tanks for water storage.
Air Pollution	▪ Use of dust screens/nets around the construction site to contain and

	arrest dust. ▪ Regular sprinkling of water on work areas to prevent fugitive dust violations especially during the dry spell. ▪ Ensure no burning of waste such as paper and bottles on site/non-designated areas. ▪ Covering and regular watering of the exposed stockpiles on site such as the sand and ballast. ▪ Regular and prompt maintenance of construction machinery and equipment to minimize generation of hazardous gases.
Noise Pollution	▪ Construction works will be carried out during the day between 0800hrs to 1800 hrs. ▪ The contractor shall use noise shields on noisy equipment such as corrugated iron sheet structures. ▪ All noisy activities shall be scheduled concurrently during the construction to reduce the exposure period. ▪ Operation of the noisy machinery shall be carried out when necessary and switch them off when not in use. ▪ Provide and enforce use Personal Protective Equipment (PPE) by the workers at all times during the construction. ▪ Regular maintenance of the machinery to reduce frictional noise. ▪ Monitor noise levels as per regulations.
Energy Demand	▪ Use of solar energy as an alternative source of energy. ▪ Install and routine maintenance of energy efficient fixtures and fittings. ▪ Turn off the machinery and equipment when not in use. ▪ Put off all the lights immediately when not in use. ▪ Regular inspection and repairs of the solar panels.
Occupational Health and Safety of workers and public	▪ Workers shall use properly fitting PPEs to avoid accidents, injuries and illness ▪ The contractor shall adapt a suitable emergency response plan to manage occurrence of anticipated hazards during construction phase. ▪ Provide appropriate signage and warnings in work areas. ▪ Provide well equipped first aid kits and ensure that workers are trained on emergency response such as first aid skills. ▪ Local individuals preparing food for the workers at the site shall be controlled, monitored and evaluated to ensure that food is hygienically prepared. ▪ Workers shall always be sensitized on social issues such as drugs, alcohol, diseases such as HIV/AIDS and STIs etc. ▪ Provide adequate and functional sanitary facilities for the workers. ▪ Comply with OSHA 2007 and all other relevant regulations governing health and safety of workplaces.

Conclusion and Recommendations

The project will play an important role in increasing the number and quality of habitable housing facilities in the area, providing employment opportunities and increasing the national and county governments' tax revenues. However, major concerns shall be focused towards minimizing the occurrence of impacts that would degrade the general environment. To greatly work in synchrony with the environment and stakeholders in order to ensure its sustainability, the proponent shall proceed with careful consideration of the prescribed mitigation measures through close follow-up and implementation of the recommended Environmental Management and Monitoring Plans throughout the project cycle.

It is therefore our recommendation that the proponent be granted EIA license to implement the proposed project.

CHAPTER ONE: INTRODUCTION

1.1 General Overview

The need to pursue sustainable development guided by environmental, social, cultural and ethical considerations has been accorded high priority worldwide in a bid to conserve the environment for the current and future generations. Due to numerous environmental challenges, resulting from unsustainable implementation of development programs and projects, the Kenyan government harmonized environmental laws under the Environmental Management and Coordination Act (EMCA), CAP 387. This law makes an Environmental Impact Assessment (EIA) mandatory for all the projects specified in the Second Schedule of the Act, this proposed project being one of them.

The proposed project is a **twelve level block comprising of 143 studio apartments, 15 parking bays** and other auxiliary facilities on plot LR No. 37/254/12 located along Kisauni Road in Nairobi West area of Lang'ata Sub County, Nairobi City County.

1.2 Objectives of the EIA

Environmental Impact Assessment (EIA) is a process having the ultimate objective of providing decision makers with an indication of the likely environmental consequences of a proposed activity. The main objectives of this EIA therefore include the following:

i. To identify potential environmental impacts of proposed project and assess the significance of these impacts.
ii. To assess the relative importance of the various project alternatives.
iii. To propose mitigation measures for the significant negative impacts of the project on the environment.
iv. To seek the views and concerns of the PAPs in regards to the proposed project.
v. To generate baseline data for monitoring and evaluation of how well the mitigation measures are being implemented during the project cycle.
vi. To develop Environmental Management and Monitoring Plan (EMP) for the project cycle.
vii. To present results of the EIA Study Report in such a way that they can guide informed decision making.

1.3 Terms of Reference (TOR)

A scoping exercise was undertaken to identify the fundamental issues to be addressed in the study and feasible project alternatives. During the exercise, terms of reference (TOR) were developed and submitted to the authority on 8th November 2018 in line with section 11 of the EIA Regulations and approved *(Attached is the TOR approval letter)*. Below are the TOR;

i. the proposed location of the project;
ii. a concise description of the national environmental legislative and regulatory framework, baseline information, and any other relevant information related to the project;
iii. the objectives of the project;
iv. the technology, procedures and processes to be used, in the implementation of the project;
v. the materials to be used in the construction and implementation of the project;
vi. the products, by-products and waste generated project;
vii. a description of the potentially affected environment;
viii. the environmental effects of the project including the social and cultural effects and the direct, indirect, cumulative, irreversible, short term and long-term effects anticipated;
ix. alternative technologies and processes available and reasons for preferring the chosen technology and processes;
x. analysis of alternatives including project site, design and technologies and reasons for preferring the proposed site, design and technologies;
xi. an Environmental Management Plan proposing the measures for eliminating, minimizing or mitigating adverse impacts on the environment; including the cost, time frame and responsibility to implement the measures;
xii. provision of an action plan for the prevention and management of foreseeable accidents and hazardous activities in the cause of carrying out activities or major industrial and other development projects;
xiii. the measures to prevent health hazards and to ensure security in the working environment for the employees and for the management of emergencies;
xiv. an identification of gaps in knowledge and uncertainties which were encountered in compiling the information;

xv. an economic and social analysis of the project;

xvi. an indication of whether the environment of any other state is likely to be affected and the available alternatives and mitigating measures.

1.4 Scope of the study

The EIA study will involve the following;

a) A description of the project

b) Documentation of all baseline information

c) Socio-economic survey to get the views of different stakeholders/affected persons using;

i. Questionnaires

ii. Interviews

iii. Public meeting

d) Review of the policy, legal and administrative framework

e) Prediction of any sources of conflicts and making appropriate recommendations

f) Assessment of both the positive and negative impacts of all environmental components

g) Developing mitigation measures for the negative impacts identified

h) Designing of a comprehensive EMP for the project

j) Examining the projects phases, stages and activities to be undertaken and integrating them with environmental characteristics

k) The monitoring programmes, parameters and procedures to be put in place for control and corrective actions in case of emergencies or accidents on site shall also be examined

1.5 Methodology

The methodology used for preparation of this EIA report is stated in the steps below:

i. Screening of the project, a process that identified the project as being among those requiring EIA under schedule 2 of the EMCA , CAP 387,

ii. A scoping exercise that identified the key issues to be addressed in the assessment.

iii. Documentary review on the nature of the proposed activities, policy and legal framework, environmental setting of the area and other available relevant data/information,

iv. Public participation and discussions with the local community, proponent and the project team regarding the proposed project,

v. Physical evaluation of the project site and the surrounding areas using a pre-prepared checklist with specific focus on environmental and human safety issues that are likely to be affected,
vi. Reviewing the proposed project designs and implementation plan/schedules with a view to suggesting suitable alternatives,
vii. Developing an EMP outline with responsibilities, schedules, monitorable indicators and time frames among other aspects,
viii. A comprehensive report including issues as listed in the Environmental (Impact Assessment) Regulations 2003.

The data used for developing the EIA can be categorized into two, primary and secondary data, as tabulated below;

Table 2

Type of data	***Source of data***
Secondary data	Published books, official government documents and statutes, plans, reports and documentation from members of the project team.
Primary data	Formal/informal interviews, field observations, pictures, questionnaires, views from resident attendees during the public meeting and inputs from the project team

1.6 Justification of the project

1.6.1 Demand for housing

The demand for housing is urban areas in Kenya and particularly Nairobi is growing with increased urbanization, an ever rising population growth rate and the evolution of the devolution system, yet the government has been unable to meet the annual housing requirements. According to a study done by the World Bank, production of housing units in Nairobi is currently at less than 50,000 units annually, well below the target number, culminating in a housing deficit of over 2 million units, with nearly 61% of urban households living in slums given that the rates of urbanization are at 4.4% an equivalent of 0.5 million new city dwellers every year.

The proponent in an attempt to alleviate this situation even in the slightest manner hereby proposes to construct the studio apartments and hence provide affordable and habitable housing units.

1.6.2 Size of the plot

At 0.0558 hectares, the plot is large enough to accommodate the proposed development while adhering to the planning standards and policies provided by the County Government for Nairobi West which is in Zone 10, allowing for high density residential and mixed use developments.

1.6.3 Socio-Economic Benefits

There will be numerous benefits attributed to the proposed development. Some of the benefits will include provision of habitable housing units and therefore contributing towards reducing demand, direct and indirect employment opportunities, market for goods and services throughout the project cycle, increased national and county governments tax revenues, enhanced overall competitiveness of this area hence more development and growth, increased property value, increased income for the proponent, increased security in the area, just to mention a few.

1.6.4 Neighborhood Development Trend

The neighborhood is currently undergoing urban transformation with the previous low density residential developments being replaced by mixed use and high density residential developments including apartments, commercial complexes and institutions.

The proposed development will therefore be in conformity with this trend which will ensure better utilization of the land giving it more and higher quality and urban character as well as increase its profitability.

CHAPTER TWO: PROJECT DESCRIPTION, DESIGN AND IMPLEMENTATION

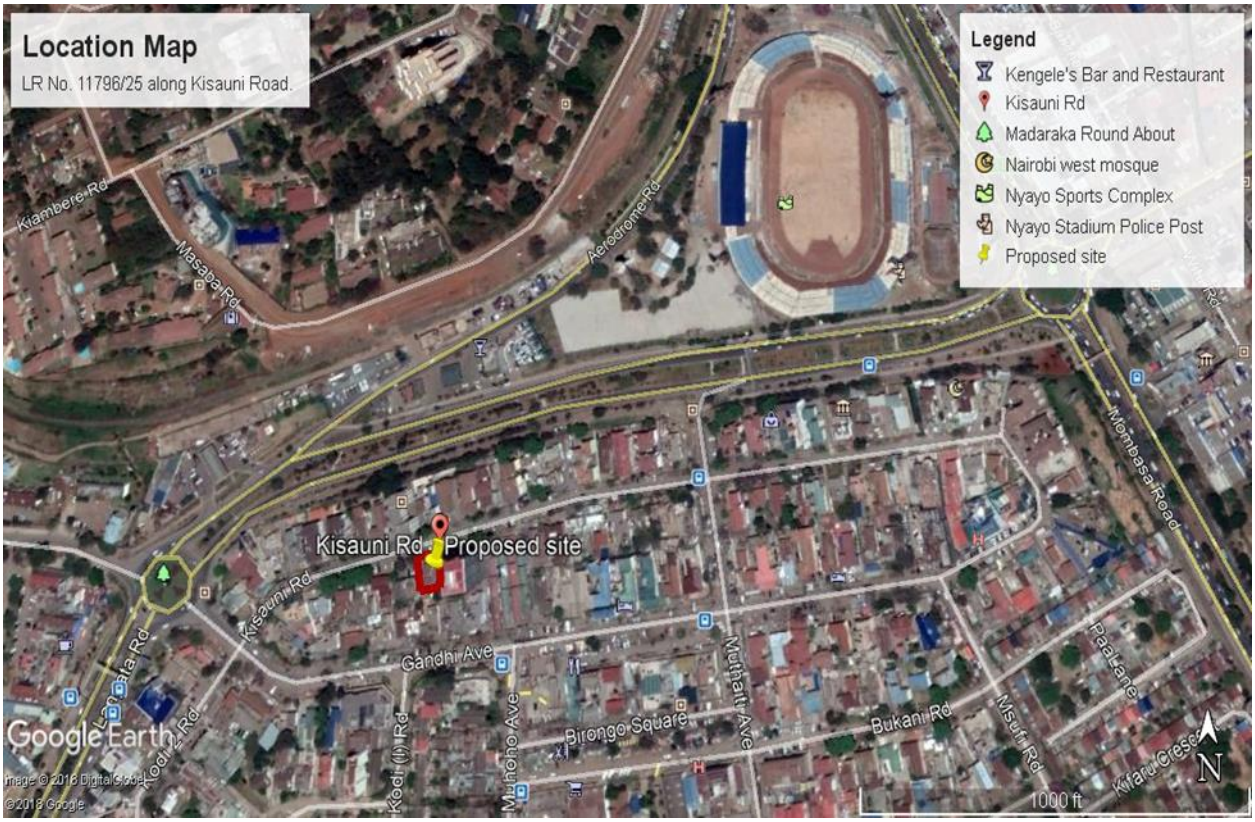
2.1 Nature of the Project

The proponent, *Laser Freight Limited*, is proposing to construct a twelve level residential block on LR No. 37/254/12 comprising of one hundred and forty three (143) studio apartments, fifteen (15) parking bays and other auxiliary facilities. The development aims at providing quality and price friendly housing units and in turn increase the utility of the land in discussion.

2.2 Project Location and Size

The proposed project site is located **along Kisauni Road** on latitude 1°18'25.36''S and longitude 36°49'17.65''E in Nairobi West Area of Lang'ata Sub County, Nairobi City County. A notable landmark is the Nyayo National Stadium which is about 400m from the site. The parcel of land to be developed measures approximately **0.0558 Ha** *(Attached is copy of the ownership documents).*

Plate 1: Site Location



Source: Google Earth, 2018

2.3 Land Tenure, Use, Ownership and Management

The parcel of land on which the subject development is proposed is held on leasehold interest for 99 years from 01/04/1955. The certificate of title is drawn under The Registration of Titles Ordinance (Chapter 160) as Plot L.R. No. 37/254/12 and the current registered proprietor is *Laser Freight Limited* (Post Office Box Number 12291 – 00400 Nairobi) who is hereby seeking the EIA License for the proposed project *(See attached the ownership document).*

According to the Nairobi City Development Ordinances and Zones Guidelines, the area is in Zone 10 which allows Commercial/Residential (Apartments). The proponent has applied for a change of use from single dwelling to multiple dwelling residential (apartments) which is subject to approval by the Nairobi City County Government.

Therefore, the proposed project is in line with the zoning ordinances of the area.

2.4 Project Description

The project proponent proposes to construct a twelve level block on the aforementioned land comprising of 143 studio apartments, 15 parking bays and other auxiliary facilities as described below:

i. **Lower Ground floor level** comprising of 7 parking bays, ground water tanks, generator room and switch room.
ii. **Upper Ground floor level** comprising of 8 parking bays and two parking bays on the road reserve, laundry area, caretaker's room and gate.
iii. **Typical 1st – 11th Floor levels** comprising of 13 studio apartments
iv. **Roof level** comprising of a lap pool, gymnasium, showers, balance tanks, pump room, service ducts, washing area and drying yard.

Other salient features include staircases and lift lobbies, borehole and refuse holding area

More fine details, specifications and features of the proposed project can be obtained from the drawings *(Attached are architectural drawings).*

2.5 Construction Inputs

The project inputs will include the following:

i. The materials that shall be used will include stones, cement, sand, crushed rock (gravel/ballast), ceramic fixtures, reinforcement bars, wood/timber, glass, painting materials, plastic, electrical and mechanical fixtures. All these materials shall be obtained

from licensed dealers who have complied with the environmental management guidelines and policies and approved by Kenya Bureau of Standards (KBS).

ii. Several machines shall be used which will include earth moving equipment (excavators, loaders, wheel loading shovels and backhoe), material handling equipment (cranes and hoists), construction equipment (concrete mixers and vibrators) and Engineering vehicles (trailers, tippers and dumpers).

iii. The project will require a labour force of both skilled and non-skilled workers. The skilled personnel will include the project consultants (architects, engineers, quantity surveyors and environmental experts) and the contractor with a team of foreman, masons, plasterers, carpenters, plumbers, welders, electricians, glaziers, painters and casual labourers.

iv. Other construction inputs will include water and electricity from the main grid or provided by generators.

2.6 Construction Activities

2.6.1 Pre-construction phase

i. Seeking of the appropriate approvals from the relevant authorities such as change of land user, demolition, tree cutting, hoarding and excavation permits.

ii. Preparation of the preliminary architectural designs for the proposed project and submission to the County Government for approval.

iii. Conducting a preliminary geotechnical exploration investigation for the project.

iv. Appraisal of baseline conditions to determine supply and demand for required infrastructural services.

v. Conducting an EIA and submission of the Study Report to NEMA for licensing.

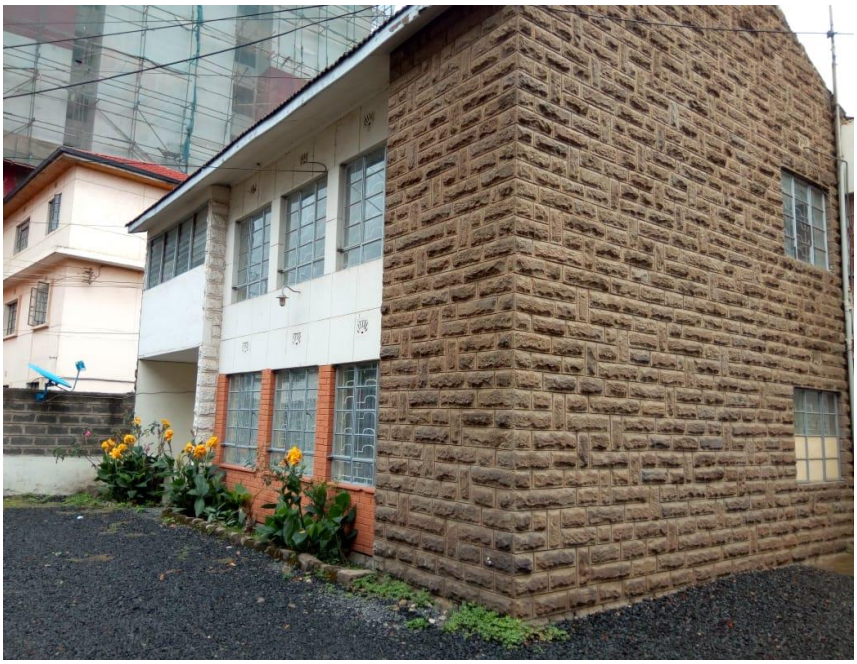
2.6.2 Construction phase

i. Demolition of existing structure

There is an existing house on the site with occupants who shall be relocated/evacuated before construction activities begin. The existing house shall then be demolished to pave way for the proposed development. Application for demolition permits shall be presented to the relevant authorities such as NCC before commencing the demolition exercise. A registered private contractor shall be engaged to carry out the demolition. The exercise shall be limited to day time

only and all personnel working on the project shall be provided with PPEs such as helmets and dust masks. The demolition debris shall be disposed of to designated areas by a registered NEMA waste handler.

Plate 2: Existing house on the plot



Source: Field survey 25/10/2018

ii. Construction site preparation

After the demolition of the existing structure, the site preparation will commence with the hoarding the area around the boundary of the plot to protect the public from the falling objects. Other preparation works shall include construction of temporary site office and storage rooms, proviso of adequate sanitary facilities for workers, first aid office and utilities area. The contractor shall mobilize materials, workforce and machinery required for ground breaking.

iii. Sourcing and Transportation of Building Materials

Building materials will be transported to the project site from their extraction, manufacture, or storage sites using trucks. The building materials to be used in construction of the project will be sourced from Nairobi and neighboring areas. Greater emphasis will be laid on procurement of building materials from within the local area, which will make both economic and environmental sense as it will reduce negative impacts of transportation of the materials to the project site through reduced distance of travel by the materials transport vehicles.

iv. Storage of Materials

Building materials will be stored on site. Bulky materials such as building stones, ballast, sand and steel will be carefully piled on site. To avoid piling large quantities of materials on site, the proponent will order bulky materials such as sand, gravel and stones to the site in accordance to the demand at any particular time. Materials such as cement, paints and glasses among others will be stored in temporary storage structures, which will be constructed within the project site for this purpose.

v. Excavation and Foundation Works

Excavation will be carried out to prepare the site for construction of foundations, pavements and drainage systems. This will involve the use of heavy earthmoving machinery such as excavators, tractors and bulldozers.

vi. Masonry, Concrete Work and Related Activities

The construction of the foundations, building walls, floors, pavements, drainage systems and parking area among other components of the project will involve a lot of masonry work and related activities. General masonry and related activities will include construction of foundations, superstructure construction, concrete mixing, stone shaping, plastering and erection of building walls and curing of fresh concrete surfaces. These activities are known to be labor intensive and will be supplemented by machinery such as concrete mixers.

vii. Structural Steel Works

The building will be reinforced with structural steel for structural stability. Structural steel works will involve steel cutting, welding and fixing.

viii. Electrical and Mechanical Works

This phase will involve installation of water and waste water piping, electrical gadgets and appliances including lighting fixtures and connection of the electrical and mechanical configuration to the sewer line and existing power lines upon acquisition of the necessary approvals. All the electrical works will be carried out by a licensed electrician to the satisfaction of the Kenya Power and Lighting Company (KPLC). The phase will followed by an inspection and a report issued to the relevant authorities before approval is granted.

ix. Interior and Exterior Finishes

After concrete and masonry works are completed, plastering will be carried out to ensure the building is structurally strong, protected from weather effects and given an attractive look. This will be done both internally and externally in line with the specifications of the project architect. After plastering, the painting of the development will be carried out with cement primer and eco-friendly zero Volatile Organic Compounds (VOC) paints and fixing of the floor and wall tiles.

x. Landscaping and Final clean up

The final cleanup will be done once the construction activities are completed. All the waste will be reused where feasible and/or transported to designated approved dumpsites. Thereafter, a landscaping exercise will be carried out to improve the aesthetic value or visual quality of the site. This will include planting of grass bed and trees, establishment of a theme gardens and lush grass lawns where applicable. It is noteworthy that the proponent will use plant species that are available locally preferably indigenous ones for landscaping.

2.6.3 Operational phase

i. Residence

A total of 143 families will reside within the proposed development. Several family activities such as cooking, laundry, cleaning, leisure and recreational activities will thus accompany residence. In addition, there will be production of domestic and sanitary wastes.

ii. Cleaning

The proponent will be responsible for regular washing and cleaning of the pavements and communal areas. The tenants/occupants will be responsible for washing and cleaning their own premises/residences. Cleaning operations will involve the use of substantial amounts of water, disinfectants and detergents.

iii. General Repairs and Maintenance

The development will be repaired and maintained regularly during its operational phase. Such activities will include repair of building walls and floors, repairs and maintenance of electrical gadgets and equipment, repairs of refrigeration equipment, repairs of leaking water pipes, painting, maintenance of the planters and grass lawns, and replacement of worn out materials among others.

2.6.4 Decommissioning phase

This is the stage where the final disposal of the residential apartments and its associated facilities will be carried out after the expiry of the project life span. All relevant agencies including the project consultants will be notified before the decommissioning is carried out with a bid to ascertain guidelines on possible impacts and mitigation measures. Some of the project decommissioning activities will include;

i. All equipment including the mechanical and electrical fixtures and fittings will be dismantled and removed from the site. Priority will be given to reuse of the equipment in other projects through auctioning to other contractors or reuse in another proponent's site.
ii. The project components including the buildings, pavements, parking areas and perimeter fence will be demolished. The debris will be reused where feasible and/or disposal by a licensed waste handler.
iii. The site will be restored through replenishment of the topsoil and re-vegetation using indigenous plant species. The unsafe areas will be fenced until natural stabilization occurs.

2.7 Construction Products, By Products and Wastes

It is anticipated that the project will generate a variety of products, by-products and wastes during its construction and operational phases. The characteristics of the products, by-products and wastes are discussed in this section.

2.7.1 Products

The final product will be **a twelve level block comprising of 143 studio apartments, 15 parking bays** and other auxiliary facilities.

2.7.2 By-Products

The by-products will be disposed-off as follows:

i. **Pieces of timber/wood:** Large pieces of timber/wood generated during the construction phase will be transported back to the contractor's yard for reuse in future while the small pieces of timber/wood will be disposed-off for use as fuel for cooking and heating.
ii. **Empty cans and drums:** These will be used to store water during construction. The damaged ones will be disposed-off to registered scrap metal and plastic waste dealers.

iii. **Excess sand, ballast and stock piles:** These can be used for future construction activities e.g. renovations. Upon completion of the project, these will be moved by the contractor to a suitable yard.

2.7.3 Wastes

The waste generated during construction will include construction debris, sanitary waste, excavated soil and rocks. The other wastes that may likely to be generated during operation are solid waste such as paper, plastics, cans, glasses, metallic pieces, and organic waste. These wastes will be disposed by the proponent in accordance with the standards and documented procedures stipulated in the EMCA Waste Management Regulations of 2006.

2.8 Project Budget and Duration

The proposed project is estimated to cost **Two hundred eighty three million, four hundred eighty two thousand Kenyan shillings** (KShs 283, 482, 000). The project implementation works is estimated to take 2 years to completion.

CHAPTER THREE: BASELINE INFORMATION

3.1 PHYSICAL ENVIRONMENT

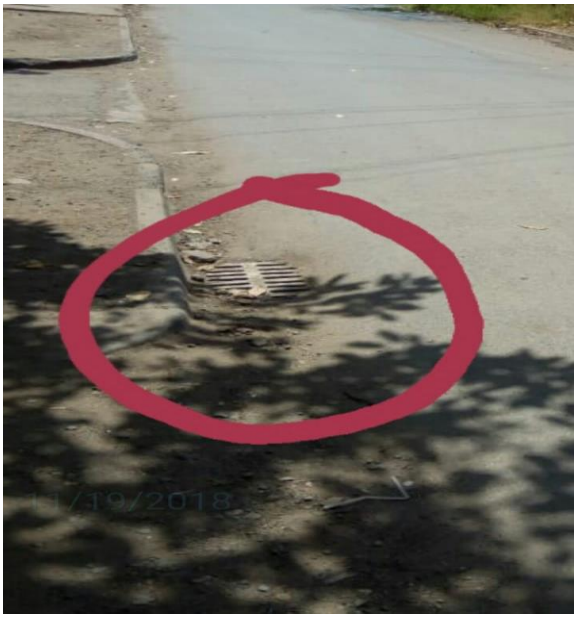
3.1.1 Climate

The area just like many parts in Nairobi experiences a fairly cool climate resulting from its high altitude. Temperature ranges from a low of 10℃ to a high of 29℃. It has a bi-modal rainfall pattern. The long rains season fall between March and May with a mean rainfall of 899 millimeters (mm) while the short rains season fall between October and December with a mean rainfall of 638 mm. The mean annual rainfall is 786.5 mm (Nairobi County Integrated Development Plan, 2014).

3.1.2 Topography

The site lies at an altitude of about 1600m above sea-level and is generally flat in its topography. It drains its storm water in the storm water kerb inlets along Kisauni Road.

Plate 3: Storm water kerb inlet



Source: Field Survey 25/10/2018

3.1.3 Geology and Soils

The soil type in the project area is primarily black cotton in nature. The soils will be excavated and disposed of in designated areas by a NEMA registered waste handler.

3.1.4 Water Resources and Wetlands

There is no river stream bordering the property. The closest natural water source is Ngong' River which is about 350 m away from the site.

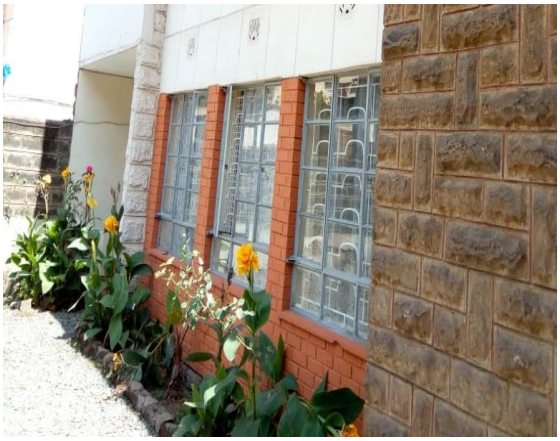
3.2 BIOLOGICAL ENVIRONMENT

This section describes key biological elements, including the identification and distribution of dominant, rare and the unique flora and faunal species within the proposed project site and other potentially affected areas.

3.2.1 Flora

The site is generally characterized by a few flowers planted around the existing building. These shall be uprooted to pave way for the new development. However, once construction ceases, the proponent shall plant more flowers to increase the green spaces in the property.

Plate 4; Vegetation within the site



Source: Field Survey 25/10/2018

3.2.2 Fauna

The project site is situated within a commercial/residential zone where human activities have altered the natural habitat for animals over the years. The property is characterized by few bird species. None of the faunal species observed are rare or endangered. It is expected that once the vegetation on the site is cleared there shall be a slight imbalance in the ecosystem but the proponent shall attempt to restore the ecological balance of the site by introducing plant and vegetation species after construction is completed.

3.3 SOCIO-ECONOMIC ENVIRONMENT

3.3.1 Land Use

The neighborhood is generally characterized by a mix of different uses. Initially, Nairobi West was a residential area with a mixture of middle and low density housing. Although most of the developments have been maintained at low levels, the trend appears to be changing with developers constructing multiple story buildings (apartment blocks such as the upcoming residential development and commercial buildings such as T Mall). The project will therefore be in character with other developments in the area.

Plate 5: Upcoming development in the neighborhood

Source; Field Survey 25/10/2018

3.3.2 Educational institutions

The area also has seen an increasing number of other developments, such as educational facilities, institutions, religious institutions and the general commerce sector. This is due to the increased demand arising from the incoming population.

The different education facilities found in the area include; Nairobi West Nursery School, PCEA Nairobi West Academy, Nairobi Muslim Academy, Shree Cutchi LPS School, Strathmore Business School, Montech Training College, just to mention a few.

3.3.3 Religious Institutions

The religious institutions that serve the residents of Nairobi West area include churches such as Nairobi West SDA Church, PCEA Nairobi West and House of Grace Mega Church and Mosques such as the Nairobi West Mosque. These will also serve the residents of the new development.

3.3.4 Health Institutions

Health institutions in the neighborhood include the Nairobi West Hospital, Gertrude's Children's Nairobi West Clinic, Shree Cutchi Leva Patel Samaj Clinic and Meridian Equator Hospital, among many others.

3.3.5 Commercial Activities

These activities are mainly concentrated along the Kisauni and Gandhi Road and some of these include banking and insurance companies (Barclays Bank and Equity Bank), corporate offices and suites such, supermarkets and retail shops. The area is also ideal for recreation activities and leisure due to the presence of Nyayo Stadium which is in the neighborhood of the site location

3.3.6 Security

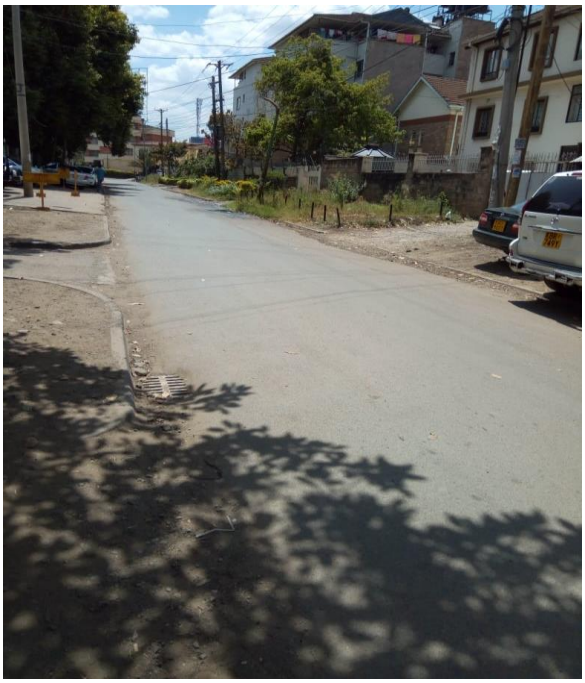
Security in the area is provided by the nearby Kenya Police Station and Akila Police Posts which are located approximately 2 kilometers from the site. However, the proponent will beef up security by employing guards 24 hours and installation of CCTV cameras at strategic points within the premises.

3.4 INFRASTRUCTURE

3.4.1 Roads and accessibility

The proposed project's site is located in an area served with good road network such as Kisauni Road which feeds to Lang'ata Road. The accessibility of the site will be instrumental during project implementation process and occupation phase

Plate 6: Access Road to site (Kisauni Road)



Source: Field Survey 25/10/2018

3.4.2 Water supply

The general area is served with water supplied by Nairobi City Water and Sewerage Company (NCWSCo). The developer intends to connect to the main water supplier. However, due to the noted inconsistencies in the delivery of the resource from the supply company, the developer intends to:

i. Drill a borehole in the property that will provide an alternative source of water for the residents of the new development
ii. Make arrangements with registered water vendors to supply the commodity (water) to the site during the construction phase.
iii. Install standard roof water collection systems for the roof catchments of the proposed building. These include gutters, down pipes and suitable water storage tanks for the harvested rainwater. It will greatly help in minimizing pressure on the existing water supply.

3.4.3 Sewer System

The general area is served with public sewerage system of NCWSCo. The proponent therefore intends to connect to the trunk sewer for sewerage disposal. The internal sewer system of the

proposed project will be suitably designed to collect all effluent/waste water from the development. All sanitary installations, fixtures and fittings will be done to the entire satisfaction of County government Public Health Office and Ministry of Health.

3.4.4 Surface Drainage

Increased surface run-off is anticipated from roof catchments of building structure; drive way and parking. In connection to this, the volume of water reaching the drain system will greatly reduce by installing rain water harvesting facilities in the development

The surface water/run-off will mainly be directed to the open drains constructed within the compound that will eventually drain to the storm water inlets on the main road

3.4.5 Solid Waste Management

Increased solid waste generation from the project is anticipated mainly arising from the construction activities (wooden, debris, metals, glass, plastics, and sanitary litter etc.). The sources include the following:

i. Debris resulting from the demolition works shall be reused on site for ground leveling and the excess disposed of at the designated dumping sites.
ii. Debris resulting from earth works and vegetative materials to be disposed of in designated dumping sites to pave way for the proposed project.
iii. All stony, wooden, metals and glass materials resulting from related activities, during implementation of the proposed project.
iv. Plastic materials resulting from such works as sewerage, drainage and water systems, electricity works etc.
v. Sanitary litter as generated during implementation and occupation of the project.
vi. Kitchen materials and other refuse especially on the occupation of the proposed project

All debris generated during project implementation process will be disposed suitably into the approved dumpsite or as directed by the Engineer, Ministry of Works.

Handling of wastes during occupation phase shall be fundamentally considered and especially through inclusion of a Refuse holding area at a strategic point at the site. This shall ease storage, collection, transportation and disposal of all solid waste of the entire project, on occupation.

3.4.6 Electricity

The site is already connected to electricity from the National grid. Upon completion of construction, the proponent will extend the connection to the new development after acquiring relevant permits. The proponent shall install solar panels to provide a supplementary source of energy for the new development.

3.4.7 Communication

The area is well covered by communication facilities such as Safaricom, Airtel, Telkom, among others. All these will facilitate communication during the project cycle.

CHAPTER FOUR: POLICY, LEGAL AND INSTITUTIONAL FRAMEWORK

4.1 Introduction

EIA is an instrument for environmental management and development control. It is now accepted that development projects must be economically viable, socially acceptable and environmentally sound. It is a condition that all developers conduct EIAs on the development projects.

EIAs are carried out in order to identify potential positive and negative impacts associated with the proposed development with a view of taking advantage of the positive impacts and developing mitigation measures for the negative ones. The guidelines on EIAs are contained in section 58 to 67 of the Act. According to section 68 of the EMCA CAP 387, the authority shall be responsible for carrying out environmental audits on all activities that are likely to have a significant effect on the environment.

There are a number of policies, laws and regulations that govern the protection, conservation and exploitation of the natural resources coupled with provisions for environmental management. These national policies, laws and regulations cover infrastructure, water, agriculture, forestry and health just to mention a few. Some of the key national laws, policies and regulations that govern the management of environmental resources in the country are discussed herein.

4.2 Relevant National Policies

4.2.1 The National Environmental Action Plan (NEAP)

The NEAP was a deliberate policy effort to integrate environmental considerations into the country's economic and social development initiatives/plans. The integration process was to be achieved through a multi-sectoral approach to develop a comprehensive framework to ensure that environmental management and conservation of natural resources are an integral part of societal decision making. As a result of its adoption and implementation, establishment of appropriate policies and legal guidelines as well as harmonization of the existing ones have been accomplished and/or are in the process of development. Under the NEAP process, EIAs were introduced targeting the industrialists, business community and local authorities (now the county governments).

The project shall be implemented and operated based on these guidelines

4.2.2 National Policy on Water Resources Management and Development (1999)

While the National Policy on water resources management and development (1999) enhances a systematic development of water facilities in all sectors for promotion of the country's socio-economic progress, it also recognizes the by-products of this process as wastewater. It therefore calls for development of appropriate sanitation systems to protect people's health and water resources from institutional pollution. This implies that Industrial and business development activities should be accompanied by corresponding waste management systems to handle the waste water and other waste emanating there from. The same policy also requires that such projects undergo comprehensive EIAs that will provide suitable measures to be taken to ensure environmental resources and people's health in the immediate neighborhood and further downstream are not negatively impacted by the emissions.

4.2.3 Sustainable Development Goals (SDG's)

On September 25th 2015, countries adopted the United Nations Sustainable Development Goals (SDG's) aimed at contributing towards ending poverty, protecting the planet, and ensuring prosperity for all as part of a new sustainable development agenda. The SDG's have very significant implications for investment needs and the role of the public sector is fundamental and pivotal. At the same time the contribution of the private sector is indispensable.

The proponent has committed to the SDG's through the proposed development in the following ways:

Goal 3 -Good Health & Well Being

The project will contribute to improved health and productivity through the provision of a safe and clean environment for living.

Goal 6 -Clean Water and Sanitation

The connection of the liquid waste to the sewer system and provision of adequate sanitary facilities shall improve water quality and sanitation by ensuring zero proportion of untreated wastewater is not discharged to the environment.

Goal 7 -Affordable and Clean Energy

The implementation of an energy management system through good orientation, solar shading, natural ventilation, natural lighting, energy efficient fitting and appliances shall contribute to increased energy efficiency.

Goal 8 -Decent Work and Economic Growth

Creation of employment opportunities during the project cycle shall contribute to reducing the proportion of youth not in employment. The proponent shall ensure an environment that emphasizes on protection of labor rights and promotes safe and secure working environments for all workers during the project cycle.

4.3 Legal framework

4.3.1 The Constitution of Kenya 2010

The Constitution of Kenya is the supreme law of the Republic of Kenya and binds all persons and all State organs at all levels of government. It provides the broad framework regulating all existence and development aspects of interest to the people of Kenya, and along which all national and sectorial legislative documents are drawn. In relation to environment, Article 42 of Chapter 4, the Bill of Rights, confers to every person the right to a clean and healthy environment, which includes the right to have the environment protected for the benefit of present and future generations through legislative measures, particularly those contemplated in Article 69, and to have obligations relating to the environment fulfilled under Article 70.

Chapter 5 of the new constitution provides the main pillars on which the 77 environmental statutes are hinged and covers "Land and Environment" and includes the aforementioned articles 69 and 70. Part 1 of the Chapter dwells on land, outlining the principles informing land policy, land classification as well as land use and property. Part 2 of the Chapter directs focus on the environment and natural resources. It provides for a clear outline of the state's obligation with respect to the environment. The Chapter seeks to eliminate processes & activities likely to endanger the environment.

There are further provisions on enforcement of environmental rights as well as establishment of legislation relating to the environment in accordance with the guidelines provided in this Chapter. In conformity with the Constitution of Kenya 2010, every activity or project undertaken within the Republic of Kenya must be in tandem with the state's vision for the national environment as well as adherence to the right of every individual to a clean and healthy environment. The proposed development project is a development activity that will utilize sensitive components of the physical and natural resources hence need for a clearly spelt out environmental management plan to curb probable adverse effects to the environment.

The proponent will therefore adhere to the provisions of the Environmental Management and Monitoring Plan provided in this report to ensure the public and employee's right to a clean and safe environment is not infringed.

4.3.2 Environment Management and Coordination Act, EMCA, Cap 387.

In EMCA, Cap 387, section 3 (1) and (2) state that "Every person in Kenya is entitled to a clean and healthy environment and has the duty to safeguard and enhance the environment and that the entitlement to a clean and healthy environment under subsection (1) includes the access by any person in Kenya to the various public elements or segments of the environment for recreational, educational, health, spiritual and cultural purposes.

Part VI Section 58 (2) of the Act states the proponent of any project specified in the Second Schedule shall undertake a full environmental impact assessment study and submit an EIA Study report to the Authority prior to being issued with any license by the Authority: provided that the Authority may direct that the proponent forego the submission of the EIA Study report in certain cases.

Section 58 (5) states that EIA studies and reports required under the Act shall be conducted or prepared respectively by individual experts or a firm of experts authorized in that behalf by the Authority. The Authority shall maintain a register of all individual experts or firms of all experts duly authorized by it to conduct or prepare environmental impact assessment studies and reports respectively. The register shall be a public document and may be inspected at reasonable hours by any person on the payment of a prescribed fee. Subsection (7) further states that EIA shall be conducted in accordance with the EIA regulations, guidelines and procedures issued under this Act.

Section 59 (1) states that upon receipt of an EIA study report from any proponent under section 58(2), the Authority shall cause to be published in the Gazette, in at least two newspapers circulating in the area or proposed area of the project and over radio stating:

(a) a summary description of the project;
(b) the place where the project is to be carried out;
(c) the place where the environmental impact assessment study, evaluation or review report may be inspected; and

(d) a time limit of not exceeding ninety days for the submission of oral or written comments by any member of the public on the environmental impact assessment study, evaluation or review report.

Subsection (2) and (3) of 59 states that the Authority may, on application by any person extend the period stipulated in sub-paragraph (d) so as to afford reasonable opportunity for such person to submit oral or written comments on the EIA report and the Authority shall ensure that its website contains a summary of the report referred to in subsection (1).

The proponent has engaged the services of the environmental experts who have conducted the EIA study in line with the regulations, guidelines and procedures issued under the Act.

4.3.3 The Environmental (Impact Assessment and Audit) Regulations, 2003

These regulations stipulate how an EIA study report should be prepared and specifies all the requirements that must be complied with. It highlights the stages to be followed, information to be made available, role of every stakeholder and rules to be observed during the EIA Study Report making process.

Section 4 (1) states that no proponent shall implement a project likely to have a negative environmental impact or for which an EIA is required under the Act or these Regulations unless an EIA has been concluded and approved in accordance with these Regulations.

Section 11 (1) states that an EIA study shall be conducted in accordance with terms of reference developed during the scoping exercise by the proponent and approved by the Authority. Section 13 (1) and (2) further states that proponent shall, on the approval of the terms of reference under regulation 11, submit to the Authority the names and qualifications of the impact assessment experts appointed to undertake the EIA study and authorized so to do in accordance with section 58 (5) of the Act and that every EIA study shall be carried out by a lead expert qualified in accordance with the criteria of listing of experts specified in the Fourth Schedule to these Regulations.

Section 17 (l) stipulates that during the process of conducting an EIA study under these Regulations, the proponent shall in consultation with the Authority, seek the views of persons who may be affected by the project.

Part IV of the regulations states how an EIA Study Report is conducted, contents and information required, submission, timelines and review process.

The proponent and consultant have undertaken this EIA Study report in line with all the provisions set out in these regulations. A public meeting, administration of questionnaires and interview were conducted to seek views of persons who may be affected by the project in line with these regulations.

4.3.4 Environmental Management and Co-ordination (Water Quality) Regulations, 2006

The Regulations apply to drinking water, water used for industrial purposes, water used for agricultural purposes, water used for recreational purposes, water used for fisheries and wildlife, and water used for any other purposes.

Part II Section 4 (1) states that "Every person shall refrain from any act which directly or indirectly causes, or may cause immediate or subsequent water pollution, and it shall be immaterial whether or not the water resource was polluted before the enactment of the Act. Subsection (2) further states that "No person shall throw or cause to flow into or near a water resource any liquid, solid or gaseous substance or deposit"

Part IV Section 24 states that "No person shall discharge or apply any poison, toxic, noxious or obstructing matter, radioactive wastes, or other pollutants or permit any person to dump any such matter into water meant for fisheries, wildlife, recreational purposes or any other uses".

According to these regulations, "Every person shall refrain from any action which directly or indirectly causes, or may cause immediate or subsequent water pollution, and it shall be immaterial whether or not the water resource was polluted before the enactment of the Act".

All waste water shall be channeled to the sewer line to avoid polluting the ground and surface water and if a pollution incidence occurs the contractor/proponent shall notify the authority immediately.

4.3.5 Environmental Management and Co-ordination (Waste Management) Regulations, 2006

The regulations are contained in the Kenya Gazette No. 69, Legal Notice No. 121. Section 4 (1) states that "No person shall dispose of any waste on a public highway, street, road, recreational area or any other public place except in a designated waste receptacle".

Section 4 (1) and (2) states that "No person shall dispose any waste on a public highway, street, road, recreational area or in any public place except in a designated waste receptacle and that any

person whose activities generate waste shall collect, segregate and dispose or cause to be disposed of such waste in the manner provided for under these Regulations"

Section 6 (1) stipulates that "Any person who owns or controls a facility or premises which generates waste shall minimize the waste generated by adopting the following cleaner production principles:

i. improvement of production process through conserving raw materials and energy, eliminating the use of toxic raw materials within such time as may be prescribed by the Authority and reducing toxic emissions and wastes,
ii. monitoring the product cycle from beginning to end by identifying and eliminating potential negative impacts of the product, enabling the recovery and re-use of the product where possible and reclamation and recycling,
iii. incorporating environmental concerns in the design, process and disposal of a product.

Section 9 states that "Any person licensed to transport waste shall collect waste from the designated area of operations or storage areas and shall deliver such waste to the designated storage site, disposal site or plant"

The proponent shall engage the services of a licensed waste handler to transport waste to the designated areas. During occupation, the proponent has set aside two waste management rooms to be used for collection and segregation of waste before disposal.

4.3.6 The Environmental Management and Coordination (Noise and Excessive Vibration Pollution) (Control) Regulations, 2009

Section 3 (1) and (2) of the regulations states that no person shall make or cause to be made any loud, unreasonable, unnecessary or unusual noise which annoys, disturbs, injures or endangers the comfort, repose, health or safety of others and the environment except as otherwise provided in the Regulations. In determining whether noise is loud, unreasonable, unnecessary or unusual, the following factors may be considered:

- Time of the day;
- Proximity to residential area;
- Whether the noise is recurrent, intermittent or constant;
- The level and intensity of the noise;

- Whether the noise has been enhanced in level or range by any type of electronic or mechanical means; and ,
- Whether the noise can be controlled without much effort or expense to the person making the noise.

These regulations also relate noise to its vibration effects and seek to ensure no harmful vibrations are caused by controlling the level of noise.

Part II Section 4 states that: except as otherwise provided in these Regulations, no person shall

a. Make or cause to be made excessive vibrations annoys, disturbs, injures or endangers the comfort, response, health or safety of others and the environment; or
b. Cause to be made excessive vibrations which exceed 0.5 centimeters per second beyond any source property boundary or 30 meters from any moving source.

Section 13 (1) states that no person shall operate construction equipment (including but not limited to any pile driver, steam shovel, pneumatic hammer, derrick or steam or electric hoist) or perform any outside construction or repair work so as to emit noise in excess of the permissible levels as set out in the Second Schedule to these Regulations except for the purposes in sub-Regulation (2) hereunder. These purposes include emergencies, those of domestic nature and/or public utility construction.

Section 14 relates to noise, excessive vibrations from construction, demolition, mining or quarrying site, and state that: where defined work of construction, demolition, mining or quarrying is to be carried out in an area, the Authority may impose on how the work is to be carried out including but not limited to requirements regarding a) machinery that may be used, and b) the permitted levels of noise as stipulated in the Second and Third Schedules to these Regulations.

The contractor shall ensure that all construction activities are carried out between 0800hrs and 1800hrs on weekdays to ensure minimal inconveniences with the neighbors. The contractor shall also ensure that all machineries are in good working condition to reduce noise that may emanate from the wear and tear of machine parts.

4.3.7 The Environmental Management and Co-Ordination (Air Quality) Regulations, 2014

The objective of these Regulations is to provide for the prevention, control and abatement of air pollution to ensure clean and healthy ambient air. Section 5 states that no person shall act in a

way that directly or indirectly causes, or is likely to cause immediate or subsequent air pollution; or emit any liquid, solid or gaseous substance or deposit any such substance in levels exceeding those set out in the first Schedule.

Further, clause 6 stipulates that no person shall cause or allow emission of the priority air pollutants prescribed in the second schedule to cause the ambient air quality limits prescribed in the first schedule to be exceeded.

Clause 25 (1) states that no person shall cause or allow the emission of visible air pollutants from a stationary or mobile vehicle in excess of the limits set out under the prescribed Standard.

Clause 33 states that no person operating construction equipment or handling construction material shall allow emission of particulate matter so as to adversely affect the limits set out in the First schedule.

Clause 35 states that no person shall cause or allow stockpiling or other storage of material in a manner likely to cause ambient air quality levels set out under the First Schedule to be exceeded.

Clause 38 stipulates that no person shall cause or allow emissions of priority air pollutants set out under the Second Schedule from disposal of medical waste, domestic waste, plastics, tyres, industrial waste or other waste by open burning.

The proponent shall comply with these regulations and implement all mitigation measures provided in the EMP to prevent air pollution during the project cycle

4.3.8 The Water Act, 2016

This Act of Parliament provides for the regulation, management and development of water resources, water and sewerage services.

Part II section 9 of this Act states that every person has a right to access water resources, whose administration is the function of the national government. Part III section 11 states the establishment of the Water Resources Authority (WRA) whose functions are stipulated in section 12 and include but not limited to receiving water permits applications for water abstraction, collection of water permit fees and water use charges.

Section 63 of the act states that every person in Kenya has the right to clean and safe water in adequate quantities and to reasonable standards of sanitation as stipulated in Article 43 of the Constitution.

Section 143 states that a person shall not, without authority conferred under this Act;

a) willfully obstruct, interfere with, divert or obstruct water from any watercourse or any water resource, or negligently allow any such obstruction, interference, diversion or abstraction; or
b) throw, convey, cause or permit to be thrown or conveyed, any rubbish, dirt, refuse, effluent, trade waste or other offensive matter or thing into or near to any water resource in such manner as to cause, or be likely to cause, pollution of the water resource.

Section 147 states that a person who commits an offence under this Act, or under any Regulations or made under this Act, shall, if no other penalty is prescribed in respect of the offence, be liable to a fine not exceeding one million shillings or to imprisonment for a term not exceeding two years, or to both such fine and imprisonment.

The proponent shall ensure that all provisions to conserve water resources both ground and underground are observed and that the EMP is implemented effectively.

4.3.9 Occupational Health and Safety Act, 2007

This is an act of Parliament to provide for the safety, health and welfare of workers and all persons lawfully present at workplaces, to provide for the establishment of the National Council for Occupational Safety and Health and for connected purposes. The key areas addressed by the Act include:

i. General duties including duties of occupiers, self-employed persons and employees. Enforcement of the act including powers of an occupational safety and health officer.
ii. Registration of workplaces.
iii. Health General Provisions including cleanliness, ventilation, lighting and sanitary conveniences.
iv. Machinery safety including safe handling of transmission machinery, hand held and portable power tools, self-acting machines, hoists and lifts, chains, ropes & lifting tackle, cranes and other lifting machines, steam boilers, air receivers, refrigeration plants and compressed air receiver.
v. Safety General Provisions including safe storage of dangerous liquids, fire safety, evacuation procedures, precautions with respect to explosives or inflammable dust or gas.

vi. Chemical safety including the use of material safety data sheets, control of air pollution, noise and vibration, the handling, transportation and disposal of chemicals and other hazardous substances materials

vii. Welfare general provisions including supply of drinking water, washing facilities, and first aid.

The proponent shall ensure that safety measures are implemented in use of tools and machinery within site and that protection of the workers and general public with any form of interaction with the construction sites is observed as stipulated in the act.

4.3.10 The Physical Planning Act of 1996 CAP 286

Part V - Control of development

30. (1) No person shall carry out development within the area of a local authority without a development permission granted by the local authority under section 33.

(2) Any person who contravenes subsection (1) shall be guilty of an offence and shall be liable to a fine not exceeding one hundred thousand shillings or to an imprisonment not exceeding five years or to both.

(3) Any dealing in connection with any development in respect of which an offence is committed under this section shall be null and void and such development shall be discontinued.

(4) Notwithstanding the provisions of subsection (2);

(a) The local authority concerned shall require the developer to restore the land on which such development has taken place to its original condition within a period of not more than ninety days;

(b) If on the expiry of the ninety days' notice given to the developer such restoration has not been affected, the concerned local authority shall restore the site to its original condition and recover the cost incurred thereto from the developer.

31. Any person requiring development permission shall make an application in the form prescribed in the Fourth Schedule, to the clerk of the local authority responsible for the area in which the land concerned is situated. The application shall be accompanied by such plans and particulars as are necessary to indicate the purposes of the development, and in particular shall show the proposed use and density, and the land which the applicant intends to surrender for;

a. Purposes of principal and secondary means of access to any subdivisions within the area included in the application and to adjoining land;
b. Public purposes consequent upon the proposed development.

36. If in connection with a development application a local authority is of the opinion that proposals for industrial location, dumping sites, sewerage treatment, quarries or any other development activity will have injurious impact on the environment, the applicant shall be required to submit together with the application an environmental impact assessment report.

This Act provides for order in terms of development execution.

The proponent has received approval of the architectural designs from the county government and engaged the environmental experts to conduct the EIA study.

4.3.11 Public Health Act Cap 242

Part IX section 115 of the Act states that No person shall cause a nuisance or shall suffer to exist on any land or premises owned or occupied by him or of which he is in charge any nuisance or other condition liable to be injurious or dangerous to health.

Section 116 requires that the local authorities (county governments) take all lawful, necessary and reasonably practicable measures for maintaining its district (counties) at all times in clean and sanitary condition, and for preventing the occurrence therein of, or for remedying or causing to be remedied, any nuisance or condition liable to be injurious or dangerous to health, and to take proceedings at law against any person causing or responsible for the continuance of any such nuisance or condition.

Part XII Section 136 states that all collections of water, sewage, rubbish, refuse and fluids which permits or facilitate the breeding or multiplication of pests shall be termed nuisances and are liable to be dealt with in the manner provided by this Act. Section 138 states that no person shall within a township permit any premises or lands owned or occupied by him or over which he has control to become overgrown with bush or long grass of such a nature as, in the opinion of the medical officer of health, to be likely to harbor mosquitoes.

The proponent shall contract a licensed waste handler to collect all waste from the site to disposal at approved dumping site. Sewage from the site shall be discharged into the conventional sewer system. The proposed development shall be kept clean at all times and the proponent shall ensure all provisions of this act are implemented.

4.3.12 County Government Act, 2012

The main purpose of the enactment of this Act was to give effect to Chapter Eleven of the Constitution; to provide for county governments' powers, functions and responsibilities to deliver services and for connected purposes. Functions which were carried out by local governments were effectively transferred to the county governments. The Act gives county the responsibility of planning and co-coordinating all developments within their areas of jurisdiction. Part XI (sections 102-115) of the Act provides for planning principles and responsibilities of the county governments. The land use and building plans provided for in the Act are binding on all public entities and private citizens operating within the particular county. The proposed project is within the Nairobi City Government and thus there will be need of working in liaison with the County Government. The plans for the proposed project must be approved by the County Government and the County government may also issue directives and authorizations on various aspects e.g. waste management and fire emergency preparedness among others.

The proponent shall work in liaison with County Government and in particular the Water, Energy, Forestry, Environment and Natural Resources Sector.

4.3.13 Energy Act, 2006

The Energy Act, 2006 was enacted on 2nd January 2007 establishes an Energy Regulatory Commission (ERC) mandated to perform all function that pertains to energy production, transmission, setting and enforcing of energy policies, Public education and enforcing energy conservation strategies, prescribing the energy licensing process and issuing of licenses that pertain to energy sector in Kenya. Section 30 of the Act provides the factors that shall be taken into consideration prior to issuance of license. It states the need and expression of an entity to conserve and protect the environment and natural resources in accordance to the EMCA 1999. Moreover, the Act gives provisions for the need to protect health and safety of users of energy by providing an enabling environment of operation that protects the health and safety of users of the service for which the license or permit is required and other members of the public affected by the undertaking.

4.3.14 National Construction Authority Act, 2011

The act is set to streamline, overhaul and regulate the construction industry in Kenya for sustainable development. The NCA establishes the authority and confers on its power to register

contactors within the construction industry. The act requires all the contractors, both foreign and local contractors to be registered with the authority. The act also regulates the practices of foreign contractor by limiting their work to only tender work. The foreign contractors are licensed for only a specific period and once they certify they are in Kenya for that specific time. The foreign contractors must also produce a certificate of compliance. Furthermore they must lodge an affidavit with the NCA that once the project they have been licensed is over, they shall wind up their business. This prevents them from engaging in any other construction activities in the country.

4.3.15 Building Code, 2000

This gives general guidelines for the construction of buildings and attendant safety measures such as installation of firefighting appliances, fire escapes etc. It equally recognizes local authorities (now referred to as County Governments) as lead planning agencies and thus requires every developer to submit building plans to the relevant local authority for approval. The local authorities are in turn empowered to disapprove any plan submitted if it is not correctly drawn or does not provide sufficient information that complies with the relevant by-laws. Any developer who intends to erect a building, such as an apartment block, must also give the concerned local authority a notice of inspection before the erection of the proposed 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. Section 214 indicates that, in any public building whose 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.

4.3.16 The Penal Code CAP 63

Chapter XVII on "Nuisances and offences against health and convenience" contained in the penal code strictly prohibits the release of foul air into the environment which affects the health of the persons. It states "Any person who voluntarily vitiates the atmosphere in any place so as to

make it noxious to the health of persons in general dwelling or carrying on business in the neighborhood or passing along a public way is guilty of a misdemeanor"

Waste disposal and other project related activities shall be carried out in such a manner as to conform to the provisions of this code.

4.3.17 Land Registration Act, 2012

According to section 26 subsection (1) states that the certificate of title issued by the Registrar upon registration, or to a purchaser of land upon a transfer or transmission by the proprietor shall be taken by all courts as prima facie evidence that the person named as proprietor of the land is the absolute and indefeasible owner, subject to the encumbrances, easements, restrictions and conditions contained or endorsed in the certificate, and the title of that proprietor shall not be subject to challenge, except on the ground of fraud or misrepresentation to which the person is proved to be a party; or where the certificate of title has been acquired illegally, unprocedurally or through a corrupt scheme. A certified copy of any registered instrument, signed by the Registrar and sealed with the Seal of the Registrar, shall be received in evidence in the same manner as the original.

Copy of land ownership documents is attached to this Report.

4.3.18 The National Land Commission Act, 2012 (No. 5 of 2012)

Section 5 of the Act outlines the Functions of the Commission, pursuant to Article 67(2) of the Constitution as follows 5(1): (a) to manage public land on behalf of the national and county governments; (b) to recommend a national land policy to the national government; (c) to advise the national government on a comprehensive programme for the registration of title in land throughout Kenya; (d) to conduct research related to land and the use of natural resources, and make recommendations to appropriate authorities; (e) to initiate investigations, on its own initiative or on a complaint, into present or historical land injustices, and recommend appropriate redress; (f) to encourage the application of traditional dispute resolution mechanisms in land conflicts; (g) to assess tax on land and premiums on immovable property in any area designated by law; and (h) to monitor and have oversight responsibilities over land use planning throughout the country.

4.4 INSTITUTIONAL FRAMEWORK

There are different institutions that deal with environmental issues in Kenya. Some of the key institutions include National Environmental Management Authority (NEMA), the Department of Resource Surveys and Remote Sensing (DRSRS), the Water Department, The Kenya Forest Service (KFS), The Kenya Forestry Research Institute (KEFRI) among others. While implementing the project, both the proponent and the contractor will have to work in liaison with a number of these institutions when dealing with issues within the jurisdiction of the institutions.

4.4.1 National Environmental Management Authority (NEMA)

The objective and purpose for which NEMA is established is to exercise general supervision and co-ordinate over all matters relating to the environment and to be the principal instrument of the government in the implementation of all policies relating to the environment. A Director General appointed by the president heads NEMA. The Authority is mandated to co-ordinate the various environmental management activities being undertaken by the lead agencies and promote the integration of environmental considerations into development policies, plan, programmes and projects with a view to ensuring the proper management and rational utilization of the environmental resources on a sustainable yield basis for the improvement of the quality of human life in Kenya and identify projects and programmes or types of projects and programmes, plans and policies for which environmental audit or environmental monitoring must be conducted under EMCA.

The EIA Study report is submitted to the authority for review and licensing. The proponent shall work in liaison with the authority in complying with the provisions of EMCA and any other subsidiary legislation under the Act.

4.4.2 National Environmental Tribunal (NET)

This tribunal guides the handling of cases related to environmental offences in the Republic of Kenya. If disputes to the proposed project arise, they are supposed to be presented here for hearing and legal direction.

CHAPTER FIVE: IMPACT ASSESSMENT AND MITIGATION MEASURES

5.1 Anticipated Impacts

The anticipated impacts of the proposed project on the environmental elements which may be negative or positive are categorized into four major parameters. The **magnitude** is described as being major or minor, the **duration** may be short-term or long term, the **extent** is evaluated in terms of being specific (localized) or widespread, and the **reversibility** in terms of being reversible or irreversible. On the basis of information gathered during both the desktop and field study, the potential environmental impacts of the proposed project are as tabulated below:

Table 3: Impacts analysis throughout the project

Impact	**Impacts Analysis**		
	Construction	**Operation**	**Decommissioning**
Provision of retail and office		Major positive Long term Localized Irreversible	
Employment	Major positive Short term Widespread Reversible	Major positive Long term, Widespread Irreversible	Major positive Short term Localized Reversible
Revenue	Major positive Short term Widespread Reversible	Major positive Long term Widespread Reversible	Major positive Short term Widespread Reversible
Market for goods and services	Major positive Short term Widespread Reversible	Major positive Long term Widespread Reversible	
Solid Waste	Major negative Short term, Localised Irreversible,	Major negative Long term Localised Irreversible,	Major negative Short term Localised Irreversible
Liquid waste	Major negative Short term Localised Irreversible	Major negative Long term Widespread Irreversible	Major negative Short term Localised Irreversible
Traffic Density	Major negative Short term Widespread	Major negative Long-term Widespread	Major negative Short-term Widespread

	Irreversible	Irreversible	Reversible
Water demand	Major negative Short term Widespread Irreversible	Major negative Long-term Widespread Irreversible	Major negative Short term Widespread Irreversible
Energy demand	Major negative Short term Widespread Irreversible	Major negative Long term Widespread Irreversible	Major negative Short term Widespread Irreversible
Noise Pollution	Major negative Short, Term Reversible Localized	Minor negative Short term Localised Reversible	Major negative Short term Reversible Localize
Air Pollution	Major negative Short term Reversible Localized	Minor negative Short term Localised Reversible	Major negative Short term Reversible Localised
Storm water drainage	Major negative Short term Widespread Irreversible	Minor negative Short term Widespread Irreversible	Major negative Short term Widespread Irreversible
Soil erosion	Major negative Short term Widespread Irreversible	Minor negative Short term Localised Reversible	Major negative Short term Widespread Irreversible
Insecurity	Minor negative Short term Localized Reversible,	Minor negative Long term Localised Reversible	Minor negative Short term Localised Reversible
Occupation health and safety	Minor negative Short term, Localized Reversible	Minor negative Long term Localised Reversible	Minor negative Short term Localised Reversible
Oil pollution	Minor negative Short term Localized Irreversible	Minor negative Long term Localized Irreversible	Minor negative Short term Localized Irreversible

5.2 Positive impacts

5.2.1 Provision of habitable studio apartments

The proposed project will provide high quality studio apartments with a modern feel and hence address the problem of housing shortage in Nairobi an the country at large.

5.2.2 Provision of employment opportunities

The proposed project will create many jobs for both skilled and semi-skilled workers. During the construction phase, the project will employ a large workforce including; masons, plumbers, electricians among others, cooks among others.

For the operation phase, the project will employ a small work force including; cleaners, security guards, caretakers among others.

5.2.3 Provision of market for building materials and services

During the construction phase, the project will consume a lot of building materials sourced both locally and in other parts of the region. This will have a positive impact towards the economic status of the supplies and to the national economy through V.A.T rates for goods.

5.2.4 Increase in revenue to the government

Through payment of relevant taxes, rates, permits and fees to the government and the County Government, the project will contribute towards the national and local revenue earnings.

5.2.5 Economic investment

The proponent will receive returns on his investments through rentals or sale of the residential units.

5.2.6 Gains in the local economy

The economy of the neighborhood will receive a boost especially during the construction phase due to the activities of the workers; buying food, drink and commodities.

5.2.7 Improved Security

Security will be ensured around the proposed development through distribution of suitable security lights and presence of 24 hour security guards. This will lead to improvement in the general security in the surrounding area.

5.2.8 Land Use Intensification

The development will result to a more economical use of the land without significant environmental degradation.

5.3 Negative Impacts

5.3.1 Soil Erosion

The activities involved in the site preparation and construction phase of the development may have a moderate impact on soil and geology of the project site. This is due to the removal of vegetation from the area which will leave considerable areas of soil exposed to weather elements, which may result in soil erosion. Heavy machinery will be traversing the site due to the construction activities this may lead to soil compaction and erosion of the soil. Uncontrolled soil erosion can have adverse effects on the local water bodies.

Potential Mitigation measures

i. Control over excavation works especially during rainy / wet conditions
ii. The stockpiling of construction materials shall be properly controlled and managed.
iii. Materials to be delivered on site in installments.
iv. Provide soil erosion control measures i.e. suppressing open surfaces with water or use of soil erosion control structures on soil-erosion prone areas within the site.
v. Avoid unnecessary excavations and other soil disturbances that can predispose it to the agents of erosion.
vi. Avoid unnecessary movement of soil materials from the site.
vii. Re-surface open areas on completion of the project and introduce appropriate vegetation.
viii. Re-cover exposed soils with grass and other ground cover as soon as possible.
ix. Leveling of the project site to reduce run-off velocity and increase infiltration of storm water into the soil
x. Building of physical barriers to prevent mass movement where necessary

5.3.2 Air Pollution

During the construction phase air quality is expected to decline as a result of an increase in levels of fugitive dust from excavation works, the stockpiled earth materials, dusty roads and concrete mixing. Tiny particulates are a public health hazard and may otherwise create considerable nuisances to the public. There may be air pollution due to combustion of fossil fuels expected from construction machinery. This is expected to be a short-term, reversible impact lasting only for the duration of the construction activity.

Potential Mitigation measures

i. Provide personal protective equipment (PPE) such as nose masks, goggles etc. to the workers
ii. Stockpiles of fine materials (e.g. sand and ballast) should be wetted or covered with tarpaulin during windy conditions.
iii. Regular and prompt maintenance of construction machinery and equipment. This minimizes generation of hazardous gases.
iv. Access roads and exposed ground must be water sprayed at a frequency that effectively keeps down the dust.
v. Providing appropriate enclosure for the concrete mixer and use of dust nets at high levels of the building
vi. Use of dust nets/screens around the proposed development.
vii. Regular watering of all the exposed areas to prevent fugitive dust violations.
viii. Minimize exposed areas through the schedule of construction activities to enable dust control
ix. Use environmentally friendly fuels such as low Sulphur diesel
x. Ensure no burning of waste on sites/non-designated areas
xi. Minimize the period for machinery idling
xii. Restricting heights from which materials are to be dropped, as far as practicable to minimize the fugitive dust arising from unloading/loading.
xiii. Where a vehicle leaving a construction site is carrying a load of dusty materials, the load shall be covered entirely by clean impervious sheeting to ensure that the dusty materials will not leak from the vehicle.
xiv. Monitor the air pollution levels regularly as per the Air Quality regulations

5.3.3 Noise and Excessive Vibrations

Construction activities of this nature are agents of noise pollution. The noise is inevitably expected to emanate from the demolition, vehicular activities, excavations and heavy equipment during construction and building works and this may create a nuisance for nearby occupants, particularly the immediate neighbors. Albeit annoying, this negative impact will be short-term (limited to the construction phase). Noise beyond some level is itself a nuisance and need to be

avoided. Such noise emissions should be minimized as much as possible from the source point through appropriate measures.

A number of measures may be undertaken by the developer to reduce the impact of noise and excessive vibrations to the neighbors as well as the workers involved in the project. This is temporary, however, and the aim at this point is to make the increase in noise as minimal as possible until this construction is completed.

Potential Mitigation measures

i. Use of noise suppressors or silencers on noisy equipment or noise shields i.e. corrugated iron sheet structures.
ii. Construction works shall be carried out only during the specified time i.e. from say 0800hrs to 1800 hrs.
iii. Machineries shall be maintained regularly to reduce noise resulting from friction.
iv. Workers should be provided with suitable PPE such as earmuffs when operating noisy machinery and when in noisy environment.
v. Drivers delivering materials shall be advised to avoid unnecessary horning of the trucks/vehicles
vi. Provision of a bill board at the construction site/gate notifying of the construction activity and timings.
vii. The contractor shall endeavor to use equipment installed with noise abatement devices as much as practicable
viii. Safe excavation shall be done using technologies that cause fewer vibrations so as to minimize the effect these excessive vibrations may have on buildings and trees nearby and in case of any inevitable damage to property, the proponent will ensure the affected parties are compensated.
ix. Regular monitoring of noise and vibration levels at the site as per the NEMA regulations.

5.3.4 Oil leaks and spills

It is important to note that oil/grease spills are prevalent in construction sites and in most areas that make use of petroleum products. Such products contain detrimental elements to the environment such as heavy metals (mercury, lead, and Sulphur among others). Though this may not be common at the site, it is wise to control and observe the little that could occur especially

during maintenance of the involved machinery. During operational phase, oil spills might occur at the parking lots.

Potential Mitigation measures

i. All machinery shall be keenly inspected not to leak oils on the ground. This can be ensured through regular maintenance.
ii. Maintenance will be carried out in a well-designed and protected area and where oils/grease is completely restrained from reaching the ground. Such areas should be covered to avoid storm from carrying away spilled oils into the soil/water systems.
iii. All oils/grease and materials will be stored in a site's store, in the contractor's yard.
iv. Proper disposal of oil handling materials such as drums, oily clothes/papers/materials and cans.
v. All drainage facilities shall be fitted with adequate functional oil water separators and silt traps.

5.3.5 Solid Waste

A significant amount of solid waste will be generated in the construction phase through the clearing of vegetation and construction activities which will generate related solid wastes including cement bags, stones, wood, broken glasses, containers, rods of metal, sharp objects (nails) etc. The proponent should take the initiative of segregation of wastes at source to enable recycling and removal of the unrecyclable solid wastes.

The project is expected to generate a significant amount of solid waste during its operation phase. The bulk of the solid waste generated during this phase will consist of paper, plastic, glass, metal, and organic wastes. Such wastes can be injurious to the environment through blockage of drainage systems, choking of water bodies and negative impacts on human health. Some of these waste materials especially the plastic/polythene are not biodegradable thus may cause long term injurious effects to the environment. Even the biodegradable ones such as organic wastes may be injurious to the environment because as they decompose, they produce methane gas, a greenhouse gas known to contribute to global warming.

Potential Mitigation measures

i. Efficient use of building material to reduce waste and recycling where possible
ii. Engage the services of registered waste handlers to transport waste to designated disposal sites
iii. Use of an integrated solid waste management system; through a hierarchy of options: source reduction, recycling, composting and reuse, will facilitate waste handling during occupation phase.
iv. Segregation of waste at the source by providing clearly marked dustbins
v. Provision of the waste management rooms as collection point before disposal
vi. To manage waste in line with the Environmental management and coordination (Waste Management) Regulations, 2006.

5.3.6 Liquid Waste

During construction stage it is expected that wastewater shall arise from the proposed activities which shall be sprinkled on the working areas to reduce dust generation by the construction machinery while contaminated waste water shall be channeled into the sewer line to prevent water and soil pollution.

Lack of or inadequate provision of toilets for use by workers can lead to ad hoc defecation in secluded areas or structures on the site, thus creating unsanitary conditions and sources of fly infestation. This can threaten the health of neighbors and workers themselves. Indiscriminate sewage disposal can also result to contamination of underground water resources.

Wastewater during operational stage if not properly managed can cause contamination of water resources, land and also air pollution. Thus all waste water shall be properly managed through connection to a sewer line.

Potential Mitigation measures

i. Channel all liquid waste to the sewer line
ii. The design of the internal sewerage system shall consider the estimate discharges from individual sources and the cumulative discharge of the entire project i.e. it will have the capacity to consistently handle the loads even during peak volumes.

iii. All drain pipes passing under building, driveway or parking should be of heavy duty PVC pipe tube encased in concrete surround. All manholes on drive ways and parking areas shall have heavy-duty covers set and double sealed airtight; as approved by specialists.
iv. Sanitary facilities will be kept clean always, through regular washing/cleaning.
v. Frequent monitoring of the internal drainage system.
vi. Blockages and damages shall be fixed expeditiously.
vii. Provision of adequate and appropriate sanitary facilities for the workers during construction phase
viii. Ensure regular maintenance of foul water drainage works at the premises to prevent clogging and fore-stall breakdowns
ix. Proper decommissioning of the sanitary facilities shall be carried out once construction is complete

5.3.7 Surface drainage

Excavation works will lead to increased soil erosion at the project site and release of sediments into the drainage systems. The building roofs and pavements may lead to increased volume and velocity of storm water or run-off flowing across the area covered by the buildings. This can lead to increased amounts of storm water entering the drainage systems, resulting in overflow and damage to such systems.

Potential Mitigation measures

i. Semi permeable materials will be used for construction of pavements.
ii. After completion of construction, the proponent shall embark on comprehensive landscaping to increase green spaces on the plot.
iii. Drainage channels shall be covered; say with gratings, to avoid occurrence of accidents and entry of dirt.
iv. Construct gently sloping drains to convey water at non-erosive speed.

5.3.8 Increased Water demand

A considerable amount of fresh water will be required during the construction works, especially for cement mixing and for wetting of the site to control dust and for use by the workers (washing, drinking etc.). This may place some amount of strain on water supply and may exacerbate current shortage of water supply in Nairobi.

Potential Mitigation measures

i. The proponent will sink a borehole that will provide an alternative source of water for the development.
ii. The contractor will use water bowsers and tankers to bring in water for construction activities i.e. during periods of high water demand (i.e. during slab formation). Water fetching shall however be subject to authorization by the local water authority.
iii. Install water conserving taps that turn-off automatically when water is not in use.
iv. Encourage water reuse/recycling during construction and occupation phases.
v. Provide notices and information signs to sensitize on means and needs to conserve water resource i.e. 'Keep/Leave the Tap Closed', etc. This will awaken the civic consciousness of the workers and occupants with regard to water usage and management
vi. Use water efficient appliances and fixtures for plumbing products and white goods

5.3.9 Public Health

During construction, there will be increased dust, air and noise pollution. These are considered harmful to human health. The occupants and workforce involved will be subjected to these environmental hazards putting them at high risk.

Waste material such as pieces of glass and nails left lying on the ground may cause injuries/ accidents to the workers. Food for the construction workforce is usually provided by mobile individuals most of which operates without licenses. This can compromise health of the workers especially if such foodstuffs are prepared in unhygienic conditions.

Potential Mitigation measures

i. Depending on the occupational safety and health hazards anticipated while performing assigned job tasks, workers will require using properly fitting PPE to avoid injuries and illness. These include working boots, overalls, helmets, goggles, earmuffs, masks, gloves etc
ii. A First Aid Kit shall be provided within the site and during construction phase. This should be fully equipped at all times and should be managed by qualified persons.
iii. Adapt a suitable emergence response plans to manage occurrence of anticipated hazards during construction phase.

iv. Safety awareness may be gained through regular safety meetings, safety training or personal interest in safety and health.

v. The contractor shall have workmen's compensation cover. It will comply with Work Injury and Benefits Act, as well as other ordinances, Regulations and union Agreements.

vi. Sanitary facilities should be provided; and maintain Standard cleanliness of the facilities.

vii. Local individuals preparing food for the workers at the site should be controlled, monitored and evaluated to ensure that food is hygienically prepared.

viii. Workers should always be sensitized on social issues such as drugs, alcohol, diseases such as HIV/AIDS and STIs etc.

ix. Ensure provision of safe drinking water for the workers on site.

5.3.10 Insecurity

Insecurity may arise during the construction phase since intruders may try to steal the building materials deposited on the site. This especially happens in cases where there is no fence.

Potential Mitigation measures

i. The project site will be enclosed using a perimeter wall to beef-up security.

ii. There will be a guard house at the gate. Security guards will be expected to monitor the gate of the facility to keep away the intruders and to control movement within the site.

iii. Contractor shall provide adequate security during the construction period when there are no works on the site.

iv. The guards stationed at the gates will document movements in and out of the site/ property.

v. Installation of CCTV cameras at strategic points for monitoring and enhancing the security of the property during operation phase.

5.3.11 Fire

The operations that lead to fire outbreaks include poor handling of electricity systems, faulty electrical equipment, carelessness etc. These should be avoided both during construction and operation phases of the project through proper training and sensitizations.

Potential Mitigation measures

i. Hire competent and properly authorized electrical contractor to do the wiring and other electrical works.
ii. Provide adequate number of appropriate firefighting equipment such as fire extinguishers
iii. Organize for inspection and maintenance of fire equipment at least once in a period of six months
iv. Conduct regular firefighting drills within the site.
v. Post 'No smoking signs' where flammable materials will be stored
vi. Develop and post at the site, fire emergency and evacuation procedures
vii. Train staff on the use of the available firefighting equipment
viii. At least one person trained on handling firefighting techniques should be available through-out the construction phase of the site.
ix. Maintain on site telephone contacts for fire brigade, G4S fire brigade and St. Johns ambulance service provider

5.3.12 Increased energy demand

There will be increased use of energy during the construction stage (fuel for running machinery and other equipment) and during operation phase (electricity used by the occupants of the project). Energy conservation is thus fundamental.

Energy conservation involves optimum use of petroleum products (diesel and gasoline), electrical appliances (equipment), lighting systems and other electric machinery as used for different purposes. It also includes use of renewable energy sources such as solar power.

Potential Mitigation measures

i. Turn off machinery and equipment when not in use.
ii. Put off all lights immediately when not in use or are not needed.
iii. Use energy conserving lighting system.
iv. Make use of alternative source of energy such as solar power. Solar panels proposed in the project shall be fully utilized and timely repaired in case of damage.

5.3.13 Traffic Density

There will be increase in traffic along the access road (Riverside Drive) especially during construction phase since trucks will be accessing the site to deliver construction materials and

taking away construction wastes. This phase of the development may have a negative impact on the present road network in the study area. During the operation phase of the project, a major negative impact on the road network in the area will also be experienced as the volume of traffic associated with the project activities will be significantly increased.

Potential Mitigation measures

i. Employ traffic marshals to control traffic along the adjacent roads and in and out of the site.

ii. Notify the motorists about the proposed development once implementation is started. It is important that warning/ informative signs be erected at the site. The signs shall be positioned in a way to be easily viewed by the public and mostly motorists.

iii. The traffic along the connecting roads shall be controlled especially during construction phase and mostly when trucks are turning into the site, say when delivering of materials.

iv. Rehabilitate the access road leading to the property. In case the major road is damaged by the heavy trucks and machinery, the proponent should embark on repair after completion of construction phase.

v. Construction an entrance with a neck from the access road within the property to avoid strain on the access road

vi. An entry and exit points within the proposed development

CHAPTER SIX: ENVIRONMENTAL HEALTH AND SAFETY

6.1 Introduction

According to the European Union construction is the sector most at risk of accidents, with more than 1300 fatalities in construction accidents every year. Worldwide, construction workers are three times more likely to be killed and twice as likely to be injured as workers in other occupations. It is therefore essential that the proponent and contractor ensure the safety and well-being of the workers, the passersby and any other person who may be directly or indirectly associated with the project.

The main hazards and risks of accidents in the construction site can be categorized and described in the following way:

i. risks of slips, trips and falls
ii. risks related to instability
iii. risks related to traffic
iv. risks related to construction machinery
v. risks related to electricity
vi. risks related to gas
vii. fire and explosion risks

After identification of these major risks and the stages when they are likely to occur, efforts should then be focused on how to alleviate these dangers before they happen

6.2 Principles of EHS

The principles of environmental health and safety involve three main actions:

i. **Risk identification and assessment -** This shall involve identifying the various hazards and risk at the site that have the potential to occur, all the people who may be at risk such as employees, cleaners, visitors, contractors, the public, etc. as well as determine whether a control program is required for a particular hazard.
ii. **Risk communication** – Risk communication refers to the exchange of real-time information, advice and opinions between workers and people facing threats to their health, economic or social well-being. The ultimate purpose of risk communication is to enable people at risk to take informed decisions to protect themselves and their loved ones. Risk communication uses many communications techniques ranging from media

and social media communications, mass communications and community engagement. It requires a sound understanding of people's perceptions, concerns and beliefs as well as their knowledge and practices.

iii. **Risk management** – This involves actions implementing risk evaluation decisions, monitoring, re-evaluation, and compliance with legal requirements that safeguard health and safety at construction sites The OHS personnel shall be required to determine if existing control measures are adequate or if more should be done.

6.3 Construction Safety, Emergency Procedures and Action Plan

The following recommendations to ensure the health and safety of the workers and general public shall be taken into consideration:

1. Create a culture of safety within construction by planning, creating and supporting ongoing OHS awareness campaigns that promote the importance of workplace occupational health and safety with industry stakeholders as well as consumers.
2. Increase safety knowledge in the construction site by promoting awareness of the top construction sector hazards (trips and falls from heights, motor vehicle incidents, struck by objects, machinery) and how to control these hazards through new and improved information channels
3. Support the role of the supervisor in creating and maintaining a culture that fosters worker participation in identifying and mitigating workplace hazards.
4. Create a strategy for continuous health and safety learning for the construction workers e.g. by conducting regular training sessions and drills on how to handle emergencies and accidents at site.
5. Identify, review and enhance health and safety content of apprenticeship training standards to keep abreast with any new methods that are effective in promoting site safety.
6. Provide suitable and well maintained Personal Protective Equipment (PPEs) to all the workers and visitors and ensure they are utilized at all times and in the right manner. These include safety boots, helmets, gas masks, gloves and googles.
7. Place visible and readable signs to control the movement of vehicles and notify motorists and pedestrians around the, and workers in the site.

8. Enclose or isolate hazardous parts of machines or sites within the construction site to minimize exposure.
9. Prepare and maintain emergency response equipment such as fire extinguishers and first aid kits in readiness for use when need be.
10. Encourage reporting of safety incidents as soon as they occur at the site, so as to enable a quick action to alleviate the extent of the damage.
11. Comply with the provision of the Occupational Safety and Health Act, (OSHA), 2007

6.4 Grievance Redress System

The proponent shall also develop a Grievance Redress System (GRS) and make it accessible to all stakeholders internal and external. The GRS will always seek to address grievances through legally acceptable methods and as fast as possible whilst not preventing any complainants from seeking other legally acceptable methods to justice. Such a GRS should be made available to staff on recruitment and to members of the public either through government agencies/offices through grievance application forms, and internally by establishing procedures for investigation and quick redress that will be recorded and tracked

The GRS shall be monitored through indicators of its efficiency and effectiveness of solving the grievance and producing lessons learnt through which corrective actions can be undertaken to improve the project's health and safety strategies. Additionally as part of monitoring and review all grievances should be reported to the relevant authorities and the corrective actions taken, to ensure the system is credible and transparent. The process should also be culturally appropriate, transparent and non-coercive

CHAPTER SEVEN: CONSULTATION AND PUBLIC PARTICIPATION

7.1 Introduction

This chapter describes the process of the public consultation followed to identify the key issues and impacts of the proposed project. Views from the local occupants, stakeholders, surrounding institutions and development partners who in one way or another would be affected or rather interested in the proposed project were sought through administering of questionnaires, interviews and public meeting as stipulated in the Environment Management and Coordination Act, 1999.

The Consultation and Public Participation (CPP) process is a policy requirement by the Government of Kenya and a mandatory procedure as stipulated by EMCA 1999 section 58, on EIA for the purpose of achieving the fundamental principles of sustainable development. Section 17 (1) of the Environmental (Impact Assessment and Audit) Regulations 2003, states that during the process of conducting an environmental impact assessment study under these Regulations, the proponent shall in consultation with the Authority, *seek the views of persons who may be affected by the project.*

7.2 Objectives of the Consultation and Public Participation (CPP)

The objective of the consultation and public participation was to:

i. Disseminate and inform the stakeholders about the project with special reference to its key components and location.
ii. Gather comments, suggestions and concerns of the interested and affected parties.
iii. Incorporate the information collected in the EIA study.

7.3 Methodology used in the CPP

The exercise was conducted on the 2nd November to 20th November 2018. In accordance to the EIA Regulations 2003 section 17(2) c, appropriate notice was circulated to the affected parties/communities on 9th November , 2018 one week prior to the public meeting *(attached is the invitation letter to the public meeting).*

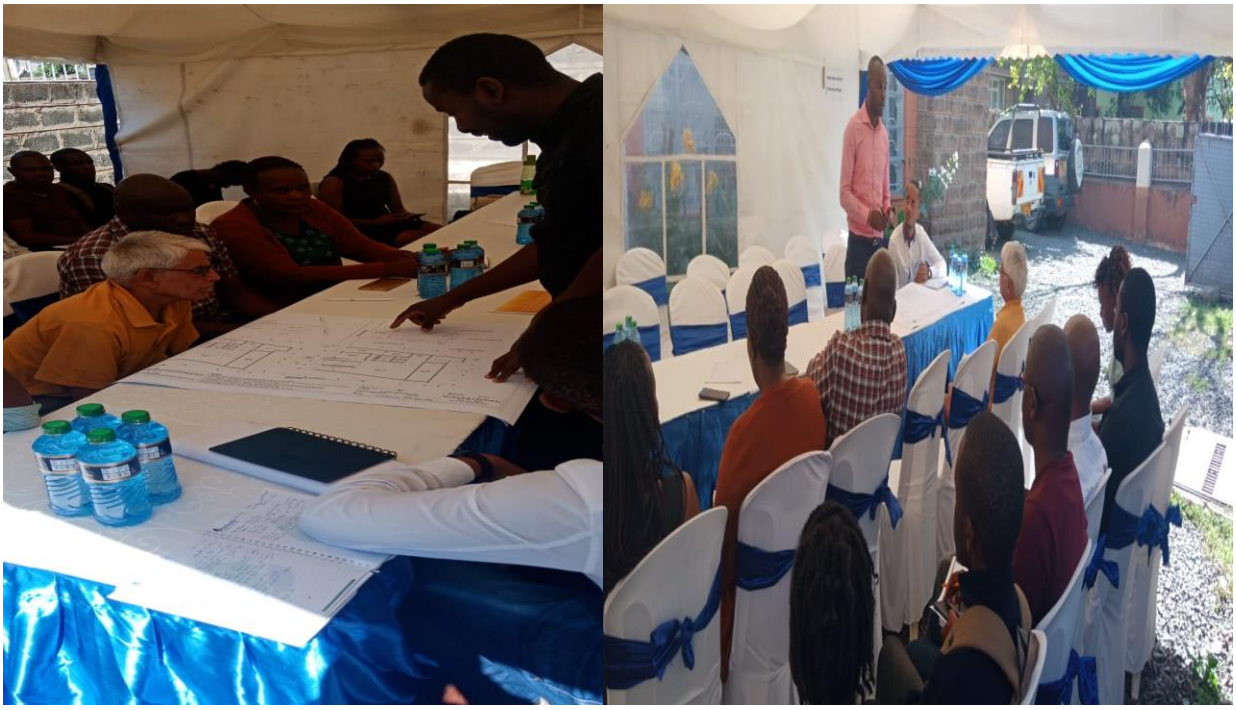
The exercise was conducted in different ways, namely;

i. interviews and discussion,
ii. field surveys and observations,
iii. administering of questionnaires,

iv. Public meeting held on 16th November, 2018*(attached is a copy of the minutes and pictures).*

The purpose for such interviews was to identify the positive and negative impacts and subsequently promote proposals on the best practices to be adopted and mitigate the negative impacts respectively. It also helped in identifying any other miscellaneous issues which may bring conflicts in case project implementation proceeds as planned.

Plate 7; Public meeting within the project site



Source; Public meeting 16/11/2018

7.4 Analysis of the Public Consultation findings

7.4.1 Positive Issues

i. The proposed development addresses the demand for housing in Nairobi
ii. Creation of job opportunities
iii. The project is geared towards achievement of government's Big four agenda

7.4.2 Negative Issues

The following are negative issues raised by the neighbors/affected parties (AP) that need to be addressed;

i. Noise and air pollution especially from dust during construction

ii. Insecurity issues due to the number of workmen that will be involved in the project

iii. Increased storm water

iv. Increased traffic along the access road

CHAPTER EIGHT: ANALYSIS OF PROJECT ALTERNATIVES

8.1 Introduction

In order to enable the proposed project to seek different ways of minimizing its impacts on the environment and at the same time achieve its objectives several alternatives were assessed through its architectural and engineering designs and environmental planning through this EIA t come up with the most suitable options in implementing this project

8.2 No project alternative

This option implies forfeiting the proposed development and thus avoiding both the positive and negative impacts that would have arisen during its implementation. This option is mostly applicable in situations where the proposed project area is in ecologically sensitive areas. The land in which the proposed project is to be constructed is in a stable environment and therefore will not be affected by this development activity. From a socio-economic perspective the "no action" alternative may not be the best alternative as the numerous benefits to be gained from the development both locally and nationally would not be realized and the resources in the area would continue to be underutilized since the land lies idle. The 'No Project Option' is the least preferred from the socio-economic and partly environmental perspective since if the project is not done:

i. The economic benefits especially throughout the project cycle i.e. provision of jobs for skilled and non-skilled workers will not be realized.
ii. There will be no generation of income by the developer and the Government.
iii. The social-economic status of Kenyans and local people would remain unchanged.
iv. The local skills would remain under utilized
v. Discouragement for investors to produce this level of standard and affordable developments.

From the analysis above, it becomes apparent that the 'No Project Alternative' is not the appropriate alternative to the local people, Kenyans, and the Government of Kenya. In addition, adopting the no action alternative will mean that the existing shortfall in office and commercial outlets needs will continue to prevail unabated.

8.3 The proposed project alternative

The proposed project will consist of one block of twelve levels with a total of one hundred forty three studio apartments and other auxiliary facilities. The project is in line with the planning of the area as the region is in Zone 10 which allows high density residential developments (apartments/flats). The government through the Big 4 Agenda on affordable Housing encourages developers to construct more apartments to alleviate the increased demand for housing especially in the urban areas. Thus, the project is a timely venture and this is the best option for the proposed site.

8.4 Alternative construction materials and technologies

The proposed project will be constructed using modern, locally and internationally accepted materials to achieve public health, safety, security, environmental and aesthetic requirements. Equipment that saves on water and energy will be given priority. The concrete pillars will be built using locally sourced stones, sand, cement, metal bars and fittings that meet the Kenya Bureau of Standards (KEBS) requirements. An alternative would be the use of clay bricks for the walls but considering their durability, stone walls would be preferred.

The alternative technologies available include the conventional brick and mortar style, prefabricated concrete panels or even temporary structures. Due to cost and durability, the brick and mortar style is most popular in Kenya.

Other various technologies include; concrete frame construction, timber construction, prefabricated space frame construction, steel frame and aluminum frame. The technology to be adopted will be most economical and one sensitive to the environment.

CHAPTER NINE: ENVIRONMENTAL MANAGEMENT AND MONITORING PLAN (EMP)

Environmental monitoring involves measurement of relevant parameters, at a level of details accurate enough, to distinguish the anticipated changes. Monitoring aims at determining the effectiveness of actions to improve environmental quality. The EMPs outlined in the table addresses the identified issues of concern (potential negative impacts) and mitigation measures as well as roles, costs and monitorable indicators that can help to determine the effectiveness of actions to upgrade the quality of environment; as regards the proposed project.

The EMPs have considered for all phases; construction, operational and decommissioning.

9.1 EMP FOR THE CONSTRUCTION PHASE

Table 4: Environmental Management and Monitoring Plan during construction phase

Environmental/ Social Impact	Proposed Mitigation Measures	Responsibility for mitigation	Monitoring frequency	Estimated Cost (Kshs)
Demolition of the existing structure	• Apply for demolition permit from relevant authorities before commencing the demolition • Engage a registered private contractor to carry out the demolition • Provide workers with PPE • The demolition exercise to be limited to day time only • Comply with EMCA (Noise and excessive vibration pollution control) Regulations 2009	- Project proponent - Contractor - NEMA inspectors	Daily inspection	150,000
Soil erosion	• Ensure management of excavation activities • Providing soil erosion control structures on the steeper areas of the site & controlling activities during the rainy season. • Compact loose soils to minimize wind erosion	- Proponent - Contractor	Routine inspection	20,000
Air pollution	• Regular sprinkling of water on dusty areas and access roads • Careful screening of construction site to contain and arrest construction related dust.	- Proponent - Contractor - Workers and	Daily inspection Routine	100,000

	• Enclosing, covering and watering of exposed stockpiles e.g. sand • Ensure construction machinery and equipment are well maintained to reduce exhaust gas emission • Drivers of construction including bulldozers, earth-movers etc. will be under strict instructions to minimize unnecessary trips and minimize idling of engines. • Using efficient machines with low emission technologies for the ones that burn fossil fuels. • Comply with EMCA (Air quality) Regulations 2008	Drivers	maintenance	
Noise and excessive vibrations	• Construction activities to be restricted to daytime i.e. 8am to 6pm • Use of suppressors or noise shields on noisy equipment for instance corrugated iron sheet structures • Sensitize operators of construction machinery on effects of noise • Trucks used at construction site shall be routed away from noise sensitive areas where feasible. • Maintain plant equipment to suppress frictional noise • Workers in the vicinity or involved in high-level noise to wear PPE • Minimize vibrations by using hi-tech equipment that produces lesser vibrations during excavation. • Comply with EMCA (Noise and excessive vibration pollution control) Regulations 2009	- Proponent - Contractor - Workers - Drivers	Random inspection Routine maintenance	150,000
Oil pollution	• Proper storage, handling and disposal of new / used oil and related wastes • Maintain construction machinery and equipment to avoid leaks • Maintenance of construction vehicles to be carried out in the contractors yard (off the site)	- Proponent - Contractor	Routine inspection maintenance	50,000
Storm water drainage	• Proper installation of drainage structures/facility • Ensure efficiency of drainage structures through proper design and maintenance	- Proponent - Contractor	Routine inspection and maintenance	100,000
Solid waste and liquid waste	• Segregate the waste at the site • Ensure proper disposal of construction waste to approved sites • Engage services of a registered NEMA waste handler to dispose the waste	- Proponent - Contractor - Workers	Weekly checks	150,000

	• Covering of the trucks during transportation, all the building materials and waste • Sensitize workers on the reuse of materials where appropriate. • Provision of adequate and appropriate sanitary facilities for the construction workers • Proper decommissioning of all the sanitary facilities • Connect to NCWSCo • Comply with EMCA (Waste management) Regulations 2006			
Increased water demand	• Employ services of waters vendors to supplement water supply • Sensitize workers to reduce water wastage e.g by reusing where applicable • Connect to NCWSCo • Install water efficient appliances	- Contractor - Workers	Daily inspection	250,000
Traffic congestion	• Employ traffic marshals to control traffic in and out of site • Ferry building materials during off-peak hours • Provide traffic control signs at the site/entrance to notify motorists and general public about the development • Enforce speed limits for construction vehicles especially along the roads leading to the site • Ensure that the vehicles comply with axle load limits • Employ well trained and experienced drivers	- Proponent - Contractor - Drivers	Daily inspection	150,000
Health and safety of workers	• Construction work shall be limited to daytime only • Workers to be adequately insured against accidents. • All workers will be sensitized before construction begins on how to control accidents related to construction. • Keep record of the public emergency service telephone numbers including: Police, Fire brigade, Ambulance at strategic points • Provide first aid kits at strategic places in the site • All workers to wear protective gear during construction e.g. helmets. • Ensure that the workers are registered with NHIF / NSSF and remits appropriate fees • A comprehensive contingency plan shall be prepared before construction begins on accident response.	- Proponent - Contractor - Workers	Weekly inspection	150,000
Insecurity	• Provide security guards to monitor movement in and out of the site during construction period for both day and night • Install security lights at the site to enhance security	- Contractor - Proponent	Daily inspection	200,000

Fire	• Installation of firefighting facilities following City County's Fire Masters requirements approval. • Conduct regular firefighting drills within the site. • Develop and adapt an (fire) emergency response plan for the project (during construction and occupation stages). • Ensure that all firefighting equipment are regularly maintained and serviced. • Provide fire hazard signs such as 'No Smoking' sign, Direction to exit in case of any fire incidence and emergency numbers.	-Workers	Routine inspection and maintenance	100,000

9.2 EMP FOR THE OPERATION PHASE

Table 5: Environmental management and monitoring plan during Operation phase

Environmental/ Social Impact	Proposed Mitigation Measures	Responsibility for mitigation	Monitoring frequency	Estimated Cost (Kshs)
Liquid waste	• Regular inspection and maintenance of the internal sewer system. • Occupants should report any incidence of blockages in their units immediately they occur	- Proponent - Occupants	Periodic checks Routine Maintenance	100,000
Solid waste generation	• Encourage segregation of waste (organic and inorganic) • Provide for clearly marked dustbins to serve the specified use. • Ensure that wastes generated are efficiently managed through recycling, reuse and proper disposal procedures. • A private NEMA licensed company to be contracted to handle solid waste and dispose it of in designated dumpsites. • Routine cleaning of the waste management rooms	- Proponent - Occupants	Periodic inspection	50,000
Air pollution	• Regular cleaning of dust prone areas such as driveways and corridors • Use of clean fuels such as solar and wind energy sources • Comply with EMCA (Air Quality regulations) 2014	- Proponent - Occupants	Routine maintenance	100,000
Noise and vibration Pollution	• Do annual noise measurements. • Sensitize occupants on minimal permissible noise levels • Comply with EMCA (Noise and excessive vibration pollution control) Regulations 2009	- Proponent - Occupants	Periodic inspection	250,000

Storm water drainage	• Proper maintenance of drainage structures • Inspection and maintenance of water harvesting facilities • Collection of excess storm water into underground tanks for reuse e.g. car washing	- Proponent	Routine inspection and maintenance	100,000
Increased water use	• Use water efficient appliances and fittings • Reuse of harvested rain-water e.g. cleaning pavements and cars • Place notices at water taps e.g. 'TURN OFF TAP AFTER USE' • Provision of roof/ underground tanks for water storage • Regular maintenance of all water components	- Proponent - Occupants	Periodic Inspection Routine maintenance	150,000
Increased energy use	• Switch off electrical appliances when not in use. • Maintenance of electrical components. • Use energy efficient electrical appliances and fixtures such as bulbs	- Proponent - Occupants	Daily Observation Routine maintenance	150,000
Fire	• Install firefighting equipment • Sensitize the occupants on fire risks i.e. conduct regular fire drills • Adapt effective emergency response plan • Maintain firefighting equipment regularly • Provide emergency numbers at strategic points	- Proponent - Occupants	Routine inspection	100,000
Insecurity	• Engage services of security guards to man the premises day and night • Installation of CCTV cameras at strategic points for monitoring and enhancing the security of the property during operation phase. • Placing alarms around the project and establishing emergency preparedness and response procedures • Place hotline numbers on strategic places • Sensitize occupants on security precautions	- Proponent - Occupants	Periodic inspecion Routine maintenance	150,000
Traffic	• Provide traffic signs to reduce risk of accidents • Provision of adequate on-site parking bays • Regular maintenance of the parking bays	- Proponent	Routine maintenance	100,000

9.3 EMP FOR THE DECOMMISSIONING PHASE

Note: A due diligence environmental audit will be undertaken and submitted to NEMA at least three months prior to decommissioning and in line with the Environmental Management and Coordination Act No. 8 of 1999.

Table 6: Environmental management and monitoring plan during Decommissioning phase

Environmental/ Social Impact	Proposed Mitigation Measures	Responsibility for mitigation	Recommended frequency of monitoring	Estimated Cost (KShs)
Demolition of existing structures	▪ Apply for demolition permit from relevant authorities before commencing the demolition ▪ Engage a registered private contractor to carry out the demolition ▪ Provide workers with PPE ▪ The demolition exercise to be limited to day time only ▪ Comply with EMCA (Noise and excessive vibration pollution control) Regulations 2009	- Project proponent - Contractor - NEMA inspectors	Daily inspection	500,000
Air pollution	▪ Dust suppression with water sprays on dusty areas ▪ Careful screening of construction site to contain and arrest construction related dust ▪ Ensure demolition machinery and equipment are well maintained to reduce exhaust gas emission	- Proponent - Contractor - NEMA inspectors	Daily inspection Routine maintenance	150,000
Noise and excessive vibrations	▪ Demolition activities to be restricted to daytime (8am to 5pm) ▪ Use of Suppressors on noisy equipment or use of noise shields for instance corrugated iron sheet structures ▪ Workers in the vicinity or involved in high level noise to wear respective safety & protective gear. ▪ Comply with EMCA (Noise and excessive vibration pollution control) Regulations 2009	- Proponent - Contractor - Workers - NEMA inspectors	Routine inspection and maintenance	250,000
Health and safety of workers	▪ All workers to wear PPEs e.g. helmets, safety boots and ear muffs ▪ All workers will be sensitized before demolition begins, on how to control accidents related to construction. ▪ Accordingly, adherence to safety procedures will be enforced. ▪ All workers will be adequately insured against accidents.	- Contractor - Workers - Proponent - NEMA inspectors	Daily monitoring	200,000

Solid and liquid waste	▪ Ensure proper solid waste disposal and collection facilities ▪ Refuse collection vehicles will be covered to prevent scatter of wastes by wind. ▪ Demolition wastes to be collected by a licensed operator to avoid illegal final dumping at unauthorized sites. ▪ All persons involved in refuse collection shall be in full protective attire.	- Contractor - Proponent - NEMA inspectors	Daily monitoring	300,000
Re-vegetation and comprehensive landscaping	▪ Put in place an appropriate re-vegetation programme to restore the site to its original status ▪ During the re-vegetation period, 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; ▪ Fencing and signs restricting access will be posted to minimize disturbance to newly-vegetated areas;	- Contractor - Proponent	Random inspection and monitoring	350,000

CHAPTER TEN: CONCLUSION AND RECOMMENDATIONS

The proposed development shall bring with it numerous positive impacts including increase in the habitable housing units in the area, creation of employment opportunities, improved businesses in the project area especially for various suppliers and service providers and increase in revenue to both the county and national governments among others as outlined in the report.

The negative environmental impacts that will result from establishment of the project which include increase in traffic along the access roads, air and noise pollution, increased water demand, strain to existing infrastructure among others can however be mitigated.

The proponent has committed to put in place various mitigation measures to mitigate the negative environmental, safety, health and social impacts associated with the proposed development. It is recommended that in addition to this commitment, the proponent should focus on implementing the measures outlined in the EMP as well as adhering to all relevant national and international environmental, health and safety standards, policies and regulations that govern establishment and operation of such projects.

It is also recommended that the positive impacts that emanate from such activities shall be maximized as much as possible. It is expected that these measures will go a long way in ensuring the best possible environmental compliance and performance standards.

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APPENDICES

1. Copy of ownership documents
2. Copy of expert practicing licenses
3. Copy of architectural plans
4. Copy of change of use approval
5. Copy of the invitation letter and attendance sheet
6. Copy of minutes of the public meeting
7. Questionnaires