ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT STUDY REPORT FOR THE PROPOSED RESIDENTIAL DEVELOPMENT ON TITLE NUMBER LR. 4275/123 LOCATED ALONG RIVERSIDE DRIVE, WESTLANDS SUBCOUNTY, NAIROBI CITY COUNTY

PROPONENT

JNC BROTHERS & COMPANY LIMITED

PREPARED BY

NEWTON KARURI GITONGA

REGISTRATION NO. 7117.

CERTIFICATE OF DECLARATION AND DOCUMENT AUTHENTICATION

This Environmental and Social Impact Assessment Study Report has been prepared in accordance with Environmental Management and Coordination Act (EMCA), 1999 (Amendment 2015) and the Environmental (Impact Assessment and Audit) Regulations, 2003 (Revised 2019).

PROJECT PROPONENTS

JNC BROTHERS & COMPANY LIMITED

PO51770678R

Signed.....

JNC BROTHERS & COMPANY LIMITED
J N C
P.O. BOX 5332-00100, NAIROBI

Date.....10-09-2025.....

On behalf of others

NEMA EXPERTS

LEAD EXPERT NEWTON KARURI

REGISTRATION NUMBER – 7117

SPATIAL DESIGN SOLUTIONS
Registered & Practicing Physical Planners
& Environmental Experts
P. O. Box 43354 - 00100, NAIROBI
Tel: +254 732 513351, 721 - 513351
Email:spatialds@gmail.com
Date:.....

Signature ----------11-09-25----------

Date: ----------

Do hereby certify that this report was prepared based on the information provided by the proponent, neighbors as well as that collected from other primary and secondary sources and on the best understanding and interpretation of the facts by the Environmental assessors. It is issued without any prejudice.

ABSTRACT

The report has been prepared in accordance with Environmental Management and Coordination Act (EMCA) CAP 387, Environmental (Impact Assessment and Audit) Regulations, 2003 under the Kenya Gazette Supplement No. 56 of 13th June 2003

EXECUTIVE SUMMARY

This Spatial Design Solutions, led by Lead Environmental Expert, Newton Gitonga Karuri, is a NEMA-registered ESIA/EA Firm of Experts, has been contracted by **JNC Brothers & Company Limited**, the registered proponent of **Title Number LR. No. 4275/123**, to carry out an Environmental and Social Impact Assessment (ESIA) Study Report for the proposed **multi-dwelling residential apartment complex** located along **Riverside Drive, Westlands Subcounty, Nairobi City County**.

The parcel of land measures approximately 0.3930 hectares and is held under leasehold tenure. It is geographically located at coordinates 1°16'08.9"S, 36°47'53.2"E. The site lies within a well-developed and highly urbanized residential and mixed-use neighborhood, easily accessible via Riverside Drive, which connects to Waiyaki Way and Kilimani through Ring Road Kileleshwa.

The proposed development will replace existing structures on-site with a 20-floor modern residential complex comprising 476 apartment units, 5 commercial shops, 3 basement levels of parking (266-car capacity), a swimming pool, landscaped recreational areas, and associated supporting amenities.

The estimated cost of the project is approximately **KES 3,405,986,404.00**. The proposed development aims to respond to Nairobi's growing demand for modern, high-density housing solutions within the urban core, while optimizing land use in line with current planning guidelines and sustainable design principles.

1.2 Justification for the Study

The Environmental and Social Impact Assessment (ESIA) has been undertaken in accordance with the requirements of the Environmental Management and Coordination Act (EMCA), 1999 (Amendment 2015) and the Environmental (Impact Assessment and Audit) Regulations, 2003 (Revised 2019).

The purpose of this study is to:

- Evaluate the potential environmental and social impacts associated with the proposed project.
- Propose suitable mitigation measures to prevent, minimize, or offset any adverse impacts.
- Develop an Environmental and Social Management and Monitoring Plan (ESMMP) for effective implementation and compliance.
- Ensure the project adheres to relevant national laws, county by-laws, and international environmental best practices.

The ESIA process was conducted under the **Terms of Reference (TOR) Approval No. NEMA/ENVIS/ESIA/TOR/Approval_0075**, Application Reference **NEMA/ENVIS/ESIA/TOR/00217**, titled *"Terms of Reference for Environmental and Social Impact Assessment for the Proposed Residential (Multi-Dwelling) Apartments on LR. No. 4275/123 located along Riverside Drive, Westlands Subcounty, Nairobi City County."*

1.3 Objectives of the Proposed Project

The main objectives of the proposed development include:

1. To develop a modern high-rise residential complex comprising 476 apartment units, 5 shops, and associated amenities.
2. To optimize land use through vertical expansion within a serviced urban area.
3. To meet the growing market demand for quality urban housing within Nairobi City County.
4. To generate employment and contribute to the national economy through construction-related activities.
5. To put the land into more productive and sustainable economic use consistent with urban planning policies.

1.4 Objectives of the ESIA Study

The objectives of this Environmental and Social Impact Assessment study are:

1. To identify and assess potential environmental and social impacts of the proposed project.
2. To determine the significance and scope of these impacts.
3. To propose mitigation measures for significant negative impacts.
4. To engage and document the views of Project-Affected Persons (PAPs) and relevant stakeholders.
5. To generate baseline environmental and social data for monitoring and evaluation.
6. To develop a comprehensive Environmental and Social Management and Monitoring Plan (ESMMP) with cost, timelines, and responsibilities.
7. To ensure that the project complies with EMCA (1999) and all other relevant environmental and social regulations.

8. To facilitate informed decision-making by the National Environment Management Authority (NEMA).

1.5 Scope of the ESIA Study

This ESIA study report covers:

- Project description and justification.
- Baseline environmental and social information for the project area.
- Policy, legal, and institutional frameworks relevant to the project.
- Identification and analysis of project alternatives.
- Assessment of potential positive and negative environmental and social impacts.
- Proposed mitigation measures and an Environmental and Social Management and Monitoring Plan (ESMMP).
- Stakeholder consultation outcomes and integration of feedback.
- Conclusions and recommendations for sustainable project implementation.

ACRONYMS AND ABBREVIATIONS

EHS	Environmental Health and Safety
EA	Environmental Audit
ESIA	Environmental Impact Assessment
EMCA	Environmental Management and Coordination Act
EMP	Environmental Management Plan
KPLC	Kenya Power and Lighting Company
NEMA	National Environment Management Authority
OHS	Occupational Health and Safety
OSHA	Occupational Safety and Health Act
PPE	Personal Protective Equipment
EISR	Environmental Impact Study Report

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CHAPTER 1: INTRODUCTION

1.1 General History

Worldwide, the need to pursue sustainable development guided by environmental, social, cultural, and ethical considerations has been prioritized. Achieving sustainable development requires significant changes in how projects are planned, implemented, and managed. Environmental conservation, protection, and security are essential elements in this process.

Kenya has made significant strides in implementing environmentally friendly legislations, particularly the Environmental Management and Coordination Act (EMCA) CAP 387. This Act mandates Environmental Impact Assessments (ESIA) as an integral part of project management to ensure developments align with sustainability principles and minimize negative environmental impacts.

1.2 Background and Rationale of the ESIA Study

In compliance with national and international environmental regulations, the proponent, **JNC Brothers & Company Limited**, has commissioned the preparation of an Environmental Impact Study Report (EISR) for the proposed residential (multi-dwelling) development on parcel Title Number **LR. NO. 4275/123**, located along Riverside Drive, Westlands Subcounty, Nairobi City County.

The EISR aims to assess potential environmental, social, and economic impacts of the project and recommend mitigation measures to minimize adverse effects. This ensures that the project adheres to environmental laws while contributing to sustainable urban development and improved housing provision in Nairobi.

1.3 Objectives of the Project

The key objectives of the proposed residential development are:

1. **Provision of Housing**
    - Deliver modern, multi-dwelling residential apartments to meet Nairobi's growing demand for quality housing.
    - Provide secure, comfortable, and accessible homes in a prime urban location.
2. **Enhancing Urban Living Quality**
    - Replace outdated structures with a modern residential complex that enhances the aesthetic appeal of Riverside Drive.
    - Incorporate green areas, parking, and amenities to improve resident comfort and community value.
3. **Efficient and Sustainable Land Use**
    - Maximize land utility in a high-demand residential area.
    - Align with urban planning frameworks by providing high-density housing in a serviced location.

1.4 Objectives of the ESIA Study

1. **To Assess Environmental and Social Impacts**
    - Identify potential positive and negative environmental impacts associated with the project.
    - Assess the effects of the development on local infrastructure, air quality, water resources, noise levels, and traffic patterns.
    - Evaluate the socio-economic benefits, including job creation and increased commercial activity.
2. **To Propose Sustainable Mitigation Measures**
    - Develop strategies to minimize negative environmental effects such as pollution, traffic congestion, and resource depletion.
    - Recommend appropriate waste management and environmental conservation measures.
    - Enhance water conservation efforts, including the installation of an underground cold water storage system.
3. **To Ensure Compliance with Environmental Regulations**
    - Align project activities with national laws and policies, including EMCA 1999 and Nairobi County regulations.
    - Provide guidelines for occupational health and safety to protect workers and tenants.
    - Establish a monitoring and evaluation framework to ensure continuous compliance and environmental sustainability.

1.5 Methodology

The ESIA study employed the following methodologies:

1. **Site Reconnaissance and Visual Surveys –** Conducted to gather baseline data and assess existing environmental conditions.
2. **Stakeholder Consultations –** Engaged local stakeholders, including nearby businesses and residents, through surveys and open-ended questionnaires.
3. **Desktop Review –** Analyzed relevant environmental policies, legal frameworks, and previous studies to support impact assessment.

1.6 Scope of the Study

The study evaluates potential environmental and social impacts of the proposed residential development on the site and surrounding environment. It is conducted in accordance with EMCA CAP 387 and the Environmental (Impact Assessment and Audit) Regulations, 2003.

1.6.1 Review of Policy, Legal, and Administrative Framework

The study reviews local and international environmental policies and regulations relevant to residential housing in Nairobi City County. These policies provide a foundation for assessing environmental compliance and impact significance.

1.6.2 Description of the Project

The proposed development consists of a **20-floor modern multi-dwelling residential complex comprising of 476 apartment units** and 5 shops with 3 basement levels of associated parking facilities with a 266-parking capacity, swimming pool, landscaped areas, and amenities.

1.6.3 Review of Baseline Information

Baseline data provides a reference point for assessing environmental changes due to the project. The study examines land use, infrastructure, air quality, noise levels, and socio-economic conditions before project implementation.

1.6.4 Assessment of Potential Environmental and Socio-Economic Impacts

The ESIA evaluates how the project will impact biophysical, socio-economic, and cultural elements, considering both positive and negative effects. The study ensures the project aligns with environmental sustainability goals and urban planning objectives.

1.6.5 Proposition of Alternatives

Alternative options regarding site location, design, and construction methodologies are analyzed to determine the most environmentally sustainable and economically viable approach for the development.

1.6.6 Development of Mitigation Measures

Mitigation strategies are proposed to address potential negative environmental impacts. These include proper waste management, traffic control measures, noise reduction techniques, and adherence to occupational safety guidelines.

The proposed commercial development is expected to enhance business activities, employment opportunities, and urban infrastructure in Upper Hill. The project will adhere to sustainable environmental practices and comply with national and local environmental regulations. Implementation of the proposed mitigation measures will ensure minimal adverse environmental impacts while maximizing economic and social benefits.

CHAPTER 2: PROJECT DESCRIPTION

2.1 Nature of the Project

The proposed project involves the construction of a modern multi-dwelling residential complex. The development will feature:

- 3 Basement parking facilities of 266 parking capacity
- 476 apartment units across 20 floors
- Energy-efficient lighting and water conservation systems
- Modern waste management solutions
- Landscaped green areas and recreational spaces
- 2 shop spaces on the ground floor

2.2 Project Location

The development is located on parcel **LR. NO. 4275/123**, situated along **Riverside Drive, Westlands Subcounty, Nairobi City County**. The area is a prime residential and mixed-use hub with demand for quality housing. The site is well-served by road networks, electricity, water supply,

2.3 Site Description

The site, covering **0.3930 hectares**, is currently occupied by existing structures that will be cleared to make way for the residential development. The land will be utilized efficiently to maximize residential opportunities in line with Nairobi's housing demand.

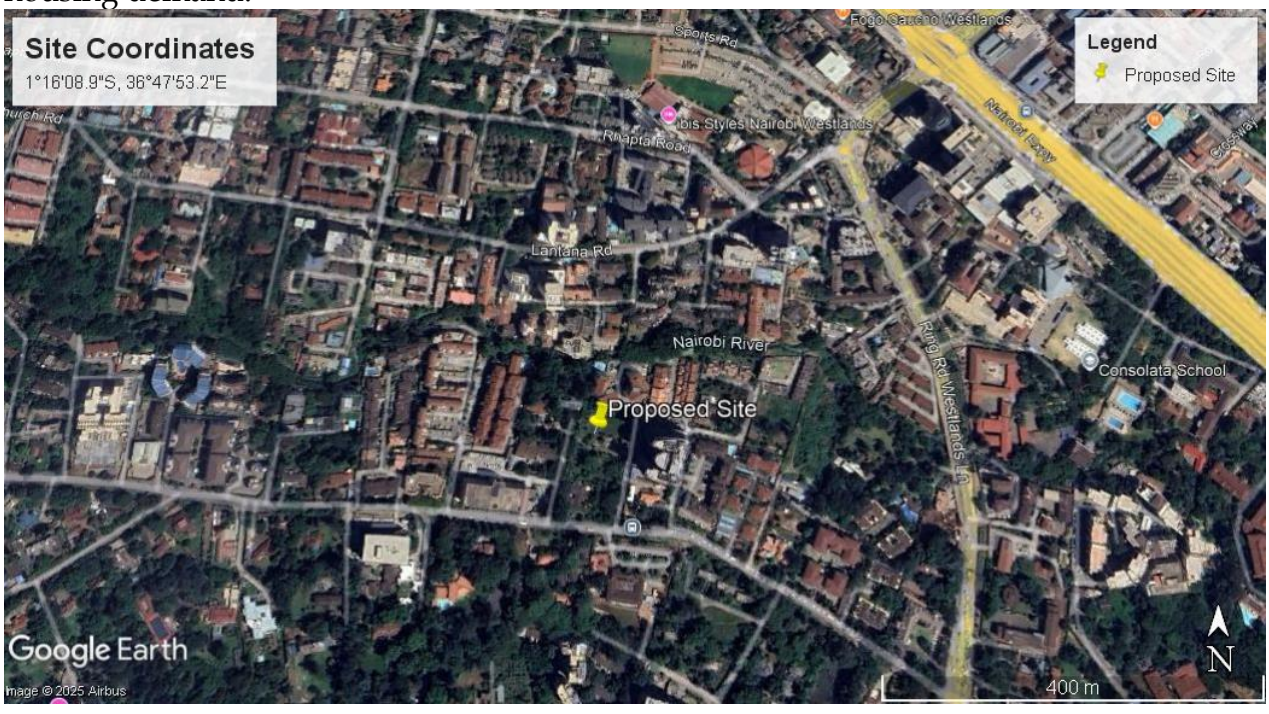

Fig 1: Location of the Site from Google Earth

2.4 Site Ownership

The property is registered to **JNC Brothers & Company Limited** under leasehold tenure. Ownership documents are attached to this report.

2.5 Design Criteria

The residential development will comply with Nairobi County planning regulations and engineering standards. Key design elements include:

- Reinforced concrete structures for durability
- Adequate natural lighting and ventilation
- Fire safety measures and emergency exits
- Accessibility provisions for persons with disabilities
- Sustainable energy (solar panels, efficient lighting)
- Water harvesting and underground storage tanks
- Modern drainage systems using PVC piping
- Compliance with Ministry of Health standards for sanitation

2.6 Waste Management Strategy

2.6.1 Solid Waste Management

- Use of licensed waste handlers
- Segregation and recycling facilities
- Proper disposal of construction debris

2.6.2 Liquid Waste Management

- Wastewater directed to the Nairobi Water and Sewerage Company sewer line
- Rainwater harvesting to supplement supply
- Proper grease traps for kitchens and utility areas

Fig 3: Manhole access of the county sewer system

2.7 Water Supply

- Main supply from Nairobi Water and Sewerage Company
- Underground water storage and rainwater harvesting system for reliability

2.8 Energy Supply

- Connection to the national grid (KPLC)
- Supplementation with solar panels
- Use of LED lighting and energy-efficient appliances

Fig 2: KPLC Transformer along the site's boundary walls.

2.9 Construction Activities and Inputs

2.9.1 Input During Construction

- Land, water, labor, machinery, and materials including sand, ballast, stones, cement, timber, steel, PVC pipes, electrical fittings, tiles, roofing sheets, and paint.

2.9.2 Construction Activities and Timetable

- To commence upon NEMA approval and licensing.

2.9.3 Project Implementation Sequencing

1) **Pre-Construction Stage**

- Preparation of construction plans and acquisition of necessary approvals from relevant authorities.

- Conducting an Environmental Impact Assessment (ESIA) and obtaining the required license.

2) **Construction Stage**

a) Establishment of related works and all support infrastructures that are significant for the construction work

This would involve the transportation of machinery and deployment of the workers to the construction site. The machinery would be used for ground breaking and transportation of materials from the sources to the site. The major machineries that will be used include mixers, welding machines and transmission machines. The contractor will also mobilize human workforce casual, permanent, skilled and unskilled.

b) Acquisition and transportation of building materials

The contractor shall source for construction materials from the various available suppliers. Supply of materials will be a continuous activity throughout the project life since different materials will be needed at future phases of the construction. Such materials include building stones, sand, ballast, cement, timber, reinforced concrete frame, steel, bars, G.I pipes, PVC pipes, pavement blocks, concrete slabs, murram, hardcore, insulated electrical cables and timber among others.

c) Excavation and land filling works

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

d) Masonry, Concrete Work and Related Activities

The engineering designs and site layout plans that have been approved shall be implemented. The setting will comply with the specifications set out by the client to the contractor under the supervision of qualified engineers. In accordance with the designs and the layout plans, the construction of the proposed project and associated infrastructure will begin immediately NEMA approves it. The contractor will then be supplied with all the approved documents including the ESIA report.

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

e) Structural Steel Works

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

f) Transportation of the construction wastes from the site for disposal

Construction waste that cannot be used for landscaping work at the site will be deposited in approved dumpsites by a contracted licensed waste handler.

g) Electrical work

Electrical work during construction of the premises will include installation of electrical gadgets and appliances including electrical cables, lighting apparatus, sockets etc. In addition, there will be other activities involving the use of electricity such as welding and metal cutting.

h) Plumbing

Installation of pipe work for water supply and distribution will be carried out within the buildings and associated facilities. In addition, pipe work will be done to connect sewage from the premises to the sewer line, and for drainage of storm water. Plumbing activities will include metal and plastic cutting, the use of adhesives, metal grinding and wall drilling among others.

i) Landscaping

To improve the aesthetic value or visual quality of the site once construction ceases, the Proponent will carry out landscaping. This will include establishment of paving the site.

2.10 Products

The facility will provide modern apartment units with parking, green spaces, and amenities for residents.

2.11 By-Products

No significant by-products are expected. Operational waste will be managed through organized waste collection.

2.12 Project Budget

The estimated total project cost is **KES 3,405,986,404**.

CHAPTER 3: Study Area Baseline Information

3.1 Introduction

The proposed project will be located on Land Reference Number 4275/123 along Riverside Drive in Westlands Subcounty, Nairobi City County. The parcel measures approximately 0.3930 hectares and is held under leasehold tenure.

The site lies at GPS coordinates **1°16'08.9"S, 36°47'53.2"E**. It is situated within a well-established urban neighborhood predominantly characterized by **medium- to high-density residential apartments, commercial offices, and institutional premises**. Riverside Drive is one of Nairobi's prime mixed-use areas, hosting embassies, office blocks, hotels, and high-rise apartments. The proposed development is therefore consistent with the surrounding land uses and the zoning guidelines of Nairobi City County.

3.2 Location of the Proposed Project Site

The project site is accessed directly from Riverside Drive, a major road that connects to Waiyaki Way, and is within proximity to Nairobi's Central Business District (CBD**)**. The location is well-served by both public and private transport systems.

Essential amenities such as hospitals (The Nairobi Hospital, Aga Khan Hospital, MP Shah Hospital), educational institutions (Strathmore School, University of Nairobi, international schools), shopping malls (Sarit Centre, Westgate Mall, Yaya Centre), and recreational facilities are within a short driving distance. This accessibility underscores the suitability of the area for residential multi-dwelling development.

3.3 Site Ownership

Land Reference Number 4275/123 is registered under **JNC Brothers & Company Limited**. The land is held under leasehold terms with rights of development as permitted by Nairobi City County physical planning and land-use regulations. There are no known disputes, encumbrances, or restrictive caveats registered against the title.

3.4 Bio-Physical Environment

3.4.1 Topography and Soils

The site is generally flat with a gentle slope draining towards the **Nairobi River**, which flows within the larger Riverside area. The soils are predominantly red loamy soils with good drainage characteristics, suitable for foundation works and landscaping.

3.4.2 Vegetation and Biodiversity

The site was previously occupied by residential structures and therefore has minimal natural vegetation cover. Vegetation on-site consists of overgrown grass lawns and

isolated fencing shrubs. No rare, threatened, or endangered plant or animal species were recorded during the site survey. Some chickens were found on site belonging to the property caretaker.

3.4.3 Climate

The climate of the area is similar to Nairobi's general climatic conditions—sub-humid tropical climate with bimodal rainfall (March–May and October–December). Average annual rainfall ranges between 850 mm and 1,050 mm, with mean daily temperatures ranging from 14°C to 26°C.

3.5 Water Resources

The site has an existing Nairobi City Water and Sewerage Company (NCWSC) connection to the municipal water supply. An underground water storage tank will be integrated into the development to ensure continuous supply. Wastewater from the project will be discharged into the Nairobi City Sewerage System, to which the site is connected.

3.6 Infrastructure

3.6.1 Energy

The site is already connected to the **Kenya Power (KPLC) electricity grid**. The project will incorporate energy efficiency measures such as LED lighting, solar panels for common area lighting, and provision for backup power through a standby generator.

3.6.2 Transport and Accessibility

The site is accessible via **Riverside Drive**, which links to key roads in Nairobi including **Waiyaki Way, Arboretum Drive, and Uhuru Highway**. The development will provide adequate basement parking to minimize on-street parking and manage traffic flow. Traffic impact is expected to be minimal due to controlled entry/exit points.

3.6.3 Communication

Telecommunication infrastructure in the area is well-established, with coverage by major service providers such as Safaricom, Airtel, and Telkom Kenya.

3.7 Population Profile

According to the 2019 Kenya Population and Housing Census, Nairobi County has a population of approximately 4.4 million people. Westlands Subcounty, where the project is located, has a population of approximately **250,000 residents**.

The Riverside Drive area is characterized by a high daytime population due to the concentration of offices, diplomatic missions, and businesses, while the nighttime population comprises mainly residents in multi-dwelling apartments. The proposed development will therefore contribute to bridging the housing demand in the area.

3.8 Socio-Economic Characteristics

The socio-economic profile of the project area is shaped by Nairobi's role as Kenya's economic and administrative capital. Riverside Drive is home to several diplomatic residences, multinational corporations, high-end apartments, hotels, and NGOs.

The proposed project will have several socio-economic benefits, including:

- **Creation of employment opportunities** during construction and operation phases.
- **Contribution to Nairobi County revenue** through rates, permits, and approvals.
- **Increased housing stock** to meet growing demand for quality urban residences.

- Alignment with the **Nairobi Integrated Urban Development Master Plan (NIUPLAN)**, which encourages mixed-use and high-density housing in serviced urban areas.

CHAPTER 4: POLICY, LEGAL, AND INSTITUTIONAL FRAMEWORK

The implementation of the proposed residential development is subject to a wide range of **policies, laws, regulations, and institutional mandates** that ensure sustainable urban growth, environmental protection, and public health and safety. This chapter highlights the relevant frameworks guiding the project.

4.1 Relevant National Policies

4.1.1 The National Environmental Action Plan (NEAP)

The NEAP integrates environmental concerns into Kenya's social and economic development agenda through a multi-sectoral approach.

Relevance to the Project

The project shall be implemented in line with NEAP principles to ensure sustainable use of natural resources, particularly in areas of land, water, and waste management.

4.1.2 Environment and Development Policy (Sessional Paper No. 6 of 1999)

This policy harmonizes environmental protection with development goals by providing comprehensive guidelines for sustainable land use.

Relevance to the Project

The construction and occupation of the proposed residential apartments may interact with soil, water, and air resources. Mitigation measures will therefore be applied to minimize environmental degradation while maximizing social benefits.

4.2 Legal Framework

4.2.1 Environmental Management and Coordination Act (EMCA), Cap 387

This Act establishes the framework for environmental governance in Kenya. Section 58 requires all projects listed in the **Second Schedule** (including residential and commercial developments) to undergo Environmental Impact Assessment (ESIA).

Relevance to the Project

This ESIA Report has been prepared in compliance with Section 58 of EMCA. Approval from **NEMA** will be obtained prior to project implementation.

4.2.2 EMCA (Environmental Impact Assessment and Audit) Regulations, 2003

These regulations outline the procedure for conducting ESIAs, specifying stakeholder involvement, documentation requirements, and environmental audits.

Relevance to the Project

The proponent shall conduct periodic **environmental audits** once the project is operational to ensure compliance with environmental standards.

4.2.3 EMCA (Water Quality) Regulations, 2006

These regulations safeguard surface and groundwater resources by prohibiting pollution and prescribing standards for wastewater discharge.

Relevance to the Project

The project shall adopt proper sewer connections to the Nairobi City sewer line and implement stormwater management systems to prevent water contamination.

4.2.4 EMCA (Waste Management) Regulations, 2006

These regulations streamline waste segregation, collection, transportation, and disposal.

Relevance to the Project

The contractor and facility managers shall:

- Segregate solid waste at source (biodegradable, recyclable, hazardous).
- Engage only NEMA-licensed waste handlers.
- Ensure tenants comply with Nairobi City County waste management bylaws.

4.2.5 EMCA (Noise and Excessive Vibration Pollution Control) Regulations, 2009

These regulations prohibit unreasonable noise and vibration, especially near residential areas.

Relevance to the Project

During construction, noisy activities will be limited to daytime hours, and well-maintained machinery will be used to minimize nuisance to neighboring residents.

4.2.6 EMCA (Air Quality) Regulations, 2013

These regulations control emissions of pollutants to protect ambient air quality.

Relevance to the Project

The project shall implement dust suppression measures during construction and ensure that generator emissions meet set standards.

4.2.7 Occupational Safety and Health Act (OSHA), 2007 – CAP 514

This Act promotes worker safety, health, and welfare in workplaces.

Relevance to the Project

The contractor will provide Personal Protective Equipment (PPE), enforce site safety rules, and ensure compliance with occupational health and safety standards.

4.2.8 The Physical and Land Use Planning Act, 2019

This Act provides for development control, zoning, and land-use planning.

Relevance to the Project
The proposed development is consistent with the zoning of Riverside Drive for residential apartments and mixed-use developments. Approval of architectural plans will be obtained from Nairobi City County prior to construction.

4.2.9 The Penal Code, Cap 63
The Penal Code prohibits nuisances such as improper waste disposal or emission of foul air harmful to human health.

Relevance to the Project
The proponent will ensure that **solid waste and wastewater** are managed responsibly to avoid public health hazards.

4.2.10 Nairobi City County By-Laws
These by-laws regulate construction permits, waste management, drainage systems, and general sanitation.

Relevance to the Project
The proponent will submit **building plans for approval**, provide **proper drainage and sanitation facilities**, and comply with all applicable county regulations.

4.3 Institutional Framework

1. **National Environment Management Authority (NEMA):** Approves the ESIA license and ensures environmental compliance.
2. **Nairobi City County Government (NCCG):** Responsible for urban planning approvals, building permits, zoning compliance, and solid waste management.
3. **National Construction Authority (NCA):** Registers contractors and ensures construction standards are met.
4. **Water Resources Authority (WRA):** Regulates water use and ensures compliance with water abstraction/discharge permits.
5. **Kenya Power and Lighting Company (KPLC):** Provides electrical connectivity and regulates energy supply.
6. **Directorate of Occupational Safety and Health Services (DOSHS):** Enforces worker health and safety regulations during construction and occupation phases.
7. **Public Health Department:** Monitors sanitation and public health compliance.
8. **Kenya Urban Roads Authority (KURA):** Ensures proper access roads and traffic management in the project area.

Law/Policy/Regulation	Key Provisions/Requirements	Project Compliance / Mitigation Measures
Environmental Management and Coordination Act (EMCA, Cap 387)	Requires ESIAs for new projects, environmental protection, waste management, and sustainable resource use.	EISR prepared and submitted to NEMA for approval; waste management plan to be implemented during construction and operation.
Physical and Land Use Planning Act (PLUPA, 2019)	All developments must conform to county physical and land-use plans.	Project located in Riverside Drive, an area designated for high-density residential/mixed-use developments; approvals sought from Nairobi County Government.
Environmental (Impact Assessment and Audit) Regulations, 2003 (as amended 2019)	Provides procedures for conducting ESIAs and audits.	This EISR follows the format and requirements; annual environmental audits to be conducted post-approval.
Water Act, 2016	Protection and sustainable use of water resources.	Project connected to NWSC; underground storage tanks for water security; water conservation measures to be implemented.
Occupational Safety and Health Act (OSHA, 2007)	Ensures worker health and safety during construction and operation.	Contractors to provide PPE, safety signage, and enforce occupational health standards.

Public Health Act (Cap 242)	Safeguards sanitation, disease prevention, and public health.	Proper solid and liquid waste management; stormwater drainage system included in design.
Energy Act, 2019	Promotes efficient energy use and sustainable energy sources.	Project integrates energy-efficient lighting and provision for solar installations.
National Construction Authority (NCA) Act, 2011	Contractors and construction activities must be registered and regulated.	Only NCA-registered contractor and supervisors engaged; compliance with NCA codes ensured.
Urban Areas and Cities Act, 2011	Requires urban development projects to align with sustainable urban development principles.	Project designed to complement Nairobi's urban growth strategy; landscaping included despite limited space.
Nairobi City County By-Laws	County permits for building works, waste collection, and occupation certificates.	Building approvals sought; solid waste to be collected by licensed providers approved by NCC.
Noise and Excessive Vibration Pollution Control Regulations, 2009	Restricts noise and vibration during construction.	Contractor to work within permissible hours; use of silencers and noise suppression equipment.
Waste Management Regulations, 2006	Requires safe collection, storage, transportation, and disposal of waste.	Construction waste to be segregated and disposed of via licensed waste handlers.

The above policy, legal, and institutional frameworks collectively provide a robust foundation for guiding the planning, construction, and operation of the proposed multi-dwelling residential project at Riverside Drive. Adherence to these frameworks will not only ensure regulatory compliance but also promote sustainable development, public safety, and environmental conservation.

CHAPTER 5: POTENTIAL ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

5.1 Description of the Existing and Anticipated Impacts

5.1.1 Existing Impacts

Few notable impacts were identified during the baseline assessment since the site is largely undeveloped/underutilized. Any existing minor disturbances will be addressed within the proposed Environmental Management Plan (EMP).

5.1.2 Anticipated Impacts

The proposed residential development is expected to generate both positive and negative environmental and social impacts during the construction, operation, and decommissioning phases.

The magnitude of each impact is assessed as significant, minor, permanent, short-term, long-term, localized (specific), widespread, reversible, or irreversible.

Table 5.1: Assessment Criteria for Significant Impacts

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

5.2 Potential Environmental Impacts

Table 5.2: Potential Environmental Impacts

Impact Area	Construction Phase	Operation Phase	Remarks
Noise Pollution	-	0	Noise from machinery and trucks during construction; mitigated through controlled working hours. Minimal noise expected during residential use.

Air/Dust Pollution	-Sh	0	Dust during excavation and construction controlled by sprinkling water and covering materials. No major air emissions during operation.
Soil Erosion	-T	0	Excavation and earthworks may loosen soil; drainage systems and stabilization to be implemented.
Water Resources	-	-L	During construction, water used for curing and dust control; during operation, demand increases due to residential use. Efficient plumbing and rainwater harvesting to be adopted.
Vegetation and Flora	-	+	Some vegetation cleared during site prep; landscaped gardens and trees introduced after construction.
Public Health	-	-	Workers and nearby residents exposed to dust and noise during construction. During operation, risks tied to waste and sanitation, but mitigated through proper systems.
Traffic Flow	-	-	Material deliveries may disrupt Riverside Drive traffic; mitigated via scheduling. During operation, residential traffic will increase moderately but parking provided.

5.3 Positive Impacts

The proposed residential project will generate multiple benefits, including:

1. **Employment Creation** – Temporary jobs during construction and permanent roles in security, maintenance, and facility management.
2. **Housing Provision** – Supply of modern multi-dwelling units to address Nairobi's housing demand.
3. **Urban Aesthetic Enhancement** – Replacement of an underutilized parcel with a modern residential facility, improving the visual appeal of Riverside Drive.
4. **Infrastructure Improvement** – Enhanced drainage, sewer connections, and access improvements in the neighborhood.
5. **Increased Revenue** – Payment of rates, permits, and service charges to Nairobi City County.
6. **Economic Stimulus** – Indirect benefits to suppliers, contractors, and local businesses.

5.4 Negative Environmental Impacts

The issues that may negatively affect the environment and nearby residents include:

5.4.1 Public and Occupational Health and Safety Risks

Construction activities may expose workers and the public to dust, noise, and falling debris. PPE will be mandatory, and barriers erected to protect passersby.

5.4.2 Increased Solid Waste

Construction will generate debris, scrap metal, packaging, and timber offcuts. During occupation, households will generate domestic waste (plastics, food, paper). Segregation, recycling, and licensed waste handlers will be engaged.

5.4.3 Increased Water Use and Management

The development will increase water demand. Mitigation includes installation of water-efficient fixtures, rainwater harvesting systems, and adequate storage tanks.

5.4.4 Increased Surface Runoff

The paved areas and roofs may increase stormwater runoff. Drainage channels and soak pits will be installed to manage excess water.

5.4.5 Increased Airborne Emissions

Dust and vehicle emissions during construction may reduce air quality temporarily. Water sprinkling, covering of materials, and efficient equipment will be used.

5.4.6 Workplace Accidents

Risks such as falls, electrocution, and injuries may occur. Training, PPE, and safety supervision will mitigate accidents.

5.4.7 Site Security

Security risks (trespassing, theft) may arise. The site will be fenced, with security guards deployed. During operation, secure access controls will be installed.

5.4.8 Fire Hazards

Both construction and residential occupation phases pose fire risks. Fire-fighting equipment, hydrants, extinguishers, alarms, and emergency exits will be integrated.

5.4.9 Traffic Congestion along Riverside Drive

Construction traffic may slow down road movement. Traffic marshals will be engaged, and deliveries scheduled during off-peak hours.

CHAPTER 6: PROJECT ALTERNATIVES

6.1 The Proposed Alternatives

This Environmental Impact Study Report (EISR) has been prepared for submission to NEMA based on desktop research, site surveys, and professional analysis undertaken by the ESIA expert. The findings and recommendations are derived from an evaluation of the proposed site, the anticipated building materials, and the construction technologies to be applied in the implementation of the residential multi-dwelling development.

6.2 Alternative to Site

The selected parcel, **LR. NO. 4275/123 located along Riverside Drive in Westlands Subcounty, Nairobi City County**, is considered ideal due to its strategic location, accessibility, security, and suitability for residential development. The site is well served with existing infrastructure, including road access, water, electricity, and sewer connections. The proponent has **no alternative site**, as this location meets the project's residential objectives and maximizes land utility in line with Nairobi's zoning and urban development framework.

6.3 Alternative to Technology

The project will adopt modern construction technologies that enhance efficiency, reduce waste, and ensure safety.

- **Building Materials:** Durable and sustainable materials will be sourced locally where possible.
- **Energy Use:** Energy-efficient lighting and provisions for renewable energy integration (e.g., solar water heating systems) will be considered to reduce overall energy demand.
- **Waste Management:** A structured waste management plan will be implemented, including segregation of biodegradable, recyclable, and non-recyclable waste at source to enhance efficiency of disposal.
- **Water Management:** Provisions for water-saving fixtures (dual-flush toilets, low-flow taps) and rainwater harvesting will be explored to minimize water consumption.

6.4 No Project Alternative

If the proposed residential development is not implemented, the land will remain underutilized, resulting in lost opportunities for:

- Provision of modern housing to meet Nairobi's increasing residential demand.
- Employment creation during construction and operation.
- Increased revenue to Nairobi City County through rates, permits, and approvals.

- Enhanced land use efficiency in line with urban development goals.

In the absence of the project, the site would continue to host only limited activity, failing to contribute optimally to the city's housing needs.

6.5 Comparison of Alternatives

- **Proposed Project Alternative:** Provides modern residential apartments that meet housing demand, optimize land use, generate employment, and contribute to Nairobi's economy.
- **No Project Alternative:** Results in underutilization of prime land, limited economic benefit, and failure to meet the area's housing deficit.
- **Technological Alternatives:** Adoption of sustainable construction technologies enhances environmental performance while reducing resource use.

The proposed residential multi-dwelling development is the most suitable option. With proper mitigation of potential impacts (waste generation, water use, noise, and traffic flow), the project will ensure sustainable development, economic growth, and improved living standards along Riverside Drive.

CHAPTER SEVEN: MITIGATION MEASURES AND ENVIRONMENTAL MANAGEMENT PLAN (EMP)

7.1 Mitigation Measures for Occupational Health and Safety

- Provide workers with PPE (gloves, boots, overalls, helmets, masks, and ear protection).
- Conduct training on safe handling of materials, machinery use, and emergency response.
- Maintain fully equipped First Aid kits at designated construction points.
- Appoint a trained Safety Officer to ensure compliance with the Occupational Safety and Health Act (OSHA) 2007.
- Ensure ventilation in enclosed workspaces to reduce exposure to dust and fumes.

7.2 Mitigation Measures for Solid Waste Management

- Segregate waste at source to allow recycling and safe disposal.
- Dispose of debris through licensed waste handlers in line with NEMA guidelines.
- Establish clearly labeled waste collection points for biodegradable, recyclable, and general waste.
- Implement a waste minimization plan to reduce excess material use.

7.3 Mitigation Measures for Water Use and Management

- Install rainwater harvesting systems to supplement supply.
- Use water-efficient plumbing fixtures (dual flush toilets, low-flow taps).
- Reuse wastewater for non-potable construction activities (curing concrete, dust suppression).
- Sensitize workers on water conservation practices.

7.4 Mitigation Measures for Surface Water Drainage

- Construct adequate drainage channels to prevent flooding and erosion.
- Integrate permeable paving where possible to enhance infiltration.
- Regularly maintain stormwater systems to prevent blockages.

7.5 Mitigation Measures for Air Quality

- Conduct frequent watering of dusty areas.

- Use dust screens in sensitive areas.
- Regularly service machinery to reduce emissions.
- Store fine materials (sand, cement) in covered enclosures.

7.6 Mitigation Measures for Accident Prevention

- Place warning signage on hazards and restricted areas.
- Regularly inspect and maintain equipment.
- Install slip-resistant flooring in wet-prone zones.
- Ensure all workers undergo safety induction training.

7.7 Mitigation Measures for Site Security

- Employ 24-hour security personnel.
- Install CCTV cameras at access points.
- Fence the site to prevent unauthorized access.

7.8 Mitigation Measures for Fire Hazards

- Provide fire extinguishers at strategic locations.
- Prohibit open fires near storage of construction materials.
- Train workers on fire response and evacuation procedures.

7.9 Traffic Management within the Site and Riverside Drive

- Designate loading and offloading zones for trucks.
- Mark site roads clearly for traffic flow.
- Schedule material deliveries during off-peak hours to reduce congestion on Riverside Drive.
- Deploy traffic marshals during peak construction activities.

7.10 Environmental Management Plan (EMP)

7.10.1 Significance of EMP

The EMP ensures that environmental impacts are properly managed during planning, construction, and operation. It provides a structured framework of mitigation measures, timelines, responsibilities, and monitoring mechanisms.

7.10.2 Environmental Monitoring and Audits

- Conduct periodic audits as per EMCA Cap 387 and ESIA/Audit Regulations, 2003.

- Monitor waste, water use, noise, air quality, and safety to ensure compliance.
- Collaborate with NEMA and Nairobi City County authorities for enforcement.
- Maintain proper records and submit periodic reports to regulatory bodies.

Table 7.1: Environmental Management Plan (EMP)

Potential Impact	Mitigation Measures	Responsible Party	Timeline
Noise & vibration	Machinery maintenance, compliance with noise limits, provision of PPE	Contractor, Site Supervisor	Construction phase
Soil & water pollution	Controlled drainage, proper waste disposal, spill prevention	Contractor, Environmental Officer	Continuous
Air pollution (dust/emissions)	Frequent watering, covered storage, machine servicing	Contractor, Site Supervisor	Continuous
Solid waste generation	Segregation, recycling, use of licensed handlers	Contractor, Waste Team	Continuous
Traffic congestion (Riverside Drive)	Signage, delivery scheduling, traffic marshals	Contractor, Traffic Officer	Construction phase
Occupational hazards	PPE provision, first aid, safety training	Safety Officer, Site Manager	Continuous
Effluent generation	Proper drainage, regular maintenance	Contractor, Environmental Officer	Continuous
Increased water demand	Water-saving devices, rainwater harvesting	Site Management	Continuous

Surface drainage	Adequate channels, permeable paving, maintenance	Site Engineer, Contractor	Continuous
Fire hazards	Fire extinguishers, fire drills, safe storage	Fire Safety Officer	Continuous
Security	24-hour security, CCTV, fencing	Site Management, Security Firm	Continuous
On-site traffic	Designated zones, marked roads, speed control	Contractor, Site Supervisor	Continuous

CHAPTER 8: ENVIRONMENTAL MANAGEMENT AND MONITORING PLAN

8.1 Introduction

The Environmental Management and Monitoring Plan (EMMP) provides a framework for implementing the mitigation measures outlined in this EISR. It ensures that the proposed residential is developed and operated in compliance with environmental regulations, including EMCA (1999) and its subsidiary legislations. The EMMP also outlines the monitoring strategy to evaluate the effectiveness of the proposed mitigation measures throughout the project lifecycle.

8.2 Objectives of the EMMP

The specific objectives of the EMMP are to:

- Provide a structured plan for mitigating adverse environmental and social impacts.
- Define roles and responsibilities for environmental management during the project cycle.
- Establish clear monitoring indicators for compliance and performance.
- Promote sustainable construction, operation, and decommissioning practices.

8.3 Monitoring Plan

Monitoring will be conducted throughout the project cycle, focusing on the construction phase, operation phase, and decommissioning phase**.** The monitoring plan includes key environmental issues, mitigation measures, monitoring indicators, frequency, responsible parties, and cost responsibilities.

8.4 Environmental Management and Monitoring Matrix

A. Construction Phase

Environmental Issue	Mitigation Measure	Monitoring Indicators	Frequency of Monitoring	Responsible Party	Estimated Cost Responsibility
Dust emissions from excavation and material transport	Water sprinkling, covering trucks, on-site speed limits	Records of water sprinkling, visible dust levels	Daily	Contractor, Site Engineer	50,000
Noise from machinery and trucks	Use of well-maintaine	Noise level measurements (dB),	Weekly	Contractor, Safety Officer	100,000

	d equipment, restrict works to daytime hours	community complaints			
Solid waste generation (construction debris)	Segregation of waste, reuse of excavated material, disposal through licensed handlers	Waste transfer records, on-site waste bins	Weekly	Contractor, Site Manager	150,000
Soil erosion and runoff	Silt traps, terracing, controlled excavation	Presence of silt traps, erosion signs	Bi-weekly during rains	Contractor, Environmental Officer	100,000
Occupational health & safety	PPE use, safety signage, toolbox talks	PPE compliance, incident reports	Daily	Contractor, Safety Officer	250,000

B. Operation Phase

Environmental Issue	Mitigation Measure	Monitoring Indicators	Frequency of Monitoring	Responsible Party	Estimated Cost Responsibility
Solid waste from households	Provision of bins, segregation, contract with NEMA-licensed waste handlers	Waste collection records, bin availability	Weekly	Property Manager	Tenants/Proponent
Wastewater management	Connection to sewer line,	Sewer connection	Quarterly	Property Manager, Nairobi	Proponent

	regular maintenance	integrity, effluent discharge quality		Water & Sewerage Company	
Water consumption	Install water-efficient fixtures, monitor usage	Meter readings, water bills	Monthly	Property Manager	Tenants/Proponent
Energy consumption	Energy-efficient lighting, solar integration	Meter readings, electricity bills	Monthly	Property Manager	Tenants/Proponent
Security and safety	CCTV, firefighting equipment, access control	Records of drills, equipment servicing	Quarterly	Property Manager	Proponent

C. Decommissioning Phase:

Environmental Issue	Mitigation Measure	Monitoring Indicators	Frequency of Monitoring	Responsible Party	Estimated Cost Responsibility
Demolition waste	Reuse/recycling of materials, licensed waste disposal	Waste transfer notes, presence of licensed contractor	Daily during demolition	Contractor	Proponent
Dust and noise	Sprinkling water, soundproof barriers, limited	Dust levels, noise measurements	Daily	Contractor	Proponent

	working hours				
Site rehabilitation	Landscaping, tree planting, leveling	Vegetation cover, soil stability	Post-demolition inspection	Contractor, Environmental Officer	Proponent
Worker safety	PPE, first aid, safety drills	PPE compliance, incident reports	Daily	Contractor	Proponent

8.5 Institutional Responsibilities

- **Proponent (JNC Brothers & Company Ltd):** Overall responsibility for implementing the EMMP, financing, and compliance.
- **Contractor(s):** Implementation of mitigation measures during construction, ensuring worker health and safety, and compliance with EMCA guidelines.
- **Environmental and Safety Officer (ESO):** Day-to-day environmental and OHS monitoring, reporting to NEMA.
- **NEMA:** External monitoring and enforcement of compliance.
- **Nairobi City County Government:** Oversight of public health, waste management, and building compliance.
- **Residents/Property Manager:** Implementation of operational phase mitigation measures, including waste management, water/energy efficiency, and community relations.

The monitoring plan ensures that the project remains environmentally sound and socially responsible across its lifecycle. Effective implementation of this EMMP will minimize negative impacts while enhancing sustainability and compliance with regulatory frameworks.

9.0 PUBLIC CONSULTATION

9.1 Methodology

Public participation will be conducted to gather views from stakeholders regarding the proposed commercial development. This will be achieved through direct interviews, observations, and questionnaire administration. Below is a detailed discussion of the methodology that will be used by the ESIA team.

9.1.1 Direct Interviews

Direct interviews will be conducted with the project proponent, local business owners, neighbouring property owners, and other key stakeholders. These discussions will provide insights into the expected benefits and potential concerns related to the commercial development. Informal engagements will allow stakeholders to freely express their opinions on the project.

9.1.2 Questionnaire Administration

Stakeholder comment sheets will be prepared and distributed to neighbouring residents and business operators in the vicinity of the project site. The responses collected will provide valuable feedback on public perception and any potential concerns regarding the development.

9.2 Stakeholders' Comments

The consultation process is expected to reveal a mix of support and concerns from the local community. Many stakeholders may welcome the project, citing increased business opportunities, improved infrastructure, and job creation. Concerns raised, such as increased traffic congestion, noise pollution, and potential disruptions during construction, will be addressed in the Environmental Management Plan (EMP).

10.0 ENVIRONMENT, HEALTH, AND SAFETY (EHS)

10.1 EHS Management and Administration

The Environment, Health, and Safety (EHS) framework will be essential in ensuring the safety of workers, visitors, equipment, and the surrounding environment during the construction and operational phases of the commercial development. The objective of the EHS plan in this project is to establish rules and procedures that regulate environmental health risks and occupational safety measures. These objectives will include:

- Preventing injuries among construction workers and future building occupants.
- Ensuring a safe and healthy working environment to enhance efficiency in construction and business operations.
- Reducing risks associated with handling construction materials, machinery, and utilities.
- Promoting environmental sustainability by implementing conservation measures such as proper waste disposal and pollution control.

10.2 Policy, Administrative, and Legislative Framework

The project proponent will be responsible for maintaining a safe and healthy work environment on the construction site and in the surrounding community. This will be achieved by implementing effective measures to prevent occupational hazards, control pollution, and minimize property damage.

10.3 Guiding Principles to be Adopted by the Proponent

- Upholding high health and safety standards for construction workers, neighboring businesses, and the general public.
- Ensuring environmental protection by preventing pollution, responsible waste management, and efficient water usage.
- Providing continuous monitoring and training for workers to enhance compliance with EHS standards.
- Encouraging personal responsibility among workers for their safety, the safety of colleagues, and the well-being of the environment.

10.4 EHS Management Strategies to be Adopted by the Proponent

The following strategies will be implemented to achieve the above objectives:

- Establishing a reporting system for all construction-related accidents and incidents.
- Providing appropriate protective gear such as helmets, gloves, boots, reflective vests, and masks for workers.
- Regular maintenance of construction equipment to prevent accidents.

- Training workers on safe handling of construction materials, machinery, and hazardous chemicals.

10.5 Safety Requirements at the Site During Construction and Operation

(a) The Project Developer/Manager

The project developer/manager will ensure that:

- Proper entry and exit points are maintained to facilitate movement of workers and construction vehicles.
- Workers receive adequate training on safe construction practices before starting work.
- Protective gear is worn at all times when handling construction materials and equipment.

(b) Traffic Management Within the Construction Site

To ensure safe movement of construction vehicles and personnel, the following rules will be observed:

- Observing speed limits and placing proper signage within the site.
- Using construction vehicles strictly for their intended purpose.
- Designating loading and offloading zones to prevent congestion and accidents.

10.6 Emergency Procedures During Construction and Operation

An emergency situation may include:

- Unforeseen incidents leading to injuries among workers or nearby community members.
- Fire, explosion, or environmental hazards such as chemical spills.
- Natural disasters such as floods or strong winds affecting construction structures.

During Construction, Workers Shall:

- Alert others in the vicinity to prevent further harm.
- Inform the site manager or designated safety officer immediately.
- Conduct a quick assessment of the emergency situation.
- Contact emergency services, including an ambulance if necessary.
- Declare an "ALL CLEAR" message once the emergency is fully resolved.

During Operation, Building Management Shall:

- Establish an emergency response plan for fire, security threats, and medical emergencies.

- Install firefighting equipment such as extinguishers and sprinklers on each floor.
- Provide emergency exits and signage for easy evacuation.
- Train building occupants and staff on emergency procedures.
- Maintain a direct communication line with emergency services in case of major incidents.

CHAPTER 11: PROJECT DECOMMISSIONING

11.1 Introduction

Decommissioning marks the final phase of the project lifecycle and involves the systematic closure, dismantling of structures, and removal of equipment and materials once the commercial development reaches the end of its lifespan. This ensures the proper disposal of waste, restoration of the site, and mitigation of any adverse environmental and social impacts. Decommissioning for this project will occur if the commercial building is repurposed, renovated, or demolished.

11.2 Purpose and Objectives of Decommissioning

The decommissioning process is guided by the principles of environmental sustainability, occupational safety, and economic viability. The key objectives include:

- Restoring the site to a near-original or improved state through rehabilitation.
- Ensuring safe dismantling and disposal of structures, machinery, and other materials.
- Reducing potential negative environmental impacts associated with demolition.
- Ensuring compliance with legal and regulatory requirements.
- Creating temporary employment opportunities during the decommissioning process.

11.3 Decommissioning Phase Impacts

Impact	Type
Site Rehabilitation	Major Positive, Localized, Long Term
Employment Opportunities	Major Positive, Short-Term, Localized
Livelihoods and Economic Loss	Major Negative, Short Term, Widespread
Solid Waste Generation	Major Negative, Short Term, Localized
Excessive Noise and Vibration Pollution	Major Negative, Short-Term, Localized
Occupational/Public Health and Safety Hazards	Minor Negative, Short Term, Localized
Displacement of Workers	Minor Negative, Short Term, Localized
Dust and Exhaust Emissions	Minor Negative, Short Term, Localized, Irreversible

11.3.1 Positive Impacts

Site Rehabilitation

After decommissioning, the site will be rehabilitated to restore or enhance its environmental quality. This may include land leveling, soil restoration, and re-vegetation with indigenous tree and grass species to prevent soil erosion and enhance biodiversity.

Employment Opportunities

The decommissioning phase will generate temporary employment for workers involved in dismantling structures, waste management, and site restoration.

Local labor will be prioritized for these activities.

11.3.2 Negative Impacts and Mitigation Measures

Livelihoods and Economic Loss

The closure of the commercial building may result in job losses and reduced economic activities for businesses relying on the facility.

- **Mitigation Measures:**
    - Provide adequate notice to affected workers and businesses.
    - Facilitate redeployment or alternative employment opportunities where feasible.

Solid Waste Generation Decommissioning will generate large volumes of waste, including construction debris, furniture, and structural components.

- **Mitigation Measures:**
    - Collect and store waste at a designated central location before disposal.
    - Adopt selective dismantling to facilitate recycling and minimize landfill burden.
    - Engage licensed waste handlers for proper disposal of hazardous and non-hazardous waste.

Excessive Noise and Vibration Pollution Demolition and dismantling activities may generate noise and vibrations that impact nearby communities and businesses.

- **Mitigation Measures:**
    - Use modern, well-maintained equipment with noise reduction features.
    - Schedule noisy activities during daytime hours to minimize disturbance.
    - Obtain necessary permits from environmental authorities.

Dust and Exhaust Emissions Decommissioning activities may lead to dust pollution and exhaust emissions from heavy machinery.

- **Mitigation Measures:**
  - Regularly water demolition sites to suppress dust.
  - Use tarpaulin sheets to fence off the site and contain airborne particles.
  - Ensure machinery is regularly maintained to minimize emissions.

Occupational/Public Health and Safety Hazards Workers involved in decommissioning activities face risks such as falling debris, accidents, and exposure to hazardous materials.

- **Mitigation Measures:**
  - Provide Personal Protective Equipment (PPE) such as gloves, helmets, and dust masks.
  - Restrict unauthorized personnel from accessing the decommissioning site.
  - Implement safe work procedures and emergency response plans.

Displacement of Workers The project's closure will lead to job losses for workers and support staff.

- **Mitigation Measures:**
  - Notify affected workers in advance to allow them to make alternative arrangements.
  - Explore opportunities for reemployment in other projects or facilitate skill transition programs.

11.4 Decommissioning Environmental Management Plan

No.	Activity/Issue	Action Required	Responsibility	Estimated Cost (KES)
1	Solid Waste Management	Collect and categorize waste, recycle where possible, and engage licensed waste handlers.	Contractor, Engineer	200,000
2	Soil Erosion Control	Re-vegetate the site with native plant species.	Contractor	-
3	Air Pollution Control	Water down dusty areas, maintain machinery, and enforce emission control measures.	Contractor	150,000
4	Noise and Vibration	Use noise barriers, maintain equipment, and schedule work within allowable hours.	Contractor	120,000

5	Health and Safety	Provide PPEs, enforce safety regulations, and restrict site access.	Contractor	-
6	Worker Displacement	Issue advance notices and support alternative employment plans.	Proponent, Contractor	50,000
7	Economic Loss	Notify businesses in advance and consider redeployment options.	Proponent	-

By implementing these measures, the decommissioning phase will minimize negative impacts and ensure an environmentally responsible and socially sustainable closure of the commercial development project.

CHAPTER 11: CONCLUSIONS AND RECOMMENDATIONS

11.1 Conclusion

The proposed residential development on parcel LR 4275/123 has been designed with full consideration of environmental sustainability, social impact, and regulatory compliance. The potential negative impacts identified during the project's lifecycle, including the construction, operational, and decommissioning phases, have been mitigated through well-structured management plans. The project poses minimal environmental risks, and any impacts will be managed through the recommended mitigation measures. The development aligns with the Nairobi City County's urban development plans and contributes to the economic growth of the Westlands area.

11.2 Recommendations

To ensure the commercial development is executed in an environmentally responsible manner, the following recommendations should be adhered to:

1. Implement the Environmental Management and Monitoring Plan (EMMP) to mitigate adverse environmental impacts throughout the project lifecycle.
2. Adhere to all occupational health and safety standards, particularly during the construction and operational phases, by providing necessary PPE and training for workers.
3. Conduct construction activities **within designated hours (08:00 to 17:00)** to minimize disturbances to neighbouring businesses and residences.
4. Ensure efficient use of water resources by incorporating a rainwater harvesting and storage system to supplement water supply.
5. Ensure that solid waste generated from the construction, operational, and decommissioning phases is properly segregated, recycled where possible, and disposed of at designated NEMA-approved sites.
6. Engage registered waste management companies for proper handling of both hazardous and non-hazardous waste during the operational and decommissioning phases.
7. Implement sustainable building practices such as energy-efficient lighting and water-saving fixtures to reduce the environmental footprint of the development.
8. Ensure proper traffic management plans are in place to avoid congestion and accidents, especially during peak operational hours.
9. Conduct regular environmental audits and compliance monitoring as per NEMA requirements to ensure continued adherence to environmental regulations.
10. Engage stakeholders, including neighbouring businesses and the Nairobi City County government, in decision-making processes related to environmental and social concerns throughout the project's lifespan.

It is recommended that the project proceeds with the issuance of the required Environmental Impact Assessment (ESIA) license, provided all mitigation measures

and regulatory requirements are followed.

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