ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT STUDY REPORT FOR THE PROPOSED RIRUTA KEZA IHS HOUSING DEVELOPMENTS LOCATED IN L.R NO. DAGORETTI/RIRUTA/6004 (NAIROBI BLOCK 66/6004) ALONG NDWARU ROAD, OFF NAIVASHA ROAD IN RIRUTA, DAGORETTI SOUTH SUB-COUNTY, NAIROBI COUNTY



PREPARED BY:

CENTRIC AFRICA LIMITED

CENTRIC AFRICA LTD

PROPONENT

IHS (KENYA) LTD

International Housing Solutions
A HUNT COMPANY

OCTOBER 2025

DECLARATION

This Environmental and Social Impact Assessment Study Report for the proposed Housing Development at Riruta on Parcel No. 6004, Block No. Nairobi/Block 66 along Ndwaru Road, off Naivasha Road in Riruta Ward, in Dagoretti South Sub County, Nairobi City County has been prepared by Centric Africa Limited, a registered and licensed EIA/EA firm of Experts, in accordance with the Environmental Management and Coordination Act 1999 (amended 2015) and the Environmental (Impact Assessment and Audit) Regulations, 2003 (revised 2019) for submission to the National Environment Management Authority.

FIRM OF EXPERTS

CENTRIC AFRICA LTD

NEMA Reg. No.: 7112
Westpark Towers, 5th Floor, Mpesi Lane off Muthithi road,
P.O. Box 102081-00101, Nairobi.
Office Tel: +254 20 3673038

NEMA EIA/EA LEAD EXPERT
Alfred Owino
NEMA Reg. No.: 6429

Signature: _____
Date: 10/11/2025

CENTRIC AFRICA LIMITED
P. O. Box 102081 - 00101
NAIROBI, KENYA

PROPONENT

International Housing Solutions
A HUNT COMPANY

Eldama Park, Tsavo Block, 3rd Floor,
Off Eldama Ravine Road, Westlands.
P. O. Box 856 – 00606, Nairobi, Kenya.

For and on Behalf of:
International Housing Solutions (IHS Kenya)
Beatrice Karanja
ESG Specialist
Signature: _____

Date: _____

10/11/2025

INTERNATIONAL HOUSING SOLUTIONS (K) P.O. Box 16725 - 00620, NAIROBI
10 NOV 2025

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LIST OF ACRONYMS/ABBREVIATIONS

1 LIST OF ACRONYMS / ABBREVIATIONS

Acronym	Meaning
AIA	Area of Influence
ASL	Above Sea Level
AQS	Air Quality Standards
BETA	Bottom–Up Economic Transformation Agenda
BoQ	Bill of Quantities
CBO	Community-Based Organisation
CIDP	County Integrated Development Plan
CO_2	Carbon Dioxide
CoK	Constitution of Kenya
CPU	County Planning Unit
DCC	Deputy County Commissioner
EA	Environmental Audit
EDGE	Excellence in Design for Greater Efficiencies
EHS	Environment, Health, and Safety
EIA	Environmental Impact Assessment
EIB	European Investment Bank
EMCA	Environmental Management and Coordination Act
EO	Environmental Officer
EPRA	Energy and Petroleum Regulatory Authority
ESIA	Environmental and Social Impact Assessment
ESMP	Environmental and Social Management Plan
ESS	Environmental and Social Standards (EIB)
FGD	Focus Group Discussion
FGD-Y	Youth Focus Group Discussion
GBV	Gender-Based Violence
GHG	Greenhouse Gas
GIS	Geographic Information System

Acronym	Meaning
GRM	Grievance Redress Mechanism
HIV/AIDS	Human Immunodeficiency Virus / Acquired Immunodeficiency Syndrome
HSE	Health, Safety and Environment
ICT	Information and Communication Technology
IEBC	Independent Electoral and Boundaries Commission
IFC	International Finance Corporation
IHS	International Housing Solutions
KFS	Kenya Forest Service
KEBS	Kenya Bureau of Standards
KMD	Kenya Meteorological Department
KPLC	Kenya Power and Lighting Company
KRA	Kenya Revenue Authority
KURA	Kenya Urban Roads Authority
LDP	Local Development Plan
LPG	Liquefied Petroleum Gas
LR	Land Reference
M&E	Monitoring and Evaluation
MEP	Mechanical, Electrical and Plumbing
MoH	Ministry of Health
MoWSI	Ministry of Water, Sanitation and Irrigation
MBBR	Moving Bed Biofilm Reactor
NCCG	Nairobi City County Government
NCA	National Construction Authority
NCWSC	Nairobi City Water and Sewerage Company
NEMA	National Environment Management Authority
NGO	Non-Governmental Organization
NMT	Non-Motorized Transport
OHS	Occupational Health and Safety
OSH	Occupational Safety and Health
PAP	Project Affected Person

Acronym	Meaning
PCU	Project Coordination Unit
PEFA	Public Expenditure and Financial Accountability
PPP	Public-Private Partnership
PWD	Persons with Disabilities
RAP	Resettlement Action Plan
RoW	Right of Way
SEA/SH	Sexual Exploitation, Abuse and Sexual Harassment
SDG	Sustainable Development Goal
SWM	Solid Waste Management
TOR	Terms of Reference
TSS	Total Suspended Solids
UNDP	United Nations Development Programme
USD	United States Dollar
WRA	Water Resources Authority
WASH	Water, Sanitation and Hygiene

EXECUTIVE SUMMARY

The proposed project by International Housing Solutions (IHS Kenya) involves the development of approximately 240 modern, environmentally friendly apartments at Riruta, Dagoretti Sub-county, Nairobi City County. This ESIA was conducted by Centric Africa Limited in compliance with the Kenyan Environmental Management and Coordination Act, EMCA 1999 and the European Investment Bank (EIB) Environmental and Social Standards.

Given the project's urban location, key anticipated impacts relate to drainage pressures along the Ndwaru Road engineered stormwater channel, traffic flow on Ndwaru Road, construction-related emissions, and utility demand. The project integrates mitigation measures including KURA-compliant stormwater buffers, connection to the existing NCWSC sewer line currently being extended to the Keza apartments, efficient energy and water systems, strict construction controls, and implementation of a comprehensive ESMP.

Based on the findings, the ESIA concludes that the project is environmentally and socially acceptable subject to full implementation of the ESMP and statutory conditions.

Project Description

The proposed Riruta Keza IHS Affordable Housing Project is a sustainable residential development by IHS Kenya Limited, located within Riruta area, Riruta Ward, Dagoretti South Sub-County, Nairobi City County. The proposed project is a modern, medium- to high-density residential development positioned within a rapidly evolving urban corridor along Ndwaru Road.

The project comprises: A single L-shaped residential block rising to 16 storeys, aligned with Nairobi County zoning for high-density residential development; 240 apartments of mixed typology; Integrated internal access roads, parking facilities, landscaped areas, open spaces, and communal amenities; and full connection to NCWSC piped water, NCWSC sewer, via the newly upgraded line serving Keza developments, KPLC electricity, and ICT networks. Sustainability features aligned to IFC EDGE certification, including energy-efficient lighting, low-flow water fixtures, water-saving landscaping, and environmentally sound materials.

The project seeks to:

- Increase access to affordable and sustainable housing in Nairobi.
- Promote green building technologies in line with the EIB Climate Bank Roadmap (2021–2025).
- Stimulate local employment and enterprise development during construction and operation.

ESIA Methodology

The ESIA was conducted in compliance with the Environmental Management and Coordination Act (Cap 387), the Environmental (Impact Assessment and Audit) Regulations, 2003 (Revised 2019), and the EIB Environmental and Social Standards (2022).

Key methodological steps included:

- Screening and Scoping: Determining the need for a full ESIA under EMCA and EIB Category B screening criteria, defining the Area of Influence, and identifying priority issues.
- Document Review: Analysis of applicable policy and regulatory documents (EMCA, CIDP, zoning plans, WRA guidelines and reconnaissance studies).
- Baseline Data Collection: Compilation of primary (field investigations, sampling, and interviews) and secondary data (published and institutional sources) on environmental, biophysical, and socio-economic aspects.

- Stakeholder Consultations: Conducted on 7th, 14th and 21st October 2025 with over 150 participants, including community members, local institutions, and authorities.
- Impact Identification and Evaluation: Using the mitigation hierarchy (avoid, minimize, reduce, compensate) and EIB ESS criteria.
- Development of Mitigation and Monitoring Measures: Resulting in the Environmental and Social Management Plan (ESMP) (Chapter 10).
- Reporting: Preparation of this ESIA Study Report for submission to NEMA and disclosure to stakeholders.

The project also aligns with EIB ESS 1–10, IFC Performance Standards, and the EIB Climate Bank Roadmap (2021–2025).

Project Area Baseline

The Karen End area lies within the Nairobi Basin and is characterized by:

- ✓ Topography: Gently sloping terrain falling eastwards to the Ndwaru engineered stormwater drainage channel.
- ✓ Soils: Sandy clays derived from weathered volcanic deposits; moderate permeability; seasonally shallow groundwater.
- ✓ Hydrology: No natural watercourse on-site; the Ndwaru drainage channel is an engineered KURA drain; not requiring WRA riparian reserve but subject to 3–6 m service buffer.
- ✓ Climate: Sub-humid, with bimodal rains and moderate temperatures typical of Nairobi West.
- ✓ Air & Noise Baseline: Within NEMA standards, with slight increases along Ndwaru Road from traffic and informal businesses.

Biodiversity

The site hosts anthropic (modified) vegetation, including Croton, Silver Oak, Aloe species, grasses, and scattered ornamental trees. Common urban fauna include doves, bulbuls, hadada ibis, rodents, and insects, none of conservation concern.

Socio-economic Setting

- ✓ Mixed residential and small commercial land uses dominate the Ndwaru corridor.
- ✓ High urbanization pressure with rising demand for regulated multi-dwelling units.
- ✓ Basic services (water, sewer, electricity, schools, health facilities) are accessible.
- ✓ Vulnerable groups include low-income households, women, PWDs, and informal workers, whose specific concerns were captured in the stakeholder consultations.

Legal Framework

The ESIA was undertaken within the framework of national and county legislation, international conventions, and lender (EIB) standards.

Key statutes reviewed include:

- ✓ The Environment Management and Co-ordination Act (Cap 387)
- ✓ County Governments Act (Cap 265)
- ✓ Land Act, 2012
- ✓ Water Act (Cap 372)
- ✓ Forest Conservation and Management Act (Cap 385)
- ✓ Physical and Land Use Planning Act (Cap 303)
- ✓ Public Health Act (Cap 242)
- ✓ Penal Code Act (Cap. 63)
- ✓ Work Injury Benefits Act (Cap 236)
- ✓ Employment Act (Cap 226)

- ✓ Standards Act (Cap 496)
- ✓ Occupiers' Liability Act (Cap 34)
- ✓ Occupational Safety and Health Act (Cap 236A)
- ✓ Energy Act (Cap 314)
- ✓ National Construction Authority Act (Cap 118)
- ✓ Sustainable Waste Management Act, 2022
- ✓ Climate Change Act (Cap 387A)
- ✓ National Museums and Heritage Act (Cap 216)
- ✓ Sexual Offences Act (Cap 63A)
- ✓ HIV/ AIDS Prevention and Control Act (Cap 246A)
- ✓ Persons with Disabilities Act (Cap 133)
- ✓ Affordable Housing Act, 2024
- ✓ National Building Code, 2024

Stakeholder Engagement

Stakeholder engagement followed EMCA requirements and EIB ESS2 principles. Key participants included:

- Local residents along Ndwaru Road and Riruta neighbourhood
- Ndwaru Road Royal Academy and Havard School
- Business operators and landlords
- Women, youth, and community groups
- Nairobi City County departments (Environment, Planning, Public Health, Water, Roads)

Key stakeholder concerns:

- Stakeholder engagement followed EMCA requirements and EIB ESS2 principles.
- Key participants included:
- Local residents along Ndwaru Road and Riruta neighbourhood
- Ndwaru Road Royal Academy and Havard School
- Business operators and landlords
- Women, youth, and community groups

Stakeholder inputs informed project design, access control, drainage planning, and labour inclusion measures. A Grievance Redress Mechanism has been established and will remain operational throughout construction and occupancy.

Potential impacts and mitigation measures

The ESIA identified a range of potential environmental and social impacts associated with the construction, operation, and decommissioning phases.

Anticipated positive impacts

- Optimal and sustainable use of urban land.
- Increased housing supply and improved living standards.
- Local employment and income generation.
- Strengthened community infrastructure and utilities.
- Improved security through planned development.
- Skills transfer and youth empowerment.
- Increased county and national government revenue.

Opportunities and measures to enhance environmental and social and augment positive impacts

The proposed green affordable housing project will have immense opportunities to enhance environmental and social impacts. First, the proposed design prioritizes energy efficiency, water conservation, and sustainable materials. Renewable energy integration is incorporated, and green

spaces will actualise the "greening plans" expected, especially during the occupation phase. Several waste management and water conservation measures shall be implemented during construction and operation phases. Community engagement will foster inclusivity, social services, and employment opportunities while transportation planning will integrate public transit. Monitoring and evaluation measures will improve the proposed housing project's sustainability performance.

Anticipated negative impacts and mitigation measures

The major mitigation/enhancement measures to address the more significant impacts for the construction and operation phases of the proposed housing project include the following (for a comprehensive list of mitigation measures please refer to the mitigation measures section in the ESIA report and Environmental and Social Management Plan, ESMP):

Table 0-1: Summary of pre-mitigation significance during construction phase

Impact	Pre-Mitigation Significance	Residual Impact Significance (Post-Mitigation)
Air pollution (dust, exhaust)	Moderate negative	Minor negative
Soil disturbance and erosion	Moderate negative	Minor negative
Noise and vibration	Moderate negative	Minor negative
Alteration of Drainage and Stormwater Patterns	Moderate negative	Minor – low negative
Changes in hydrology and drainage	Moderate negative	Minor negative
Water resources (use and pollution)	Moderate negative	Minor negative
Energy consumption and GHG emissions	Moderate negative	Minor negative
Oil leaks and spills	Minor – moderate negative	Minor negative
Occupational and public health and safety	Moderate negative	Minor negative
Fire safety and preparedness	Minor negative	Minor negative
Wastewater generation	Moderate negative	Minor negative
Solid waste management	Moderate negative	Minor negative
Security and social impacts	Moderate negative	Minor negative
Traffic and movement	Moderate negative	Minor negative
Gender-Based Violence / SEA–SH risks	Moderate negative	Negligible – low negative
Risk of exclusion of vulnerable groups	Minor negative	Negligible
Cultural heritage / chance finds	Minor negative	Negligible
Visual intrusion / landscape alteration	Minor negative	Negligible
Cumulative infrastructure impact	Moderate negative	Minor negative

All negative impacts associated with the Project have been mitigated to a level which is deemed appropriate for the construction phase to proceed.

Table 0-2: Summary of pre-mitigation significance during operational phase

Impact	Pre-Mitigation Significance	Residual Impact Significance (Post-Mitigation)
Air pollution (indoor / ambient)	Moderate – minor negative	Minor negative
Noise and vibration	Minor negative	Minor negative
Changes in hydrology and drainage	Moderate negative	Minor negative
Water resources (supply and demand)	Moderate negative	Minor negative
Energy efficiency / GHG emissions	Moderate negative	Minor negative
Biodiversity management	Moderate negative	Negligible
Oil pollution (parking and service areas)	Moderate negative	Minor negative
Wastewater and sanitation	Moderate negative	Minor negative
Solid waste management	Moderate negative	Minor negative
Fire safety and preparedness	Minor negative	Negligible
Public and occupational health and safety	Minor negative	Negligible
Security and social impacts	Minor negative	Negligible – positive
Traffic management and parking	Minor negative	Minor negative
Visual aesthetics / urban character	Minor negative	Negligible
Inclusion of vulnerable groups (PWDs, elderly, women)	Minor negative	Negligible
Social cohesion and integration	Minor negative	Negligible – positive
Cumulative infrastructure impact	Moderate negative	Minor negative
Community grievance and engagement	Minor negative	Negligible – positive

All negative impacts associated with the Project have been mitigated to a level which is deemed appropriate for the occupational phase of the proposed housing project to be sustainable.

Conclusion and recommendations

Centric Africa is confident that every effort will be made by IHS to accommodate the mitigation measures recommended during the ESIA process to the extent that is practically possible, without compromising the economic viability of the proposed housing project. The implementation of the mitigation measures as detailed in Chapters 8, 9 and 10 will provide a basis for ensuring that the potential positive and negative impacts associated with the establishment of the development are enhanced and mitigated to a level which is deemed adequate for the development to proceed. In summary, based on the findings of this assessment, Centric Africa Limited finds no reason why the proposed green affordable housing units by IHS should not be authorized, contingent on the mitigations for potential environmental and socio-economic impacts as outlined in the ESMP.

2 CHAPTER 1: INTRODUCTION

2.1 Overview

The Government of Kenya, through the Bottom-Up Economic Transformation Agenda for Inclusive Growth under the Fourth Medium Term Plan (2023-2027), has prioritized housing and settlement as one of its five core pillars for national development. This plan aims to increase affordable housing and improve settlement conditions, supporting inclusive economic growth, addressing housing shortages, and creating jobs.

It is against this backdrop that International Housing Solutions-Kenya (IHS), herein referred to as the proponent/developer, financed by the European Investment Bank (EIB), proposes to develop and sell approximately 240 green affordable housing units. The proposed development, referred to as the "Riruta Keza IHS Housing Project," is located on L.R. No. Dagoretti/Riruta/6004 (Nairobi Block 66/6004) off the Naivasha Road, along Ndwaru Road in Riruta Location, Dagoretti South Sub-County, Nairobi City County. The main goal of this investment is to provide accessible and environmentally friendly affordable housing units for sale to potential buyers in Kenya.

IHS has contracted Centric Africa Limited (herein referred to as the consultant) to undertake an Environmental and Social Impact Assessment (ESIA) study for the proposed project. The ESIA covered all project phases: pre-construction, construction, and operational. The legal authority for this study stems from the Environmental Management and Co-ordination Act (EMCA), 1999 (amended 2015), and the Environmental (Impact Assessment and Audit) Regulations, 2003 (Legal Notice No. 101, revised 2019), which requires the proponent to prepare an ESIA Report for approval by the National Environment Management Authority (NEMA) prior to commencement of such development.

2.2 Purpose of the Report

The information contained in this report, along with comments and inputs received from stakeholders, will assist the competent authority (NEMA) in deciding whether or not to grant environmental authorization for the proposed project and inform the conditions associated with such authorizations. The ESIA process involved the identification, prediction, and evaluation of the actual and potential environmental and social impacts of the proposed housing project. This report outlines the proposed mitigation measures for negative impacts and enhancement measures for positive impacts that the proposed project will implement.

2.3 Project Objectives

The overall objective of the proposed project is to develop 240 green affordable housing units for the local and national markets on L.R. No. Dagoretti/Riruta/6004 (Nairobi Block 66/6004). Directly linked to the overall objective is a specific objective to support the development of accessible, robust, and green affordable housing for sale to potential buyers in Kenya.

2.4 Scope of the ESIA

The proposed project requires a comprehensive ESIA study in compliance with the applicable laws and regulations of Kenya concerning environmental, health, and safety standards, as well as the EIB Environmental and Social Safeguard (2022). This ESIA took into consideration all environmental and social impacts and identified the main aspects to optimize the project by avoiding, minimizing, or offsetting negative impacts and enhancing positive impacts. The ESIA further aimed at developing a cost-effective Environmental and Social Management Plan for the lifetime of the project.

The ESIA team conducted the assessment by incorporating the specific Terms of Reference approved by NEMA for the Karen End Housing Project, including:

- The description of the proposed location, including baseline information
- A concise description of the national environmental legislative and regulatory framework, baseline information, and any other relevant information related to the project.
- The technology, procedures, and processes to be used in the implementation of the project
- The materials to be used in the construction and implementation of the project
- Project description and layout plan. The location, project site, and architectural designs for the overall project;
- A description of the potentially affected environment, including hydrology, micro-climate, biological environment; and socioeconomics associated with the proposed project;
- The environmental effects of the project, including any direct, indirect, cumulative, irreversible, short-term, and long-term effects anticipated,
- Analysis of alternatives, including project site, design, and technologies.
- An environmental management plan proposing measures for eliminating, minimizing, or mitigating adverse impacts on the environment, including the cost, timeframe, and responsibility to implement the measures.
- Propose measures to prevent health hazards and to ensure security in the working environment for the employees, residents, and management in case of emergencies.
- Such other matters as the relevant authority requires.

2.5 Project Proponent

Established in 2005, the International Housing Solutions (IHS Kenya), a pioneer in the green affordable housing sector and has built a strong reputation by successfully financing the construction and delivery of new homes while building sustainable communities. The group has established long-term partnerships with key stakeholders, which allows them to bring together the necessary elements for creating successful investments in the affordable housing market. The certificate of registration and KRA Pin certificate is attached under Annex 1.

2.6 ESIA Consultant

Centric Africa Limited was contracted by IHS to undertake the ESIA for the proposed project. Centric Africa Limited is a regional environmental consulting organization with a wide range of experience in delivering ESIA in Kenya and Africa. The firm is registered and licensed with NEMA as a Firm of Environmental Impact Assessment/Audit Experts, with NEMA Reg. No. 7112. The NEMA licence is attached under Annex 2.

2.7 Report Structure

The structure of this ESIA Report is outlined as follows:

Chapter 1	:	Introduction
Chapter 2	:	Methodology and approach
Chapter 3	:	Project description
Chapter 4	:	Biophysical and socioeconomic baselines
Chapter 5	:	Legal and institutional framework
Chapter 6	:	Stakeholder engagement
Chapter 7	:	Analysis of alternatives
Chapter 8	:	Anticipated impacts and mitigation measures overview
Chapter 9	:	Occupational health and safety and grievance redress mechanism
Chapter 10	:	Environmental and Social Management Plan (ESMP)
Chapter 11	:	Conclusion and recommendations
References	:	Contains a list of references used in compiling the report.
Annexure	:	Contains relevant documents associated with the project

3 CHAPTER 2: METHODOLOGY AND APPROACH

3.1 Overview

The ESIA for the proposed Karen End Housing Project was carried out in fulfillment of the Environmental Management and Co-ordination Act (EMCA), 1999 (amended 2015), and the Environmental (Impact Assessment and Audit) Regulations, 2003 (revised 2019), specifically Legal Notice No. 101. Additionally, the methodology aligns with the EIB Environmental and Social Standards (2022) to ensure an internationally compliant assessment.

This detailed approach serves to identify all potential adverse environmental and social impacts arising from the project phases and develop a comprehensive mitigation and management plan.

3.2 ESIA Objectives

The objectives of this ESIA were specifically tailored to the Riruta Housing Project context:

- Identify all potential significant adverse environmental and social impacts of the proposed green affordable housing project and recommend measures for avoidance or mitigation.
- Generate baseline data that will be used to monitor and evaluate the mitigation measures implemented during the project cycle.
- Recommend cost-effective measures to be used to avoid or reduce the anticipated negative impacts and enhance the positive impacts;
- To analyze feasible alternatives, including access options, wastewater treatment technologies, and design layouts, to ensure the optimal and most sustainable project configuration, and
- Prepare an ESIA report compliant with EMCA and the Environmental (Impact Assessment and Audit) Regulations (2003), and the EIB Environmental and Social Standards, detailing findings and recommendations and a cost effective ESMP.

3.3 Screening

The screening process was conducted to formally determine the legal requirement for a full ESIA, based on national and lender criteria of EMCA 1999 (amended 2015), second schedule and EIB standards respectfully. The project characteristics were considered, highlighting the proposed development to involve the establishment of a new housing multilevel blocks of approximately 240 residential units on a 1acre parcel.

The national legal requirement for projects involving the establishment of new housing estate developments exceeding 200 housing units are explicitly listed in the Second Schedule of EMCA (Cap 387) as projects for which an EIA is mandatory. Whereas, EIB standards falls under Category B of the EIB project screening categories. Category B projects, particularly those related to urban development and housing, require the competent authority (NEMA) to determine the need for an EIA based on Annex 2 criteria, thus confirming the need for a full ESIA.

Based on these regulatory and scale-based criteria, it was concluded that a detailed ESIA study was mandatory for the proposed Karen End Housing Project. The Terms of Reference for the ESIA were subsequently approved by NEMA, the TOR approval is attached under Annex 15: NEMA-Approved ESIA ToR.

3.4 Scoping

As the first step of the ESIA process, a scoping study was undertaken to define the boundaries and focus of the full assessment. The objectives of the scoping exercise were to establish the Area of Influence and identify and prioritize the potentially significant environmental and social issues specific to the Karen End site that would require detailed investigation.

As part of the scoping the following activities were undertaken:

- Identification of sources of data on baseline conditions of the proposed project area;
- Establishing the project boundaries and defining the immediate surrounding environment.
- Determination of the likely area of influence to be considered in the ESIA;
- Consideration of alternatives related to the proposed housing project;
- Identification and consultation with stakeholders who would be interested and/or affected by the proposed project;
- Identification of cross-sectoral issues and impacts, prioritizing them on a shortlist which would need to be considered as part of the ESIA;
- Defining the environmental and legislative setting of the proposed housing project.

3.5 Baseline Data Collection

In order to understand the existing baseline environmental and social conditions in the Riruta area, a variety of data collection methods were undertaken, ensuring the data collected informs the detailed impact assessment.

3.5.1 Document Review

A comprehensive desktop literature review was conducted as part of the scoping process, involving the systematic compilation and analysis of relevant secondary data. This review was essential for establishing the legal, institutional, and environmental context of the proposed project, particularly regarding legal and regulatory frameworks, physical planning documents, site specific technical data, and varied ancillary data.

The specific activities covered entailed reviewing of EMCA Cap 387, the EIA/EA Regulations 2003, (revised 2019), NEMA sectoral regulations[1], and the EIB Environmental and Social Standards. The planning documents included but not limited to Nairobi City CIDP, relevant sub-county physical plans, and zoning regulations to confirm the suitability of high-density residential use in the area. Other technical documents reviewed included the existing reconnaissance reports and specialized surveys. This information was crucial for designing the E&S mitigation measures for the project. Additionally, ancillary data was obtained to assess the cumulative impacts. The desk study outcomes guided the development of specialized fieldwork tools, baseline sampling protocols, and the Public Consultation and Disclosure Plan.

3.5.2 Site Visits

A series of targeted site visits were conducted to collect primary environmental and social baseline data and ground-truth desktop findings. The consultant conducted the initial site reconnaissance visit on 26th September 2025. The ESIA Team, accompanied by Mr. Nimrod Mureithi from Keza-Mivida Homes, the IHS project management representative, confirmed the project's precise location and its position relative to Ndwaru Road, the existing access roads, and the Keza developments adjacent to the site. The initial

[1] including recently published regulation incl. Water Quality Regulations, 2024; Waste Management Regulations, 2024

site visit observed key infrastructural upgrades and development within the project area that includes installation of sewer line connection to the existing masterplan, and ongoing construction to the immediate south of the site. Further intensive scoping and baseline verification visits were undertaken on 7th of October, 14th of October and the 21st of October 2025. During the site visits, photography was also used to record the salient features and baseline conditions of the project site and its surroundings. The photos were used to define existing features in the project area and identify fauna and flora species. Photography was combined with walks within and around the project site to identify possible impacts of the proposed project. All the relevant images were stored and are attached to this report.

3.6 Stakeholder Engagement

Stakeholder engagement is a core element of this ESIA, mandated by both the Constitution of Kenya, 2010 (Article 69), the EMCA (Cap 387), and the EIB ESS Standard 2. It ensures that the views and concerns of Project Affected Persons (PAPs) and Interested and Affected Parties are systematically incorporated into the project's planning and design. This is crucial for anticipating community issues and minimizing potential opposition, thereby adopting workable and sustainable models. The ultimate objective is to obtain and incorporate stakeholder inputs, concerns, and recommendations into the project design. This is to be achieved by considering the stakeholder engagement period, consultation scope, methodology to be deployed, and the documentation.

The open and inclusive consultation process was conducted on 7th October 2025, 14th October 2025 and 21st October 2025 at the proposed site area within Riruta. During the stakeholder engagement process, over 150 individuals were consulted within and around the project area, and their comments and concerns were recorded and incorporated into the ESIA Study Report. Their continued involvement in the ESIA process and project implementation was always encouraged. The meetings and interviews took place in the stakeholder's choice of language (English and Kiswahili) and were translated where necessary.

3.7 Impact Assessment Methodology

The purpose of this impact assessment is to systematically identify and evaluate the significance of all potential impacts on the defined environmental and social receptors and resources within the Karen End Project's Area of Influence. The outcomes directly inform the development of pragmatic mitigation and enhancement measures in compliance with both national and international standards.

The overall methodology followed a precautionary approach and was structured around the principles of the mitigation hierarchy (Avoid, Minimize, Reduce, Compensate). Impacts were first distinguished as either positive or negative. The primary cross-sectoral issues assessed, given the site's unique constraints, included but not limited to: air pollution and waste management, pressure on water/energy supply, wastewater management, and socio-economic aspects.

3.7.1 Definition of Key Terminology

Key terminology is defined as per the EMCA Cap 387 and the EIA/EA Regulations.

Environmental and Social Impact Assessment (ESIA):	Means a systematic study conducted to determine whether or not a project will have any adverse impacts on the environment as stipulated in section 58 of EMCA, 1999 and Regulations 11 to 17 of the Environmental (Impact Assessment and Audit) Regulations, 2003.
Project:	The components and actions that are essential to the Proponent's Project development, including any related facilities that are required for the Project to move forward. The 240 residential units and ancillary infrastructure constitute the Project.

Project Site:	The primary operational area for the Project activities, specifically L.R. No. Dagoretti/Riruta/6004 (Nairobi Block 66/6004).
Project Footprint:	The area that may reasonably be expected to be directly affected by project activities, across all phases, including temporary disturbance areas like laydown and haul routes, both public and private.
Area of Influence:	The area where direct, indirect, or cumulative impacts could reasonably be expected, extending beyond the site to encompass the local community, the immediate road network, and the adjacent stream catchment

3.7.2 Impact Types and Definitions

An impact represents any change to a resource or receptor resulting from a project activity. The impacts are categorized as provided in **Table 3-1** below.

Table 3-1: Impact nature and type

Nature or Type	Definition
Positive	An impact that is considered to represent an improvement on the baseline or introduces a positive change
Negative	An impact that is considered to represent an adverse change from the baseline or introduces a new undesirable factor.
Direct impact	Impacts resulting from a direct interaction between a planned project activity and the receiving environment/receptors
Indirect impact	Impacts resulting from other activities encouraged by the Project such as increased in-migration for employment placing demand on local utilities
Cumulative impact	Impacts that act together with other concurrent or planned activities like, development in the adjacent properties or Ndwaru Road traffic, to affect the same resources and/or receptors as the Project.

3.7.3 Assessing Significance

Impacts are quantitatively described in terms of 'significance', which is a function of the Magnitude that shows the severity and the Likelihood that shows the probability of the impact occurring. This systematic scoring method, derived from international best practice, ensures objectivity and transparency in assessing environmental effects appropriately.

A. Magnitude/Severity Criteria

Impact magnitude or severity is assessed based on three criteria: *Extent, Duration,* and *Intensity*. The intensity is specifically differentiated for biophysical and socio-economic contexts to ensure appropriate weighting of risks, such as the site's geotechnical sensitivity or community vulnerability.

Table 3-2: Significance criteria

Impact	Magnitude	Criteria
Extent	**On-site**	Impacts that are limited to the boundaries of the development site.
	Local	Impacts that affect an area in a radius of 20km around the development site.
	Regional	Impacts that affect regionally important environmental resources or are experienced at a regional scale as determined by administrative boundaries.

	National	Impacts that affect nationally important environmental resources or affect an area that is nationally important/ or have macro-economic consequences.
Duration	**Short-term**	Impacts that are predicted to last only for the duration of the construction period.
	Long-term	Impacts that will continue for the life of the project but ceases when the project stops operating.
	Permanent	Impacts that cause a permanent change in the affected receptor or resource like the removal or destruction of ecological habitat, that endures substantially beyond the project lifetime.
Intensity (Biophysical)	**High**	Where natural functions or processes are altered to the extent that they will temporarily or permanently cease.
Intensity (Socio-Economic)	**High**	Affected people/communities will not be able to adapt to changes or continue to maintain-pre-impact livelihoods.

B. Likelihood Criteria

Likelihood measures the probability of an impact occurring and is combined with Magnitude to determine the final Significance rating.

Table 3-3: Likelihood criteria

Impact	Likelihood
Unlikely	The impact is unlikely to occur.
Likely	The impact is likely to occur under most conditions.
Definite	The impact will occur.

C. Significance Rating

The matrix combination of Magnitude and Likelihood results in the final significance rating (**Negligible**, **Minor**, **Moderate**, **or Major**), guiding the prioritization of mitigation measures to achieve the goal of reducing all negative impacts to an acceptable residual level. See **Table 3-4** and **Table 3-5** below.

Table 3-4: Significance colour scale

Impact	Colour code
Negligible	
Minor	
Moderate	
Major	

It is important to note that the positive impacts are not rated, merely stated.

Table 3-5: Significance definitions

Significance	Definitions
Negligible significance	An impact of negligible significance is where a resource or receptor will not be affected in any way by a particular activity, or the predicted effect is deemed to be 'negligible' or 'imperceptible'.
Minor significance	An impact of minor significance is one where an effect will be experienced, but the impact magnitude is sufficiently small and well within accepted standards, and/or the receptor is of low sensitivity/value.
Moderate significance	An impact of moderate significance is one within accepted limits and standards. The emphasis is on demonstrating that the impact has been reduced to a level that is As Low as Reasonably Practicable (ALARP).
Major significance	An impact of major significance is one where an accepted limit or standard may be exceeded, or large magnitude impacts occur to highly valued/sensitive resource/receptors.

3.7.4 Mitigation Measures and Residual Impacts

This section establishes the formal process for the mitigation hierarchy, ensuring that measures are explicitly defined and costed for the ESMP, and that the project's success is ultimately measured by the resulting Residual Impact. Mitigation measures are formulated to be incorporated into the project design and are intended to form the basis of the NEMA Conditions of Approval.

Table 3-6: Mitigation measures and residual impacts

Mitigation Measures:	For activities with significant impacts, suitable and practical measures are identified in collaboration with the developer to avoid, reduce the negative impacts, or enhance the positive impacts.
Residual Impact:	The impact is reassessed after assuming the appropriate mitigation measure(s) are effectively applied, resulting in a significance rating for the residual impact. The goal is to avoid any major residual impacts, particularly those that are permanent

3.8 Reporting

This ESIA Study Report, developed as a result of the systematic ESIA process, is the formal document submitted to NEMA for regulatory review and decision-making on environmental authorization.

3.9 Assumptions and Limitations

An ESIA inherently deals with prediction and future uncertainty. This assessment adopts a precautionary approach where, if direct predictions were not possible, such as precise water quality changes, a conservative judgment based on professional experience and similar projects was applied to determine the likelihood of a significant impact. This ensures that the environmental management strategies are robust enough to cover reasonable worst-case scenarios.

4 CHAPTER 3: PROJECT DESCRIPTION

4.1 Overview

This Chapter presents a detailed description of the proposed Riruta Housing Project by the proponent, IHS, covering the full lifecycle of design, construction, operation and maintenance. It describes the project concept, physical components, required infrastructure and utilities, access and servicing, and the expected operational regime. The intent is to provide a clear baseline of the project scope and parameters to inform the subsequent impact identification and mitigation measures. The Project involves delivery of a mixed-residential housing estate in the Riruta, along Ndwaru Road area of Nairobi, targeting a range of green affordable residential units together with ancillary facilities, landscaped open space, and supporting infrastructure; roads, services, and utilities. The housing estate is designed to EDGE meet green building standards and sustainability criteria whilst addressing market demand for mid-to-upper-end residential accommodation in Riruta, Dagoretti and the greater Nairobi area.

Key project activities include: Site preparation works that include clearance of vegetation and debris, geotechnical investigations, controlled earthworks, grading, and surface drainage establishment; Foundation and superstructure works: construction of reinforced concrete-framed apartment blocks founded on site-specific engineered substructures designed to accommodate the area's clayey soils and local hydrogeological conditions; Building construction and finishes: erection of multi-storey residential units, installation of mechanical, electrical, and plumbing systems, and application of durable, low-VOC interior and exterior finishes; Utility and infrastructure development: connection to existing municipal networks for water supply, power (KPLC), ICT, and integration of an on-site wastewater treatment system compliant with NEMA and WRA standards; Stormwater management: landscaping and amenities; access and circulation; and energy and sustainability integration.

The project seeks to demonstrate a replicable model of sustainable urban housing that integrates environmental management, social inclusion, and modern infrastructure to improve the urban living conditions of Nairobi's residents. The development directly contributes to the government's BETA Agenda through creation of local employment, promotion of climate-resilient building practices, and expansion of the city's affordable housing stock.

4.2 Project Location and Context

4.2.1 Administrative and geographical setting

The proposed housing project is located within Riruta Ward, Dagoretti South Sub-County, Nairobi City County, Kenya. The project site forms part of the broader Dagoretti South Constituency, which has experienced steady residential concentration over the past decade due to its proximity to Nairobi's western transport corridors and expanding housing market.

Geographically, the site lies approximately 9 kilometres west of the Nairobi Central Business District and is positioned along the Ndwaru Road corridor. The approximate central coordinates of the site are Latitude 1°16'47.3"S and Longitude 36°44'01.7"E. The area is accessible and well connected to the rest of the city via Ndwaru Road to the immediate north, Naivasha Road (200 m east, and 1.9 m west of the site) and Dagoretti Road (about 500 m to the south).

The Riruta area is designated under the CIDP 2023–2027, as a medium- to high-density residential growth zone supporting sustainable housing and infrastructure improvements.

4.2.2 Site location, access and surrounding land uses

The project site fronts Ndwaru Road, a bitumen-surfaced secondary urban road that connects to Naivasha Road toward the east and the Dagoretti Road toward the south-west. The site is reached directly from Ndwaru Road through an existing access, which will be upgraded to meet County standards and accommodate construction and operational traffic.

Surrounding land uses reflect the area's mixed urban character, transitioning from older low-cost housing to modern apartment developments. The immediate neighbourhood comprises residential, educational, and small-scale commercial land uses, as detailed below:

The Table 4-1 below highlights the details immediate neighbourhood.

Table 4-1: Surrounding Land Uses include

North:	Ndwaru Road defines the northern boundary of the site. Across the road are groceries, tailoring shops, small convenience outlets, low-cost housing units, medium-rise residential flats, and small urban farms. Also located along this frontage is the Ndwaru Road Royal Academy, a local primary school.
East:	The eastern boundary adjoins existing residential homes and apartments, as well as small retail businesses. The ACT St. Matthews Riruta West Parish church lies nearby, with Naivasha Road situated approximately 200 metres east of the site, providing regional access.
South:	Immediately south of the site are the Keza Apartments and other recently developed residential blocks of similar design and scale, together with local retail outlets and service businesses. Dagoretti Road lies about 500 metres to the south, linking the area to Dagoretti Corner and the wider city road network.
West:	The western side neighbours the Havard School and Havard Apartments, alongside several other private residential homes and multi-storey flats typical of the Riruta landscape.

This mixed-use setting positions the proposed project within a fully serviced and rapidly densifying urban environment, supported by public utilities and existing sewer infrastructure along Ndwaru Road. Figure 4-1 below presents the location of the project site within Nairobi City County.

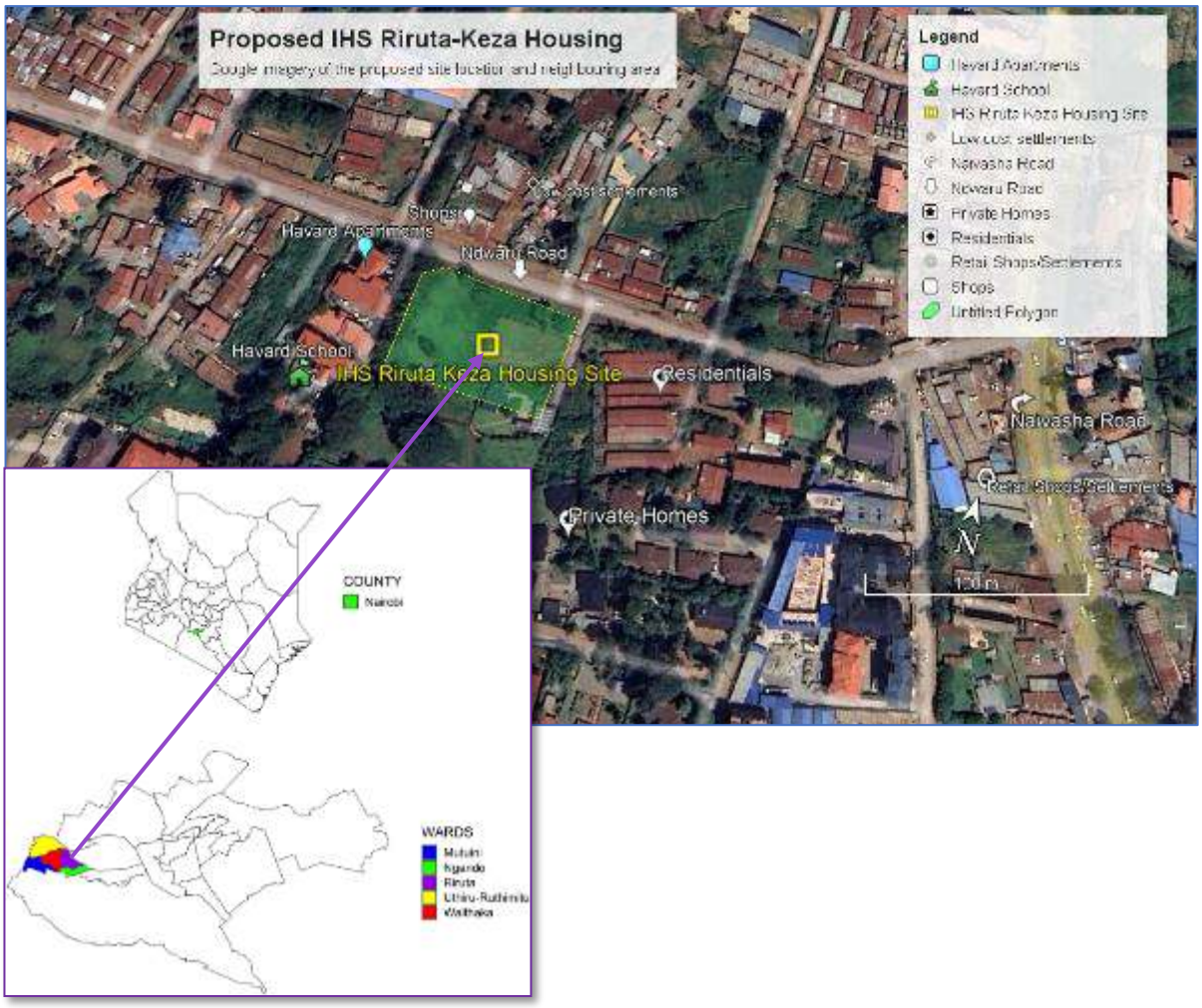


Figure 4-1: Project site location in Riruta, Nairobi City County *Source: Google Earth imagery*

4.2.3 Topography, drainage and site features

The topography of the project site is gently undulating, sloping marginally eastwards toward the existing Ndwaru Road drainage corridor. Elevation differences across the site are minor and suitable for urban construction. A shallow surface drainage channel, forming part of the Ndwaru catchment, exists near the southern boundary and will be integrated into the project's stormwater management plan.

The stormwater drainage channel is an engineered drain within the Ndwaru Road reserve, which is managed by the KURA. As a man-made drainage structure, it is not subject to WRA riparian reserve requirements. KURA and the Nairobi City County Government apply practical maintenance and safety setbacks. A 3–6 metre service buffer from the drain edge is therefore required to allow access and ensure proper stormwater flow, with no permanent structures permitted within this corridor..

Soils in the locality are primarily reddish-brown sandy clays derived from weathered volcanic deposits, with moderate permeability. Groundwater is typically shallow during rainy seasons; hence, geotechnical and hydrological investigations have been undertaken to guide appropriate foundation design and drainage control.

4.2.4 Zoning and development control compliance

The site lies within an area zoned for medium to high-density residential use under the Nairobi City County Physical and Land Use Planning Framework. The proposed single L-shaped, 16-storey

apartment block conforms with the County's objectives for urban densification, efficient land use, and infrastructure optimization in the Dagoretti South area.

The proposed project site was formerly designated for agricultural use but has since received official approval for Change of Use from Agricultural to Multi-Dwelling Units (Apartments) from the Nairobi City County Government. The approval reclassifies the land for residential redevelopment and aligns it with the County's Medium- to High-Density Residential Zone and the Nairobi CIDP 2023–2027 objective of promoting sustainable housing densification along the Ndwaru–Dagoretti corridor. All project designs have been submitted to Nairobi City County's Department of Urban Planning and Building Permits for approval, to ensure full compliance with the relevant requirements. As provided in the change of use approval, the key planning conditions for the approval is provided in the below table.

Table 4-2: Key planning conditions for the county approval

SN	Key condition	Status
1	Submission of satisfactory building plans within two years and completion of construction within three years of approval	In progress and compliant. Preliminary architectural, structural, and MEP drawings have been prepared and submitted for review under the Nairobi City County Building Approval process. Construction will commence upon receipt of NEMA licensing, within the two-year timeframe stipulated
2	Compliance with the Physical and Land Use Planning Act (2019) and the County zoning policy, including provision of adequate setbacks and maintenance of the area's residential character	Compliant. The project has obtained formal Change of Use approval from Agricultural to Multi-Dwelling Units and adheres to the Dagoretti–Riruta zoning designation for medium- to high-density residential development. The proposed L-shaped 16-storey design maintains statutory 3 m, 6 m, and 9 m setbacks and conforms to County zoning and land-use planning
3	Undertaking an ESIA and obtaining a NEMA licence prior to commencement of any works	Ongoing. The Environmental and Social Impact Assessment (ESIA) study is currently being undertaken in accordance with the Environmental (Impact Assessment and Audit) Regulations, 2003, under EMCA (Cap 387). The NEMA licensing process will be initiated upon submission of the final ESIA Study Report.
4	Provision of adequate on-site parking and observation of the prescribed 3 m, 6 m, and 9 m building lines to the satisfaction of the County's Director of Roads, Public Works & Transport	Compliant (design stage). The project layout provides adequate and functional on-site parking spaces within the ground and podium levels. The design incorporates the required 3 m, 6 m, and 9 m building line setbacks in accordance with County development control standards and the approved rezoning plan.

This approval provides the legal basis for redevelopment of the site into high-rise residential apartments and confirms conformity with both national planning legislation and local development control frameworks. Subsequent project implementation will therefore proceed under the dual oversight of Nairobi City County and NEMA, ensuring full compliance with environmental and planning statutes.

4.2.5 Neighbourhood context and sensitive receptors

The surrounding neighbourhood hosts several sensitive receptors that warrant attention during both construction and operational phases. These include:

Ndwaru Road Royal Academy to the north and Havard School to the west, which may be affected by construction noise, traffic, and dust emissions;

- ACT St. Matthews Riruta West Parish, an active place of worship located east of the site;
- Adjacent residential apartments (Keza-just completed and Havard) whose occupants may experience temporary disturbances during construction;
- The Ndwaru Road drainage corridor, a key environmental receptor requiring protection from sedimentation and pollution; and
- The Ndwaru public road corridor, which accommodates vehicular and pedestrian traffic and utilities likely to be affected by construction access.

Mitigation for these receptors will be addressed through appropriate Environmental, Social, Health and Safety measures, including dust suppression, noise control, traffic management, community communication, and buffer landscaping. Given the 16-storey configuration, additional environmental and social considerations; such as visual and skyline effects, shadowing, wind-tunnelling, traffic increase, and emergency egress design; will be carefully assessed in the impact analysis chapters of this ESIA.

4.3 Zoning and Surrounding Establishments

The proposed Riruta Housing Project site lies within a rapidly transforming urban corridor along Ndwaru Road in Dagoretti South Sub-County. The area has transitioned from predominantly agricultural and low-density residential use to a mixed pattern of medium to high-density apartment developments, supported by expanding infrastructure and proximity to major arterial roads such as Naivasha Road eastwards and Dagoretti Road to the south.

4.3.1 Neighbourhood and surrounding establishments

The immediate environs of the project reflect a mix of residential, educational, and small commercial land uses typical of the Riruta Ndwaru corridor:

Table 4-3: Land use within the immediate site boundaries

Direction	Description of land use
North	Bounded by Ndwaru Road, featuring groceries, tailoring shops, and small-scale retail outlets interspersed with low-cost housing and residential flats. The Ndwaru Road Royal Academy lies across the road about 100m from adjacent Ndwaru Road.
South	Adjacent to the Keza Apartments (an IHS-linked development already licensed by NEMA) and other residential blocks, with retail premises and Dagoretti Road about 500 m south.
East	Bordered by residential homes and apartments, ACT St. Matthews Riruta West Parish, and small retail businesses, with Naivasha Road approximately 200 m east.
West	Neighbouring Havard School, Havard Apartments, and several private residential homes.

These establishments provided on the Table 4-3 above collectively define a predominantly residential environment, confirming the site's compatibility with its surroundings and the County's residential-density objectives.

4.3.2 Infrastructure and utility integration

The site is fronted by Ndwaru Road, a bitumen-surfaced County road equipped with drainage channels and service wayleaves. Public utilities available in the area include NCWSC water supply and sewer line, KPLC electricity, and telecommunication services, all of which the project will connect to. Wastewater from the development will discharge into the existing NCWSC sewer along Ndwaru Road, already serving the adjacent Keza development, ensuring environmental compliance and operational efficiency.

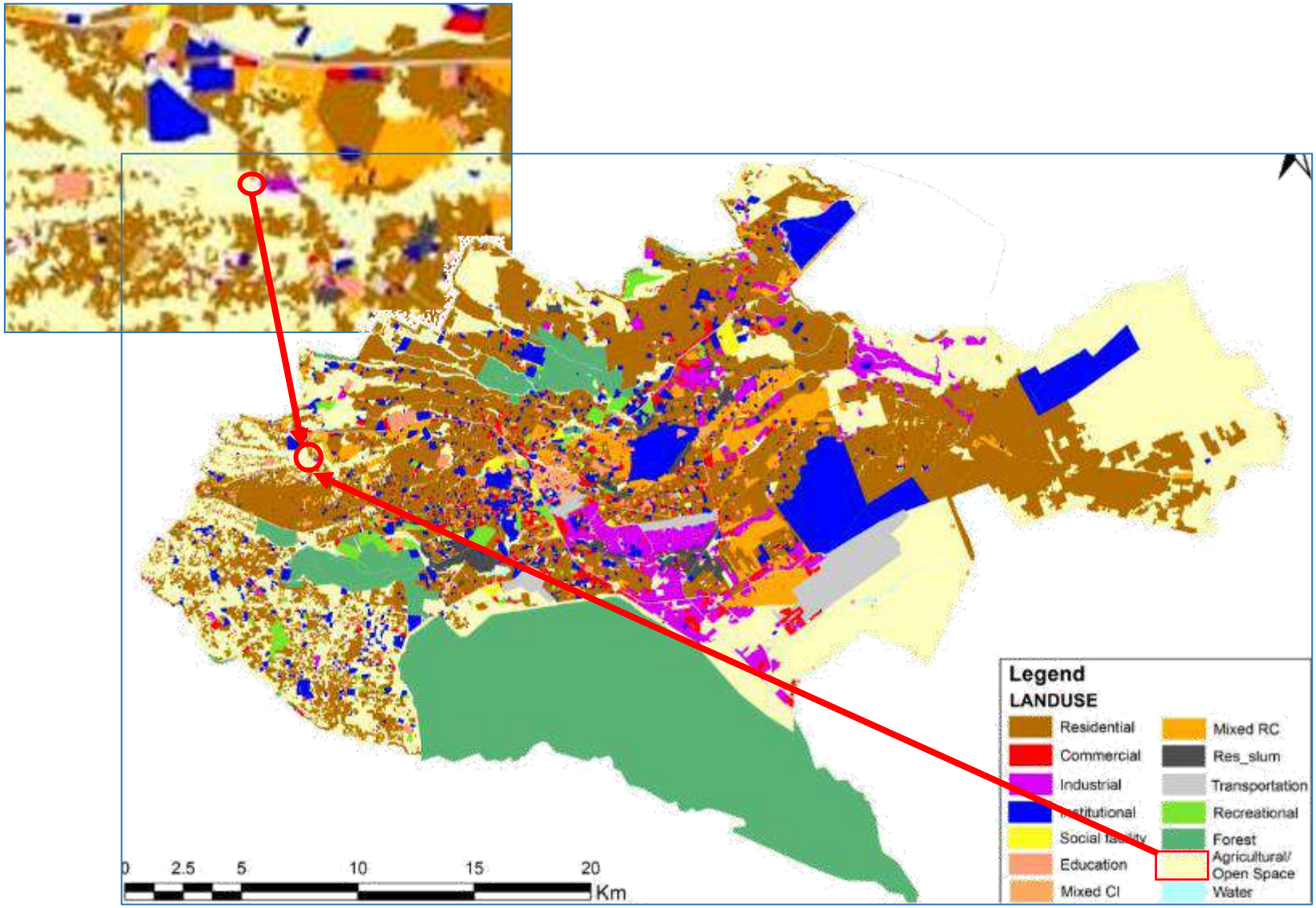


Figure 4-2: Outlook of the mapped land zonation within the proposed development area



Plate 1: View of the neighbouring private houses to the immediate east of the site



Plate 2: View of the completed Keza apartments south of the site



Plate 3: View of main access road (Ndwaru Road) to the site



Plate 4: View of Havard apartments located at the immediate west of the site



Plate 5: View of ongoing internal road access (to Keza development) to the immediate west of the site



Plate 6: View of the existing open drainage channel to the immediate north of the site along Ndwaru Rd

4.4 Proposed Housing Units and Layout

The proposed development is a high-rise, mixed residential project designed to provide sustainable and affordable urban housing within Riruta Ward, Nairobi City County. The project will deliver 240 green-certified apartment units within a single L-shaped 16-storey block (Ground + 15 floors) as highlighted in Table 4-4 below. The Riruta development adopts a single L-shaped building configuration, designed to maximize land efficiency, daylight access, natural ventilation, and aesthetic coherence. The tower's

geometry responds to the site's elongated parcel layout and prevailing wind direction, minimizing overshadowing on adjacent properties and optimizing passive cooling performance.

4.4.1 Design Concept and Housing Typology

The design will adhere to IFC EDGE and World Bank/IFC Performance Standard 3 benchmarks for resource-efficient buildings.

Table 4-4: Development unit description

Housing Typology	Quantity (No. Units)	Plinth Area	Target Occupancy
One-Bedroom Units	144	40m^2	1-2 persons
Two-Bedroom Units	96	60m^2	3-4 persons
Total Units	240		

4.4.2 Building Configuration and Structural Layout

The proposed L-shaped tower has a footprint of approximately 1,000 square metres and a total built-up area of about 19,500 square metres. The structure rises to 16 storeys (Ground + 15 floors), with the ground floor primarily housing utility and management facilities, while the upper levels accommodate the residential units.

The plot coverage is approximately 38%, maintaining compliance with Nairobi City County's medium-to high-density zoning standards. The remaining site area is devoted to circulation spaces, landscaped courtyards, service yards, and green buffer zones. The open and green space ratio is estimated at 18% of the total site area, providing ample recreational and visual relief within the urban setting.

Building setbacks conform to Nairobi County development control guidelines. Vertical circulation is provided through two passenger lifts and two protected stairwells per vertical core, ensuring safe and efficient egress in accordance with the National Building Code (2024) and Fire Safety Code (2023).

4.4.3 Architectural and Spatial Planning

Architecturally, the Riruta housing project presents a modern yet contextually responsive urban form. The front design incorporates vertical fins, recessed balcony spaces, and energy-efficient glazed surfaces to reduce direct solar heat gain, limit glare, and enhance natural airflow within the units. Overall, the building massing and elevation treatment align with the evolving skyline along Ndwaru Road, delivering a modern architectural expression that complements rather than dominates its environment.

The L-shaped form creates a central communal courtyard that serves as the estate's focal outdoor space. This courtyard will be landscaped with grass lawns, shade trees, and seating areas, and will include a small play area for children. The arrangement ensures that every apartment enjoys access to daylight and cross-ventilation while maintaining privacy for residents.

4.4.4 Community and Shared Facilities

The development incorporates a range of shared amenities intended to enhance resident comfort, promote social interaction, and support safe estate management. Key facilities include a main entrance gatehouse with 24-hour security, controlled access systems, and CCTV surveillance. An estate management office and maintenance store are provided for operational efficiency, alongside designated waste handling areas for segregation and temporary storage of household refuse prior to collection by licensed waste service providers.

A central element of the shared spaces is the Mugumo Park, created around the mature Mugumo (Figure 4-4) tree preserved on-site. This landscaped pocket park will function as a communal green space offering shaded seating, passive recreation, and cultural/ecological value, reinforcing the project's commitment to environmental stewardship and context-sensitive design. Additional recreational amenities include a children's play area and landscaped courtyard zone strategically positioned within the internal open space. Essential service infrastructure such as the standby generator and transformer enclosure will be housed within a secure, acoustically treated service zone with an appropriate containment bund for spill control. Other shared facilities incorporated into the design include a rainwater harvesting system, pedestrian walkways, bicycle parking racks, and a clearly marked emergency assembly point in compliance with statutory health and safety requirements.



Figure 4-4: View of Mugumo tree south of the site

4.4.5 Parking and Access

The project site will be accessed directly from Ndwaru Road, which connects to Naivasha Road, facilitating convenient access for residents and service vehicles. Internal roads within the site will be cabro-paved and designed for both vehicular and pedestrian circulation.

Parking will be provided on-grade and in covered ground-floor podium areas, consistent with the project's architectural drawings. Lighting along all internal roads and parking courts will be provided through solar-powered LED fixtures, promoting both safety and energy efficiency. The specific number of parking bays and parking ratio will be maintained as per the design documentation submitted with the development approval drawings.

4.4.6 Landscaping and Open Space Design

The landscaping strategy for the proposed project emphasizes the creation of a comfortable microclimate and the integration of natural green spaces within the urban setting. Landscaping elements will include a perimeter green buffer, central courtyard planting, permeable paving, and grass pavers to enhance surface water infiltration. Rainwater harvesting systems will collect runoff from roof areas for reuse in irrigation and cleaning purposes. The green spaces will not only improve aesthetics and resident well-being but also contribute to the minimum 5% tree cover requirement under the Physical and Land Use Planning (Building) Regulations, 2021.

4.4.7 Building Services and Green Building Features

The Riruta housing project is designed to meet IFC EDGE green building certification standards and incorporates several sustainable service systems:

- ✓ *Energy Efficiency:* Use of LED lighting in common areas, solar water heating systems on the rooftop, and design-ready provisions for solar photovoltaic (PV) installation to power common utilities.
- ✓ *Water Efficiency:* Use of low-flow sanitary fittings, dual-flush toilets, and individual metering for both water and electricity to encourage responsible consumption.
- ✓ *Solid Waste Management:* On-site segregation and storage before collection and disposal by licensed service providers in compliance with NEMA requirements.
- ✓ Stormwater Management: Construction of lined and vegetated channels, surface gratings, and infiltration zones to prevent runoff and erosion.

4.4.8 Wastewater Management

The project will connect to the existing NCWSC sewer line located along Ndwaru Road. This sewer line is already operational and currently serves the immediate neighbouring Keza Development to the south. The connection will be implemented in accordance with NCWSC design approval standards, ensuring that all generated domestic wastewater is safely conveyed for off-site treatment at the designated municipal wastewater treatment facility. This approach eliminates the need for on-site effluent treatment, reduces maintenance burdens, and ensures alignment with both NEMA (Water Quality) Regulations, 2006 and IFC Performance Standard 3 requirements for pollution prevention and resource efficiency. Detailed waste management and pollution control systems is provided under section 4.10.



Figure 4-5: View of ongoing sewer line connection to the adjacent Keza developments

4.4.9 Site Zoning and Land Use Allocation

The indicative land-use allocation for the Riruta project site is presented below.

Table 4-5: Overview of site zoning and description

Land-Use Component	Description	Approx. Area (%)
Residential Block (L-Shape)	16-storey superstructure housing all 240 units	38–40 %
Circulation & Parking	Internal roads, access lanes, on-grade parking	25 %
Landscaped Courtyard & Recreation	Children's play area, seating, turf lawn	15 %
Green Buffer & Setbacks	Perimeter planting	10 %
Utilities & Services	Generator yard, solid waste area, transformer	10 %
Total	—	100 %



Figure 4-6: An artistic impression of the proposed green affordable housing



Figure 4-7: Overview of the proposed masterplan inclusive of the IHS development



Figure 4-8: Preliminary design for the proposed Riruta apartments projects

4.5 Architectural Design and technology

The proposed housing has been conceived as a modern, sustainable high-rise apartment development that integrates environmental performance, safety, and community functionality. The architectural concept and building technology have been designed to optimize land use within the constrained urban fabric of Riruta while maintaining harmony with surrounding developments along Ndwaru Road.

4.5.1 Design concept

The project adopts an L-shaped tower configuration rising to 16 storeys. This configuration maximizes plot efficiency and creates a semi-enclosed internal courtyard that functions as the primary communal green space. The L-form also enhances cross-ventilation and natural lighting to all apartments, reducing reliance on mechanical cooling. Orientation of the block responds to the site's prevailing east–west winds and solar path, minimizing direct heat gain on the longer façades while ensuring daylight access throughout the day.

The architectural expression is defined by clean vertical lines, recessed balconies, and light-coloured façade finishes that reduce heat absorption. The building massing transitions sensitively into the existing urban skyline, complementing nearby mid-rise apartments while introducing a contemporary architectural identity consistent with Nairobi's emerging green-building typology.

4.5.2 Building technology and materials

The structure will be of reinforced concrete frame construction with flat-slab floor systems designed for efficiency, seismic stability, and cost control. External walls will comprise hollow concrete blocks finished in weather-resistant paint, while internal partitions will use lightweight masonry to reduce structural load.

All finishes and fittings have been selected for durability, maintainability, and low environmental impact, including low-VOC paints, energy-efficient glazing, and water-saving fixtures. Construction materials will be locally sourced where feasible, promoting local employment and minimizing transport-related emissions.

4.5.3 Building services, Safety and Accessibility

The project design is aligned with the IFC EDGE green-building certification framework and incorporates multiple sustainability technologies:

- *Energy efficiency:* solar water-heating systems on the rooftop, LED lighting in common areas, and building orientation for natural daylighting and ventilation;
- *Water efficiency:* low-flow plumbing fixtures, dual-flush toilets, rainwater harvesting for landscape irrigation, and smart sub-metering per unit;
- *Resource management:* preference for locally manufactured materials with low embodied carbon and minimal waste generation during construction; and
- *Climate resilience:* elevated foundation levels, perimeter drainage, and storm-water attenuation chambers to mitigate runoff within the Ndwaru catchment.

These measures collectively reduce operational energy and water consumption by an estimated 30% compared with conventional residential buildings, supporting national climate-resilient housing objectives.

4.5.4 Fire, Safety and Accessibility design

The architectural design incorporates comprehensive fire, life-safety, and accessibility measures in accordance with the National Building Code (2024) and the Fire Safety Code (2023). Each vertical circulation core is equipped with two protected fire-rated stairwells and two lifts, supported by fire-rated compartment doors, an automatic sprinkler system, internal hydrants, and dedicated smoke-

extraction shafts. Emergency exits are clearly identified and positioned to ensure safe egress in the event of a fire. Accessibility features; including barrier-free routes, compliant gradients, and entry ramps, will be provided for persons with disabilities in line with the Persons with Disabilities Act (Cap 133).

4.5.5 Building performance, and durability

The building layout allows for efficient estate management and long-term maintainability. Service ducts are centrally aligned for ease of inspection and replacement; rooftop utility zones are screened for safety and aesthetics; and materials selected minimize repainting and maintenance cycles. The courtyard and façade design enhance natural cooling and daylight penetration, directly improving occupant comfort and reducing lifecycle operating costs

4.5.6 Compliance and Certification

The project will undergo: County approval for building plans and land-use compliance; NEMA and WRA compliance regarding riparian setbacks and environmental safeguards; IFC EDGE certification assessment during design and post-construction phases; and Quality assurance and inspection throughout construction and commissioning.

4.6 Climate Resilience and Adaptation Design

4.6.1 Flood & Drainage Resilience

The site has a slight east-north-east slope towards the existing drainage corridor adjacent to Ndwaru Road. The respective mitigation measures to manage intense rainfall runs-off within this sub-catchment, the design is provided under section 9.4.

4.6.2 Water Resource Security

Given the pressures on municipal water supply in Nairobi and the site's urban location, the development includes; A metered connection to the NCWSC network as the principal supply; ain-water harvesting from rooftop surfaces, collected and stored for irrigation of the landscaping and cleaning of the podium/parking areas; and low-flow fixtures within apartments (one- and two-bedroom units) to reduce potable water demand and improve resilience during supply interruptions.

4.6.3 Energy Efficiency & Thermal Comfort

The tower block is oriented and designed to suit the local micro-climate that consist of apartments that are arranged to allow cross-ventilation via openings on the frontage oriented away from prevailing midday sun exposure, east-west corridor. Outdoor lighting and communal area illumination will utilise solar-assisted LED systems to reduce reliance on the grid and improve reliability for residents. The solar water-heating arrays will be installed on the rooftop, serving all 240 units and reducing the peak electrical load.

4.6.4 Ecological & Landscape Adaptation

The landscaping strategy is tailored to the Riruta environment to use native and drought-tolerant plant species in common areas and buffer zones to minimize irrigation needs. Additionally, turf and shrub areas within the courtyard and around perimeter edges to stabilize soils, reduce dust and cooling loads, and enhance local microclimate.



Figure 4-10: Outlook of the general slope at the site

4.7 Road Access and Traffic Assessment

4.7.1 Road Access

The project is located along Ndwaru Road, approximately 200 metres west of Naivasha Road and 500 metres north of Dagoretti Road, within Riruta Ward, Dagoretti South Sub-County, Nairobi City County. The site enjoys excellent vehicular and pedestrian accessibility through the existing Ndwaru Road corridor, which serves as a two-lane tarmac arterial road forming part of the urban feeder road network under the jurisdiction of the Kenya Urban Roads Authority.

Ndwaru Road connects directly to Naivasha Road to the east and Dagoretti Road to the west, both of which are major regional routes facilitating movement between the Nairobi CBD, Dagoretti Corner, and the wider western suburbs. Naivasha Road, in turn, links to Waiyaki Way, integrating the project site into the greater metropolitan road system.

The road surface along Ndwaru Road is in good condition, fully tarmacked with well-marked lanes and adequate drainage. The existing carriageway is approximately 7 metres wide, accommodating two-way traffic with moderate peak-hour volumes. The road shoulders are partially developed, providing informal pedestrian paths, though in some stretches they are narrow and unpaved.



Plate 7: View of main access road (Ndwaru Road) to the site

4.7.2 Site Access

The project site will be accessed via a single main gate opening directly onto Ndwaru Road. This access point is strategically positioned to ensure safe visibility and turning radius for both inbound and outbound vehicles. The main entry and exit lanes will be clearly demarcated and surfaced with cabro paving, allowing for the segregation of vehicular and pedestrian movements.

The access design incorporates:

- Acceleration and deceleration lanes along the frontage to reduce vehicular conflict during entry and exit;
- Security gatehouse and control barrier to manage traffic flow and enhance safety;
- Pedestrian walkway integrated along the frontage, connecting to the adjacent developments; and
- Raised zebra crossing and rumble strips recommended across Ndwaru Road at the entrance to slow approaching traffic and safeguard pedestrians.

The project is well-served by the existing transport network and does not require major off-site road upgrading beyond localized frontage improvements and safety features. Coordination with KURA will be undertaken to implement minor access realignments and install signage consistent with urban traffic safety standards.

4.7.3 Traffic Assessment

The Traffic Impact Assessment conducted on September 2025[2] for the Keza–Riruta corridor, which comprising the Riruta IHS site, provides the baseline and forecast traffic conditions applicable to the proposed development. The study was undertaken in accordance with the applicable standards[3], adjusted to reflect Nairobi's urban mobility context and local vehicle ownership patterns.

a) Baseline Traffic Conditions

Traffic surveys were carried out at key intersections along Ndwaru and Naivasha Roads during weekday (Friday and Monday) and weekend (Saturday) peak periods. The data covered morning (6:00–9:00 a.m.), midday (12:00–3:00 p.m.), and evening (4:00–7:00 p.m.) peaks.

Findings indicated that:

- Current traffic operations along Ndwaru Road and the immediate access points function at acceptable Levels of Service during all peak periods.
- The Naivasha Road–Ndwaru Road junction experiences moderate congestion during the morning peak, attributed to turning movements from Naivasha Road northbound traffic.
- Pedestrian activity along Ndwaru Road is high, though sidewalks are narrow and occasionally encroached, forcing pedestrians to share the carriageway with vehicles.
- Existing speeds are occasionally excessive, necessitating traffic calming and enhanced signage for pedestrian safety.

These baseline findings confirm that Ndwaru Road currently operates within capacity, with adequate provision for motorized and non-motorized users, though localized safety and pedestrian infrastructure improvements are warranted.

b) Future Traffic Projections and Trip Generation

The TIA projected traffic growth to Year 2027, factoring in both background traffic increase of 5% annual growth rate, and additional trips generated by the proposed development. Using the ITE Land Use Code 221 for Multifamily Housing – Mid-Rise; the study estimated that the combined developments within

[2] Done *ITEC Engineering Ltd*

[3] Standards followed; *Highway Capacity Manual (HCM 2016) and Institute of Transportation Engineers (ITE) Trip Generation Manual (9th Edition)*

the Ndwaru–Riruta cluster that includes the proposed IHS project, would generate approximately 2,016 daily trips. The peak-hour distributions were estimated as posted in the Table 4-6 below

Table 4-6: Peak-hour distributions

Time Period	AM In	AM Out	PM In	PM Out	Total (veh/hour)
Vehicular Trips (MT)	20	44	48	35	147
Non-Motorized Trips (NMT)	25	56	61	44	186
Total Trips	**45**	**99**	**109**	**79**	**333**

A modal split analysis determined that approximately 56% of all trips will be accommodated through non-motorized and public transport modes such as walking, boda-boda, and matatus, while 44% will comprise private vehicle trips.

The site benefits from its proximity about 200 m to Naivasha Road bus stops, enabling residents and visitors to use public transport for onward travel, thereby reducing dependence on private vehicles.

c) Traffic Performance and Levels of Service[4]

Analysis of current and projected traffic performance revealed that Ndwaru Road link: Currently operates at LOS A, indicating free-flowing conditions during all peak periods.

Naivasha–Ndwaru Junction: Exhibits LOS D in the morning peak (moderate delays) and LOS B–C during midday and evening peaks. By 2027, without intersection improvements, the morning peak is forecast to degrade to severe congestion (LOS F). Access to the Project Site: The main access to the Riruta IHS Housing site is projected to maintain LOS C or better, even during peak flow, confirming adequate design capacity.

To address the localized junction congestion, the report recommends collaborative interventions with KURA to improve signalization and channelization at the Naivasha–Ndwaru junction.

d) Non-Motorized Traffic and Pedestrian Safety

Pedestrian surveys along Ndwaru Road revealed significant non-motorized traffic volumes, particularly during morning and evening hours. Many pedestrians currently walk along the road edge due to insufficient walkways and lack of designated crossings. The traffic impact assessment recommends:

- Widening pedestrian walkways along the project frontage to a minimum effective width of 2.0 metres to support two-way movement and enhance accessibility for persons with disabilities;
- Installation of raised zebra crossings and rumble strips at the project entrance and other high-pedestrian-traffic points;
- Boda boda and taxi drop-off zones along the frontage to minimize informal roadside parking;
- Provision of adequate street lighting and signage to improve nighttime visibility and safety.

e) Parking Demand and Management

The TIA evaluated parking demand using both ITE (5th Edition) and local adjustment factors to account for Nairobi's car ownership characteristics. The analysis concluded that:

While ITE standards indicate a theoretical requirement of 580 parking bays, local context analysis adjusted this figure to approximately 274 bays for the entire development cluster, reflecting Kenya's lower vehicle ownership rates and higher reliance on shared mobility.

[4] extract from Highway Capacity Manual, 2016: LOS A – Free Flow Conditions, LOS B – Stable Flow (Light Traffic), LOS C – Stable Flow (Moderate Traffic), LOS D – Approaching Unstable Flow, LOS F (severe congestion). With two major categories LOS A–C indicating good and acceptable traffic operations, and LOS D represents approaching congestion, where intervention or management may be necessary to maintain acceptable mobility levels

Providing parking in line with local demand (≈0.45 bays per unit) will optimize land use, reduce construction cost, and discourage excessive car ownership.

The Riruta Housing Project's parking layout adheres to this context-sensitive approach, providing sufficient on-site spaces while supporting non-motorized and public transport access.

f) Recommended Traffic Mitigation and Safety Measures

The respective assessment findings are provided under section 9.3.19 which outlines the recommended mitigation measures for traffic impacts.

4.8 Proposed Construction Phasing & Implementation

Construction will be executed over an estimated period of approximately 20 to 24 months, encompassing the entire cycle from site preparation through commissioning and handover. The project's implementation approach is designed to ensure efficient resource use, strict adherence to environmental, social, health and safety standards, and minimal disruption to the surrounding community and existing developments adjacent road. The construction programme will be carried out under the supervision of Keza-Mivida Homes, as the project manager and a qualified principal contractor, supported by specialist consultants in architecture, civil/structural, MEP engineering, and ESHS management.

4.8.1 Construction Components and Design scope

The project constitutes multiple structural and service components essential for a modern, green-certified residential building. The works will encompass civil, structural, architectural, mechanical, electrical, and environmental systems necessary for full functionality and sustainable operation.

a) Substructure and Foundation Works

The substructure will comprise reinforced concrete pile foundations and raft footings designed to support the 16-storey load. Excavations will be carried out under controlled conditions to prevent erosion and siltation of the adjacent Ndwaru drainage channel.

Foundation works will include ground slab construction, retaining structures, and the installation of underground service ducts for sewer, stormwater, and electrical conduits.

b) Superstructure and Frame Construction

The building's structural frame will be constructed using reinforced concrete columns, beams, and slabs, providing a durable and seismically stable framework. Vertical circulation cores will include dual staircases and two passenger lifts, enclosed within fire-rated shafts.

Formwork systems and batching techniques will be employed to ensure high-quality finishes and minimize material wastage.

c) Walling and Roofing

External and internal walling will use hollow concrete blocks finished with cement render and paint for durability.
The roof structure will be a flat reinforced concrete slab with waterproofing layers and solar water-heating installations. Service areas on the rooftop will accommodate water storage tanks, solar systems, and maintenance access platforms.

d) Internal and External Finishes

Internal finishes will include plastering, tiling, painting, and gypsum ceilings, designed for durability and ease of maintenance.

External finishes will feature light-coloured, weather-resistant paints to reflect heat and improve building energy performance. All paints and adhesives will be low- Volatile Organic Compound (VOC) to minimize indoor air pollution.

Balcony railings, staircases, and internal fixtures will meet national safety and accessibility standards.

e) Mechanical, Electrical, and Plumbing (MEP) Systems

All mechanical and electrical installations will be integrated into the building framework and will include:

- *Plumbing and Drainage Systems:* Pressurized piping for domestic water, wastewater lines connected to the existing NCWSC sewer main along Ndwaru Road, and stormwater drains with surface channels and soakaways.
- *Electrical Systems:* Metered power supply, internal lighting, external solar-powered streetlights, and backup generator connection.
- *Fire Protection Systems:* Hydrant points, fire alarm systems, and extinguishing units on each floor.
- *Vertical Transportation:* Two high-speed lifts with backup power supply and accessible emergency control systems.
- *Ventilation:* Natural cross-ventilation supported by mechanical exhaust in common areas and bathrooms.

f) External Infrastructure and Ancillary Works

External works will comprise:

- *Driveways and Parking:* Cabro-paved access roads and parking courts, with stormwater channels.
- *Boundary Wall and Gatehouse:* Reinforced masonry perimeter wall, guardhouse, and entry/exit gates for security.
- *Underground Water Tank:* Reinforced concrete tank for domestic and firefighting water supply.
- *Solid Waste Handling Area:* Roofed and bunded waste segregation bay for domestic refuse.
- *Landscaping and Recreational Areas:* Courtyard greenery, soft landscaping with native plants, shaded seating zones, and children's play area with safety surfacing.

g) Sustainability and Green-Building Provisions

The project design and construction integrate IFC EDGE green-building principles, targeting over 30% efficiency in energy and water consumption through: Solar water heating and LED lighting; Rainwater harvesting and reuse for irrigation; Use of energy-efficient materials and insulation; On-site waste segregation and reuse of non-hazardous materials; and inclusion of natural ventilation and daylighting strategies in all habitable rooms.

4.8.2 Construction Phasing and Programme

The project will be executed in five structured and overlapping phases, ensuring that each activity is completed sequentially and in compliance with environmental and safety standards.

(i) Phase 1: Site Preparation and Mobilization

This initial phase will focus on preparing the site for construction while establishing the necessary logistical, environmental, and safety infrastructure. The contractor will first secure the site perimeter using solid hoarding and safety signage to demarcate construction zones and protect nearby developments, including the adjacent Keza Apartments and residential homes along Ndwaru Road.

Topsoil and vegetation will be stripped and stockpiled for later use in landscaping. The site will be graded to create gentle slopes directing runoff towards temporary surface drains, which will prevent sediment-laden water from entering the nearby drainage channel.

Temporary site offices, workshops, sanitation units, and worker welfare facilities will be installed within a designated camp area, along with storage zones for materials and machinery. Utilities, including temporary electricity and water connections, will be established in coordination with KPLC and NCWSC.

Dust suppression using water spraying, noise control through restricted work hours, and waste segregation measures will be enforced from the onset as part of the site's environmental management setup. By the end of this phase, the site will be fully fenced, serviced, and ready for foundation works.

(ii) Phase 2: Substructure and Foundation Works

Once site mobilization is complete, the focus will shift to excavation and foundation construction. The building's foundation system will comprise reinforced concrete piles and raft foundations, designed to address the local soil bearing capacity and maintain structural stability given the high-rise nature of the building.

Excavation activities will be carefully managed to control dust, vibration, and soil erosion. Excavated soil will be stockpiled and reused on-site where feasible, while surplus material will be transported to approved County dumping sites using covered trucks to minimize dust and spillage.

Following excavation, formwork and steel reinforcement for pile caps, ground beams, and the ground-floor slab will be placed. Underground utilities; such as water, sewer, and electrical ducts; will be installed concurrently, ensuring seamless integration into the later stages of construction.

By the close of this phase, the foundation and ground-level structure, including retaining walls and surface drains, will be completed, forming the structural base for the superstructure.

(iii) Phase 3: Superstructure Construction

This phase represents the core of the construction process, during which the full 16-storey L-shaped superstructure will be constructed. The structural frame will consist of reinforced concrete columns, slabs, beams, and shear walls, forming the skeleton of the building.

The construction sequence will proceed floor by floor, typically completing one level every two to three weeks. As the concrete works progress vertically, blockwork partitioning, staircase erection, and lift shaft construction will advance in tandem. Internal conduits for electrical, plumbing, and fire systems will be embedded within the walls and slabs during this stage to minimize later disruption.

To ensure efficiency and structural integrity, modular formwork and batching plants will be used for concrete production. Each pour will undergo slump testing and cube strength verification in accordance with Kenyan standards. The contractor will ensure that all safety protocols; such as scaffolding, fall protection, and personal protective equipment, are consistently enforced. Given the proximity to residential and institutional receptors, vibration and noise will be monitored, and noisy works restricted to daylight hours. By the end of this phase, the entire reinforced concrete structure, external walls, and roofing slab will have been completed, ready for internal finishes and service installations.

(iv) Phase 4: Finishes, MEP Installations, and External Works

After the superstructure has been completed, the focus will shift to internal and external finishes, installation of mechanical and electrical systems, and development of the site's external infrastructure.

Internally, all walls and ceilings will be plastered and painted with low-VOC finishes. Floor tiles, internal doors, sanitary fittings, and cabinetry will be installed in sequence. Mechanical, Electrical, and Plumbing (MEP) systems; including electrical wiring, plumbing networks, firefighting installations, solar water heaters, and lift systems; will be installed and progressively tested for functionality and safety.

Externally, works will include the construction of cabro-paved driveways, parking courts, footpaths, and boundary walls, as well as stormwater and foul drainage systems connecting to the NCWSC sewer main along Ndwaru Road. Landscaping activities will commence, including the planting of grass lawns, shade trees, and shrubs, installation of seating benches and play area equipment, and completion of the refuse collection bay and transformer yard.

During this period, the contractor will begin gradual demobilization of heavy machinery while maintaining strict environmental controls, including waste segregation, safe storage of paints and solvents, and disposal of construction waste through licensed handlers.

(v) Phase 5: Testing, Commissioning, and Handover

This final phase will focus on verification, quality assurance, and environmental compliance before project handover. Comprehensive testing will be conducted for all building systems, including electrical installations, plumbing, solar heating, and lift operations. Fire safety systems; comprising hydrants, alarms, and extinguishers; will be tested to ensure readiness. Water and wastewater connections will be inspected in collaboration with NCWSC, and electrical systems certified by KPLC. The project site will undergo a final clean-up, and all temporary facilities will be dismantled. Exposed soil areas will be rehabilitated through planting and surface stabilization to prevent erosion.

Prior to commissioning, a post-construction Environmental Audit will be undertaken by an independent NEMA-registered expert to confirm compliance with the approved ESMP and licence conditions. Once certified, the facility will be formally handed over to IHS Kenya for occupation and long-term estate management.

4.8.3 Workforce and construction management

At peak construction, the project will employ approximately 250–300 workers, including skilled technicians, artisans, and local casual labourers. Employment preference will be given to residents from Riruta and Dagoretti South to enhance local socioeconomic benefit. A dedicated Construction Environmental and Social Management Plan (CESMP) will guide implementation, covering waste control, dust suppression, noise management, occupational health and safety, and emergency response procedures.

All site operations will comply with:

- *Occupational Safety and Health Act (2007);*
- *Work Injury Benefits Act (2007);*
- *Environmental (Impact Assessment and Audit) Regulations, 2003; and*
- *World Bank/IFC EHS Guidelines (General and Construction Sector).*

4.8.4 Construction Oversight and ESHS Compliance

Environmental, Health, and Safety supervision will be integrated into all phases, coordinated between:

- *The Proponent's Environmental and Social Safeguards Officer;*
- *Resident Engineer and Site Supervisor;*
- *NEMA-approved Environmental Expert; and*
- *Relevant County departments (Public Health, Environment, and Occupational Safety).*

Periodic environmental audits will be undertaken during and after construction to verify compliance with NEMA Licence conditions and the approved ESMP.

4.9 Construction Inputs, Utilities, and Outputs

The construction of the Riruta Housing Project will require a combination of materials, machinery, utilities, and human resources sourced from licensed and reputable suppliers within Nairobi County.

The project will be managed under environmentally and socially responsible procurement and usage principles, ensuring minimal waste generation, resource efficiency, and compliance with national standards and IFC Performance Standard 3 on Resource Efficiency and Pollution Prevention.

All procurement and use of inputs will be governed by a CESMP, which will outline handling, storage, waste minimization, and health-and-safety procedures.

4.9.1 Construction Materials and Sources

The project will utilize locally available construction materials to reduce transportation costs and environmental footprint. The materials will be procured from qualified suppliers with main key focus the local suppliers within Dagoretti, and neighbouring areas. The suppliers should be certified under the KEBS. The primary materials for key components are summarized in the table below.

Table 4-7: Primary construction materials and description

Material Category	Description / Use
Cement & Concrete Aggregates	Ordinary Portland Cement for structural works; sand and ballast for concrete and mortar
Reinforcement Steel	Rebars and structural steel for columns, beams, slabs, and piles
Masonry Units & Blocks	Hollow concrete blocks for walling and partitioning
Timber & Joinery	Doors, frames, skirting, cabinetry, roof formwork
Roofing & Waterproofing Materials	Reinforced concrete slab, waterproof membrane, solar water heaters
Finishing Materials	Tiles, paint, plaster, gypsum, and fittings
Plumbing & Drainage Fittings	Pipes, valves, water closets, sinks, and tanks
Electrical Installations	Cables, switchboards, lighting fixtures, conduits
Glass & Glazing Materials	Windows, balcony railings
Bitumen / Cabro / Paving Blocks	Access roads, driveways, parking bays

All material delivery trucks will comply with the Traffic Act (2015) requirements and restrict haulage to designated access hours to avoid congestion on Ndwaru Road.

4.9.2 Machinery, Equipment and Labour Inputs

The project will deploy a range of construction plant and equipment during various stages of the works. The use of modern, well-maintained machinery will ensure fuel efficiency, reduced noise and air emissions, and compliance with Occupational Safety and Health Act (OSHA 2007) and Noise and Excessive Vibration Regulations 2009.

(i) Machinery and Equipment to be Utilized

- Excavators and backhoes for bulk earthworks and trenching
- Concrete mixers, pumps, and hoists for structural works
- Tower cranes and material lifts for vertical conveyance
- Welding and cutting machines for reinforcement and steelwork
- Formwork systems and scaffolding
- Compactors and rollers for driveway construction
- Generators (for backup power) with acoustic enclosures

- Trucks and tippers for material transport

Routine maintenance and emissions checks will be carried out on-site to minimize oil leaks, fuel wastage, and air pollution.

(ii) Labour Requirements

Construction manpower will peak at approximately 250 to 300 workers, including engineers, foremen, artisans, operators, and casual labourers.

Where possible, recruitment will prioritize local residents from Riruta Ward and Dagoretti South, ensuring social inclusion and community benefit.

Workers will be covered by employment contracts consistent with the Employment Act (2007) and provided with:

- Adequate personal protective equipment (PPE);
- Safe drinking water and sanitation facilities;
- Induction on environmental, health, and safety procedures; and
- A grievance-redress mechanism to address labour-related concerns.
- A full Occupational Health and Safety Plan (OHS Plan) will be enforced under the CESMP.

4.9.3 Utilities and Resource Requirements

The construction works will require the following key utilities and resource inputs:

a) Water Supply

Source and supply arrangements: Water required during construction will be supplied primarily by the NCWSC through a legally authorized metered connection. The metering system will be installed prior to commencement of structural works and monitored to track consumption.

In the event of temporary supply interruptions, the contractor will source supplementary water from NCWSC-approved licensed water vendors. Any private borehole or tanker source used must hold a valid abstraction permit from the WRA.

Uses and demand: Water will be used for concrete mixing, curing, masonry, plastering, equipment washing, and dust suppression. It will also be used for worker welfare facilities, including sanitation and cleaning. The project's estimated daily water demand during peak construction is 10–15 cubic metres (m^3/day), depending on the intensity of works and climatic conditions.

Efficiency Measures: Water-saving taps, reuse of curing water where possible, and prohibition of unnecessary runoff.

Estimated Demand: Average daily consumption of 10–15 m^3/day during peak construction.

b) Power Supply

Source: Electric power for the project will be sourced from the Kenya Power and Lighting Company through a temporary site connection approved under the company's construction supply arrangement. The power will be distributed via a site-based distribution board connected to sub-panels serving the batching plant, cranes, lighting, and site office.

Backup power: A diesel-powered standby generator equipped with an acoustic canopy and spill containment bund will provide backup electricity for critical functions such as tower cranes, hoists, lighting, and office operations during power interruptions.

Efficiency Measures: Use of LED lighting, energy-efficient tools, and scheduled machinery operation to avoid peak-load wastage.



Figure 4-11: View of existing powerline and pole mounted transformer at the site

c) Fuel Requirements

Diesel will be the main fuel used for operating heavy machinery such as excavators, mixers, and compactors, as well as for the standby generator.

A designated fuel storage area will be established within the contractor's compound and will consist of a bunded tank (capacity approximately 5,000 litres) fitted with spill-control devices, fire extinguishers, and a drip-tray system to prevent soil or groundwater contamination.

Fuel transfers will only be carried out by trained personnel, using hand pumps and hoses equipped with automatic shut-off valves. Refueling will take place during designated hours to reduce traffic and fire risk. All storage and dispensing operations will comply with the Petroleum Act, 2019 and the Fire Risk Reduction Rules, 2007.

Average daily diesel consumption is projected at 500–700 litres per day, depending on the construction phase. Consumption will peak during foundation and superstructure stages due to increased machinery use.

d) Sewerage and Sanitation

Worker Sanitation: During construction, approximately 250–300 workers will be present on site at peak periods. Adequate portable toilets and septic holding tanks will therefore be provided to ensure proper sanitation.

Toilets will be gender-segregated, regularly cleaned, and located in accessible areas. Waste from the holding tanks will be collected and disposed of by licensed waste handlers, authorized by the Nairobi City County Department of Environment and Solid Waste Management.

Sewerage Connection: Upon completion, all wastewater from the residential apartments and common facilities will be directed through the internal sewer network to the existing NCWSC sewer main along Ndwaru Road, which currently serves the adjacent Keza development and other nearby properties.

This connection has been designed in compliance with NCWSC technical specifications, ensuring that domestic effluent is conveyed to the Dandora Wastewater Treatment Plant for safe off-site treatment.

e) Communication and ICT

The site will use mobile network coverage (Safaricom, Airtel) available in Riruta for daily coordination and emergency communication.

The contractor's office will be equipped with broadband internet via temporary Wi-Fi routers or fibre connection, facilitating digital project management, EHS reporting, and coordination with consultants.

In addition, a two-way radio communication system will be deployed for intra-site coordination, crane signaling, and emergency response to reduce the risk of accidents associated with miscommunication.

f) Stormwater Management

Given the site's gentle eastward slope and proximity to an existing drainage line, temporary stormwater controls will be established at the onset of construction to prevent flooding, erosion, and sediment discharge. The permanent systems will include lined drains, catch basins, and soakaways integrated with the site's final stormwater network.

During operation, the drainage network will be regularly inspected and desilted by the estate management team to prevent blockage and flooding. Landscaping within green buffer zones will also aid in surface runoff absorption and soil stabilization.

4.9.4 Environmental and Resource Management Measures

All resource use will follow the hierarchy of avoid–reduce–reuse–recycle, ensuring responsible consumption and pollution control:

- *Waste Segregation:* Separate collection bins for organic, recyclable, and hazardous waste.
- *Water Recycling:* Reuse of wash-water for dust control and concrete curing.
- *Material Reuse:* Re-use of formwork, steel off-cuts, and excavated soil for backfilling.
- *Emission Control:* Regular maintenance of generators and vehicles to meet air-quality standards.
- *Noise and Dust Suppression:* Water sprinkling, acoustic barriers, and scheduling of noisy operations.
- *Spill Prevention:* Fuel storage in bunded enclosures with absorbent materials on-site.

A designated Environmental Health and Safety (EHS) Supervisor will monitor compliance and maintain records for periodic reporting to NEMA.

4.9.5 Project Outputs

At the completion of construction, the project will yield several tangible outputs contributing to Nairobi County's sustainable housing goals:

(i) Physical Output

One fully constructed 16-storey L-shaped residential block comprising 240 apartments with 144 one-bedroom and 96 two-bedroom units.

The completed development will integrate all key physical and supporting infrastructure, including:

Internal Roads and Parking: Well-designed cabro-paved access roads and on-site parking courts to accommodate residents, visitors, and service vehicles. The internal circulation will link efficiently to Ndwaru Road, ensuring safe ingress and egress.

Boundary Wall and Gatehouse: A secure, reinforced masonry boundary wall enclosing the compound, with a gatehouse, security control station, and 24-hour surveillance system to ensure estate safety and controlled access.

Recreational and Communal Spaces: A landscaped central courtyard and children's play area equipped with safe play structures, seating benches, and shade trees. These spaces will encourage social interaction, recreation, and promote community well-being.

Solid Waste Handling Facility: A dedicated waste segregation and collection bay fitted with impervious flooring, roof cover, and drainage system for hygienic waste handling prior to disposal by licensed service providers.

Utility and Ancillary Infrastructure: Transformer yard, generator enclosure, underground water storage tank, firefighting assembly points, and utility ducts ensuring efficient service delivery and compliance with statutory design standards.

Landscaping and Environmental Enhancements: Soft landscaping incorporating indigenous tree species, shrubs, and lawn cover to stabilize soils, reduce dust, and enhance visual appeal. The green design complements the surrounding urban setting and promotes a balanced micro-climate.



Figure 4-12: Architectural view of the output external view (shown in Red)

(ii) Service and Utility Output

- Connection to existing NCWSC water and sewer networks, KPLC electricity, and telecommunication lines.
- Installation of solar-assisted water-heating and energy-efficient lighting systems.

(iii) Socio-Economic Output

- Creation of temporary employment for approximately 300 workers during construction.
- Enhancement of local economic activity through supply of construction materials and services.
- Provision of safe, modern, and affordable housing units that contribute to the affordable housing programme under the BETA.

(iv) Environmental Output

The project exemplifies green urban development by integrating sustainable design principles and climate-resilient infrastructure throughout its lifecycle. Environmental outputs will include:

(a) Resource efficiency gains

Achievement of measurable reductions in energy and water demand through implementation of IFC EDGE green-building measures, including solar-assisted systems, water-efficient fixtures, natural ventilation, and passive cooling design.

(b) Pollution prevention and waste reduction

Adoption of environmentally sound construction practices and operation-phase waste management systems that minimize solid waste generation, promote segregation and recycling, and prevent discharge of untreated effluent or pollutants.

(c) Green infrastructure and landscaping

Incorporation of landscaped courtyards, perimeter green buffers, and indigenous vegetation that enhance the site's ecological and aesthetic value. The greenery will help sequester carbon, improve air quality, and create a cooling effect within the built environment.

(d) Microclimate enhancement

The landscaped areas, combined with permeable surfaces and shading, will mitigate heat-island effects and improve local ambient conditions. The development's open spaces and tree planting will also provide habitat for urban bird species, contributing to urban biodiversity.

(e) Demonstration of sustainable urban design

The project will serve as a benchmark for environmentally sustainable and socially inclusive housing in Nairobi County. By demonstrating that high-rise residential development can be implemented with minimal environmental footprint, it will contribute to knowledge transfer and replication of green-building practices in future IHS and County housing initiatives.

4.10 Waste Management and Pollution Control Systems

The proposed project will generate various waste streams and potential pollutants during both construction and operational phases. An integrated Waste Management and Pollution Control System will be implemented to ensure that all solid, liquid, and gaseous wastes are handled, treated, and disposed as per the relevant standards and regulations. The system will focus on the waste hierarchy principle of avoid, reduce, reuse, and recycle; while minimizing residual wastes requiring off-site disposal.

4.10.1 Construction-Phase Waste Management

During construction, a range of solid and liquid wastes will arise from excavation, material off-cuts, packaging, and worker welfare facilities. All waste will be collected, segregated, and managed in compliance with NEMA requirements and the Nairobi City County Solid Waste By-laws (2015). The Table 4-8 below highlights the types of construction wastes.

Table 4-8: Types of construction waste

Waste Type	Typical Source	Handling & Disposal Method
Excavated Soil and Debris	Site clearing and foundation works	Re-use for backfilling and landscaping where feasible; surplus transported to NEMA licensed county dumpsites.
Concrete, Masonry and Tiles	Formwork, off-cuts, demolitions	Reuse as sub-base material for pavements; remainder disposed of via NEMA licensed inert waste handlers.
Metals and Reinforcement Off-cuts	Steel fixing and fabrication	Collected and sold to licensed scrap dealers/recyclers.
Timber and Formwork	Shuttering, joinery	Re-used multiple times; damaged timber used for fuel or disposed of at approved sites.
Packaging Materials	Cement bags, plastics, paint tins	Sorted at source; recyclable materials returned to suppliers or recyclers; non-recyclables disposed of properly.
Hazardous Waste	Paint residues, used oil, solvents, contaminated rags	Stored in labelled, leak-proof containers in a covered area; collected by NEMA-licensed hazardous-waste contractor.
General Waste	Food remnants, office waste, PPE	Segregated into biodegradable and non-biodegradable bins and handled by NEMA licensed waste collectors.

4.10.2 Operational-Phase Waste Management

After occupation, routine solid and liquid waste will be generated from domestic activities, landscaping, and facility maintenance. Waste management during operation will be incorporated into the estate's facilities management plan under the estate management.

Solid Waste Streams and Handling

Table 4-9: Solid waste streams and handling

Waste Category	Source	Management Approach
Biodegradable Waste	Kitchen waste, garden trimmings	Collected daily; composted within landscaped zones or transported to County organic-waste composting centre.
Recyclable Waste	Plastics, paper, metals, glass	Sorted at household level into labelled bins; collected by contracted recycler.
Residual Waste	Non-recyclable plastics, sanitary waste	Disposed of through County-approved waste contractor to designated landfill.
E-Waste & Hazardous Waste	Batteries, bulbs, cleaning agents	Stored safely in a locked utility area; removed quarterly by licensed hazardous-waste handler.

A roofed solid-waste bay; bunded, ventilated, and easily accessible to collection trucks; will be located near the gatehouse. Residents will receive waste-segregation awareness and signage guidance to encourage source separation.

4.10.3 Air, Noise and Dust pollution control

During construction, airborne particulates and noise emissions will arise from excavation, concrete mixing, and vehicle movement. Mitigation measures covered under section 9.3.5 and 9.3.8.

4.10.4 Pollution prevention and spill control

Fuel, oil, and chemical use will follow strict containment and emergency procedures that include; bunded storage areas, spill kits, training, immediate reporting and clean-up, and used-oil disposal. Mitigation measures covered under section 9.3.11.

4.10.5 Monitoring, record-keeping and compliance

The proponent will establish a Waste and Pollution Register documenting quantities generated, storage duration, transportation, and final disposal site. The monthly inspections will be undertaken by the EHS Supervisor, and quarterly audits will verify adherence to the ESMP. As provided in the ESMP under section 11, the key performance indicators will include: Percentage of waste recycled or reused; compliance with NCWSC effluent standards; noise and dust-level trends; and record of incident-free operation.

4.11 IFC EDGE Certification and Sustainability

The proposed housing development is designed to achieve IFC EDGE certification, targeting measurable reductions in energy, water, and materials consumption. The design responds directly to the local context of Karen End, including its climate, intermittent water supply, and available resources.

4.11.1 Energy efficiency

The project aims for a ≥35% reduction in operational energy use through a combination of passive architectural design and efficient building systems using the latest tool by IFC EDGE.

The L-shaped, 16-storey tower is oriented to reduce direct solar gain on the long façades and maximize natural daylighting, improving thermal comfort and minimizing artificial lighting requirements. Each apartment is designed for cross-ventilation, with operable windows on at least two façades, allowing for effective airflow without mechanical cooling. Additionally, all common areas and corridors will use LED lighting and energy-efficient fittings. Electrical circuits are designed with dedicated conduits for future integration of solar photovoltaic (PV) systems to power common facilities such as lifts, lighting, and the security system.

The roof-mounted solar water-heating panels will supply hot water for all residential units, reducing grid electricity use for domestic hot water production, and additionally use of light-coloured exterior finishes, recessed balconies, and vertical fins minimizes heat absorption and glare while maintaining aesthetic consistency.

With the application of these measures, it is expected to yield energy savings exceeding 30% compared to a standard baseline apartment building in Nairobi, contributing to reduced operational carbon footprint and improved affordability for residents through lower utility bills.

4.11.2 Water efficiency

To address the intermittent municipal water pressure in Riruta, the project integrates dual-source supply, combining NCWSC connection with borehole supplementation under WRA licensing.

Water-saving features; The estate will be supplied by a metered NCWSC connection, supplemented by rainwater harvesting from roof catchments stored in underground tanks for irrigation and cleaning purposes. Each unit will be fitted with low-flow faucets, aerated showerheads, and dual-flush toilets, reducing per capita potable water demand by an estimated 20–25%.

Additionally, the collected rainwater will be used for landscape irrigation and cleaning of paved areas. Landscaping has been optimized with drought-tolerant indigenous species, further minimizing irrigation demand. The plumbing design includes individual water meters per unit, allowing consumption tracking and encouraging responsible water use among resident.

4.11.3 Sustainable materials

The project targets a ≥20% reduction in embodied energy through locally sourced and low-impact materials. Structural design efficiency is achieved through optimized reinforced concrete frames and locally manufactured concrete blocks, minimizing transportation emissions.

Low-VOC finishes, eco-certified paints, and ceramic tiles will promote healthy indoor environments. Construction waste management will follow segregation and recycling protocols, diverting recyclable materials from landfill and supporting circular economy objectives.

4.12 Climate Change Risk, Vulnerability & Greenhouse Gas (GHG) Assessment

This assessment evaluates the project's GHG gas footprint and its vulnerability to climate change, based on the specific conditions of the Riruta site within the Dagoretti South area.

4.12.1 Potential sources of GHG emissions

GHG emissions will occur during both construction and operation phases.

- *Construction Phase:* Diesel combustion from on-site equipment: -excavators, mixers, generators, and transport: - deliveries of materials such as concrete, masonry, steel etc., will produce CO_2 emissions; and Embodied carbon contained in major materials: - reinforced concrete, structural steel) for the 16-storey block adds a significant one-time emissions component.

- *Operational Phase:* Electricity consumption for lifts, lighting, appliances and services draws from Kenya's national grid and contributes ongoing annual GHG emissions; Occasional diesel use from the standby generator for backup power during outages; and Minor emissions may arise from wastewater pumping and solid-waste handling operations within the estate.

4.12.2 Projected GHG emission estimates

Given the absence of full detailed calculator input data for this specific project, only indicative estimates are provided based on standard factors modified for Nairobi context, the estimated annualized GHG emissions are summarized in the below[5]:

- Construction equipment & transport: Approximate one-off embodied and fuel emissions estimated at abot 600–700 t CO_2e for the full build-out (based on similar scale high-rise developments in Nairobi).
- Annual operational grid electricity: If average unit energy use is 30 % below a conventional baseline (as per the project's energy efficiency design) and using Kenya's grid emission factor (≈0.46 kg CO_2/kWh) then expected annual emissions might be in the order of about 250-350 t CO_2e/year.
- Standby generator: Estimating annual diesel usage of say 3,000 litres at 2.68 kg CO_2e/litre yields roughly 8 t CO_2e/year.

4.12.3 Climate change risk and vulnerability profile

The project's vulnerability is assessed against climate projections for the Riruta area, which indicate increased rainfall intensity and rising temperatures.

- *Increased rainfall intensity & surface runoff:* Nairobi's climate projections suggest more frequent high-intensity rain events, which places the gently sloped Ndwaru Road corridor and adjacent drainage systems at risk of flooding or siltation.
- *Rising ambient temperatures:* Riruta's elevation, approx. 1,660 m, moderates temperature but heat-stress risk remains, and rising temperatures may increase cooling load in apartments.
- *Water-supply stress:* Whilst the site has connection to municipal water, Nairobi experiences periods of rationing. The estate's reliance on municipal water increases its vulnerability to water scarcity or supply interruption.
- *Grid power interruptions:* Urban power supply disruptions may lead to increased generator use, higher emissions and reduced resilience if backup systems are over-used.

4.12.4 Climate-proofing adaptation and mitigation measures

The following site-specific measures are integrated into the project design to mitigate GHG emissions and adapt to identified climate risks.

Table 4-10: GHG emissions and adapt to identified climate risks

Risk Area	Adaptive / Mitigative Measures (Riruta Project Specific)
Rainfall & Run-off	Use of permeable cabro paving and onsite infiltration trenches; attenuation tanks sized for extreme events; retention of a green buffer along drainage corridor to reduce overland flow and channel clutter.
Heat / Rising Temperatures	Building orientation and façade design provide passive cooling; solar water-heating and LED systems reduce reliance on grid; native species landscaping reduces heat-island effect.

[5] These values serve as approximate indicators until full bespoke modelling is conducted

Water Scarcity	Rain-water harvesting from rooftops for irrigation; low-flow sanitary fittings in all units; storage tanks ensure resilience during municipal supply dips.
GHG Emissions	Energy-efficient design reduces grid consumption; solar hot-water system lowers thermal load; use of local materials and waste-segregation reduces embodied carbon and operational waste.

Refer to Annex 12 for detailed GHG emission calculations, methodology, and the Climate Change Risk and Vulnerability Matrix[6].

4.13 Decommissioning and Site Restoration

A decommissioning plan will be developed to guide the eventual restoration of the site, ensuring compliance with environmental regulations.

The process will involve the safe demolition of structures and the removal of all utility connections. Materials, including concrete, metals, and timber, will be segregated for recycling, while any hazardous waste will be handled by licensed contractors. A final closure report will be submitted to the relevant authorities to verify that all restoration obligations have been met.

4.14 Cost estimates

The proposed project is expected to cost KES 722,906,080.00. The project's bill of quantities is attached under Annex 7.

[6] Prepared in fulfilment of Climate Change Act, 2016 and NEMA's ESIA approved ToR Clause 9

5 CHAPTER 4: BIOPHYSICAL AND SOCIO-ECONOMIC BASELINES

This chapter provides a comprehensive description of the existing environmental, physical, biological, and socio-economic conditions within the proposed project area and its broader area of influence. The baseline information forms the foundation for assessing potential project impacts and for developing appropriate mitigation and management measures.

The data presented herein were obtained through a combination of primary field investigations and secondary data sources. Primary data were collected through on-site surveys, field measurements, stakeholder consultations, and direct observations, while secondary information was compiled from relevant published reports, maps, government databases, and previous studies within the project area. This section presents the results of the detailed baseline surveys, providing the contextual framework necessary for the evaluation of potential project impacts in subsequent chapters of this report.

5.1 Physical baseline

5.1.1 Geographic context

The site is situated at coordinates 1°16'47.2"S, 36°44'01.6"E, along Ndwaru Road within Riruta Ward, Dagoretti South Sub-County, in the western sector of Nairobi City County. The project site lies approximately 9 km west of the Nairobi CBD and about 2.5 km south-west of Dagoretti Corner; one of the main services and transport nodes in the area. The area administrative location is provided in the table below;

County:	**Nairobi City County**
Sub-County:	Dagoretti South
Ward:	Riruta
Constituency:	Dagoretti South Constituency
Approximate Coordinates:	Latitude 1°16'47.2"S, Longitude 36°44'01.6"E
Elevation:	Approx. 1,815 metres above mean sea level (amsl)

The project area forms part of the Dagoretti–Riruta urban growth corridor, characterized by increasing residential concentration driven by proximity to Naivasha Road, and other arterial routes. The immediate neighbourhood comprises mixed-use residential and commercial land uses, dominated by multi-storey apartment developments such as Keza Apartments to the south and Havard Apartments to the west, interspersed with small businesses, schools, and places of worship.

The site fronts directly onto Ndwaru Road, which is tarmacked and in good condition. Ndwaru Road connects Naivasha Road to the east and Dagoretti Road to the west, linking the area to the wider metropolitan road network, including Waiyaki Way an, Ngong Road. Public transport is easily accessible along both Ndwaru and Naivasha roads, served by numerous matatu routes and boda-boda operators.

The parcel is privately owned, with valid Change-of-Use approval from Agricultural to Multi-Dwelling Residential (Apartments) issued by Nairobi City County, covering approximately 1 acre, forming part of L.R. No. Dagoretti/Riruta/6004. The land is free of encumbrances and not within any designated riparian reserve or public-utility land as confirmed through initial survey and the county planning approvals.

The surrounding land use and area of influence us within a 500-metre radius, land use is predominantly residential with supporting commercial and institutional facilities with Ndwaru Road corridor with mixed residential flats, retail shops, and Ndwaru Royal Academy to the north. To the east are Residential blocks

and ACT St. Matthews Riruta West Parish; Naivasha Road lies about 250 m east. To the south Keza Apartments and other multi-dwelling developments; retail businesses fronting Ndwaru Road. Neighbouring to the west is Havard School, Havard Apartments, and several privately-owned homes.

The site lies within the Nairobi Plateau, underlain by volcanic soils derived from the Nairobi Trachytes and Kikuyu Tuffs, gently draining towards the Ngong River/Motoine catchment system. The area vegetation is typical of peri-urban Nairobi—modified grasslands and ornamental plantings with scattered indigenous trees.

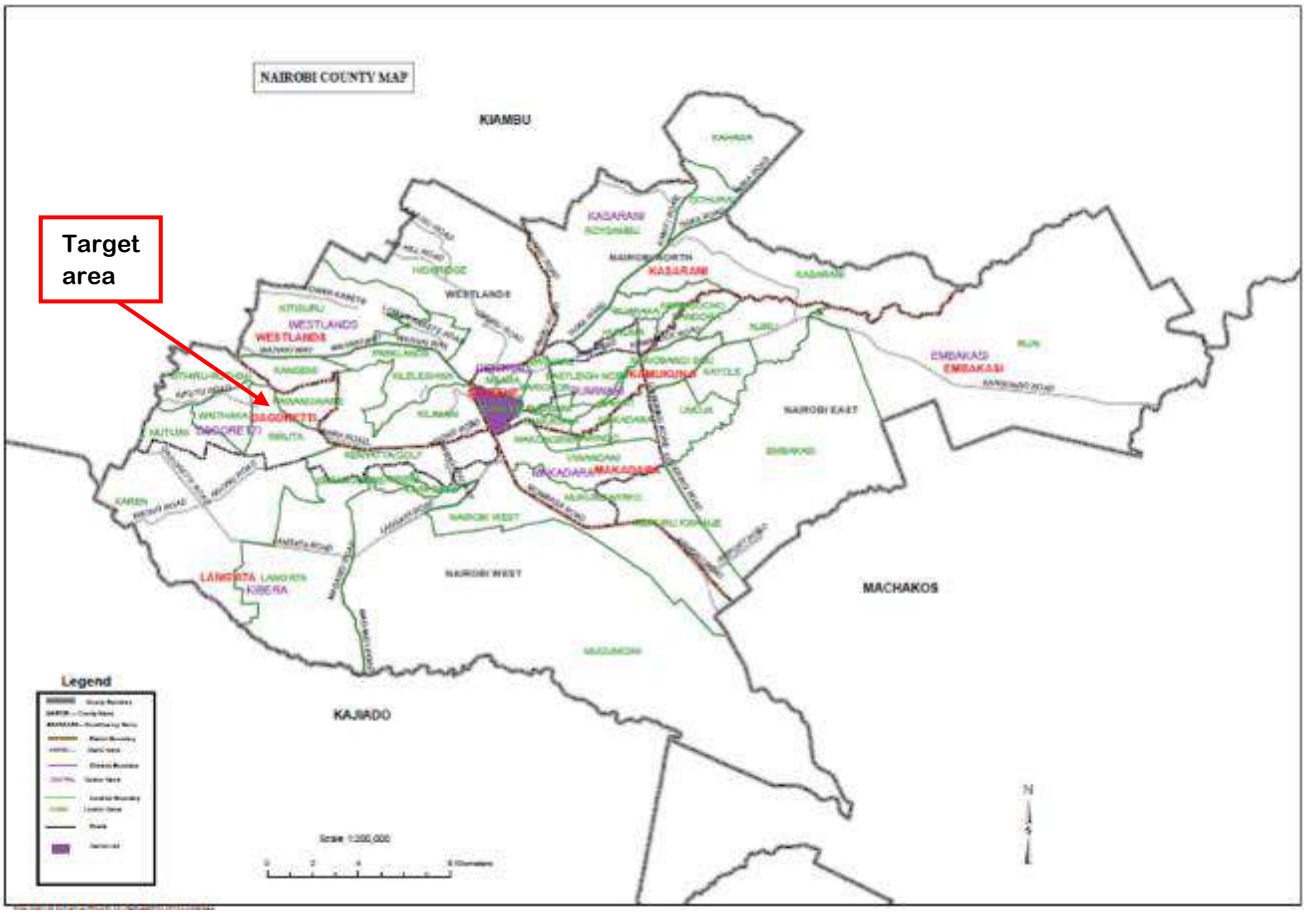


Figure 5-1: Nairobi County Administrative Units

5.1.2 Geology and Soils

The wider Dagoretti South Sub-County, encompassing Riruta, Waithaka, Karen, Mutuini, and Ngando Wards, lies within the Nairobi Volcanic Plateau, part of the central highlands of Kenya formed during the Pleistocene–Holocene volcanic phases associated with the East African Rift System. The regional geology is dominated by a sequence of trachyte and phonolite lavas, tuffaceous deposits, and lateritic soils, overlying the older Kapiti Phonolites. These formations weather into deep, red to reddish-brown residual soils with high clay content and stable structure, commonly classified as Rhodic Nitisols and Acric Ferralsols under FAO/WRB taxonomy. The greater Dagoretti South area is characterized by geologically stable volcanic substrates, fertile Nitisols, and moderate groundwater potential, making it well-suited for both high-density urban development and subsistence horticulture in remaining peri-urban parcels.

The project area lies on the Nairobi volcanic plateau, underlain by successions of trachytic and tuffaceous lavas associated with the late Tertiary–Quaternary volcanic activity of the East African Rift System. These volcanic formations are deeply weathered and locally interbedded with lateritic horizons. The regional

structure dips gently eastwards toward the Athi Basin, and no active faults or instability zones intersect the project site.

Site-specific Field observations and previous geotechnical surveys conducted for developments along Ndwaru Road, including the neighbouring Keza Apartments, confirm the subsurface profile as presented in the table below:

Depth (m)	Material Description
0 – 0.3	Topsoil with dark brown clayey silt and organic matter.
0.3 – 3.0	Reddish-brown fine sandy silt to silty gravel with sand; classified A-7-6/A-6 under AASHTO – generally fair to poor as subgrade.
3 – 6	Completely weathered tuff – sandy elastic silt (MH) of moderate plasticity, firm consistency.
6 – 9	Grey completely weathered tuff recovered as fat clay.
9 – 18	Brownish-grey to yellowish-brown highly fractured tuff of variable strength (UCS 6–29 MPa).
> 18	Grey to medium-strong trachytic tuff bedrock providing competent founding material.

The geotechnical investigations on site confirms that the underlying Rhodic Nitisols and weathered tuff offer good bearing capacity and drainage, with low risk of expansive or collapsible behaviour. The gentle slope and firm sub-base minimize erosion or settlement hazards. No contamination or unstable zones were observed.

5.1.3 Hydrogeology and hydrology

The Riruta project site falls within the Upper Athi River Catchment and the Ngong–Motoine sub-basin, one of the main drainage systems serving the southwestern part of Nairobi City County. This basin collects runoff from Dagoretti, Karen, Riruta, and Waithaka areas before discharging eastwards into the Nairobi and Athi Rivers. The regional aquifer system is developed within fractured and weathered volcanic formations, primarily the Nairobi Trachytes and Tuffs, which form the main groundwater-bearing units across Dagoretti South. These formations exhibit moderate permeability and are recharged mainly by direct infiltration of rainfall and percolation from ephemeral drainage channels. Groundwater within the sub-county generally occurs under unconfined to semi-confined conditions, with static water levels typically between 15–40 metres below ground level, depending on local topography and weathering depth. Boreholes within a 1 km radius of Ndwaru Road report yields of 3–7 m^3/hour, adequate for domestic use and small-scale abstraction.

A geotechnical investigation undertaken in March–April 2025 for the proposed development identified a perched groundwater table and a deeper regional aquifer. Groundwater was encountered variably between 0.0 m to 16 m across the five locations within the site. Two locations exhibited shallow seepage zones, consistent with temporary perched water following rainfall, while one recorded a more permanent groundwater level near 16 m depth.

The hydrostratigraphy can thus be described as:

- *Perched water table:* Intermittent and rainfall-dependent within the weathered tuff zone; discontinuous across the site.
- *Regional aquifer:* Confined within fractured trachyte bedrock at approximately 15–25 m depth, consistent with other Dagoretti South boreholes.

Water movement is generally eastward toward the surface drainage along Ndwaru Road. The presence of a competent tuff bedrock layer minimizes risk of deep seepage and foundation instability, though temporary dewatering may be required during excavation in the rainy season.

The project area exhibits a gentle eastward gradient of approx. 2–3 % towards Ndwaru Road, where surface runoff converges into an existing roadside drain that ultimately connects to the Ngong River system downstream. The site lies outside any designated riparian reserve or perennial watercourse. However, a minor surface drainage channel traverses approximately 70 m east of the project boundary, carrying stormwater from upslope plots during rainfall events. The existing drainage infrastructure along Ndwaru Road consists of lined open side drains constructed by the County Government. These are functional but frequently blocked by silt and waste from nearby commercial premises, which occasionally causes localized ponding during heavy rainfall. Within the project site, no permanent watercourses, springs, or wetlands were observed during field reconnaissance. The site's natural surface drainage will be maintained and enhanced through a Sustainable Urban Drainage System integrated into the estate design. This includes permeable paving, infiltration trenches, and underground attenuation tanks to detain peak flows before discharge to the municipal drains.



Plate 8: View of the general slope in relation to waterflow to the adjacent drainage channed



Plate 9: View of the adjacent open drainage channel at the immediate north of the site, along Ndwaru Rd

5.1.3.1 Nairobi city county water wources

The Nairobi City County network faces a perennial water supply deficit, where the estimated daily water demand of approximately 579,000m^3 often exceeds the total available supply 482,940m^3. This deficit results in insufficient water volumes and subjects the area to a rationing schedule, meaning only an estimated 40% of consumers with a connection receive continuous water supply.

The greater Dagoretti South area, including Riruta Ward, is served primarily by the NCWSC network, which sources water from the Ruiru Dam, Sasumua Dam, and borehole systems within the area. These surface reservoirs collectively supply over 80 % of Nairobi's domestic water, distributed through a pressurized reticulation network. However, the Riruta area periodically experiences water rationing, especially during prolonged dry seasons, due to high urban demand and limited storage capacity. Private boreholes supplement municipal supply in some developments along Ndwaru Road, but their yields are moderate (2–5 m³/hr) due to deep weathered tuff layers and variable recharge rates. For the proposed development, water supply will be from the NCWSC distribution line along Ndwaru Road, complemented by rainwater harvesting and storage systems as secondary sources to enhance resilience during supply interruptions.

5.1.3.2 Water quality assessment

Since no perennial surface water sources occur within or adjacent to the project site, baseline water-quality assessment relied on analysis of a groundwater sample from the Kanare Borehole No. 2, located

approximately 200 m south of the site along Ndwaru Road, at coordinates of latitude 1°16'53.7"S, and longitude 36°44'00.8"E.

The borehole, drilled to a depth of 352 m, is representative of the local aquifer tapped by most nearby residential developments, including Keza Apartments and Havard Residences.



Figure 5-2: Water Sampling Points

The water sample collected after extended pumping over 24hours showed the following key parameters as presented in Table 5-1 below.

Table 5-1: Water quality for adjacent borehole

Parameter	Unit	Analytical Method	Measured Result	WHO (2022)	KS EAS 12:2018	EMCA (First Schedule) – Domestic Water	EMCA (Third Schedule) – Effluent to Environment	Remarks
pH (@ 25 °C)	pH scale	APHA 4500-H^+ B	8.03	6.5 – 8.5	6.5 – 8.5	6.5 – 8.5	6.5 – 8.5	Within permissible range
Colour	Hazen Units	APHA 2120 B	15.0	≤ 15	≤ 15	–	≤ 15	Meets limit
Nitrate (NO_3^-)	mg/L	APHA 4500-NO_3 B	0.16	≤ 50	≤ 50	≤ 10 (as NO_3-N)	Total inorganic N ≤ 100	Excellent – no pollution
Fluoride (F^-)	mg/L	PQA/LIM/061	**2.25**	≤ 1.5	≤ 1.5	≤ 1.5	–	Exceeds guideline – requires blending/ defluoridation if used directly
Total Dissolved Solids (TDS)	mg/L	APHA 2540 C	164.9	≤ 1500	≤ 1000	≤ 1200	≤ 1200	Very low – excellent quality
Ammonia (NH_3)	mg/L	APHA 4500-NH_3	ND	≤ 0.2	≤ 0.5	≤ 0.5	–	Not detected
Turbidity	NTU	APHA 2130 B	4.87	≤ 5	≤ 5	Acceptable clarity		
Total Alkalinity (as $CaCO_3$)	mg/L	APHA 2320 B	58.0	≤ 500	≤ 500	Normal alkalinity		
Electrical Conductivity (25 °C)	µS/cm	APHA 2510 B	266	≤ 2500	≤ 1500	Low mineralization		
Iron (Fe^{2+})	mg/L	APHA 3111 B	**0.35**	≤ 0.3	≤ 0.3	Slightly above ideal but acceptable after aeration/filtration		
Calcium (Ca^{2+})	mg/L	APHA 3111 B	ND	≤ 100	≤ 150	Not detected		
Magnesium (Mg^{2+})	mg/L	APHA 3111 B	21.38	≤ 100	≤ 100	Acceptable		
Total Hardness (as $CaCO_3$)	mg/L	APHA 2340 C	88.0	≤ 500	≤ 500	Moderately hard water		
Chloride (Cl^-)	mg/L	APHA 4500-Cl B	19.0	≤ 250	≤ 250	Low salinity		

Manganese (Mn)	mg/L	APHA 3111 B	0.012	≤ 0.4	≤ 0.1	Acceptable
Sulphate (SO_4^{2-})	mg/L	APHA 4500-SO_4 E	33.0	≤ 450	≤ 400	Well within limits
Carbon Dioxide (CO_2)	mg/L	APHA 4500-CO_2	4.0	–	Not applicable	Normal level

The analytical results presented in presented in Table 5-1 above is attached under annex 8. The results show that groundwater in the Riruta–Ndwaru area is generally of good physico-chemical quality and suitable for domestic use with minimal treatment. The pH of 8.03 falls within WHO, KS EAS 12:2018 and EMCA limits, indicating slightly alkaline groundwater typical of Nairobi's volcanic aquifers. Mineralization levels are low, as reflected by conductivity (266 µS/cm) and TDS (164.9 mg/L), classifying the water as fresh and soft with no scaling or corrosion concerns. Total hardness (88 mg/L) and concentrations of key ions are far below allowable limits, demonstrating the absence of saline intrusion, industrial influence, or agricultural runoff. The nitrate level of 0.16 mg/L further indicates that the aquifer is free from sewage or organic contamination, consistent with controlled land use in the surrounding residential area.

Most trace metals are within acceptable ranges, though iron at 0.35 mg/L slightly exceeds the 0.3 mg/L WHO and KS guideline. This minor elevation is common in volcanic terrains and presents mainly aesthetic concerns, easily corrected through simple aeration or filtration.

The only parameter of concern is fluoride at 2.25 mg/L, above the 1.5 mg/L guideline, reflecting natural geochemical enrichment typical of Dagoretti South and surrounding volcanic zones. Long-term consumption would require mitigation through blending or defluoridation.

Other parameters, including turbidity, alkalinity, manganese, and hardness, all meet applicable standards, and no microbiological or organic contamination was detected.

5.1.4 Topography

The project area lies within the western plateau of Nairobi City County, part of the gently undulating highland zone that extends across Dagoretti South Sub-County towards the Ngong Hills. The elevation in this area ranges between 1,620 metres and 1,850 metres above mean sea level (amsl), gradually descending eastwards toward the Ngong and Motoine River catchments which drain into the Nairobi and Athi Rivers. The broader Dagoretti–Riruta landscape is characterized by rolling to gently sloping terrain, underlain by volcanic rocks that have weathered into deep, well-drained soils. The regional slope gradients typically range between 2% and 6%, forming broad convex uplands interspersed with shallow valleys and minor drainage depressions. This terrain supports efficient natural runoff without major erosion or flooding hazards, provided that drainage is well maintained.

The housing site occupies approximately 1 acre of land along Ndwaru Road, at an average elevation of about 1,815 metres asl. The ground slopes gently eastward, with a total fall of approximately 1.5 to 2.0 metres across the entire plot from the western boundary (adjacent to Havard Apartments) toward the Ndwaru Road frontage. This represents an average slope gradient of about 3–4%, typical of the surrounding residential blocks along this corridor. The slope facilitates natural surface runoff towards Ndwaru Road, where stormwater is collected in existing lined side drains constructed by the County Government.

The surface is relatively even, with only minor undulations caused by previous grading and vegetation removal. No steep embankments, gullies, or evidence of significant erosion were observed during the site reconnaissance. The topsoil layer consists of firm red-brown silty clay, consistent with the Rhodic Nitisols prevalent in the Dagoretti area.

This gentle terrain provides excellent suitability for construction, as it minimizes the need for extensive cut-and-fill or retaining structures. The site's elevation also ensures adequate drainage without risk of surface water accumulation, even during periods of heavy rainfall.



Figure 5-3: Google earth's imagery view of the site's North to Southern topography outlook



Figure 5-4:Google earth's imagery view of the site's West to Eastern topography outlook

The eastward slope direction and moderate relief naturally direct runoff toward Ndwaru Road, supporting the integration of the project's Sustainable Urban Drainage System described in Section 4.12.3. The design harnesses the existing slope to facilitate gravity-based drainage and surface runoff control without altering the natural gradient significantly.

Given the absence of steep slopes or depressions, no topographic constraints are anticipated for the foundation works or infrastructure layout. The topographic configuration also contributes to low flood risk, with the site well above nearby drainage lines associated with the Ngong–Motoine catchment system.

5.1.5 Climatic conditions

5.1.5.1 Climate change in Kenya

Kenya's climate is largely controlled by the migration of the ITCZ, resulting in a bimodal rainfall pattern. The long rains typically occur between March and May, and the short rains between October and December. The country experiences significant regional climatic variation, influenced by altitude, topography, and proximity to the Indian Ocean. Over the last few decades, national records by the Kenya Meteorological Department (KMD) show a general warming trend, with increased rainfall variability and more frequent heavy rainfall events in the central highlands, including Nairobi. These shifts have influenced urban drainage design and water management planning, reinforcing the importance of resilient urban housing designs such as the Riruta IHS development.

5.1.5.2 Climatic conditions in Nairobi city county

The Riruta project area lies within the humid to sub-humid agro-climatic zone of Nairobi City County, characterized by moderate temperatures, distinct wet and dry seasons, and generally favourable climatic conditions for residential development. The site's elevation about 1,815m asl moderates both temperature and humidity, producing a mild subtropical highland climate.

(i) Rainfall

The area receives an average annual rainfall of about 975 mm[7], distributed across two main wet seasons. The long rains from March to May, account for 45% to 50% of annual precipitation, peaking

[7] based on 10-year (2014–2024) mean data from the Dagoretti Corner Meteorological Station

in April with approximately 240 mm/month. The short rains from October to December, contribute about 35% to 40%, peaking in November at about 190 mm/month. The dry seasons from January to February and July to September, are generally cool and dry, with monthly totals below 50 mm.

The rainfall pattern is reliable but spatially variable due to local convection and topographic effects. Intense short-duration storms occasionally cause temporary surface runoff along Ndwaru Road, especially where drains are silted or blocked.

(ii) Temperature

The average temperatures in the Riruta–Dagoretti area range between 13°C and 26°C with mean maximum temperatures between 24°C to 26°C, warmest in February and March. The mean minimum temperatures between 13°C to 15°C, the coolest in July and August. The moderate diurnal range results in a comfortable climate with low heat-stress potential, ideal for residential occupation.

(iii) Humidity and Evaporation

Relative humidity averages between 70% to 85% during mornings and 50% to 60% during afternoons, reflecting Nairobi's upland moisture regime. Evaporation rates are moderate, averaging 3.5 mm/day to 4.5mm/day, balancing well with the rainfall regime and supporting good vegetation growth.

(iv) Wind Patterns

The dominant winds in Nairobi originate from the east and southeast, following the general monsoon patterns. Average wind speeds are moderate (2–5 m/s), with occasional gusts during the rainy seasons. These winds contribute to good natural ventilation, a feature incorporated into the Riruta project's passive building design.

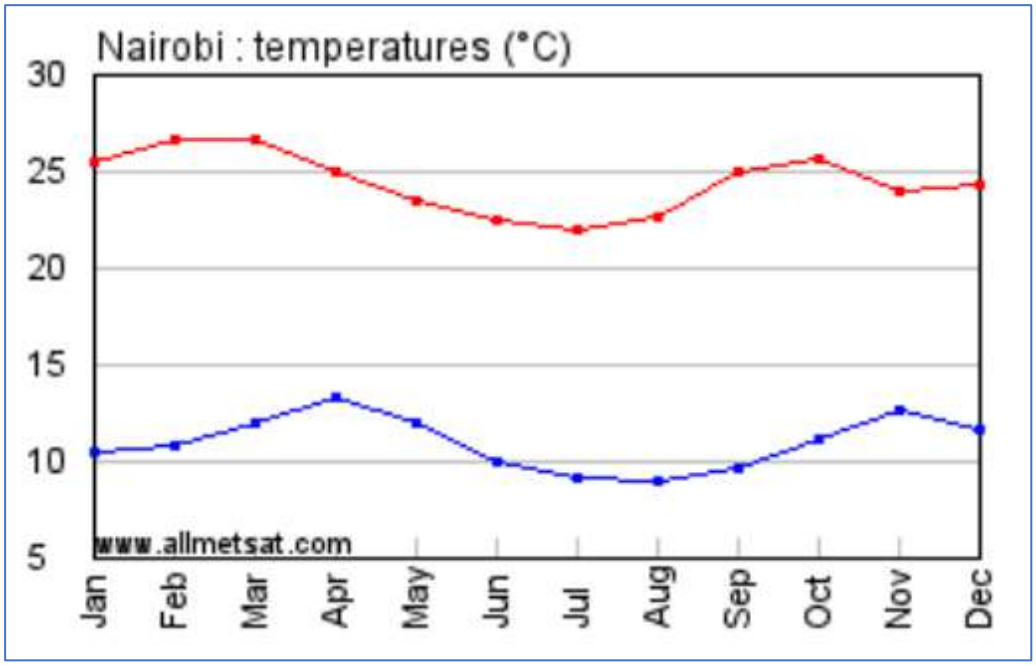


Figure 5-5: Nairobi City County Monthly ave. temperatures. Source: en.allmetsat.com

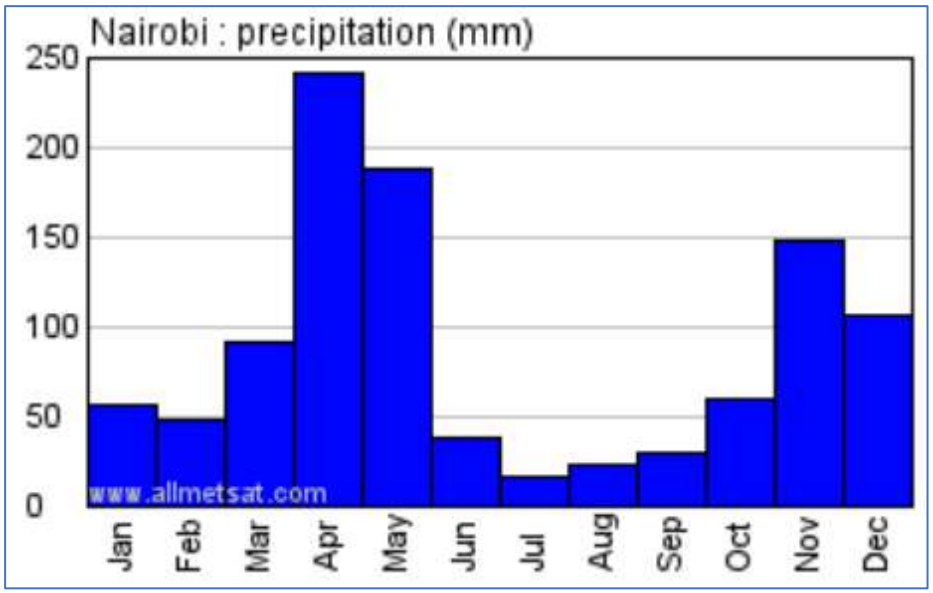


Figure 5-6: Nairobi City County Monthly mean precipitation Source: en.allmetsat.com

5.1.6 Air quality

5.1.6.1 Ambient air quality survey

Air quality is a critical environmental and public health parameter influencing the sustainability of residential developments. Baseline assessment is essential to establish existing atmospheric conditions, identify pollution sources, and provide a benchmark for monitoring project-related impacts. The assessment for the Riruta IHS Housing Project was undertaken in accordance with the Environmental Management and Coordination (Air Quality) Regulations, 2014, the WHO Air Quality Guidelines (2021), and the IFC Performance Standard 3.

The Riruta area, located along Ndwaru Road within Dagoretti South Sub-County, represents a mixed residential and commercial setting with limited industrial activity. The main potential air pollutants in the locality are vehicular emissions, road dust, and domestic fuel combustion.

The baseline monitoring was undertaken in 30th October 2025 to supplement baseline study. Sampling was conducted at three representative points of AQ-1: Within the proposed project site; AQ-2: Adjacent to Ndwaru Road; and AQ-3: Southern boundary near Keza Apartments.

The monitoring covered the main regulated parameters of $PM_{2.5}$, PM_{10}, SO_2, NO_2, CO, and O_3,using a calibrated Aeroqual Air Quality Monitor and Testo 350 multi-gas analyzer. Meteorological conditions (temperature, humidity, wind speed/direction) were simultaneously recorded using a portable weather station. The exercise followed USEPA and NEMA QA/QC procedures.

Table 5-2: Ambient Air Quality Results and Comparison with Standards

Parameter	Unit	Observed Range	EMCA (2014) 24-hr Limit	WHO (2021)	IFC EHS Guideline	Compliance Status
$PM_{2.5}$	µg/m³	12–18	25	15	15	Within limits
PM_{10}	µg/m³	21–22	50	45	50	Within limits
SO_2	µg/m³	<10	125	40	40	Within limits
NO_2	µg/m³	<15	200	40	40	Within limits
CO	mg/m³	<1	10	10	10	Within limits
O_3	µg/m³	<30	120	100	100	Within limits

Temperature	°C	22–24	—	—	—	Typical Nairobi average
Relative Humidity	%	58–65	—	—	—	Typical for site
Wind Speed	km/h	8–12 (NE)	—	—	—	Moderate

The results confirm that all pollutant concentrations were well within national and international standards. The slightly elevated $PM_{2.5}$ and PM_{10} levels along Ndwaru Road were attributed to light vehicular dust resuspension and construction traffic within the neighbourhood, typical of peri-urban Nairobi. No significant gaseous pollutants (SO_2, NO_2, CO, O_3) were detected beyond normal urban background concentrations. Meteorological data showed a steady northeast wind (8–12 km/h) and average temperature of 23°C, promoting good dispersion and low pollutant accumulation. The air quality of Riruta can be classified as good and compliant, suitable for residential use.

The ambient air quality within the Riruta project area is clean, compliant, and stable, reflecting minimal anthropogenic emissions. To preserve these conditions during the project's construction and operation, section 9.3.5 has provided for measures implement.

5.1.7 Noise and excessive vibrations

Ambient noise and vibration levels are key determinants of residential quality of life. The baseline assessment was conducted to establish the existing noise climate within the Riruta project area and to determine compliance with the Environmental Management and Coordination (Noise and Excessive Vibrations Pollution Control) Regulations, 2009, WHO Community Noise Guidelines (1999), and IFC Performance Standard 3. Given the site's proximity to Ndwaru Road, schools (Ndwaru Royal Academy, Havard School), and residential apartments, the area is classified as a mixed residential–commercial

5.1.7.1 Noise levels measurement

Noise measurements were taken using a Calibrated Brüel & Kjær Type 2238 Sound Level Meter positioned at three representative locations: N1: Within the project site; N2: Along Ndwaru Road, the main traffic influence; and N3: Near Keza Apartments, the southern residential receptor. Readings were recorded over 15-minute intervals for daytime (0700–1800 hrs) and evening (1800–2200 hrs) periods.

Table 5-3: Measured Noise Levels and Comparison with Standards

Area Category	Time (hrs)	Permissible Limit (dB(A)) – EMCA 2009	WHO (1999)	Measured Range (dB(A))	Compliance
Mixed residential / commercial	Day (06:00–18:00)	55	55	56.9–58.3	Slightly above / Acceptable
Mixed residential / commercial	Night (18:00–06:00)	45	45	45.7–47.1	Within limits

The measured noise levels during daytime slightly exceeded the 55 dB(A) limit, primarily due to vehicular movement along Ndwaru Road and community activity (school traffic, small businesses). Evening levels were within permissible limits, consistent with typical urban residential patterns. No impulsive or tonal noise sources were identified. Sensitive receptors include Ndwaru Road Royal Academy, Havard School, and ACT St. Matthews Parish, which currently experience typical ambient suburban noise.

Noise conditions in the project area are moderate and acceptable for residential environments. To prevent nuisance during project execution will implement the listed measures under section 9.3.8.

5.1.7.2 Vibration levels measurement

Ground vibration monitoring was performed using a Casella CEL-712 vibration meter to record Peak Particle Velocity at three points corresponding to the noise locations. Measurements focused on identifying background ground movement and assessing potential risks to human comfort and structural integrity.

Table 5-4: Vibration Level Compliance

Parameter	Measured (mm/s)	EMCA Limit (mm/s)	Observation
Peak Particle Velocity (PPV)	0.2–0.5	5.0 (Structural)	Well within limits
Human Comfort Range	0.2–0.5	0.5	Acceptable – no disturbance

Measured vibration levels were very low, indicating no potential for structural damage or human discomfort. Values are typical of stable ground in built urban environments and confirm that the area's substrata can safely support high-rise residential development.

Vibration levels within the project area are minimal and fully compliant with EMCA and IFC standards. No mitigation is necessary beyond normal equipment maintenance and scheduling of heavy vehicle movements during daylight hours to minimize transient ground excitation.

Table 5-5: Summary of Compliance for Air & Noise Baselines

Parameter	Observed Condition	Applicable Standard	Compliance Status
Air Quality	Clean, low PM levels, compliant with EMCA & WHO	EMCA 2014, WHO 2021, IFC PS3	✓ Compliant
Noise	56–58 dB(A) (day), within limits (night)	EMCA 2009, WHO 1999	✓ Acceptable
Vibration	0.2–0.5 mm/s	EMCA 2009	✓ Within limits

5.2 Biodiversity

5.2.1 Assessment methodology

The biodiversity baseline assessment for the Riruta IHS project site was conducted through a combination of field reconnaissance and review of secondary ecological data. Field observations were undertaken during the site visits of August–September 2025 and focused on identifying existing vegetation cover, notable plant species, habitat structure, and observable fauna or evidence of their presence, such as birds, insects, reptiles etc. Photographic documentation was undertaken to support habitat mapping and vegetation classification. Biodiversity baseline for the surrounding area obtained during the assessment and supplemented by the relevant secondary information.[8] This combination of methods ensured an accurate depiction of the site's current ecological condition within its 500-metre Area of Influence. The assessment recognizes the site as part of a heavily modified peri-urban ecosystem, with limited natural habitats remaining due to long-term residential and infrastructural development.

5.2.2 Flora

5.2.2.1 Anthropic Landscapes Vegetation

The Riruta IHS project site and its immediate surroundings support anthropogenic vegetation, dominated by cultivated lawn grasses, scattered trees, and ornamental shrubs. The ground cover consists primarily of *Axonopus compressus* (carpet grass) and patches of mixed herbaceous species such as *Bidens pilosa* and *Euphorbia heterophylla*, as shown in the field photos.

Vegetation within the site is largely secondary and managed, maintained through periodic clearing and trimming. Most of the trees are planted exotics and semi-indigenous species common in Nairobi's residential landscapes, contributing shade, soil stabilization, and limited microhabitat functions.

Representative species recorded or observed include:

Table 5-6: Checklist of flora species recorded at the proposed project site in Riruta

English Name	Scientific Name	Status
Silver oak	*Grevillea robusta*	Indigenous native
Croton	*Croton megalocarpus*	Indigenous native
Jacaranda	*Jacaranda mimosifolia*	Exotic introduced
Nile tulip tree	*Markhamia lutea*	Indigenous native
Cypress	*Cupressus lusitanica*	Exotic
Fig (Mugumo) tree	*Ficus sycomorus*	Indigenous fig
Mango tree	*Mangifera indica*	Cultivated fruit tree
Carpet grass	*Axonopus compressus*	Grass groundcover

The most ecologically significant feature is the mature Mugumo tree, centrally located within the site. This tree holds ecological, cultural, and aesthetic importance, providing canopy cover, bird habitat, and spiritual symbolism in Kikuyu culture. As highlighted in Section 4.4.4, the tree will be preserved and integrated into a landscaped communal park, forming a core element of the project's green infrastructure and biodiversity conservation effort.

[8] Nairobi City County Biodiversity Strategy 2022–2030; KFS Nairobi Urban Tree Inventory 2023; and IFC Performance Standard 6



Plate 10: View of (A) fully grown Croton Trees; (B) Silver oak tree

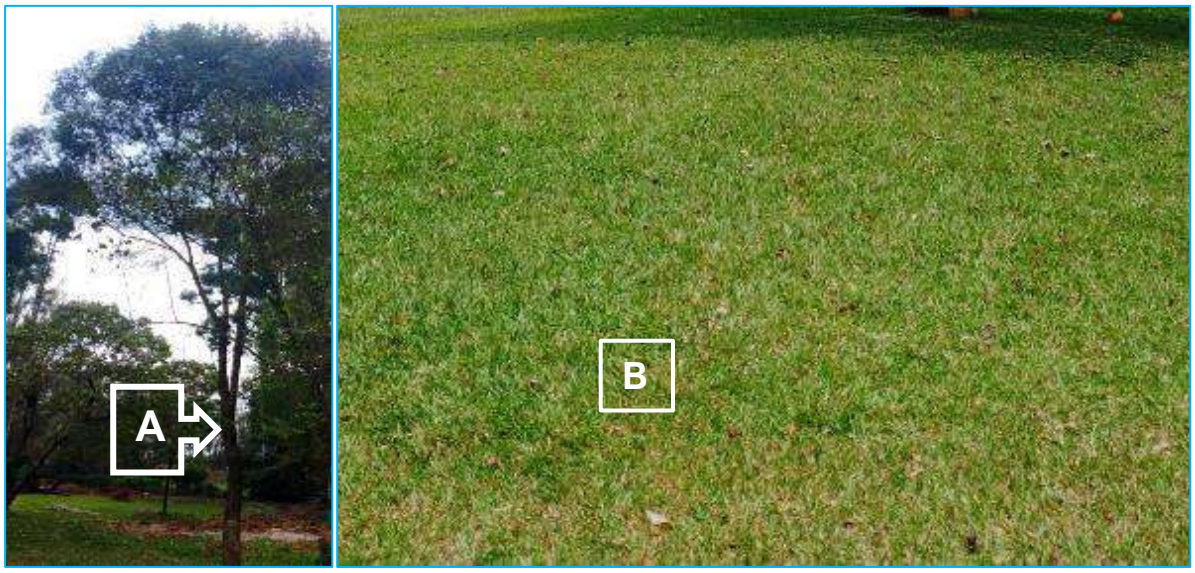


Plate 11: View of (A) Olive tree; (B) Carpet grass

5.2.2.2 Habitats

The vegetation structure across the site defines a modified terrestrial habitat, classified as a man-made/urban green space habitat under IFC PS6 typology. Natural habitats have been extensively altered by previous land clearing, compaction, and surrounding built-up developments.

Within the the Area of Influence, similar vegetation types dominate; mixed ornamental gardens, planted shade trees, and small lawns around residential plots, schools, and churches that includes ACT St. Matthews Parish and Ndwaru Royal Academy. Despite high modification, these vegetated patches provide ecological connectivity for small fauna and pollinators.

No rare, threatened, or endemic plant species were recorded within the site or its vicinity. The Kenya Forest Service and Nairobi City County biodiversity databases classify Dagoretti South as having low conservation priority due to extensive urbanization, though individual mature trees, like the Mugumo, are recognized for retention under the Nairobi Urban Tree Protection Guidelines (2023).

5.2.3 Fauna

The faunal assemblage in the Riruta IHS site reflects the urban-modified environment, dominated by common adaptable species that coexist with human activity. During field reconnaissance, no large mammals or reptiles were observed, and there are no nearby natural habitats capable of supporting such fauna.

However, a variety of urban bird species and small reptiles were observed within the site and surrounding plots, including:

Table 5-7: Checklist of fauna species recorded at the proposed project site in Riruta

English Name	Scientific Name	Status
Village weaver	*Ploceus cucullatus*	Native – Least Concern
Speckled pigeon	*Columba guinea*	Native – Least Concern
White-browed robin-chat	*Cossypha heuglini*	Native – Least Concern
Common bulbul	*Pycnonotus barbatus*	Native – Least Concern
White-bellied go-away bird	*Corythaixoides leucogaster*	Native – Least Concern
Agama lizard	*Agama agama*	Native – Least Concern
Striped skink	*Trachylepis striata*	Native – Least Concern
Chameleon	*Calumma sp. (Genus)*	Native – Least Concern

Insect life was active and diverse, including butterflies, bees, and ants, suggesting healthy micro-ecological balance. The faunal presence at the adjacent areas have similar patterns, with no sensitive or threatened species identified in the Dagoretti–Riruta area.

The Mugumo tree supports several bird and insect species, serving as a microhabitat and seed-dispersal point within the urban matrix. Its preservation is thus ecologically valuable, enhancing local biodiversity and providing a green refuge in an otherwise developed environment.

No evidence of wildlife migratory corridors, breeding sites, or protected faunal habitats was identified within or near the site. The nearest ecological feature of significance is the Ngong–Motoine River corridor, located approximately 1.2 km east of the project area, which supports limited riparian vegetation and avifaunal movement.

These species are all classified as Least Concern by the IUCN and are characteristic of peri-urban Nairobi habitats. No threatened, range-restricted, or migratory species of global concern were recorded or are expected within the site.

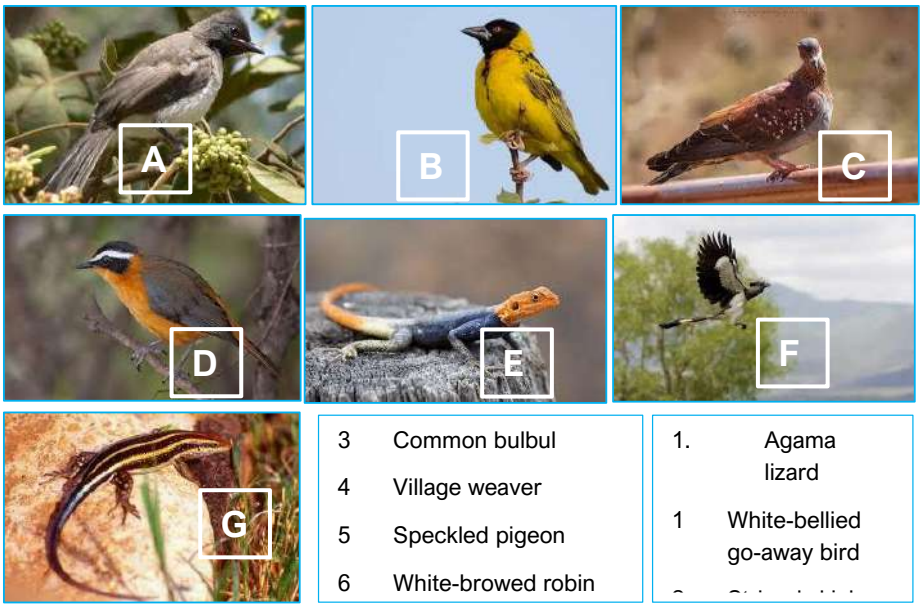


Plate 12: View of Common fauna spp. observed at the site

The detailed species that is found within the greater Riruta area is provided in the table below;

Table 5-8: Checklist of fauna species recorded at the proposed project site in Karen End

Group	Common English Name	Scientific Name	Occurrence in Riruta IHS Site / AoI	Status / IUCN Category
Birds (Avifauna)	Hadada Ibis	*Bostrychia hagedash*	Common visitor; forages on lawns and open fields	Native – Least Concern
	Speckled Pigeon	*Columba guinea*	Frequently observed around rooftops and open compounds	Native – Least Concern
	Common Bulbul	*Pycnonotus barbatus*	Very common resident, nesting in shrubs and hedges	Native – Least Concern
	Village Weaver	*Ploceus cucullatus*	Observed nesting on *Grevillea* and *Croton* trees	Native – Least Concern
	White-browed Robin-Chat	*Cossypha heuglini*	Observed within Mugumo canopy and hedgerows	Native – Least Concern
	African Pied Wagtail	*Motacilla aguimp*	Common along open grounds and parking areas	Native – Least Concern
	Variable Sunbird	*Cinnyris venustus*	Regular around flowering shrubs	Native – Least Concern
	Black Kite	*Milvus migrans*	Frequently seen soaring above built-up areas	Native – Least Concern
	Red-eyed Dove	*Streptopelia semitorquata*	Common urban species, often nesting on utility poles	Native – Least Concern
	Bronze Mannikin	*Spermestes cucullata*	Small flocks in ornamental gardens	Native – Least Concern
	African Palm Swift	*Cypsiurus parvus*	Occasionally sighted around tall buildings	Native – Least Concern
Reptiles	Agama Lizard	*Agama agama*	Observed basking on paved areas and rocks	Native – Least Concern

Group	Common English Name	Scientific Name	Occurrence in Riruta IHS Site / AoI	Status / IUCN Category
	Striped Skink	*Trachylepis (Mabuya) striata*	Common around building foundations and leaf litter	Native – Least Concern
	House Gecko	*Hemidactylus mabouia*	Common in building interiors and walls at night	Introduced / Native – Least Concern
	Jackson's Chameleon	*Trioceros jacksonii*	Occasional in treed compounds (secondary data)	Native – Least Concern
Amphibians	Guttural Toad	*Sclerophrys gutturalis*	Heard in wetter months; common in nearby drains	Native – Least Concern
	Common Reed Frog	*Hyperolius viridiflavus*	Possible in grassy patches during rainy season	Native – Least Concern
Mammals	Tree Squirrel	*Paraxerus ochraceus*	Occasionally observed in large trees (Mugumo)	Native – Least Concern
	House Mouse	*Mus musculus*	Widespread in built environments	Introduced – Least Concern
	Epauletted Fruit Bat	*Epomophorus wahlbergi*	Roosts in mature trees within the AoI	Native – Least Concern
Invertebrates	African Monarch Butterfly	*Danaus chrysippus*	Observed around open lawns	Native – Least Concern
	Carpenter Bee	*Xylocopa flavorufa*	Common around flowering shrubs and timber structures	Native – Least Concern
	Ants and Termites	*Various spp.*	Abundant in soil and deadwood; important decomposers	Native – Common

5.3 Socio-economic baseline

5.3.1 Population

According to the KNBS 2019 Population and Housing Census, Riruta Ward had a population of approximately 52,200 persons with 25,800 males and 26,400 females, representing a sex ratio of 98 males per 100 females. Using an annual urban growth rate of 2.3% (KNBS Urban Projections 2023), the 2025 estimated population for Riruta Ward stands at approximately 57,900 residents.

Dagoretti South Sub-County, as a whole, hosts a population of 240,081 persons, representing about 5.3% of Nairobi City County's total population. The age structure is youthful, with over 60% of residents under the age of 35 years, consistent with urban demographics across Nairobi. This youthful population contributes to high housing demand, informal sector employment, and pressure on social services.

5.3.1.1 Population Size and Structure

According to the KNBS 2019 Population and Housing Census, Riruta Ward had a population of approximately 52,200 persons with 25,800 males and 26,400 females, representing a sex ratio of 98 males per 100 females. Using an annual urban growth rate of 2.3% (KNBS Urban Projections 2023), the 2025 estimated population for Riruta Ward stands at approximately 57,900 residents. Dagoretti South Sub-County, as a whole, hosts a population of 240,081 persons, representing about 5.3% of Nairobi City County's total population.

The age structure is youthful, with over 60% of residents under the age of 35 years, consistent with urban demographics across Nairobi. This youthful population contributes to high housing demand, informal sector employment, and pressure on social services.

5.3.1.2 Population Density and Settlement Pattern

Riruta Ward has an estimated population density of 14,000 persons per km², reflecting a dense but organized urban settlement pattern. The area around Ndwaru Road, where the project is located, displays a mix of:

- Low- to mid-rise apartments of Keza, Havard, and new gated developments;
- Older single-family homes and small farms; and
- Commercial nodes along the main road and near schools and churches.

The project site itself is surrounded by residential and educational land uses that include Keza Apartments to the south, Ndwaru Royal Academy to the north, and single residential maisonette and ACT St. Matthews Parish to the east, making it compatible with existing settlement patterns and community infrastructure.

5.3.1.3 Household Characteristics

The average household size in Riruta Ward is approximately 3.1 persons per household, slightly below Nairobi's average of 3.3 (KNBS 2022). About 71% of households live in rented accommodation, while 26% are owner-occupied. The majority of dwellings are permanent structures with access to piped water, electricity, and shared sanitation facilities. Energy use for cooking is dominated by liquefied petroleum gas (LPG) and charcoal, while electricity is the main source of lighting. Access to basic services such as schools, health centres, and retail markets is high, owing to the area's proximity to Dagoretti Corner and Naivasha Road.

5.3.1.4 Population Dynamics and Growth Trends

Key drivers of population growth in Riruta include:

- Proximity to Nairobi CBD and major road corridors (Dagoretti Road and Naivasha Road);
- Expansion of affordable and middle-income housing projects by private developers;
- Improved infrastructure: - upgraded roads, drainage, and sewer connections; and

- Urban in-migration driven by employment opportunities in Nairobi's western growth corridor.

These dynamics continue to attract working-class and middle-income households seeking accessible, serviced housing options—precisely the market segment targeted by the Riruta IHS Housing development.

5.3.2 Land use, land tenure and local economy

5.3.2.1 Existing land use context

The proposed project is located along Ndwaru Road, within a rapidly urbanizing segment of Riruta Ward, Dagoretti South Sub-County, approximately 9 km west of Nairobi's Central Business District. The immediate environment comprises a mix of medium-density residential developments, educational institutions, and small-scale commercial establishments, reflecting the transition of the area from peri-urban agricultural holdings to a fully integrated urban settlement.

Within the 500 m Area of Influence, land use is predominantly residential, with supporting institutional and commercial functions. Specifically to the north is Ndwaru Road corridor hosting low- and mid-rise apartments, small groceries, tailoring shops, and Ndwaru Royal Academy primary school; to the east: are residential plots and ACT St. Matthews Riruta West Parish, with small retail shops fronting Naivasha Road approximately 250 m away; to the south is the Adjacent Keza Apartments and other multi-dwelling residential blocks, retail businesses, and access towards Dagoretti Road about 500 m; and westward is Havard School, Havard Apartments, and scattered private homes.

The dominant built form consists of four- to six-storey apartment blocks, interspersed with smaller single-family dwellings and a few remaining undeveloped plots. Public infrastructure includes surfaced roads, street lighting, and a sewer line along Ndwaru Road, indicating a fully serviced urban environment suitable for high-rise residential occupation.

5.3.2.2 Land tenure status

The project parcel is registered as L.R. No. Dagoretti/Riruta/6004, held under user rights for IHS Kenya Limited, the project proponent. The land has been lawfully converted from agricultural to multi-dwelling residential use, in line with approval issued by the county's department of Physical Planning.

The Change-of-Use approval granted to the development approval for land use from agricultural to multi-dwelling units, in the specified location; the key compliance conditions summarized under Section 3.3.4, includes: Submission and approval of building plans within two years; Completion of development within three years; Adherence to the Physical and Land Use Planning Act (2019) and zoning regulations; Compliance with EMCA (1999, amended 2015) environmental licensing requirements; and Provision of adequate on-site parking and setbacks.

The parcel is not part of any public utility or riparian land and lies within a legally subdivided residential block consistent with Nairobi's zoning policy for medium- to high-density residential development.

Surrounding parcels within the AoI are similarly under private freehold or leasehold tenure, used for residential, educational, and small commercial purposes. There are no known disputes or land acquisition requirements, and the project will not entail physical or economic displacement, satisfying the provisions of IFC Performance Standard 5 (Land Acquisition and Involuntary Resettlement).

5.3.2.3 Land use compatibility

The proposed residential development is fully compatible with the existing and planned land use in Riruta Ward. The area has experienced continuous densification over the last decade, supported by county-approved infrastructure upgrades, including road surfacing, sewer connection, and power distribution.

The project aligns with the Nairobi City County Integrated Urban Development Plan for year 2023 to 2027, which identifies Dagoretti South as a priority growth node for affordable and mixed-income

housing. The retention of the on-site Mugumo Park (see Section 4.4.4) enhances green space balance within the built environment, complementing the area's emerging pattern of urban greening and recreational integration.

5.3.2.4 Local economic setting

a) Economic Overview

Riruta Ward exhibits a diverse, service-based economy dominated by informal sector employment and small-scale enterprises. According to KNBS 2022 Ward Profiles, over 55 % of the working population in Dagoretti South is engaged in clusted businesses that include: retail and petty trade like grocery, tailoring, hardware, and food vending; public transport of matatu and boda-boda operations; construction and maintenance services; education and private school employment; and domestic and hospitality services.

The area also benefits from proximity to Naivasha Road and Dagoretti Road, which connect residents to industrial and service employment nodes in Dagoretti Corner, Karen, and Kawangware.

b) Household Incomes and Livelihoods

Average monthly household incomes in Riruta Ward range between KES 25,000 – 60,000, with most residents falling within the lower- to middle-income bracket. Approximately 70 % of working adults are employed in the informal sector, often combining wage employment with small household businesses.

Women's economic participation is high, particularly in small retail, market vending, and home-based services. Youth employment remains a challenge but has been improving through construction-related opportunities in the area's growing real estate sector.

c) Local Enterprises and Market Activity

The Ndwaru Road corridor functions as a local commercial spine, hosting kiosks, food outlets, carpentry shops, motorbike repair sheds, and small grocery stores. The nearby Dagoretti Market and retail centres along Naivasha Road serve as key trade hubs for residents. Most economic activities are micro-scale, providing essential goods and services to the surrounding residential community.

d) Linkages to the local economy

The proposed project will directly and indirectly stimulate the local economy through the construction-phase employment for skilled and unskilled labour sourced locally; through the increased demand for construction materials such as sand, aggregates, hardware supplies, and transport services from local suppliers; also post-construction service jobs, including estate maintenance, landscaping, and security; and enhanced business opportunities for nearby shops and service providers due to population growth within the estate.

By targeting middle-income households, the project will also contribute to stabilizing rental markets and expanding the tax base within Dagoretti South, consistent with county economic development priorities.

5.3.3 Housing

5.3.3.1 Housing characteristics in Riruta ward

Riruta Ward forms part of the Dagoretti South Sub-County housing belt, which has evolved rapidly over the past 15 years from a peri-urban settlement with mixed agricultural and residential land use into a medium- to high-density residential zone. According to the KNBS 2019 Census and 2022 Ward Profiles, housing in Riruta is primarily rental-based, reflecting the area's urban proximity and population mobility. Approximately 71% of households rent their dwellings, while 26% are owner-occupied, and the remaining 3% live in institutional or employer-provided housing. The households have varied dwelling types include 64% – Multi-dwelling units (apartments and flats); 21% – Single-family permanent houses; 10% – Semi-permanent structures; and 5% – Informal or temporary dwellings.

These statistics highlight the area's steady transformation into an apartment-dominated residential zone, supported by the densification along Ndwaru Road, Naivasha Road, and Dagoretti Corner. Most buildings within the project's 500 m Area of Influence are four- to seven-storey apartment blocks constructed from reinforced concrete, reflecting the demand for vertical housing solutions to optimize limited urban land. Older, detached dwellings and residual small-scale farms remain in isolated plots west of Ndwaru Road.

5.3.3.2 Housing condition and quality

The quality of housing in Riruta varies by sub-zone and construction period. Modern apartments such as Keza Apartments and Havard Apartments represent a new phase of formalized, planned development, characterized by serviced plots, on-site parking, and NCWSC water and sewer connections. Conversely, older or informal dwellings toward the interior lanes exhibit substandard drainage and limited infrastructure access.

Overall, about 78% of Riruta households occupy permanent masonry structures, while 17% occupy semi-permanent housing, often built with iron sheets and timber. Access to utilities is comparatively high that include resident water supply that is 82% connected to NCWSC mains; the electricity at 95% connection to the national grid; and sewerage connectivity at 69% connected to public sewer, the remaining portion utilising septic tanks or pit latrines.

These statistics reflect Nairobi County's progressive urban infrastructure coverage, though pockets of under-serviced housing persist along unpaved inner roads.

5.3.3.3 Housing affordability and demand

Riruta's location within 10 km of Nairobi CBD and direct connectivity via Naivasha Road and the Dagoretti Road make it highly attractive to middle- and lower-middle-income earners. The average monthly rent ranges between KES 10,000–15,000 for one-bedroom apartments, and KES 18,000–30,000 for two-bedroom units, depending on size and amenities.

Despite a strong construction boom, housing demand continues to outpace supply due to population growth, rural-urban migration, and limited access to affordable mortgage financing. KNBS and the State Department for Housing estimate that Nairobi requires approximately 150,000 new housing units annually, with Dagoretti South contributing less than 3% of that need. The Riruta IHS project directly responds to this gap by providing 240 well-planned apartment units designed for affordability, sustainability, and environmental efficiency. This development aligns with both the Kenya Affordable Housing Programme and the Nairobi CIDP (2023–2027) objective of improving access to decent and affordable housing within serviced urban areas.

5.3.3.4 Housing tenure security and planning compliance

Land tenure in Riruta is largely private freehold, subdivided from historical agricultural holdings into smaller residential plots. The project site is held under valid private ownership and has approved Change of Use for residential development. Adjacent properties follow similar tenure arrangements, with no evidence of public or community land within the 500 m AoI. All formal developments are regulated by the Nairobi City County Physical Planning and Building Approval System, which requires compliance with zoning, parking, height, and setback standards. The proposed Riruta IHS Housing project conforms to these requirements, with a G+15 structure, approved setbacks, and lawful use authorization, ensuring full tenure and regulatory compliance.

5.3.4 Informal Settlements

Dagoretti South Sub-County contains a mix of formal and semi-formal residential zones, with informal housing pockets primarily located in older peri-urban areas where tenure regularization and planning control have been slow to mature. According to the Nairobi City County Department of Housing and Urban Renewal (2023), informal settlements in the wider Dagoretti area are relatively small compared

to those in Eastlands or Embakasi, but they remain socio-economically significant. The most notable informal settlements in Dagoretti South include Riruta Satellite near the Riruta Trading Centre; Waithaka Village cluster, approximately 1.2 km southwest of the project site; and Kawangware 56 settlement, located about 1.5 km northeast along Naivasha Road.

These areas exhibit mixed tenure situations, part freehold and part unplanned subdivisions, where dwellings are often built incrementally with limited infrastructure provision. Within Riruta Ward, the project's immediate surroundings along Ndwaru Road are formally developed and do not host informal settlements. The 500 m AoI comprises fully serviced private parcels under lawful tenure, accommodating mid-rise apartments including Keza, Havard, and neighbouring developments, educational institutions, and commercial plots. However, pockets of informal housing occur in the wider Riruta locality, particularly to the west near Satellite and Githembe, where informal extensions host semi-permanent structures with limited drainage and water supply; and near Waithaka, where small informal dwellings persist along access roads pending redevelopment. These settlements are typically inhabited by low-income earners engaged in small-scale trade, transport, and construction-related work, many of whom provide labour to nearby formal developments. Although these areas fall outside the project's immediate footprint, they form part of the social and economic ecosystem that supports construction and service industries in the Ndwaru corridor.

The informal settlement dwellings in the greater Riruta area are built on privately subdivided land without approved plans or regularized titles. Typical features include:

- *Semi-permanent housing built from corrugated iron sheets, timber, and reused materials;*
- *High occupancy density and shared sanitation facilities;*
- *Irregular access roads and inadequate solid-waste management; and*
- *Limited formal drainage systems, causing temporary flooding during heavy rainfall.*

5.3.5 Economic Activities

Riruta Ward forms part of Dagoretti South Sub-County, one of Nairobi's key western urban growth zones, characterized by a vibrant, service-oriented economy. The area's economic base is primarily driven by informal trade, construction, education, transport, and household services, reflecting its role as both a residential and employment hub within the Nairobi metropolitan area.

Over 55% of the working population in Dagoretti South is engaged in informal sector activities[9], while about 35% are in formal employment, and 10% are unemployed or underemployed. This pattern closely mirrors the socio-economic profile of Riruta Ward, which supports an active informal economy with strong backward and forward linkages to the construction, transport, and retail sectors.

The area's proximity to Naivasha Road, and Dagoretti Corner provides strong commercial connectivity to industrial and business nodes such as Karen, Kawangware, and Ngong Road, enhancing employment mobility and market access.

The labour force in Riruta Ward is young, dynamic, and predominantly employed within the informal and small enterprise sectors. Based on KNBS data and field observations, the employment structure is approximately distributed as follows:

Employment Category	Approx. Share of Working Population (%)	Description
Informal / Self-Employed	55%	Market vending, retail kiosks, boda-boda operations, tailoring, food vending
Formal / Salaried Jobs	35%	Teachers, security officers, artisans, estate caretakers, county staff, SMEs

[9] According to the Kenya National Bureau of Statistics (KNBS, 2022) and the Nairobi City County CIDP (2023–2027),

Unemployed / Casual	10%	Job-seeking youth, intermittent construction workers, domestic helpers

Most residents hold multiple income sources, combining part-time work with informal trade. Youth (18–35 years) dominate the labour force, with women actively engaged in small-scale retail, catering, and service provision.

During field reconnaissance, several local businesses were identified along Ndwaru Road and within 500 m of the project site, including groceries and fruit vendors; tailoring and barber shops; food kiosks and small eateries; building material depots and hardware stores; motorbike (boda-boda) repair sheds and transport stages; and household goods and small retail stalls.

The sectoral distribution and livelihood patterns within the area entail the following;

Trade and Retail: The largest contributor to household incomes in Riruta. Small shops, open markets, and street vendors dominate Ndwaru and Naivasha Roads, providing employment to youth and women. Most businesses operate under single proprietorships and rely on high pedestrian traffic from residential estates and schools.

Construction and real estate: A rapidly expanding sector driven by Nairobi's housing demand. Riruta and Dagoretti South have seen significant construction of apartments and mixed-use buildings. Construction employs skilled and unskilled labourers, artisans, electricians, plumbers, masons, and vendors of construction materials. The sector directly supports over 20% of the ward's active labour force.

Transport: Matatu and boda-boda operations form a critical part of the local economy, offering mobility and small-scale employment. The Ndwaru–Naivasha Road corridor has several informal stages connecting to Dagoretti Corner, Kawangware, and Karen.

Education and services: Schools such as Ndwaru Royal Academy, Havard School, and ACT St. Matthews Parish institutions employ teachers, caretakers, and support staff, providing steady formal employment. The increasing number of households also sustains demand for domestic workers and security guards.

Micro-manufacturing and cottage industries: Small carpentry workshops, welding sheds, tailoring units, and food processing businesses operate along the corridor. These enterprises provide localized economic resilience and contribute to material supply chains supporting ongoing construction projects.

During the construction phase, the project is expected to engage approximately 250–300 workers including engineers, artisans, machine operators, and casual labourers. Many of these will be drawn from within the Dagoretti–Riruta area, supporting local employment and income generation.

other indirect economic benefits will include increased demand for materials and logistics services, benefiting nearby hardware stores, transporters, and suppliers; Boost to local retail and food vendors, especially around Ndwaru Road; and Post-construction employment for caretakers, cleaners, landscapers, and security personnel within the completed development.

5.3.6 Solid Waste Management and Sanitation

The broader project area of Dagoretti South Subcounty is characterized by a mixed solid waste management system, combining formal county services and private collection contractors operating under county licensing. Household and commercial waste is generated from dense residential developments, small businesses, and institutions such as schools and churches along the Ndwaru–Naivasha Road corridor.

5.3.6.1 Waste generation and collection

Waste streams, originating from dense residential areas, small businesses, schools, and churches along the Ndwaru–Naivasha Road corridor, are significant. Rapid urban growth has unfortunately led to increased waste generation, yet collection efficiency and segregation remain limited. The county government is the central authority, guided by the Solid Waste Management Act, 2021, which promotes public–private partnerships, recycling, and minimizing waste at its source.

5.3.6.2 Solid waste in Riruta

According to the Nairobi City County Department of Environment (2023), urban residents generate roughly 0.6 to 0.8 kg of waste per person daily. Given Riruta Ward's estimated 2025 population of around 57,900, the ward produces a substantial 35–45 tonnes of solid waste every day, predominantly domestic and organic material.

Composition analysis of typical household waste in Dagoretti South reveals presence of the organic/biodegradable waste that is a large majority at 60% with food scraps, and yard waste; 15% plastics and packaging; 10% paper and cardboard; 5% glass, metals, and inert waste; and approximately 5% hazardous waste.

Waste collection relies on three main groups: private registered companies contracted by households and apartments, Community-Based Organizations (CBOs) for aggregation and segregation, and NCCG vehicles servicing public collection points along Naivasha and Dagoretti roads. The collected waste is eventually transported to either the Kang'oki or Dandora transfer sites.

5.3.6.3 Project area solid waste management

Within the 500-meter Area of Influence of the proposed project, waste management is generally better organized, thanks to the formal nature of apartment developments. Estates like Havard Apartments utilize regular private collection services. However, roadside littering remains a problem in open and unserviced plots. Site checks observed minor accumulations of mixed domestic and construction debris along Ndwaru Road shoulders, suggesting occasional collection lapses. Consequently, the proposed housing project will implement a structured solid waste management system. This includes private contracting, source segregation, and dedicated on-site storage infrastructure to ensure compliance with county by-laws.

5.3.6.4 Sanitation and sewerage systems

The project site and surrounding areas are serviced by the NCWSC sewer line running along Ndwaru Road. This line feeds into the Kikuyu–Dagoretti trunk sewer system before reaching the Nairobi West wastewater treatment network. Most properties within the AoI are already connected. NCWSC data indicates that approximately 78% of Riruta Ward households are connected to the public sewer, with the rest relying on septic tanks or bio-digesters. Sanitation primarily uses flush and pour-flush toilets, often shared in older housing. Public and institutional sanitation is regulated by the Public Health Department of Nairobi City County.

5.3.6.5 Public health and environmental challenges

Riruta contends with challenges typical of high-density zones that includes irregular waste collection and illegal roadside dumping; limited household segregation, hindering recycling efforts; blocked drains during heavy rain due to improper disposal of plastics and organic waste; and strain on sewerage systems in areas with inadequate infrastructure.

5.3.6.6 Project-area waste and sanitation provisions

The proposed housing project is set to adopt a comprehensive plan aligning with all regulations.

Solid Waste Management Measures: Segregation at source into biodegradable, recyclable, and residual streams; Construction of lidded, washable masonry waste storage bays within the estate; Engagement

of a licensed private waste collector approved by the NCCG; and Regular waste audits and participation in plastics and paper recycling programs.

Sanitation Infrastructure Measures: Connection of all units to the existing NCWSC sewer line on Ndwaru Road for safe wastewater disposal; Provision of adequate sanitary facilities in each apartment block, meeting Building Code standards; Routine inspection and maintenance of sewer connections to prevent leaks and blockages; and ensure the project adheres to the environmental standards established.

5.3.7 Vulnerable Groups

Vulnerable groups in Riruta Ward represent community segments that experience limited access to resources, reduced adaptive capacity, or heightened exposure to socio-economic or environmental risks. Based on field reconnaissance, stakeholder interviews, and focus group discussions, the main vulnerable categories in the project's Area of Influence include women (particularly single mothers and widows), youth, persons with disabilities (PWDs), elderly persons, low-income earners, and people living with HIV/AIDS (PLWHA).

5.3.7.1 Social and Economic Characteristics

Women in Riruta play an important role in the local economy through food vending, tailoring, and home-based businesses. However, many face challenges such as low earnings, dependence on informal trade, and limited access to formal employment and credit facilities.

Youth constitute about 63% of the ward's population, with unemployment and substance abuse identified as key vulnerabilities. The area hosts several youth support initiatives such as the Youth Empowerment and Engagement Program (YEEP) and Kaa-Sober rehabilitation scheme.

Persons with disabilities and the elderly were identified as socially and physically disadvantaged due to mobility barriers, health constraints, and limited access to economic opportunities. Low-income earners, mainly casual labourers and informal traders, remain economically vulnerable to fluctuations in daily income and rising living costs. People living with HIV/AIDS continue to experience stigma and require regular access to healthcare and social support services.

5.3.7.2 Community Perceptions and Concerns

During social consultations, community members expressed strong support for the proposed housing development, recognizing its potential to create employment and improve the neighbourhood's physical environment. However, vulnerable groups raised specific concerns regarding: Exclusion from job opportunities during construction; Potential increases in living costs and rent post-development; Noise, dust, and safety concerns during construction; and Limited consultation of women and youth in project decision-making.

They requested inclusion in local employment, priority for supply-chain opportunities, and collaboration with existing community structures such as Chiefs, Nyumba Kumi, and local CBOs for communication and grievance management.

5.3.7.3 Vulnerable Groups in the Riruta Location

Based on the socio-economic baseline survey, stakeholder consultations, and field assessment, the following groups are recognized as vulnerable within the Riruta location area and its broader socio-economic context:

(a) Low-Income and Informal Sector Households

A significant share of residents depend on informal trade, domestic work, or casual labour, with limited savings and job security. They are highly sensitive to income disruption, rent changes, and health-related costs.

(b) Women and Female-Headed Households
About 17% of households are female-headed, with many women facing restricted access to formal employment, lower wages, heavy domestic burdens, and GBV risks in poorly serviced areas. These factors limit their economic resilience.

(c) Youth and Unemployed Young Adults
Youth (18–35) represent roughly 63% of the population and commonly experience unemployment or low-paying informal work. Consultations highlighted limited skills training and risks of negative coping behaviours. The project offers opportunities through local hiring and skills transfer.

(d) Older Persons
Elderly residents, particularly widows and those living alone, face income insecurity and health challenges. Reduced physical mobility affects access to services and increases dependency.

(e) Persons with Disabilities (PWDs)
PWDs encounter physical barriers, limited employment opportunities, and social stigma. The project's universal access features; ramps, wider pathways, and handrails: - will enhance inclusion in line with national accessibility laws.

(f) Children and Orphans & Vulnerable Children (OVC)
Children in low-income households face risks of school dropout, malnutrition, and exposure to unsafe environments. OVC remain particularly vulnerable to exploitation or child labour, underscoring the need for strong safety and community oversight during construction.

(g) People Living with HIV/AIDS (PLWHA) and the Chronically Ill
These groups face stigma, ongoing medical expenses, and unstable employment. Engagement with local health facilities is important to support continuity of care.

(h) Informal Workers, Vendors, and Petty Traders
Roadside and mobile traders depend on foot traffic along Ndwaru Road. Construction-related access disruptions could affect their livelihoods; early notifications and managed access routes will reduce impacts.

(i) Households in Informal Extensions
Nearby settlements such as Satellite and Waithaka include semi-regularized areas with insecure tenure and poor services. While not directly displaced, these households face heightened environmental and health vulnerabilities.

5.3.8 Markets and urban centers

The main urban and market centres serving the project area include Riruta Market, Dagoretti Corner, and Kawangware Market, supplemented by smaller retail and service clusters along Ndwaru Road and Naivasha Road.

These centres function as important economic and social convergence points for surrounding residential estates, schools, and transport corridors.

5.3.8.1 Local market characteristics

Within the AoI, the project site along Ndwaru Road is bordered by active micro-trading enterprises; grocery vendors, tailors, eateries, boda-boda operators, hardware outlets, and kiosks which provide daily goods and services to the surrounding residential community. Field reconnaissance and community consultations revealed that these small enterprises are typically family-run and form the primary income source for many local households.

The nearby Riruta Market, approximately 1 km to the northwest, serves as the ward's main aggregation point for agricultural produce, food items, and household commodities. It attracts vendors from Dagoretti, Waithaka, and Karen, employing hundreds of traders, many of them women.

Dagoretti Corner, situated 2.5 km east of the site, represents a higher-order urban node with formal shops, hardware suppliers, retail outlets, banks, and matatu termini connecting the area to the Nairobi CBD, Ngong Road, and Kawangware. Meanwhile, Naivasha Road, approximately 250 m east of the site, functions as a continuous commercial corridor lined with supermarkets, food outlets, and small-scale service businesses.

5.3.8.2 Economic significance and employment

Tade and services contribute approximately 40–45% of employment within Riruta Ward. The informal retail and service sector remains the largest employer of youth and women, who operate as small-scale traders, food vendors, and service providers.

Key observations from the assessment in Riruta focus groups highlight:

- High dependence on local trading for daily income;
- Women's dominance in open-air and food vending;
- Increasing competition due to population growth and limited trading space; and
- Desire for improved waste management, market stalls, and access roads.

These local markets play a central role in supporting household livelihoods and facilitating urban food distribution across Dagoretti South.

5.3.8.3 Urban centres and service infrastructure

Riruta's markets are supported by basic public infrastructure including paved access roads, power connections, and piped water supply from NCWSC. However, traders cited periodic challenges such as poor drainage, inadequate lighting, and irregular waste collection. The County is implementing the Urban Economic Empowerment Initiative to modernize local markets and strengthen informal trading systems through improved stalls, hygiene facilities, and waste management partnerships.

The housing project aligns with these county objectives by improving the local built environment, supporting road upgrades, and increasing residential density that sustains consumer demand and commercial growth.

5.3.9 Social Infrastructure and Services

Riruta Ward, located within Dagoretti South Sub-County, is a well-established residential area with extensive access to social infrastructure and basic services. The area's growth has been supported by Nairobi City County's investments in schools, health centres, religious institutions, and transport networks. The proposed Riruta IHS Housing Project lies along Ndwaru Road, which is served by essential public and private institutions within a 500 m radius. This section describes the available social infrastructure supporting the local community and how the proposed project fits within this framework.

5.3.9.1 Education

Education facilities in Riruta Ward range from public and private early childhood centres to secondary and tertiary institutions. According to KNBS (2022) and County Education Office records, the ward hosts over 30 schools, including primary, secondary, and vocational institutions. Within and near the project's Area of Influence, notable institutions include: Ndwaru Road Royal Academy (directly north of the site); Havard School (to the west); ACT St. Matthews Riruta Parish Primary (to the east); and several early childhood development centres and daycare facilities.

Most schools are privately owned but affordable, serving the working-class and middle-income population. Enrolment levels are high, and literacy rates in Dagoretti South exceed 90%, reflecting good access to education. However, stakeholder feedback from the assessment, it was noted that there was overcrowding and limited space for recreational facilities in some schools due to high population density.

The presence of nearby schools ensures that the proposed housing development will not strain existing educational resources, but rather expand demand for childcare and after-school services within walking distance.

5.3.9.2 Health services

Riruta Ward has access to both public and private health facilities. The main public facility is the Riruta Health Centre, located approximately 1.2 km from the project site, offering outpatient and maternal services. Other nearby facilities include:

Dagoretti Sub-County Hospital at about 3.2 km east; St. Odilia Dispensary and Maternity; and Several private clinics and pharmacies along Ndwaru and Naivasha Roads. Residents also access referral hospitals such as Kenyatta National Hospital at about 8 km east) and Karen Hospital at about 5 km southwest.

During consultations, community members acknowledged good proximity to clinics but cited challenges with affordability, staffing, and long queues at public facilities. The proposed IHS project will not exert direct pressure on these facilities but may enhance demand for private outpatient and pharmacy services, supporting local economic diversification in the health sector.

5.3.9.3 Water supply and sanitation services

Water supply within Riruta Ward is provided primarily by the NCWSC through the Dagoretti distribution network, supplemented by private boreholes and water vendors. Connection coverage in the ward is estimated at 82%, with frequent rationing during dry periods. The proposed project will be connected to the NCWSC main line along Ndwaru Road, complemented by internal storage and rainwater harvesting systems. Sewerage services are available via the NCWSC Dagoretti trunk sewer, which also serves adjacent developments such as Keza Apartments and Havard School.

Residents in informal pockets of Satellite and Waithaka still rely on septic tanks or shared pit latrines. The project's design ensures full compliance with the Public Health Act (Cap. 242) and Water Act (2016) standards, contributing to improved sanitation management in the area.

5.3.9.4 Security services

Security in Riruta Ward is maintained by the Kenya Police Service (Riruta Police Station) and community policing initiatives (Nyumba Kumi) under the area Chief. The station, located about 1.5 km from the project site, coordinates patrols along Ndwaru Road and Naivasha Road. Private security companies also operate extensively within the area, guarding apartment complexes, shops, and schools.

Community feedback during the consultations indicated that general security has improved following road lighting and active community-police partnerships, though petty theft and substance abuse remain localized concerns.

The project's integrated security design; boundary walling, controlled access, CCTV surveillance, and lighting; will enhance neighbourhood safety and complement existing county initiatives.

5.3.9.5 Religious and community facilities

Riruta hosts a diverse mix of religious institutions and community centres that play an important role in social support and cohesion. Key institutions within the AoI include: ACT St. Matthews Riruta West Parish (east of the site), Riruta SDA Church, Deliverance Church Ndwaru, and Several small mosques and youth community halls.

These institutions contribute to education, moral guidance, and welfare services for vulnerable members of the community. CBOs such as the Youth Empowerment and Engagement Program (YEEP) and Kaa-Sober Initiative have been instrumental in supporting rehabilitation, environmental clean-up, and vocational training for unemployed youth.



Figure 5-7: View of church location east of the site



Figure 5-8: View of the completed Keza apartments south of the site

5.3.9.6 Transport and accessibility

The project site is strategically located along Ndwaru Road, a fully tarmacked route linking Naivasha Road (250 m east) to Dagoretti Road (500 m south). Public transport is readily available through matatus and boda-bodas connecting Riruta to Dagoretti Corner, Kawangware, and Nairobi CBD. The area benefits from ongoing county road improvement and drainage maintenance works that have improved mobility and reduced seasonal flooding. Accessibility to social amenities is therefore adequate, supporting sustainable residential occupation of the area.

5.3.10 Utilities and Physical Infrastructure

Riruta Ward benefits from well-established urban infrastructure typical of Nairobi's western suburbs, including access to piped water, sewerage, electricity, and paved road networks. The proposed Riruta IHS Housing Project, located along Ndwaru Road, lies within a fully serviced zone connected to the Nairobi NCWSC and KPLC distribution systems. The project's location provides excellent connectivity to major utility corridors and public services, making it suitable for high-density residential development.

5.3.10.1 Water supply infrastructure

Potable water within Riruta Ward is supplied primarily by the NCWSC Dagoretti distribution network, which draws from the Kikuyu Springs and Kabete reservoirs. The MEP Site Survey Report (2025) confirmed that a functional NCWSC main line runs along Ndwaru Road, already servicing adjacent developments such as Keza Apartments and Havard School. The proposed housing development will connect directly to this existing main through an authorized metered connection, with on-site storage tanks sized to meet daily domestic and firefighting requirements.

Average water demand is estimated at 60–80 m³ per day, accounting for residential use, landscaping, and common-area maintenance. Given the area's occasional rationing cycles, the project includes:

- Rainwater harvesting systems from rooftop surfaces for non-potable use;
- Dual plumbing for recycled water such as irrigation and cleaning and
- Water-efficient fittings; low-flow taps, dual-flush cisterns, to minimize wastage.

5.3.10.2 Sewerage and wastewater management

The site is well served by the NCWSC sewer trunk line running parallel to Ndwaru Road, which also receives effluent from the adjacent Keza Apartments. The project's wastewater network will discharge into this existing sewer line via a controlled connection approved by NCWSC. All domestic wastewater from residential blocks, communal areas, and utility spaces will be conveyed through an internal separate drainage system for foul and stormwater. Temporary on-site sanitation during construction will be managed through portable toilets and septic holding tanks, serviced regularly by licensed waste handlers.



Figure 5-9: View of ongoing sewer line connection to the adjacent Keza developments

5.3.10.3 Electricity and energy infrastructure

Electrical power supply to the project area is provided by the Kenya Power and Lighting Company (KPLC), with an existing 11 kV distribution line along Ndwaru Road. The initial survey done identified adequate capacity for a new connection, supported by nearby transformers serving the Keza and Havard developments.

The project's electrical system will include: a hree-phase power connection from KPLC via a dedicated transformer; Energy-efficient LED lighting for all common and circulation areas; Solar-assisted water heating systems on rooftops; and Provision for future solar PV installation to offset common-area power use.

A standby diesel generator will be installed to provide emergency backup power for lifts, lighting, and critical systems during outages.



Figure 5-10: View of existing powerline and pole mounted transformer at the site

5.3.10.4 Telecommunications and ICT infrastructure

Riruta Ward is covered by Kenya's major telecom service providers; Safaricom, Airtel, and Jamii Telecommunications Ltd; offering mobile, internet, and fibre-optic connectivity. Ndwaru Road hosts overhead and underground fibre routes, ensuring reliable service availability for both residential and commercial users.

The project will incorporate: Provision for fibre-optic connections to each unit; Wi-Fi-enabled common areas; and Structured cabling for internal communication, security, and automation systems such as the CCTV, and intercom.

This will enhance digital access and align with Nairobi's Smart City Development Strategy.

5.3.10.5 Road and transport infrastructure

Access to the project site is provided directly from the tarmacked Ndwaru Road, which links Naivasha Road (250 m east) and Dagoretti Road (500 m south). The road is maintained under the Nairobi City County Department of Roads, Public Works and Transport and is in good condition, supporting both public and private transport operations.

The area is served by regular matatu and boda-boda routes, providing connectivity to Dagoretti Corner, Kawangware, and Nairobi CBD. Sidewalks and drainage improvements have been implemented under the county's ongoing urban mobility and resilience upgrades (2022–2025). Internal access roads within the development will be cabro-paved, featuring speed humps, pedestrian walkways, and directional signage to enhance safety and circulation.



Figure 5-11: View of Ndwaru road access adjacent north of site

5.3.10.6 Stormwater drainage and flood management

Stormwater in Riruta is managed through roadside channels discharging into the Dagoretti–Kikuyu drainage system. To minimize local flooding risks, the project integrates a Sustainable Urban Drainage System, described in detail under Section 4.12.3.

Key components include: Permeable paving to promote infiltration; Vegetated swales and infiltration trenches to slow runoff; and Underground attenuation chambers designed for a 1-in-100-year rainfall event. This system will ensure controlled discharge, minimize erosion, and enhance groundwater recharge.

5.3.10.7 Solid waste and environmental utilities

Solid waste collection in Riruta is coordinated by NCCG-licensed private contractors, supported by community groups. The project will maintain waste segregation at source, with an on-site waste collection bay designed to county standards. Waste will be collected regularly by approved service providers for disposal at designated NCCG transfer stations.

5.3.11 Transport, Connectivity and Road Network

Riruta Ward is well integrated into Nairobi's western transport network through a system of primary, secondary, and local access roads connecting it to Dagoretti Corner, Kawangware, and the Nairobi CBD. The project site, located along Ndwaru Road, enjoys excellent connectivity to both Naivasha Road (250 m east) and Dagoretti Road (500 m south); two key arterial routes under the Nairobi urban mobility corridor. The area's transport system supports both vehicular and non-motorized traffic and is a critical enabler of residential and commercial development in Dagoretti South Sub-County.

5.3.11.1 Existing road network

The immediate project area is served by the following major road links:

Road Name	Type	Condition / Surface	Connectivity Function
Ndwaru Road	Secondary distributor	Fully tarmacked, 7–9 m wide, with side drainage and lighting	Direct access road serving project site and adjoining developments
Naivasha Road	Primary arterial	Dual carriageway; connects Dagoretti Corner–Kawangware–Westlands	Provides access to Nairobi CBD and western suburbs
Dagoretti Road	Secondary arterial	Paved; connects Dagoretti Market–Waithaka–Karen	Feeder to Southern Bypass and Karen Link Road
Access lanes / estate roads	Local	Mostly cabro or compacted gravel	Internal access to apartments, schools, and retail nodes

5.3.11.2 Public Transport and Non-Motorized access

Public transport is readily available within Riruta Ward, primarily via matatus and boda-boda operators. Matatu routes operating along Ndwaru Road connect the area to Dagoretti Corner, Kawangware, and Nairobi CBD, while boda-boda operators provide flexible last-mile connectivity for local commuters. Sidewalks exist intermittently along Ndwaru Road and are complemented by several designated pedestrian crossings near schools and commercial nodes. County plans under the Nairobi Non-Motorized Transport (NMT) Policy, 2023 propose enhancements to pedestrian safety through continuous sidewalks, cycle lanes, and junction management along Naivasha Road and its feeder corridors, including Ndwaru Road.

(a) Traffic Conditions

The traffic volumes along Ndwaru Road are moderate, averaging: Peak-hour morning flows: approximately 850 Passenger Car Units (PCUs); Evening peak flows: about 910 PCUs; and Daily average traffic: approximately 9,200 vehicles/day.

The intersection of Ndwaru–Naivasha Road has a stable traffic flow with minimal congestion, while mid-block conditions near the project site which has acceptable operation for a mixed residential–commercial corridor. The local traffic comprises predominantly private cars, school transport vans, delivery trucks, and boda-boda riders. No major congestion or queuing issues were observed at the proposed site access junction.

(b) Project Traffic Integration

The Riruta IHS project is projected to generate approximately 250–300 vehicle movements per day during operation, mostly private cars, service vehicles, and visitors. This is considered a minor incremental increase (<5%) to existing volumes along Ndwaru Road, hence manageable within current capacity levels. Access to the site will be provided via a dedicated left-in/left-out driveway, designed with appropriate sight distances and signage. Internal circulation will follow a one-way cabro-paved loop system with defined pedestrian walkways, parking bays, and speed calming measures.

Construction-phase traffic impacts will arise from delivery trucks and construction machinery. The project should implement several measures that include: Scheduling heavy deliveries during off-peak hours (09:00–16:00); Use of flagmen and reflective signage at the entrance; On-site loading/unloading bays; and Enforcement of a 20 km/h speed limit within the access corridor. These are incorporated into the Traffic Management Plan and discussed in detail under Section 9.3.19 of this report.

(c) Non-Motorized Transport and Pedestrian Safety

Non-motorized transport within the Riruta area is common, especially walking and cycling for short trips to schools, shops, and bus stages. The Nairobi NMT policy encourages inclusion of safe pedestrian pathways, cycle lanes, and street lighting in all new developments.

The project will enhance NMT safety through: Clearly marked pedestrian routes within the compound; Ramps and handrails for persons with disabilities; Adequate street and pathway lighting; and Integration with the existing sidewalk along Ndwaru Road. These measures promote accessibility and align with IFC Performance Standard 4 (Community Health, Safety, and Security).

(d) County level and Urban Connectivity

Riruta's strategic location within Nairobi's western growth zone provides access to major urban and regional networks:

- Ngong Road (3.5 km east) links the sub-county to Kilimani, Karen, and Nairobi CBD;
- Naivasha Road and Dagoretti Road facilitate intra-ward movement and connection to educational and commercial centres.

6 CHAPTER 5: LEGAL, POLICY AND INSTITUTIONAL FRAMEWORK

6.1 General Overview

This chapter sets out the standards to which the legal, policy and administrative framework within which the proposed green affordable housing project will be developed. It identifies the applicable national standards and lender requirements. For convenience and to demonstrate a systematic approach to identifying legal constraints, it has been structured around the broad topic areas set out in the Kenyan laws and policies as these comprehensively address the environmental and social risks that may be faced by the proposed housing project. The legal framework presented in this section is not exhaustive and aims to outline key legal requirements and frameworks that are most relevant for the proposed project during the construction and operation phases. The ESIA will conform to the Kenyan legislative and regulatory framework and in line with the EIB Environmental and Social Standards (2022). For the majority of disciplines, where there is a difference between the national Kenyan standards and EIB Environmental and Social Standards, whichever is more stringent shall apply.

6.2 National Legal Framework

Item	Description	Relevance
The Constitution of Kenya 2010	(a) According to Article 42 of the 2010 Kenyan Constitution, every person has the right to a clean and healthy environment. This right includes the right to have the environment protected for the benefit of current and future generations through legal and other measures, especially those envisioned in Article 69, as well as the right to have environmental obligations under Article 70 met. (b) Every worker has a right to fair remuneration; to reasonable working conditions; to form, join or participate in the activities and programmes of a trade union; and to go on strike as per article 41. (c) Article 43. (1)(b) states that every person has the right to accessible and adequate housing, and to reasonable standards of sanitation; (d) According to Article 69(2), everyone has a responsibility to work with government agencies and other individuals to safeguard and maintain the environment and ensure the sustainable exploitation of natural resources.	The Proponent is obliged to execute the project within legal boundaries, ensuring it is environmentally, economically, and socially sustainable. They also have the right to a fair administrative decision-making process from NEMA and other state organs, and must fully comply with the Constitution's stated articles.
The Environment Management and Co-ordination Act (Cap 387)	(a) With the enactment of the Environmental Management and Co-ordination Act (EMCA) in December 1999 (Rev. 2015), the institutional framework for environmental management was strengthened. EMCA provides for the establishment of NEMA, which became operational in July 2002. NEMA has statutory mandate to co-ordinate all environmental activities. (b) Part II of EMCA states that every person in Kenya is entitled to a clean and healthy environment and has the duty to safeguard and enhance the environment. In order to partly ensure this is achieved, Part VI of the Act directs that any new programme,	As per the act's second schedule, establishment of multi-dwelling housing developments is listed as one of the activities that must undergo environmental impact assessment. The Proponent has commissioned the environmental and social impact assessment of the proposed housing project in compliance with the Act. This study report also complies with the requirements of the Act. The Proponent shall be required to commit to implementing the environmental management and monitoring plan laid out in this report, and other conditions for approval by NEMA prior to issuing of the EIA licence.

Item	Description	Relevance
	activity or operation should undergo environmental impact assessment, and a report prepared for submission to NEMA who in turn may issue a license as appropriate. (c) Part VIII section 72 of the Act prohibits discharging or applying poisonous, toxic, noxious or obstructing matter, radioactive or any other pollutants into the aquatic environment. Section 87 Sub-section 1 states that no person shall discharge or dispose of any wastes, whether generated within or outside Kenya, in such a manner as to cause pollution to the environment or ill health to any person. Sections 90 through 100 outlines more regulations on management of hazardous and toxic substances including oils, chemicals and pesticides.	
County Governments Act (Cap 265)	(a) The Act empowers Nairobi City County Government to plan development projects within her jurisdiction, focusing on projects of national or local importance. (b) Section 102 outlines principles for planning and development facilitation, including integrating national values, protecting self-fulfillment rights, promoting equity resource allocation, and protecting minority rights and marginalized groups. This ensures responsibility for future generations and the protection of marginalized communities. (c) Section 111 states that for each city and municipality there shall be the following plans— • city or municipal land use plans; • city or municipal building and zoning plans; • city or urban area building and zoning plans; • location of recreational areas and public facilities.	The project Proponent should initiate the process of county government engagement in the initial project planning through the application of essential development approvals from Nairobi City County Government. The proponent shall obtain an approval letter from the Nairobi City County Government. The proposed green affordable housing should comply with the Nairobi City land use and building plans

Item	Description	Relevance
	The city or municipal plans shall be the instrument for development facilitation and development control within the respective city or municipality. The city or municipal plan shall, within a particular city or municipality, provide for— • functions and principles of land use and building plans; • location of various types of infrastructure within the city or municipality; • development control in the city or municipality within the national housing and building code framework.	
Land Act, 2012	(a) Provides for the sustainable administration & management of land & land-based resources & connected purposes. (b) Part VI section 66 states that there shall be implied in every lease, covenants by the lessee with the lessor binding the lessee to use any land in a sustainable manner and in accordance with any conditions imposed on the use of that land by the lease, or any written law or any provisions in a grant of a public land out of which that lease has been created and, in particular, not to cut down, injure or destroy any living tree on the land unless the purpose for which the land has been leased cannot be carried out without so doing;	This Act applies to all land declared as public, private and community land under Article 62, 64 and 63 of the Constitution of Kenya. The site is private land, of L.R. Dagoretti/Riruta/6004, with approved Change of Use to multi-dwelling residential. The proposed project site was acquired by IHS from Kanare Limited, and has been provided user rights for the 1 acre land parcel. The proponent will be required to comply fully with the relevant land legislations. Development must comply with lease conditions and zoning standards.
Water Act (Cap 372)	(a) Part III Section 36 states that a permit is required for any of the following purposes— • any use of water from a water resource, except as provided by section 37; • the drainage of any swamp or other land; • the discharge of a pollutant into any water resource; and	Water abstraction from natural sources necessitates a permit from WRA, including borehole construction works, along with an abstraction license, requiring full compliance with the Act. The Proponent will be required to fully adhere to this Act during construction and operation phases of the project.

Item	Description	Relevance
	• any other purpose, to be carried out in or in relation to a water resource, which is prescribed by Regulations made under this Act to be a purpose for which a permit is required. (b) Section 40 outlines the procedures for obtaining a permit which includes subjection to public consultation and, where applicable, of environmental impact assessment in accordance with the requirements of the Environmental Management and Co-ordination Act (Cap. 387). (c) Part IV Section 63 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.	
Forest Conservation and Management Act (Cap 385)	(a) The Forest Conservation and Management Act Cap 385 of the Laws of Kenya provides for the development and sustainable management, including conservation and rational utilization of all forest resources for the socio-economic development of the country and for connected purposes. (b) The Act confers powers on the Cabinet Minister to the ministry of Environment, Climate Change, and Forestry, on the advice of the Kenya Forestry Research Institute, by order published in the Gazette, to declare any tree species or family of tree species to be protected in the whole country or in specific areas thereof and shall cause this information to be disseminated to the public. That no person shall fell, cut, damage or remove, trade in or export or attempt to export any protected tree species or family of trees or regeneration thereof or abet in the commission of any such act. That these provisions shall be reversed when the Cabinet Secretary, on the advice of the Kenya Forestry Research Institute, is satisfied that the protection is no longer necessary. The Cabinet	This Act applies to all forests on public, community and private lands. No protected tree species exists at the proposed site, however, the proponent will preserve the existing Mugumo tree and implement on-site greening and landscaping. Although the project is not located in a gazetted public forest, however, it is advisable that the proponent should plant trees on the site after completion of the project. Additionally, the Proponent shall adhere to all regulations regarding vegetation management during the construction and operations of the sites.

Item	Description	Relevance
	Secretary may prescribe Regulations or guidelines for the protection and regeneration of a protected tree species.	
Physical and Land Use Planning Act (Cap 303)	(a) This Law provides for the principles, procedures and standards for the preparation and implementation of physical and land use development plans at the national, county, urban, rural and cities level; and the administration and management of physical and land use planning in Kenya (b) Section 24 of the Act provides the objectives of the National Physical and Land Use Development Plan being the basis for environmental conservation, protection and improvement; and optimal use of land and natural resources among others. (c) Section 37 of the Act provides the objectives of a county physical and land use development plan which includes guiding the use and management of natural resources; enhancing environmental protection and conservation; and to identify the proper zones for industrial, commercial, residential and social developments among others. (d) Part IV Section 57 states that a person shall not carry out development within a county without a development permission granted by the respective county executive committee member. Application for the development permission shall include notifying the public of the development project being proposed to be undertaken in a certain area in such a manner as the Cabinet Secretary shall prescribe.	The proponent should obtain development permission from the Nairobi City County executive committee member by applying for development permission in the prescribed form and after paying the prescribed fees. The proposed green affordable housing project should conform to the Nairobi City County physical and land use development plan.
Public Health Act (Cap 242)	(a) Part IX focuses on sanitation and housing, with a particular emphasis on preventing nuisances. 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	The proponent should ensure the construction and operation phases of the proposed housing project do not cause any form of nuisance. Measures to mitigate nuisance should be put in place throughout the proposed project phases.

Item	Description	Relevance
	dangerous to health. SSection 118 defines what constitutes a nuisance. (b) Section 126 states that the Cabinet Secretary, on the advice of the board, may make rules and may confer powers and impose duties in connection with the carrying out and enforcement thereof on local authorities, magistrates, owners and others as to periodical cleansing and whitewashing or other treatment of dwellings, and the cleansing of land attached thereto, and the removal of rubbish or refuse therefrom; the drainage of land, streets or premises, the disposal of offensive liquids and the removal and disposal of rubbish, refuse, manure and waste matters; the standard or standards or purity of any liquid which, after treatment in any purification works, may be discharged therefrom as effluent; the subdivision and general lay-out of land intended to be used as building sites, the level construction, number, direction and the width of streets and thoroughfares, the limitation of the number of dwellings or other buildings to be erected on such land, the proportion of any building site which may be built upon and the establishment of zones within which different limitations shall apply and of zones within which may be prohibited the establishment or conduct of occupations or trades likely to cause nuisance or annoyance to persons residing in the neighbourhood; among others.	
Penal Code Act (Cap. 63)	(a) Part XVII Section 191 of the Penal Code states that any person or institution that voluntarily corrupts or foils water for public springs or reservoirs, rendering it less fit for its ordinary use is guilty of an offence. Section 192 of the same act says a person who makes or vitiates the atmosphere in any place to make it noxious to health of persons/institution in dwellings or business premises in the neighbourhood or those passing along public way, commit an offence.	Discharge and air pollution offences apply if improper waste disposal occurs.

Item	Description	Relevance
Work Injury Benefits Act (Cap 236)	(a) The Act provides for compensation to employees for work related injuries and diseases contracted in the course of employment. It covers employer obligations, right to compensation, accident reporting, compensation, occupational diseases, medical aid, appeals, and miscellaneous provisions. It also provides schedules for disablement, occupational diseases, and dependent's compensation. (b) The Act guides the course of action in case of accidents or incidents during the project cycle.	The project proponent will need to observe the provisions of this Act during the proposed green affordable housing project's life cycle. The construction contractor should also meet this requirement during the proposed project construction phase.
Employment Act (Cap 226)	(a) The Act outlines fundamental employee rights, basic employment conditions, and child employment regulation. It covers employment relationships, wages, rights and duties, termination and dismissal, and protection of children.	The contractor is advised not to engage underage individuals in construction work, and the proponent must ensure the contractor is knowledgeable and compliant with the Employment Act's provisions. The provisions of this Act will guide both the proponent and the contractor on matters touching on Prohibition against forced labour, Discrimination in employment, Sexual harassment, terms of service, and Prohibition of worst forms of child labour at the workplace.
Standards Act (Cap 496)	(a) This Act promotes the standardization of the specification of commodities and provides for the standardization of commodities and codes of practice to ensure public health and safety.	The Proponent is required to ensure that all materials and equipment used during construction and operation of the facility meet the highest standards and do not pose any human health and safety risks.
Occupiers' Liability Act (Cap 34)	(a) An act of parliament to amend the law as to liability of occupiers and others for injury or damage resulting to persons or goods lawfully on land or property from dangers due to the state of the property or to things done or omitted to be done there.	The occupier(s) of the proposed green affordable housing shall be responsible to his visitors in respect of dangers due to the state of the premises or to things done or omitted to be done on them. The contractor should ensure the safety of workers during construction the construction phase.
Occupational Safety and Health Act (Cap 236A)	(a) This act provides for the safety, health and welfare of workers and all persons lawfully present at workplaces. It provides for the	The proposed project construction phase may pose hazards like falls, exposure to energized circuits, heavy equipment, and confined spaces. The project contractor should ensure safety and health standards, ensuring everyone's responsibility. Emergency response plans, warning signs,

Item	Description	Relevance
	registration of workplaces and outlines safety requirements in use of machinery to prevent accidents and injuries. (b) Occupiers must secure and maintain adequate cleanliness, prevention of overcrowding, ventilation, lighting, drainage of floors, and sanitary conveniences for employees. They must also make arrangements for ensuring safety and absence of risks to health in connection with the use, handling, storage and transport of articles and substances; the provision and maintenance of a working environment for every person employed that is, safe, without risks to health, and adequate as regards facilities and arrangements for the employees welfare at work. (c) Part 2 Section 21 states that an employer or self-employed person shall notify the area occupational safety and health officer of any accident, dangerous occurrence, or occupational poisoning which has occurred at the workplace. (d) The Act also requires that all plant, machinery, and equipment used in the workplace must be used for work designed and operated by a competent person. (e) Occupiers are also required to ensure safety provisions in case of fire.	machinery safety provisions, and construction safety provisions will be implemented. The Proponent and contractors must obtain necessary approval, and permits, including a Workplace Registration Certificate. Additionally, this ESIA study has outlined clear modalities to be followed by contractors towards mitigating/minimizing/avoiding hazards to occupational health and safety.
Energy Act (Cap 314)	(a) The Act consolidates the laws relating to energy and provides for national and county government functions in relation to energy. Provides for promotion of renewable energy; exploration, recovery, and commercial utilization of geothermal energy; regulation of midstream and downstream petroleum and coal activities; regulation, production, supply, and use of electricity and other energy forms; and enforcement and compliance with environmental, health and safety laws; and quality standards.	The installation and use of electricity in the proposed green affordable housing units will prioritize environmental protection and worker health and safety. This includes incorporation of renewable energy technologies. Only licensed electricians, in accordance with EPRA, should be engaged for the electrical works. Liaison with relevant organizations, like KPLC is encouraged. The project integrates solar water-heating and PV-ready systems; all electrical works will use EPRA-licensed contractors. The Proponent is further encouraged to follow the Act rules throughout the project.

Item	Description	Relevance
	(b) Part IV Section 75 states that the Cabinet Secretary shall promote the development and use of renewable energy technologies, including but not limited to biomass, biodiesel, bioethanol, charcoal, fuelwood, solar, wind, tidal waves, hydropower, biogas and municipal waste. (c) Part VI Section 148(1) stipulates that any electrical installation work should be conducted by a person licensed by the EPRA as an electrician or an electrical contractor.	
National Construction Authority Act (Cap 118)	(a) This is an Act of Parliament that provides for the registration of contractors operating or willing to undertake construction operations in Kenya as by law through the National Construction Authority (NCA), which is constituted under this Act. (b) Section 15 of this Act demands the registration of contractors with the NCA, while sections 17 and 18 outline the procedure for the registration of contractors.	The Proponent should comply with the Act by ensuring that the site and project contractors are registered and certified by NCA.
Sustainable Waste Management Act, 2022	(a) The Sustainable Waste Management Act, 2022 establishes the legal and institutional framework for the sustainable management of waste. The Act ensures the realisation of the constitutional provision on the right to a clean and healthy environment and for connected purposes. (b) Section 12 of the Act stipulates that all private and public sector entities shall segregate non-hazardous waste into organic and non-organic fractions, the segregated waste shall be placed in properly labelled and colour coded receptacles, bins, containers and bags. (c) Section 13 of the Act states that every producer shall bare extended producer responsibility obligations to reduce pollution and environmental impacts of the products they introduce into the Kenyan market and waste arising therefrom.	The proponent and the contractor will be required to bare extended producer responsibilities obligations of any products they introduce. They should also practice waste segregation. The proponent should also develop a waste management plan during the operation phase of the proposed green affordable housing project as required under the Act.

Item	Description	Relevance
	(d) Each county government is required to prepare an integrated county waste management plan once every five years and submit to the county assembly for approval under section 18 of the Act. (e) In section 19, a private sector entity is required to prepare a three-year Waste management plan and submit an annual monitoring report to the authority.	
Climate Change Act (Cap 387A)	(a) The Climate Change Act is pivotal for housing infrastructure projects in Kenya, emphasizing minimization of greenhouse gas emissions. It mandates integrating robust adaptation measures into project design, ensuring resilience and enhancing adaptive capacity to the impacts of climate change; mainstream and reinforce climate change disaster risk reduction into strategies and actions of public and private entities; provide incentives and obligations for private sector contribution in achieving low carbon climate resilient development; promote low carbon technologies, improve efficiency and reduce emissions intensity by facilitating approaches and uptake of technologies that support low carbon, and climate resilient development; and mainstream the principle of sustainable development (b) By aligning with these regulations, projects can enhance climate resilience, minimize environmental impact, and contribute to sustainable development goals through proactive adaptation strategies and responsible resource management practices. (c) Part IV Section 16 states that the Climate Change Council may, in consultation with the Cabinet Secretary and relevant State Departments, impose climate change obligations on private entities. That he Cabinet Secretary shall make regulations governing the nature and procedure for reporting on performance by private entities, including the authority to monitor and evaluate compliance.	The proposed housing project should integrate adaptive measures to enhance resilience against extreme weather events, and promote sustainable development to mitigate environmental impacts and support long-term climate goals in Kenya. It guides the incorporation of climate resilience and low-carbon principles in project design, ensuring reduced greenhouse gas emissions, energy-efficient construction, and adaptive measures, such as proper drainage, green landscaping, and resilient materials, to protect the project and community from climate-related risks.

Item	Description	Relevance
	(d) NEMA is tasked to monitor, investigate and report on whether public and private entities are in compliance with the assigned climate change duties imposed by this Act including monitoring compliance on levels of greenhouse gas emissions as set by the Council under this Act. (e) The Act provides the legal and institutional framework for Kenya's climate change response. It emphasizes reducing greenhouse gas (GHG) emissions and integrating adaptation measures into project planning. It further mandates the mainstreaming of climate change and disaster risk reduction across sectors, promotion of low-carbon technologies and resource efficiency, and active private sector participation in achieving climate-resilient, low-carbon development aligned with national sustainable development goals.	
National Museums and Heritage Act (Cap 216)	(a) The Act provides for the establishment, control, management and development of national museums and the identification, protection, conservation and transmission of the cultural and natural heritage of Kenya; (b) Part V Section 30 states that where a person discovers a monument or object of archaeological or palaeontological interest, the person shall, within seven days, give notice thereof, indicating the precise site and circumstances of the discovery, to the National Museums, and in the case of an object, shall deliver the object to the National Museums or to the District Commissioner to keep it for any particular purpose or for any particular period. (c) The Act also states that all antiquities which are lying in or under the ground, or on the surface of any land already protected under any law as a monument or being objects of archaeological, palaeontological or cultural interest are discovered in a part of	Where any physical cultural resources are identified at the proposed site during the excavation works, the Act should be complied with.

Item	Description	Relevance
	Kenya after the commencement of this Act, shall be the property of the Government.	
Sexual Offences Act (Cap 63A)	(d) This Act of parliament makes provision about sexual offences and aims at the prevention and the protection of all persons from harm from unlawful sexual acts and for connected purposes. (e) Section 23 prohibits sexual harassment by any person in a position of authority.	The proponent and the proposed project contractor are obligated to put in place mechanisms which are expedient in order to achieve or promote the objectives of this Act, including for instance, a policy to prevent sexual harassment.
HIV/ AIDS Prevention and Control Act (Cap 246A)	(a) The object and purpose of this Act is to • Promote public awareness about the causes, modes of transmission, consequences, means of prevention and control of HIV and AIDS; • Extend to every person suspected or known to be infected with HIV and AIDS full protection of his human rights and civil liberties. (b) This legislation prevents discrimination in all forms and subtleties against persons with or persons perceived or suspected of having HIV and AIDS. Without prejudice, no person shall compel another to undergo an HIV test as a precondition to, or for continued enjoyment of employment. (c) Part VIII of the Act requires no person to be denied access to any employment for which he is qualified; or (b) transferred, denied promotion or have his employment terminated, on the grounds only of his actual, perceived or suspected HIV status. Only except where an employer can prove, on application to the Tribunal that the requirements of the employment in question are that a person be in a particular state of health or medical or clinical condition	All employees, suppliers and contractors in this project shall be treated fairly and in accordance with the provisions of this Act; without any form of discrimination. The proposed project contractor will be required to create awareness among the workers and community at large.

Item	Description	Relevance
Persons with Disabilities Act (Cap 133)	(a) This Act provides for the rights and rehabilitation of persons with disabilities; to achieve equalisation of opportunities for persons with disabilities; to establish the National Council for Persons with Disabilities; and for connected purposes. (b) The act prohibits employers from discriminating against a person with disability. This includes provision of such facilities and effect such modifications, whether physical, administrative or otherwise, in the workplace as may reasonably be required to accommodate persons with disabilities by the employer. Part III section 12 states that no person shall deny a person with a disability access to opportunities for suitable employment. That a qualified employee with a disability shall be subject to the same terms and conditions of employment and the same compensation, privileges, benefits, fringe benefits, incentives or allowances as qualified able-bodied employees. In addition, a person living with disability shall be exempted from tax on all income accruing from his employment. (c) Section 21 of the Act states that persons with disabilities are entitled to a barrier-free and disability-friendly environment to enable them to have access to buildings, roads and other social amenities, and assistive devices and other equipment to promote their mobility.	The proposed affordable housing project proponent and the contractor should not discriminate against a person with disability during employment of workers not unless the particular requirements of the type of employment are a relevant consideration.
Affordable Housing Act, 2024	(a) This Act gives effect to Article 43(1)(b) of the Constitution; to provide a framework for development and access to affordable housing and institutional housing; and for connected purposes. (b) Part V section 44 of the act states that the Affordable Housing Board may enter into an agreement with a private institution to develop and construct affordable housing units and associated social and physical infrastructure; and for the supply of goods and	IHS as a private sector agency should comply with the act.

Item	Description	Relevance
	materials in connection with the construction of affordable housing units.	
National Building Code, 2024	(a) The Code promotes order and safety in construction works, and the health and safety of persons in or about construction works. (b) Part I Section 5(1) states that a person who engages in construction works, or a person who owns or occupies a building shall comply with this Code. (c) Part III Section 38 states that an owner of a commercial building or multi-dwelling unit shall designate at least 5% of the parking spaces for charging electric vehicles. (d) Part IV Section 47 of the code requires an owner to install a boundary to prevent the public from entering the construction site and to protect the public from the activities on the construction site before the erection of a building. (e) Part IX Section 103 states that a wall shall be constructed in accordance with the requirements for fire safety and fire installations specified in Part XXI. (f) In part X section 133 a room is required to have a means of lighting and ventilation which shall enable the room to be used for the purpose for which the room is designed without detriment to the health or safety, or causing nuisance. (g) 198- A building shall have a means of escape in case of an emergency as may be required by the intended use of the building. (h) 199(1)- A building that exceeds one storey in height shall have a staircase that is so designed and constructed as to allow a fireman safe and unobstructed access to all floors of the building in the event of a fire.	The Act addresses issues of sustainability, green building, and climate change. It also emphasises sustainability, hazard-resilient designs, safety, and environmental well-being. The proponent and contractor should ensure health, safety and environmental conservation during all the project phases in accordance with this Act. They should address issues of sustainability, green building, and climate change. This includes emphasising sustainability, hazard-resilient designs, safety, and environmental well-being. The design shall comply with Code requirements on fire safety, EV charging, rainwater harvesting, waste chutes, and soft landscaping.

Item	Description	Relevance
	(i) Part XIV section 244 states that Construction works shall provide for rainwater harvesting. (j) In section 247 no person is allowed to cause or permit sewage discharged from a sanitary fixture to enter a stormwater drain, storm-water sewer, an excavated or constructed watercourse; a river, stream or natural watercourse, whether ordinarily dry or otherwise; or a road or another construction site. storm-water shall not be drained into a sewer installation. (k) Part XVI 329 states that an owner shall provide for a soft landscape at the construction site when engaging in construction works. (l) Construction of a pit latrine in an urban area is prohibited unless approved by the approving authority; Part XVIII section 339. (m) Part XIX section 344 states that every building shall have an approved means of refuse storage and disposal. Section 346 makes provisions for a waste container in a building; In a multi-storey residential building, each dwelling up to the fourth storey may have its own waste container, or share a waste container. (3) In a multi-storey residential building, a dwelling that is situated above the fourth storey shall share a container that is fed by a chute. (4) Where the siting or operation of the chute referred to in subparagraph (3) is impracticable, a management arrangement for conveying refuse to the waste container shall be provided. (n) In part XX 352, a building shall be designed in a manner that facilitates access to the building, and to the use of its facilities, by a person living with a disability in accordance with KS ISO 21542 (Building construction -Accessibility and usability of the built environment).	

Item	Description	Relevance
	(o) Part XXI makes provisions for fire safety and fire installations in buildings to ensure safety of its occupants from fire; this includes appropriate means of escape in case of fire, firefighting equipment etc. (p) A person undertaking a design, planning, preparation, or construction phase, in the use or demolition of a project is required to take account of general principles of disaster prevention in the performance of those duties during all the stages of the project; Part XXIII section 462.	
Nairobi City County Solid Waste Management Act (2021)	Regulates waste collection, transport and licensing within the County.	The estate management will engage NCCG-licensed waste collectors and adhere to county segregation guidelines.
Nairobi City County Environmental Management By-laws (2015)	Require fire equipment, training and emergency plans in workplaces and multi-storey buildings. These by-laws operationalize environmental management functions at the county level in line with EMCA. They provide rules and standards for: (q) Air quality control restrictions on dust emissions, burning of waste, and industrial fumes. (r) Noise regulation; permissible noise levels, control of construction noise, and enforcement procedures. (s) Waste management – requirements for segregation, storage, transportation, and disposal of solid waste through licensed handlers. (t) Drainage and stormwater control – obligations to maintain proper run-off management, prevent blocked drains, and ensure construction activities do not pollute drainage channels.	Construction and operation must conform to county environmental standards and inspection protocols. The project must comply with county inspections, obtain relevant approvals, control dust and noise, manage construction waste properly, protect the Mugumo tree, and maintain clean drainage along Ndwaru Road.

Item	Description	Relevance
	(u) Landscaping and greening – requirements for tree planting, maintenance of vegetation, and protection of existing trees (including penalties for unauthorized removal). (v) Public health and sanitation – control of nuisances, sanitation standards, and maintenance of clean construction sites.	
Fire Risk Reduction Rules (2007)	Provide local rules on air and noise control, drainage, signage and landscaping. Issued under the Occupational Safety and Health Act (OSHA, 2007), these rules prescribe mandatory fire safety requirements for workplaces and multi-storey buildings. They cover: (a) Provision of firefighting equipment (extinguishers, hydrants, hose reels, sprinkler systems). (b) Installation of fire detection and alarm systems. (c) Preparation of workplace fire emergency plans and clearly marked evacuation routes. (d) Fire safety training for workers, including regular evacuation drills. (e) Designation of fire marshals and maintenance of fire equipment registers. (f) Safe storage of flammable materials and control of ignition sources. (g) Approval of fire safety design by the Directorate of Occupational Safety and Health Services (DOSHS).	The 16-storey building will include firefighting installations, hydrants, alarms, and evacuation plans per DOSHS approval. The multilevel residential tower must include fire-rated staircases, hydrants, sprinklers, alarms, extinguishers, signage, and an approved fire safety layout. Regular drills and maintenance of fire systems are required during occupation.
Traffic Act (Cap 403)	Regulates road safety and vehicle operation. The Traffic Act regulates the safe operation of motor vehicles on public roads. Key provisions applicable to construction projects include: (a) Vehicle roadworthiness, licensing, and insurance requirements.	Guides safe movement of construction vehicles along Ndwaru Road and enforcement of speed limits in the TMP. Construction vehicles using Ndwaru Road must comply with speed limits, loading requirements, TMP guidelines, and safety protocols to avoid pedestrian conflicts, road degradation, and congestion.

Item	Description	Relevance
	(b) Speed limits, especially in built-up areas and near pedestrian zones. (c) Driver conduct and competency requirements. (d) Transport of materials, including securing loads and preventing spillage. (e) Management of heavy vehicles, especially on narrow or high-traffic roads. (f) Rules governing pedestrian safety, signage, and temporary diversions. (g) Enforcement of overloading restrictions, which is critical for trucks delivering sand, ballast, and cement. (h)).	
Nairobi City County Integrated Development Plan (CIDP, 2023–2027)	Strategic planning instrument defining county development priorities. The CIDP is the county's five-year strategic development framework required under the County Governments Act. It defines: (i) Development priorities and spatial planning direction. (j) Infrastructure expansion targets, including roads, drainage, water, and sewer systems. (k) Affordable housing agenda under the county's urban renewal and settlement upgrading strategy. (l) Environmental sustainability frameworks, focusing on green spaces, climate adaptation, clean energy, and waste management.	The project supports CIDP objectives for affordable housing and infrastructure improvement in Dagoretti South.

Item	Description	Relevance
	(m) Socio-economic investment priorities, especially for youth employment and local enterprise development. (n) Public service delivery improvements (health, education, and utilities).	

6.3 National Regulatory Framework

Item	Description	Relevance
Environmental (Impact Assessment and Audit) Regulations, 2003.	a) These Regulations contain rules relative to the content and procedures of an EIA, to environmental audit and to Monitoring and strategic environmental assessment. These rules regulate other matters such as the appeal for, and registration of, information regarding EIA. The rules also provide the applicable environmental licensing fees for the different project categories. b) The Guidelines require the EIAs be conducted in accordance with the issues and general guidelines spelt out in the second and third schedules of the Environmental Regulations (2003). These include coverage of the issues on Schedule 2 (ecological, social, landscape, land use and water considerations) and general guidelines on Schedule 3 (impacts and their sources, project details, national legislation, mitigation measures, a management plan and environmental auditing schedules and procedures).	The EIA to be carried out on the proposed green affordable housing should be carried out in accordance to these regulations. An initial environmental audit should also be carried out in the first year of operation of the project.
Environmental Management and Co-ordination (Water Quality) Regulations, 2024	(a) The regulation provides for the protection of ground and surface water resources.". (b) Of immediate relevance to the proposed facility for the purposes of the proposed green affordable housing project is Part II Section 4 which requires every person to refrain from any act which directly or indirectly causes, or may cause immediate or	The project will connect to the existing NCWSC sewer along Ndwaru Road and will not discharge directly to surface water. Stormwater management will utilize SuDS to prevent runoff pollution.

Item	Description	Relevance
	subsequent water pollution, and it shall be immaterial whether or not the water resource was polluted before the enactment of the Act. (c) Part II Section 6(c) states that no person shall cultivate or undertake any development activity within a minimum of six metres and a maximum of thirty metres from the highest ever recorded flood level, on either side of a river or stream, and as may be determined by the Authority. (d) Part V Section 26 prohibits the discharge or application of any poison, toxic, noxious or obstructing matter, radioactive wastes, or other pollutants or permit any person to dump or discharge any such matter into water meant for fisheries, wildlife, recreational purposes or any other uses unless such discharge, poison, toxic, noxious or obstructing matter, radioactive waste or pollutant complies with the standards set out in the Third Schedule.	
Environmental Management and Co-ordination (Waste Management) Regulations, 2024	In addition to encouraging waste minimization, cleaner production, waste segregation, recycling, and composting, the regulation sets requirements for managing, transporting, and disposing of various waste types, including hazardous waste. It also covers the licensing of vehicle hauling and garbage disposal facilities.	During the construction and operation phases of the proposed housing project, different solid and liquid wastes will be generated. The Proponent and the contractor should ensure proper waste management during the proposed project lifecycle. This includes Segregating waste by type (hazardous and non- hazardous), segregating non-hazardous waste into organic and non-organic fractions and then disposing them in an environmentally acceptable manner.
Environmental Management and Co-ordination (Wetlands, Riverbanks, Lake Shores and Sea Shore Management) Regulations, 2009	(a) These Regulations apply to the protection, conservation and management of Inland, coastal and marine, lake basin and river basin wetlands, whether occurring on private, public or community land, both natural and man-made. (b) Part II Section 14 states that every owner, occupier or user of land which is adjacent or contiguous to a wetland shall, with advice	Open stormwater channel present along Ndwaru Road. There are no wetlands/rivers at a close proximity to the site..

Item	Description	Relevance
	from the Authority, have a duty to prevent the degradation or destruction of the wetland, and shall maintain the ecological and other functions of the wetland. (c) Part IV section 21 states that a developer intending to a undertake a project which may have a significant impact on a wetland, riverbank, lake shore or the sea shore shall carry out an environmental impact assessment and environmental audits in accordance with the provisions of the Act.	
Environmental Management and Co-ordination (Noise and Excessive Vibration Pollution) (Control) Regulations, 2009	(a) This regulation forbids the creation of unreasonable, pointless, or unusual noise (as defined in the regulations and except as otherwise provided) that irritates, disturbs, harms, or endangers the environment, other people's peace of mind, health, or safety. It outlines the highest noise levels that are permitted in a variety of environments, including mixed-use residential areas, business areas, and places of worship. (b) Part II section 4 states that, except as otherwise provided in these Regulations, no person shall make or cause to be made excessive vibrations which annoy, disturb, injure or endanger the comfort, repose, health or safety of others and the environment; or cause to be made excessive vibrations which exceed 0.5 centimetres per second beyond any source property boundary or 30 metres from any moving source. (c) A license is necessary if a sound source produces or is likely to produce noise, excessive vibrations, or otherwise violates the terms of these laws.	During the construction and operation phases, the permissible noise levels in the 1st and 2nd schedule must be adhered to. Where necessary, a license to release noise or vibrations in excess of allowable limits must be obtained. The contractor shall be required to implement these measures to ensure that all machinery is in good working condition to reduce noise. Also, construction activities shall be restricted between 0800Hrs-1700Hrs to ensure that the neighbors are not disturbed.
Environmental Management and Co-ordination (Air Quality) Regulations, 2024.,	These regulations provide for ambient air quality tolerance limits; Prohibits air pollution in a manner that exceed specified levels; Provides for installation of air pollution control systems where pollutants emitted exceed specified limits; Provides for the control of fugitive emissions within property boundary; Provides for the control	The contractor should ensure compliance to these regulations during the construction phase. The following should be closely monitored: • Exhaust emissions from construction machinery.

Item	Description	Relevance
	of emissions from stationary and mobile sources; Provides for prevention of dispersion of visible particulate matter or dust from any material being transported; and also provides for acquisition of an emission license.	• Dust from Site clearance and excavation of foundations. • Dust and exhaust emissions from transportation and disposal of spoil The Proponent should ensure that operations at the proposed housing project do not generate dust, particulates and other emissions beyond allowable limits during the operation phase.
Environmental Management and Co-ordination (Management of Toxic and Hazardous Chemicals and Materials) Regulations, 2024.	These regulations are meant to ensure protection of human health and environment from adverse effects of toxic and hazardous industrial chemicals and materials; reduce risks posed by chemicals and provide for the sound management of chemicals.	These regulations ensure that any chemicals used during construction or incorporated in building materials are managed to prevent environmental contamination and protect human health. By adhering to these standards, the project will minimize risks associated with chemical exposures, promote a safe living environment for future residents, and comply with national environmental protection mandates.
Environmental Management and Co-ordination (Controlled Substances) Regulations, 2007	These regulations are meant to control the use and import of compounds that deplete the ozone layer. The classification of controlled substances is provided in section 3.	The Proponent and the contractor should completely adhere to these regulations by abstaining from ozone depleting substances.
Water Harvesting and Storage Regulations, 2021.	a) These Regulations shall apply to— • the policies, plans, programmes and activities of the national government, county governments and entities of the national and county governments; and • public and private waterworks for water harvesting and storage, reservoirs for impounding surface run-off and for regulating stream flows to synchronize them with water demand patterns and structures and devices for flood control and management. b) Part VIII section 46 states that a person may directly capture and store precipitation on a parcel of land owned or leased by that person in accordance with sub regulation (2); and place the water captured and stored as provided in sub regulation (1)(a) to	The proponent is encouraged to make provisions for water harvesting and storage at the proposed green affordable housing.

Item	Description	Relevance
	beneficial use on the parcel on which the water is captured and stored.	
Water Resources Regulations, 2021	a) These Regulations apply to the regulation, management, use and development of water resources. They also apply to all water resources whether perennial or seasonal and including water resources of the territorial sea. b) Part III section 7 states that a person who intends to undertake an activity involving the use of water from a water resource shall apply to the Authority for a permit before commencing the activity. Section 9 states that an application for a water use permit shall be made by the owner of the land on which the water use is to take place and, where the applicant is not the landowner, the consent of the owner of the land shall be endorsed on the application. c) The regulations prohibits any person from causing water pollution by discharge or spillage. A person intending to discharge waste, effluent or other pollutant into a water resource shall apply to the Authority for waste disposal permit. d) Part V Section 51 states that a person intending to abstract ground water shall apply for approval of the activity by the Authority in Form WRA 001 set out in the Thirteenth Schedule. Where any borehole or well is to be equipped with a motorised pump, the application shall be accompanied by a Hydrogeological Survey Report prepared in the form set out in the Fourth Schedule. e) Where any borehole or well is being constructed within five hundred metres of an existing borehole or well, the Authority may by notice require the person constructing the borehole or well to undertake tests, specified in the notice, on the existing well and to supply to the Authority the particulars of the results of such tests including the rate of pumping and rest levels of water.	The project will not abstract surface water or discharge effluent to the environment. The planned borehole drilling will require a WRA permit and hydrogeological assessment. The proponent and/or contractor should ensure that hydrogeological assessments are conducted prior to groundwater abstraction, and prior to that obtain appropriate permits from the WRA for any planned water use, borehole development, or effluent discharge.

Item	Description	Relevance
The Physical and Land Use Planning (Building) Regulations, 2021	a) These regulations provide for the procedures, standards and forms for carrying out development control applications and processes, and the regulation of physical planning and land use in respect of buildings. b) Part II Section 4(1) requires that any person who intends to erect a new building or make alterations or additions to an existing building whether permanent or temporary, shall be required to submit Building Plans before obtaining development permission. c) An application for a housing estate shall provide for a tree cover of at least five per cent of the total land area of the housing estate intended to be developed. d) A person shall only put up a building in accordance with approved plan of the area, zoning regulations and registered user on the land parcel. e) Section 6 of these regulations state that any person intending to construct or modify a building must comply with the relevant building codes, local planning authority by-laws, and physical planning requirements. The approving authority may impose conditions regarding the location, size, height, shape, and appearance of the building to preserve the dignity and aesthetic of the surrounding area, such as streets, squares, or public spaces. f) Additionally, new buildings or extensions, including latrines and sanitary facilities, must be positioned to ensure optimal hygiene and sanitation, while minimizing nuisance or disruption. g) Developers are also required to display an on-site construction board, clearly identifying the roles of the professionals involved. h) The regulations also make provisions for safety, security and light. That every storey of every building shall be provided with effectual means of lighting and ventilation; adequate access to persons living with disabilities; erected in such a manner so as to allow for adequate natural cross-ventilation. In permitted cases, buildings may be permitted to use ventilating aperture; Security	The proposed green affordable housing is not in the exclusion list of these regulations. The proponent shall be required to submit the building plans to the planning authority. The proposed project plan and/or site should have at least 0.0395 acres preserved for tree cover. The proponent should comply with the relevant building codes, local planning authority by-laws, and physical planning requirements. The proposed housing development including sanitary facilities should be positioned to ensure optimal hygiene and sanitation, while minimizing nuisance or disruption. During the construction stage, an on-site construction board should be displayed in accordance with these regulations. Safety, security and light considerations should be included in the project's design.

Item	Description	Relevance
	features and access to buildings should be installed so as not to inconvenience the patrons of the building and to afford their safety in case of emergencies (No emergency exits should be blocked or closed on account of security).	
The Physical and Land Use Planning (General Development Permission and Control) Regulations, 2021	a) The objective of these Regulations is to provide for the procedures and standards for development control and the regulation of physical planning and land use. b) Part II Section 4 states that a person who seeks to put land into use other than that which it is registered under shall apply to the planning authority for a change of user; or an extension of user. c) Part V Section 14 on measurement of the extent of riparian reserves states that for rivers, a minimum riparian reserve of ten metres or a reserve that is equal to the average full width of the river measured from the highest water mark, whichever is higher, but which shall not exceed thirty metres, on either side of the river shall be maintained; Provided that in the case of a flood plain, the riparian reserve may be higher. For a riparian reserve of at least 10 metres as measured from the source of the spring shall be maintained as may be determined by the Water Regulation Authority.	Change of Use from Agricultural to Multi-Dwelling Residential has been approved by NCCG. No permanent river occurs on-site; storm drain buffer zones will be maintained.

6.4 National Policies, Plans and Institutional Frameworks

Item	Description	Relevance
Kenya's Vision 2030	(a) Kenya Vision 2030 is the country's long-term development strategy, which aspires to make Kenya a middle-income country providing a high	The Kenya Vison 2030 aims to improve affordable housing production in the country. In doing so, there is the need for all housing projects to comply with the national environment vision and respect everyone's right to a clean and healthy environment. The

Item	Description	Relevance
	quality of life to all its citizens by 2030 in a clean and secure environment. Under the Social Pillar which involves the building of a just and cohesive society that enjoys equitable social development in a clean and secure environment, the pillar aims to improve the quality of life for all Kenyans by targeting a cross-section of human and social welfare projects and programmes. This quest is the basis of transformation in eight key social sectors, namely; Education & Training, Health, Water & Sanitation, Environment, Housing & Urbanization and Gender, Youth, Sports & Culture. This pillar also makes special provisions for Kenyans with various disabilities and previously marginalized communities.	program includes development activities that use sensitive environmental components. The Proponent should ensure that sustainable development principles are respected throughout the project's implementation.
National Environment Policy, 2013	(a) This policy puts up a wide range of suggestions for solutions to pressing environmental problems. Through responsible management and use of the environment and natural resources, this policy seeks to enhance both the quality of life for current and future generations. (b) The policy's main goal is to establish a structure for an integrated strategy for the planning and sustainable management of Kenya's environment and natural resources. (c) The policy also makes sure that the environment is considered in all decisions made by the government in order to promote and realize sustainable development on all fronts. In addition to promoting a green economy, this would also improve social inclusion, human wellbeing, employment possibilities, and ecological health.	This ESIA study has developed a management and monitoring plan for the project's environmental and social aspects, aiming to better coordinate environmental management and minimize negative environmental impacts. This tool is aimed at promoting coordination of environmental management of the proposed project such that sensitive ecosystems are not destabilized by the subsequent project activities. The Proponent should adhere to this policy's guidelines to ensure environmental protection during the project's construction and operation stages.
National Environnemental Action Plan (NEAP)	The National Environmental Action Plan (NEAP) was created with the intention of encouraging and facilitating the integration of plans and programs for Kenya's social and economic development with strategies and measures to conserve and manage the environment. It was created by EMCA to address environmental management and protection at the district, province, and national levels.	To avoid, reduce, or control environmental impacts, the Proponent should abide with NEAP policies and laws because the physical, social, and economic environments may be negatively impacted by project operations. Through project-level EIAs, stakeholders' comments and inputs should be given high considerations to ensure that environmental integrity is maintained.

Item	Description	Relevance
National Climate Change Response Strategy, 2010	The National Climate Change Response Strategy (NCCRS) is a strategic document with a multi-sectoral approach whose vision is for a prosperous and climate change resilient Kenya. The objective is to strengthen and focus nationwide actions towards climate change adaptation and Global Greenhouse Gas emission mitigation. In summary, the objective of the NCCRS is to respond to climate change by, among other aspects: ▪ recommending robust adaptation and mitigation measures needed to minimise risks associated with climate change while maximising opportunities, ▪ recommending vulnerability assessment, impact monitoring and capacity building framework needs, Adaptation measures have been proposed for key sectors including Social Amenities comprising human settlements. The measures include strengthening disaster preparedness; proper planning of urban settlements which takes into consideration the expected high growth rate of urban population due to climate induced migration from rural areas to urban centres; and establishing insurance schemes to support preparedness in regions susceptible to climatic disasters.	This strategy provides guidelines on climate resilience, sustainable resource management, and adaptation measures that have to be complied with to ensure the proposed green affordable housing project is environmentally sustainable and aligns with the national climate goals.
Kenya National Adaptation Plan 2015 - 2030	This is a strategic framework designed to enhance the resilience and adaptive capacity of the country to the impacts of climate change. It outlines priority interventions across various sectors aiming to integrate climate resilience into national development policies. The plan emphasizes sustainable practices, vulnerability reduction, and social inclusion, ensuring that adaptation measures address the needs of all communities, particularly the most vulnerable. Through collaboration with local and international partners, the Kenya National Adaptation Plan provides a roadmap for mainstreaming climate change adaptation into long-term development planning.	This plan offers guidance on incorporating climate-responsive design, sustainable urban planning, and improved building standards that safeguard infrastructure and communities from climate impacts. Undertaking a climate vulnerability and risk assessment is essential to identify potential hazards, adapt construction methods, and implement mitigation strategies. This not only aligns the project with national adaptation priorities but also enhances its long-term durability and safety, ensuring that housing developments contribute to resilient urban growth and sustainable development in a rapidly changing climate.

Item	Description	Relevance
National Climate Change Action Plan 2023 - 2027	This Action Plan aims at aligning climate change actions in the country with the Government's development agenda, and at strengthening the participation in climate change actions by the private sector, civil society, women, youth, children, vulnerable groups and indigenous people. The goal of the Action Plan is to promote Kenya's sustainable development by providing mechanisms and measures to achieve low carbon climate resilient development.	The Action Plan identifies eight priority areas, where actions and targeted measures need to be implemented; the most relevant to this green affordable housing project being health, sanitation and human settlements. The proposed housing project should focus on reducing risks to communities and infrastructure resulting from climate-related disasters; and improving the ability of people to cope with disasters caused by climate hazards.
National Policy on Gender and Development, 2019	The National Policy on Gender and Development (2019) aims to promote gender equality and empower all genders in Kenya. It replaces the Gender Policy of 2011, emphasizing the integration of gender perspectives in all sectors of development. The policy focuses on eliminating gender disparities, promoting women's rights, enhancing women's participation in decision-making processes, and addressing gender-based violence. It underscores the government's commitment to achieving gender equality as a fundamental human right and a driver of sustainable development.	This policy emphasises gender equity in resource access, benefits, and decision-making. This policy guides the ESIA to consider gendered impacts of the project, ensuring that both men and women, especially marginalized groups, have equitable access to housing benefits, employment, and participation in project planning. Integrating gender considerations helps prevent inequality, promotes inclusive development, and aligns the project with Kenya's sustainable development and social inclusion goals.
Kenya Youth Development Policy 2019	This policy provides the framework for addressing issues affecting the youth, notably employment creation, health, education, sports and recreation, environment, art and culture, partnership and empowerment. It promotes youth participation in economic development and decision-making.	By integrating the policy's objectives, the proposed Green Affordable Housing Project can engage the youth in Riruta area and Riruta location in employment and skill-building opportunities during the construction, operations, and maintenance phases. Engaging the youth in the project through community outreach and stakeholder consultations ensures their inclusion in decision-making processes, fostering a sense of ownership and empowerment. Incorporating these aspects supports the policy's broader aims of reducing youth unemployment and involving young people in the country's development, while contributing to the long-term sustainability of the proposed housing project.

Item	Description	Relevance
National Biodiversity Strategy and Action Plan (2019-2030)	The Kenya NBSAP is a ten-year national plan aimed at conserving Kenya's biodiversity, using its components sustainably, sharing benefits, and enhancing technical cooperation. It aims to eliminate hunger, food insecurity, and malnutrition, and strengthen agricultural biodiversity conservation for food and agriculture. The NBSAP aims to reduce poverty's impact on biodiversity and implement economically and socially sound incentives for conservation. Additionally, it aims to strengthen institutional and community capacity, promote gender equity, and utilize indigenous knowledge. The NBSAP designates actions to specific stakeholders with clear timeframes for implementation.	The National Biodiversity Strategy and Action Plan is quite relevant in the context of the present project prudent biodiversity conservation and management during the construction and operation phases of the project will be required.
National Environment Management Authority (NEMA)	(a) The goal and intent behind the establishment of NEMA is to provide broad oversight and coordination over all environmental issues and to serve as the main tool for the government in carrying out all environmental regulations. (b) The main tool used by the government to carry out all environmental policies is NEMA, which is in charge of general supervision and coordination of all environmental concerns. Additionally, the authority is in charge of ensuring that all NEMA regulations are being followed.	The Proponent is required to contract the services of a licensed EIA expert, submit an EIA report to NEMA, and acquire an EIA license from the authority before commencing any construction activities.
County Environment Committee	(a) The County Environment Committee manages the county's environment and creates a strategic environmental action plan every five years for review by the County Assembly. (b) They assist in decentralizing NEMA's operations, enabling nearby communities to access environmental management data. The committees also conduct site visits, review project reports, and attend site meetings.	The project will be monitored by Nairobi City County Environmental Committee, who will review environmental reports and occasionally attend site meetings.
National Environment Complaints Committee (NECC)	The committee, established under EMCA is an environmental ombudsman responsible for investigating environmental complaints in Kenya, playing a crucial role in assessing the country's environmental condition.	The NECC will be crucial in facilitating alternative dispute resolution methods for environmental challenges if any develop in connection with this project.

Item	Description	Relevance
National Environmental Tribunal (NET)	The tribunal, established under Section 125 of the EMCA, Cap 387, handles all environmental offense cases in Kenya, primarily handling appeals from NEMA's decisions on the issuance, denial, or revocation of environmental impact assessment (EIA) licenses, among other decisions.	The NET would operate very much like a court of law where conflicts regarding the proposed housing project are reported.
National Housing Corporation	(a) The National Housing Corporation (NHC) (established through Housing Act Cap 117 section 3) is responsible for research, experimentation, information dissemination, exhibition participation, training, and other housing-related duties as directed by the Minister. (b) The corporation also establishes and promotes companies' syndicates or partnerships for the carrying out of its functions, and also assist in establishing and promoting partnerships for housing development and related matters.	NHC aims to make Kenya a "decently housed nation" by providing affordable housing and related services. The proposed green affordable housing by IHS aligns with this vision by offering various housing units.
Sessional Paper, No. 1 of 2017 on National Land Use Policy	(a) The National Land Use Policy aims to provide a legal, administrative, institutional, and technological framework for sustainable land use and productivity at various levels. It includes recommendations for land use planning, resource allocation, environmental management, coordination of institutional linkages, equitable land resource utilization, anchored land development initiatives, a comprehensive GIS-based national land use information management system, an independent, accountable, and democratic institution for land use conflict resolution, and addressing problems associated with poor land use. (b) The policy aims to promote public good, environmental management, collaboration among land users, and address governance, social, economic, and cultural obligations. It also aims to anchor land development initiatives that respond positively to market demands.	The objective of this policy is to assist the protection and best use of the values of economic production, environmental sustainability, and cultural preservation. The Proponent will be expected to adhere to the principles of this policy.
Kenya Affordable Housing Programme	The Development Framework Guidelines provide qualitative guidance on the key components of the Affordable Housing Programme. These guidelines provide instruction on how the vision and policies of the GoK,	This agreement governs the relationship between the GoK and the developer, private investor, or contractor, and sets out in detail the

Item	Description	Relevance
Development Framework Guidelines	through the SDHUD, will be implemented and how progress will be monitored and reviewed. The aim of the guidelines is to set out: (a) the rationale, priority needs, and trade-offs to achieve consistency between the assessment, policy formulation, and delivery of affordable housing; (b) the affordable housing delivery mechanisms and the means to ensure their financial viability, including the different sources of subsidy. Consistent information for key stakeholders on the process of the development and delivery of affordable housing.	terms and conditions for the development and delivery of each Project. The developer is required to adhere to these guidelines.

6.5 Nairobi City County Legal Framework

Item	Description	Relevance
Nairobi City County Air Quality Act, 2022	a) The Act provides a legislative framework on air quality in order to protect the right to a clean and healthy environment by providing reasonable measures for the prevention of air pollution and for connected purposes. b) Part II section 8 states that the owner or occupier of a premises involved in any activity or industry that is likely to cause air pollution shall incorporate measures to reduce the emission of air pollutants to the atmosphere in accordance with the best available techniques economically achievable approved by the Chief Officer responsible for environmental issues within Nairobi City County. Section 9 further requires that no person shall discharge a pollutant into the air from any source without a license. c) In case of accidental, emergency or unauthorized release or discharge of a pollutant into the air occurs the person in charge of the undertaking which caused the release or discharge shall immediately inform the Chief Officer or nearest police station within twenty-four (24) hours of the occurrence and submit a written report to the Chief Officer within seven (7) days. d) The Act also prohibits the burning of specific materials at any place without authorisation and in accordance with a valid and subsisting license. e) Any person transporting or storing construction materials or materials from construction works is required to avoid air pollution or dispersion of visible particulate materials by complying with relevant quality standards.	The proponent and contractor shall be required to provide reasonable measures for the prevention of air pollution during both the construction and operation phase.
Nairobi City County Solid Waste Management Act, 2015	(a) The Act makes provisions for the management of solid waste in the county. (b) The Act stipulates that solid waste management is a shared responsibility amongst all actors including the county government, generators, owners and occupiers of premises and contracted service providers. (c) Every occupier, owner or agent of a house or other premise has a duty to clean or cause to be cleaned ten meters radius around his or her house or other premises or any area otherwise in his/her control but which shall include a main road or street.	Proper waste management practices in accordance with this act should be implemented during both the construction and operation phases of the green affordable housing project.

Item	Description	Relevance
	(d) The Act also requires any person who generates solid waste to segregate the waste into various categories.	
Nairobi City County Public Nuisance Act, 2021	The Act prohibits any person from discharging any dangerous material, substance or oil into land, water or air	The proponent and contractor should ensure that no dangerous material, substance or oil is discharged into land, air or the water environment during the construction and operation phase of the housing project.
Nairobi City County Persons with Disabilities Act, 2015	(a) Employers should not discriminate against persons living with disability in a way that is contrary to this act. (b) Employers are also required to provide facilities and effect such modifications in the workplace that ensure a barrier-free and disability-friendly environment; this includes access to buildings.	Fair and equal employment opportunities shall be given to persons with disabilities during the recruitment of workers for various phases of the housing project by the proponent and contractor. The proposed housing project should be developed to provide a disability-friendly environment.
Nairobi City County Climate Action Plan 2020-2050	(a) The climate action plan outlines how the City will work towards achieving its emissions reduction targets and reduce the vulnerability of its citizens to climate change impacts. It aims, through defined theme areas, to cover adaptation and mitigation in an integrate way thus, creating a cohesive climate action plan. Working together with the national government, city stakeholders, and all citizens, the city aims to transition to a lower emissions and resilient future through the following goals and ready to implement and supporting actions. (b) Nairobi's extended conditional target aims to achieve a 24% reduction below BAU emissions by 2025, 51% reduction by 2035, and will strive to achieve carbon neutrality by 2050.	By aligning the proposed housing development with the plan's objectives, IHS can contribute to Nairobi's climate action goals, reduce the development's environmental footprint, and create more sustainable and comfortable living spaces for residents.

6.6 EIB Environmental and Social standards

Promoting sustainable and inclusive development is at the heart of the EIB's objectives and its lending strategy. The EIB Group Environmental and Social Policy provides the overarching framework for the Group's commitments and a vision for the critical decade up to 2030, placing sustainable finance at the centre of everything the EIB does. To honour its sustainability commitments, the EIB has adopted a set of 11 environmental and social standards (E&S) that establish the requirements the promoter and the project must meet throughout the EIB project life cycle. Here is a summary of these standards. A summary of the EIB-E&S is as provided in table 22.

Table 6-1: Overview of the Applicable EIB E&S Standards

Item	Description	Relevance
Standard 1 – Environmental and Social Impacts and Risks	This Standard promotes an integrated approach to impact assessment and risk management by ensuring that environmental, climate, social and human rights considerations are addressed and taken into account in the decision-making processes. It also recognises the importance of the promoters' commitment to effective and sustained environmental and social performance through the establishment of an environmental and social management system commensurate with the identified impacts and risks. This Standard applies to all projects likely to have significant environmental, climate and/or social impacts and risks. These impacts and risks need to be taken into account at the earliest possible stage of planning and decision-making processes, including to ensure consistency with "Do Not Significant Harm" (DNSH) and "Minimum Safeguards" (MS) principles and requirements. Standard 1 also requires such projects to comply with the applicable national legislation and includes the steps for carrying out the EIA process.	This ESIA has been conducted as part of compliance with Kenya's environmental legislation and as per EIB Standard 1 because of its typical construction and operational impacts of medium-density housing, including vegetation clearance, drainage alteration, construction waste, and community safety issues. This ESIA has been undertaken in line with EMCA (1999 Rev 2015) and NEMA regulations, meeting EIB ESS 1 requirements. The 16-storey L-shaped residential development introduces typical high-rise construction impacts (noise, dust, waste, traffic, community safety) managed through an ESMP consistent with IFC PS 1 and EIB ESS 1.
Standard 2 – Stakeholder Engagement	This Standard emphasizes the significance of stakeholder engagement in project management, ensuring access to information, public participation in decision-making, and access to justice. The promoter shall engage with stakeholders early on in the decision-making process, when all options are still open, to allow for their meaningful contribution and ensure that their opinions, interests and concerns are considered to reach an optimal result. The engagement process shall be respectful of human rights, including the rights to privacy and data protection guidelines, and adapted to the country context by acknowledging and respecting the values and the historical, cultural and local knowledge of affected communities and other stakeholders. The promoter shall engage with stakeholders in a manner that is free from intimidation, coercion or violence against any individuals, in particular those who voice their opinion in relation to the project. This shall include the establishment and/or maintenance of a Grievance Mechanism.	Detailed stakeholders' engagements have been undertaken as part of this ESIA. Different stakeholders were consulted to get their views and comments about the proposed green affordable housing project. Stakeholder consultations were conducted with Riruta community members, nearby residents, schools, small business owners along Ndwaru Road, and NCCG officials. A project-specific GRM has been established to handle worker and community concerns.
Standard 3 – Resource efficiency	This Standard acknowledges resource efficiency's role in reducing environmental pressures and curb climate change, while boosting competitiveness through cost savings from improved efficiency,	The design integrates rainwater harvesting, low-flow fixtures, solar-assisted water

Item	Description	Relevance
and pollution prevention	commercialisation of innovation and better management of resources over their whole life cycle. It promotes the transition to a circular economy by utilizing technologies, processes, and services to achieve environmental quality objectives. The promoter shall be prepared to respond to any incident, accident and emergency; ensure management of waste; and sound management of hazardous substances and materials.	heating, and energy-efficient lighting. Wastewater will connect to the NCWSC sewer along Ndwaru Road. Construction waste segregation, dust suppression, and noise control measures are embedded in the ESMP. Resource efficiency measures have been embedded in the design and will be monitored through the contractor's environmental management plan.
Standard 4 – Biodiversity and Ecosystems	The EIB emphasizes the importance of protecting biodiversity and ecosystems for environmental and social sustainability. It supports projects that maintain biodiversity integrity and resilience, aiming to halt biodiversity loss and increase benefits. For all projects, the promoter shall identify, assess and manage the impacts and risks that could potentially affect biodiversity and ecosystems, either positively or negatively, directly or indirectly, and on which the project may depend on for its success. The promoter shall also take into consideration the risks associated with the accidental or deliberate introduction of invasive alien species throughout the project's life cycle; ecosystem services assessment; identification and assessment of supply chains.	The site supports modified urban vegetation typical of Riruta. No critical or natural habitats exist. A mature Mugumo (Ficus sycomorus) tree has been preserved as part of an on-site green park. Landscaping will use indigenous, drought-tolerant species to enhance ecological value.
Standard 5 – Climate Change	This Standard acknowledges the urgent need to combat climate change, a global threat causing severe impacts on people, ecosystems, and the planet. It emphasizes the role of finance in supporting low-carbon and climate-resilient development. All projects shall also be consistent with the delivery of applicable climate change mitigation and adaptation objectives, and/or be consistent with reaching emission reduction or resilience pathways, in accordance with relevant national legislation implementing the Paris Agreement as well as any other international agreements relevant to the fight against climate change. All projects shall comply with the EIB's alignment framework, as set out in the EIB Group Climate Bank Roadmap (CBR), including to ensure consistency with the "Do No Significant Harm" principle to climate change mitigation or adaptation objectives, as defined by the EU Taxonomy Regulation. The promoter shall provide the EIB with information establishing the project's impact on GHG emissions and its vulnerability to physical climate change risks, as well as its alignment with relevant low-carbon and climate-resilient pathways. The extent of the promoter's reporting requirements relating to physical	The ESIA included a climate risk and vulnerability analysis. The project incorporates climate-adaptive design: permeable paving, SuDS drainage, and stormwater attenuation for 1-in-100-year rainfall events. Solar-assisted heating and LED systems reduce emissions. GHG emissions were assessed and found to be minimal and manageable under EIB ESS 5 requirements.

Item	Description	Relevance
	and transitional climate risks and impacts shall be commensurate to the risks and potential impacts identified.	
Standard 6 – Involuntary Resettlement	Involuntary resettlement is displacement resulting from land acquisition or restriction on land use, including physical and economic displacement. It can have severe negative effects on the economic, social, and cultural well-being of rights-holders. It can lead to temporary or permanent loss of income sources, relocation to less suitable environments, and inadequate compensation. Efforts should be made to avoid involuntary resettlement in the first instance. Where involuntary resettlement cannot be avoided, it should be minimised and appropriate measures should be implemented to mitigate adverse impacts on rights-holders with a view to improving or at least restoring their socioeconomic and cultural conditions. Management of involuntary resettlement shall be based on consultation of affected persons and disclosure of information to the public. In projects requiring the displacement of persons, such as slum-dwellers or squatters, that are occupying land or assets without a formal title, the promoter shall prepare and implement a plan in compliance with this Standard.	Not triggered. The project is located on privately owned, unoccupied land and being acquired. No physical or economic displacement has occurred. Documentation confirming land ownership and occupation status is appended to the ESIA.
Standard 7 – Vulnerable Groups, Indigenous Peoples and Gender	This Standard outline the responsibilities of promoters in terms of assessing, managing and monitoring project impacts, risks, and opportunities related to Indigenous Peoples as well as persons or groups that are vulnerable, marginalised or discriminated against due to their socioeconomic characteristics. The vulnerability of vulnerable or marginalised persons and groups, who are exposed to multiple risks and adverse impacts simultaneously, are more sensitive to these risks, and have a weaker adaptive capacity due to limited access to resources. These individuals or groups may be systematically discriminated against or excluded based on their socioeconomic characteristics, such as sex, gender, race, ethnicity, religion, or economic status. The promoter shall take the necessary measures to identify and avoid potential project risks and impacts that would affect the lives and livelihoods of vulnerable, marginalised or discriminated against persons and groups, and Indigenous Peoples; or when avoidance is not feasible, to reduce, minimise, mitigate or effectively compensate/remedy such impacts. Such projects shall comply with the relevant national legislation and this Standard, To this end, the promoter shall, as relevant, seek to strengthen their adaptive capacity and give them equal opportunity to voice their opinions about proposed project activities and mitigation measures	The proposed project will not have effects on vulnerable, indigenous peoples or gender. The project will be undertaken on a site already acquired and designated for the proposed project. As such, the project does not trigger EIB Standard No. 7.

Item	Description	Relevance
	that might affect them. The promoter shall adopt a gender-responsive approach to the identification, management, and monitoring of environmental and social impacts and risks that considers the rights and interests of women and girls, men and boys, and non-binary and gender non-conforming persons, including specific attention to the differential burdens, barriers and impacts that they might experience, including gender-based violence and harassment.	
Standard 8 – Labour Rights	This Standard applies to project workers including full-time, part-time, temporary, seasonal and migrant workers. It aims to ensure that promoters of EIB projects comply with the core labour standards of the International Labour Organization and with national labour and employment laws. It sets the need for a workers' grievance mechanism. It further defines standards to protect migrant workers and workers affected by collective dismissals. The standard also requires the establishment, maintenance and improvement of worker-management relationships and terms and conditions of employment. The standard defines the assessment requirements that are needed for the promoter's own workforce, third-party workers and supply chain workers. The promoter shall pay special attention to identifying the likelihood of risks of child labour, forced labour, discrimination and unequal treatment towards migrant or non-national workers, discrimination and/or restrictions to freedom of association or other risks of violations of fundamental labour rights, due to the country context, sector, contractor or supply chain. In addition, projects shall as well comply with any obligations deriving from the relevant international conventions and multilateral agreements signed and ratified by the host country or otherwise applicable in the host country.	The project should follow labour managements provisions provided under the ESMP. The project will comply with Kenya's Employment Act (2007) and Occupational Safety and Health Act (2007). Site-HSE Plans, worker induction, PPE provision, and a worker grievance system that have been defined and will be enforced during construction. The promoter (IHS) should use reasonable efforts prior to contracting for the construction work to ascertain that the contractor(s) or the intermediaries to assume their legal responsibilities with regard to employment and the implementation of the requirements of this Standard. The promoter should establish policies and procedures for managing and monitoring the performance of third parties in relation to contracted workers and the requirements of this Standard.
Standard 9 – Health, Safety and Security	This Standard, whilst acknowledging the role of relevant authorities in protecting and promoting the health and safety of workers and the public, outlines the promoter's responsibilities in assessing, managing and monitoring occupational and public health, safety and security risks associated with projects supported by the EIB.	The ESIA identifies occupational and community safety risks related to construction traffic, material handling, and fire hazards. Mitigation measures include a Traffic Management Plan, fire safety

Item	Description	Relevance
	The Standard requires promoters to use reasonable efforts to identify these hazards, risks and impacts and to design and use of appropriate measures to avoid or mitigate adverse health and safety impacts associated with project activities on the rights-holders (project workers, supply chain workers, and affected people and communities).	systems, site access control, and emergency response procedures. Security services will operate under human-rights compliant protocols.
Standard 10 – Cultural Heritage	This Standard emphasizes the importance of protecting and conserving cultural heritage, which is a source of valuable historical and scientific information, an asset for economic and social development, and an integral part of people's cultural rights, identity, and practices. Projects that are likely to have significant cultural heritage impacts shall be subject to an Environmental and/or Social Impact Assessment (ESIA) process and should include considerations of potential human rights risks. All projects shall also align with the principles and standards set out in the international instruments concerning the protection of cultural heritage, such as the UNESCO 1972 Convention concerning the Protection of the World Cultural and Natural Heritage. The promoter is responsible for locating and designing a project in such a manner that it will avoid significant adverse impacts on cultural heritage. This Standard also applies to projects under implementation that are likely to have a significant impact on cultural heritage but were not previously identified as such and for which chance find procedures shall be applied.	Not triggered materially, as no cultural or archaeological resources were identified on-site. Nevertheless, chance-find procedures are incorporated into the ESMP to comply with the National Museums and Heritage Act (2006) and this standard.
Standard 11 – Intermediated Finance	The EIB uses intermediated finance to support smaller projects by SMEs, midcaps, and public entities. These projects are designated as sub-projects and must be identified, assessed, managed, and monitored based on their size, nature, socioeconomic context, location, and sector sensitivity to Environmental, Climate and Social (ECS) impacts and risks. For such projects in Kenya, the Financial Intermediary (FI) shall require final beneficiaries to ensure that rights holders have access to meaningful stakeholder engagement and effective means to raise grievances on ECS matters in connection with sub-projects benefiting from EIB support. In order to enhance transparency on non-financial, sustainability-related information, the FI shall if the located in the rest of the world, comply with the applicable national legislation and as a matter of course make available to the public information on its due diligence and monitoring policies and procedures, or equivalent, for assessing, managing and monitoring the ECS impacts and risks of sub-projects.	The proposed project is of appropriate scale and will not trigger EIB Standard No. 11.

6.6.1 Alignment with the EIB Group Climate Bank Roadmap 2021–2025

The EIB Group Climate Bank Roadmap 2021–2025 provides the strategic framework through which the European Investment Bank is operationalising its commitment to become the *EU Climate Bank* and align all financed activities with the objectives of the Paris Agreement. The Roadmap requires that projects demonstrate measurable contributions to climate mitigation, adaptation and resilience, and environmental sustainability, while progressively phasing out high-carbon or environmentally harmful activities. It also emphasises climate-aligned investment planning, resource efficiency, and integration of circular-economy principles across the project lifecycle.

The proposed housing development, directly supports these goals through its low-carbon design, water- and energy-efficiency features, and climate-resilient site planning. The project integrates solar water-heating systems, natural ventilation and lighting, rainwater harvesting, and low-flow water fixtures to reduce operational energy and water demand, thereby contributing to EIB's mitigation objectives. Climate-adaptation measures have been embedded through on-site storm-water drainage control, and elevated foundation design to withstand increased rainfall intensity and runoff linked to regional climate variability.

Furthermore, the connection to the county wastewater sewereline to ensure compliant effluent discharge, aligning with the Roadmap's priority on resource circularity and pollution prevention. The ESIA also includes a climate-risk and GHG screening consistent with EIB guidance, confirming that the project is Paris-aligned and climate-resilient.

By embedding energy efficiency, resilient infrastructure, and green urban planning measures, project represents a qualifying climate-action investment within the EIB's 2021–2025 operational period. Its design and management framework are therefore consistent with the Roadmap's three central pillars: (i) *accelerating the transition to low-carbon and climate-resilient development*, (ii) *enhancing environmental sustainability through efficient resource use*, and (iii) *supporting inclusive, sustainable urban growth in developing regions*.

6.7 International Agreements

Multilateral Agreements	Relevance
Paris Agreement, 2015	The treaty for aligning with global climate action goals, particularly in terms of minimizing greenhouse gas emissions and considering climate adaptation.
Vienna Convention for the Protection of the Ozone Layer (1985)	This treaty mandates the reduction of ozone-depleting substances. The project must ensure that construction and operational processes do not involve or release such substances, thus contributing to global efforts to protect the ozone layer.
The International Convention on Biological Diversity	The Convention is a multilateral treaty with three main goals. These are the conservation of biodiversity, the sustainable use of its components, and the fair and equitable sharing of benefits arising from genetic resources.
The Agreement on the Conservation of African-Eurasian Migratory Waterbirds (AEWA)	The agreement aims to conserve migratory water bird species.
The convention on International Trade and Endangered species of Wild Fauna and Flora (CITES).	CITES is a multilateral treaty to protect endangered plants and animals. It aims to ensure that international trade in specimens of wild animals and plants does not threaten their survival.
Convention on the Conservation of Migratory Species of Wild Animals.	The Convention on the Conservation of Migratory Species of Wild Animals (also known as CMS or the Bonn Convention) aims to conserve terrestrial, aquatic andavian migratory species throughout their range.

International Plant Protection Convention	• The objectives of this agreement is to: protect sustainable agriculture and enhance global food security through the prevention of pest spread; protect the environment, forests and biodiversity from plant pests; facilitate economic and trade development through the promotion of harmonized scientifically based phytosanitary measures. • The convention requires the parties to secure common and effective action to prevent the spread and introduction of pests of plants and plant products, and to promote appropriate measures for their control.
Stockholm Convention on Persistent Organic Pollutants	The objective of the Stockholm Convention, which was adopted on 22 May 2001 and entered into force on 17 May 2004, is to protect human health and the environment from Persistent Organic Pollutants (POPs). The Convention requires Parties to adopt and implement measures aimed at reducing and/or eliminating the releases of POPs into the environment.
Aichi Biodiversity Target on Invasive Species	The major aim of this agreement is to eliminate, minimize, reduce and or mitigate the impacts of invasive alien species on biodiversity and ecosystem services by identifying and managing pathways of the introduction of alien species, preventing the introduction and establishment of priority invasive alien species, and reducing the rates of introduction.
Convention on the Elimination of All Forms of Discrimination against Women	This treaty require that the project promotes gender equality and safeguards women's rights. This involves ensuring equal employment opportunities and addressing specific needs of women in community engagement and project implementation.
The Protocol to the African Charter on the Rights of Women in Africa (Maputo Protocol)	The Maputo Protocol underscores the importance of gender equality, emphasizing equitable access to resources and the involvement of women in decision-making. In the context of the water pipeline project, this means ensuring that women and girls have equal access to the new water resources and are actively included in planning and decision-making processes to address their specific needs. By aligning with these principles, the project supports gender equality and enhances its overall effectiveness.
Convention on the Rights of the Child	The project must consider and protect the rights and welfare of children, ensuring that construction activities do not adversely affect their health, education, or overall well-being.
The African Charter on the Rights and Welfare of the Child	The African Charter on the Rights and Welfare of the Child emphasizes the right to access clean water and protection from harm. For the water pipeline project, this means ensuring the pipeline delivers safe water to children and implementing measures to safeguard them from construction-related hazards.
Convention on the Rights of Persons with Disabilities	This requires the project to ensure accessibility for persons with disabilities, both in terms of physical access to project areas and in employment opportunities.
The African Charter on Human and Peoples" Rights (African Charter)	The project must respect and uphold the human rights of local communities, including their right to a healthy environment and participation in decision-making processes

7 CHAPTER 6: STAKEHOLDER ENGAGEMENT

7.1 Introduction

This chapter sets out the general approach to participation and communication with stakeholders, proposed as part of the ESIA for the proposed Green Affordable Housing Units project by IHS.

Properly informing and consulting local communities and stakeholders is an important component of any successful project delivery. The stakeholder engagement program aims to create and sustain through various project development phases, a constructive and collaborative relationship with local authorities, organizations, and communities that are likely to be interested in or directly affected by the proposed Green Affordable Housing Units in Riruta (hereafter referred to as "the Proposed Project").

Continuous stakeholder engagement ensures that the views and concerns of identified stakeholders are incorporated from the beginning of a project's implementation phase, through its operation phase, and during any proposed improvements to an existing project. This practice ensures the minimization of any potential unexpected opposition to the proposed development and potential adverse effects on the environment and the surrounding community. Incorporating the views of the stakeholders into the proposed design is also very beneficial for adopting the best workable models and systems. Further, stakeholder engagement forms the basis for future collaboration and partnerships with affected parties

The engagement process has been designed to meet both Kenyan legal requirements, specifically the Environmental (Impact Assessment and Audit) (Amendment) Regulations, 2019 for public participation in an ESIA report and the European Investment Bank's requirements for engagement as outlined in Chapter 10 of EOBs Environmental and Social Standards Handbook.

This chapter starts by outlining the objectives of undertaking stakeholder consultation and identification of the stakeholders. The section further discusses the national and the lender's (European Investment Bank) framework for undertaking stakeholder consultation. Subsequently, it outlines the process followed for undertaking the consultation meetings and identifies the key issues, concerns, and expectations that the stakeholders raised. Finally, the section concludes by discussing the Proponent's robust Grievance Redress Mechanism, designed to address complaints received regarding the proposed project, and suggesting the next steps following the stakeholder engagement associated with this ESIA Study.

7.2 Objectives of stakeholder consultation

Stakeholder engagement refers to a process of sharing information and knowledge, seeking to understand the concerns of others and building relationships based on collaboration and partnership. It is a long-term process that requires the building of trust through open dialogue and the delivery of commitments.

The most important objective of stakeholder consultation is to provide sufficient and accessible information to potential Interested and Affected Parties (I&APs) in an objective manner and to provide a platform for constructive participation in the application process.

Specific objectives of the Stakeholder Engagement for the proposed green affordable housing units include the following:

- ✓ **Communication with stakeholders:** To identify the best methods for project developers to provide stakeholders with balanced and objective information on the proposed projects and to obtain their feedback;

- ✓ **Ensuring understanding:** An open, inclusive and transparent process of culturally appropriate engagement and communication is undertaken to ensure that stakeholders are well informed about the proposed project as it develops. Information is disclosed early and as comprehensively as possible and as appropriate
- ✓ **Involving stakeholders in the assessment**: Stakeholders are included in the scoping of issues, the assessment of impacts, the generation of mitigation measures and the finalization of the (Environmental) Study Report. They also play an important role in providing local knowledge and information for the baseline to inform the impact assessment.
- ✓ **Building relationships**: Develop a model for the project developers to use for enhanced community participation and collaboration through the project lifecycle, including environmental mitigation and management;
- ✓ **Managing Expectations**: It is important to ensure that the project does not create or allow unrealistic expectations to develop amongst stakeholders about Project benefits. The engagement process serves as one of the mechanisms for understanding and then managing stakeholder and community expectations, where the latter is achieved by disseminating accurate information in an open manner
- ✓ **Ensuring Compliance**: The process is designed to ensure compliance with both local regulatory requirements and international best practices on stakeholder engagement
- ✓ **Grievance Redress**: To provide tools for effective resolution of community issues during project implementation.

One of the key outcomes of engagement should be free, prior, and informed consultation of stakeholders, where this can be understood to be:

- **Free:** engagement free of external manipulation or coercion and intimidation;
- **Prior**: engagement undertaken in a timely way, for example, the timely disclosure of information; and
- **Informed**: engagement enabled by relevant, understandable and accessible information

IHS recognizes that open and transparent communication is essential due to the importance of the activities in which it is engaged and the impact on the local, regional, and national economies and individuals.

7.3 Overview of the stakeholder engagement requirements

7.3.1 National requirements

7.3.1.1 The Constitution of Kenya, 2010

Consultation and Public Participation (CPP) is a mandatory requirement for proposed projects as entrenched in the Constitution of Kenya, 2010, and in the EMCA 1999 (amended 2015) section 58, by achieving sustainable development. Part III Section 17 of the Environmental (Impact Assessment and Audit) Regulations of 2003, further requires that all ESIA studies incorporate public consultation to ensure all parties interested in the proposed project are informed of anticipated project impacts and benefits, and that their views, concerns, and recommendations are incorporated in project planning, design, construction, operation and decommissioning phases. The CPP process is further supported by the Kenya Public Participation Bill of 2018 further supports the CPP process.

7.3.1.2 The Environmental and Management Coordination Act- Legal Notice 32

Legal Notice 32 of 2019 titled "The Environmental (Impact Assessment and Audit) (Amendment) Regulations, 2019 public participation and consultation requirements states that the Proponent will:

(i) Seek the views of persons who may be affected by the project in consultation with the Authority (NEMA);
(ii) Publicize the project and its anticipated effects and benefits by erecting posters in strategic public places informing the affected parties and communities of the proposed project;
(iii) Hold public meetings with the affected parties and communities to explain the project and its effects, and to receive their oral or written comments.
(iv) Ensure that appropriate notices are sent out at least one week prior to the meetings and that the venue and times of the meetings are convenient for the affected communities and the other parties concerned.
(v) Publish a notice on the proposed project in a newspaper that has a nationwide circulation and announce in both official and local languages on a radio station with nationwide coverage.

Upon submission of the ESIA report to NEMA, the Authority shall, within fourteen days of receiving the report, invite the public to provide oral or written comments. If deemed necessary, the Authority may then hold a public hearing based on these comments.

7.4 Lender Requirements-European Investment Bank (EIB)

According to Chapter 10 of EIB's Environmental and Social Standards Handbook, the EIB expects that promoters uphold an open, transparent, and accountable dialogue with all relevant stakeholders at the local level targeted by its EIB operations. This standard stresses the value of public participation in the decision-making process throughout the preparation, implementation, and monitoring phases of a project.

The standard recognizes that a meaningful engagement process allows for the efficient implementation of a financed operation and in particular, the early and effective identification, assessment and management of any environmental and social risks, impacts, and opportunities. The views, interests and concerns of project-affected communities and other interested stakeholders are heard, understood, and taken into account throughout the project lifecycle.

Effective and meaningful engagement and consultation is a two-way process to be guided by the following general principles:

- be initiated by the promoter early in the process of identification of environmental and social risks and potential adverse impacts and continue throughout the project life cycle as risks and impacts arise;
- be inclusive of the affected communities and accessible to any vulnerable groups within, and differentiated by various segments;
- be inclusive, beyond the affected parties, of any groups or individuals who have been identified as other interested parties; and
- be adequately documented both in substance and process

About Chapter 10 of EIB's Environmental and Social Handbook, the specific objectives of stakeholder engagement and public consultation include the following:

- Establish and maintain a constructive dialogue between the promoter, affected communities and other interested parties throughout the project life cycle;
- Ensure that all stakeholders are properly identified and engaged;
- Engage stakeholders in the disclosure process, engagement, and consultations appropriately and effectively throughout the project lifecycle, in line with the principles of public participation, non-discrimination and transparency;
- Ensure that the relevant stakeholders including commonly marginalized groups on account of gender, poverty, educational profile, and other elements of social vulnerability, are given equal opportunity and possibility to voice their opinions and concerns, and that these are accounted for in the project decision-making.

7.4.1 EIB stakeholder engagement requirements based on project category

The proposed project falls under Category B under the EIB project screening categories in the EIB Environmental Assessment Document. *Category B* projects; *are those for which the competent* authority determines the need for an EIA according to specified criteria (Annex II of the Directive). The EIB's Interpretation of definitions of project categories of Annex I and Annex II of the EIA Directive- lists Infrastructure Projects under Annex II (10) and includes Housing developments which are considered urban developments.

Subsequently, levels of consultation required or projects from Annex II of the EIA directive (*Guidance Note for EIB Standard on Stakeholder Engagement in the EIB Operations-October 2020*) include:

1. During concept and design- the Proponent/promoter to invite impacted stakeholders and those known to have an interest in the project to one or more consultation meetings;
2. Project planning; hold further meetings with categories of stakeholders as the need becomes apparent and as stakeholders request
3. Project Construction/Implementation: continue consultation with affected stakeholders as stakeholders request and while differences remain
4. Project operation and decommissioning: if impacts on stakeholders continue, plus consultation due to changed circumstances and with those who may be impacted by the project's closure

7.5 Engagement Approach: Affected Parties and Other Stakeholders

7.5.1 Stakeholder Identification and Analysis

Stakeholder identification and analysis is the first critical step in the stakeholder consultation and engagement process. This section outlines the process of addressing the following:

- Approach to the identification of stakeholders;
- Analysis of stakeholders to determine the extent to which they are potentially impacted by the project, or could exert influence on the project; and
- Overview of consultation and engagement approaches and tools relevant

As it is not practical and not necessary to engage with all stakeholder groups with the same level of intensity all of the time, a stakeholder identification and analysis process was conducted where stakeholders were

identified and mapped. This will form the foundation for planning and designing of successive stakeholder engagement activities. The stakeholder mapping was done based on the identification of individuals, communities, groups and institutions who:

- Are most likely to experience at significant levels, the negative and/or positive impacts of the proposed project;
- Have the mandate over the various elements of the project's activities (such as Government ministries and leadership);
- Are considered the projects main supporters and opponents

For the proposed project, project stakeholders include the following categories of persons or institutions:

1. Project Owners & Financiers

- The Project Proponent-IHS Investments
- European Investment Bank (EIB), International Finance Corporation (IFC) etc.

2. Those directly and indirectly affected by the project including their legitimate representatives

a) Directly affected persons/parties such as;

- Neighbouring Communities/ Occupiers of neighbouring residential parks and estates, i.e. KEZA Homes, Havard Apartments, Ashane Gardens, Riruta Gardens, Jacaranda Homes, etc
- Educational and faith-based organizations in the vicinity of the proposed project; i.e. Harvard School Riruta, Ndwaru Road Royal Academy, ACK St. Matthews Church, etc.

b) Indirectly affected people/parties: private sector businesses operating in the vicinity of the proposed project

c) Legitimate representatives of project-affected people;

- Project Area Administration Personnel
  - National Government Administrative Officials (NGAOs) i.e. Assistant County Commissioner, Chiefs, Assistant Chiefs, and Nyumba Kumi Representatives
- Members of local resident associations i.e. Karen-Lang'ata District Association (KLDA)
- Village Elders and Nyumba Kumi Representatives,
- Community-based organizations, and local women and youth groups

3. Stakeholders with an influence on the project;

a) Institutions, groups, and individuals who are involved in approving/implementing aspects of the project:

- Nairobi local government at the county and sub-county level i.e., such as the Dagoretti South Sub-County physical planning office, Nairobi City Water and Sewerage Company (NCWSC), etc.
- Government parastatals such as the National Environment Management Authority (NEMA), and Directorate of Occupational Safety and Health Services (DOSHS) etc.

b) Landowners- Mi Vida Homes

c) Resident/Unit Owners

7.5.2 Stakeholder Mapping and Analysis

The stakeholder analysis process sought to prioritize identified stakeholders based on: interests and expectations in relation to the proposed project; required levels of participation for each stakeholder throughout the project lifecycle; degree of influence of each stakeholder group to the direction and success of the proposed project; interrelationships between different stakeholders and the convergence/divergence between their interests and expectations.

'Interest' measures the degree to which stakeholders are likely to be affected by the project and the degree of interest/concern they have in or about it.

'Power/Influence' refers to leverage a stakeholder may have in relation to decisions either taken by or affecting the project and the degree to which they can affect project success/failure.

Figure 7-1 below depicts the recommended stakeholder communication strategy based on their level of influence/power and interest in relation to the proposed project.

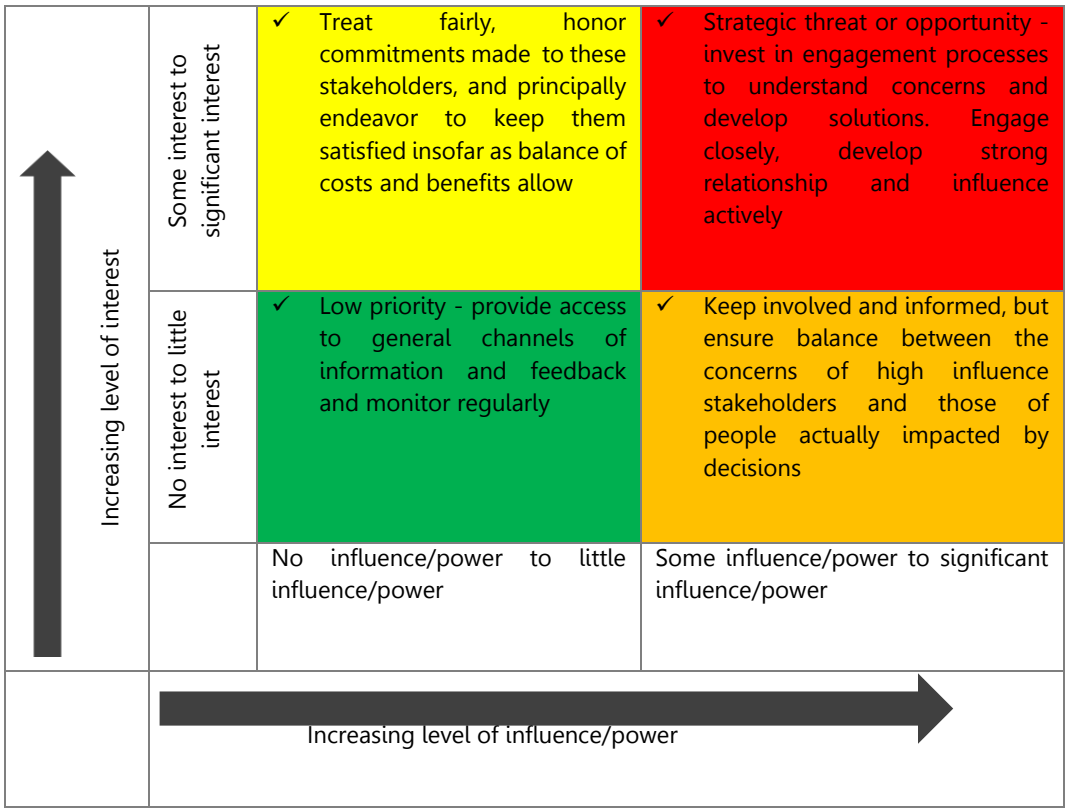
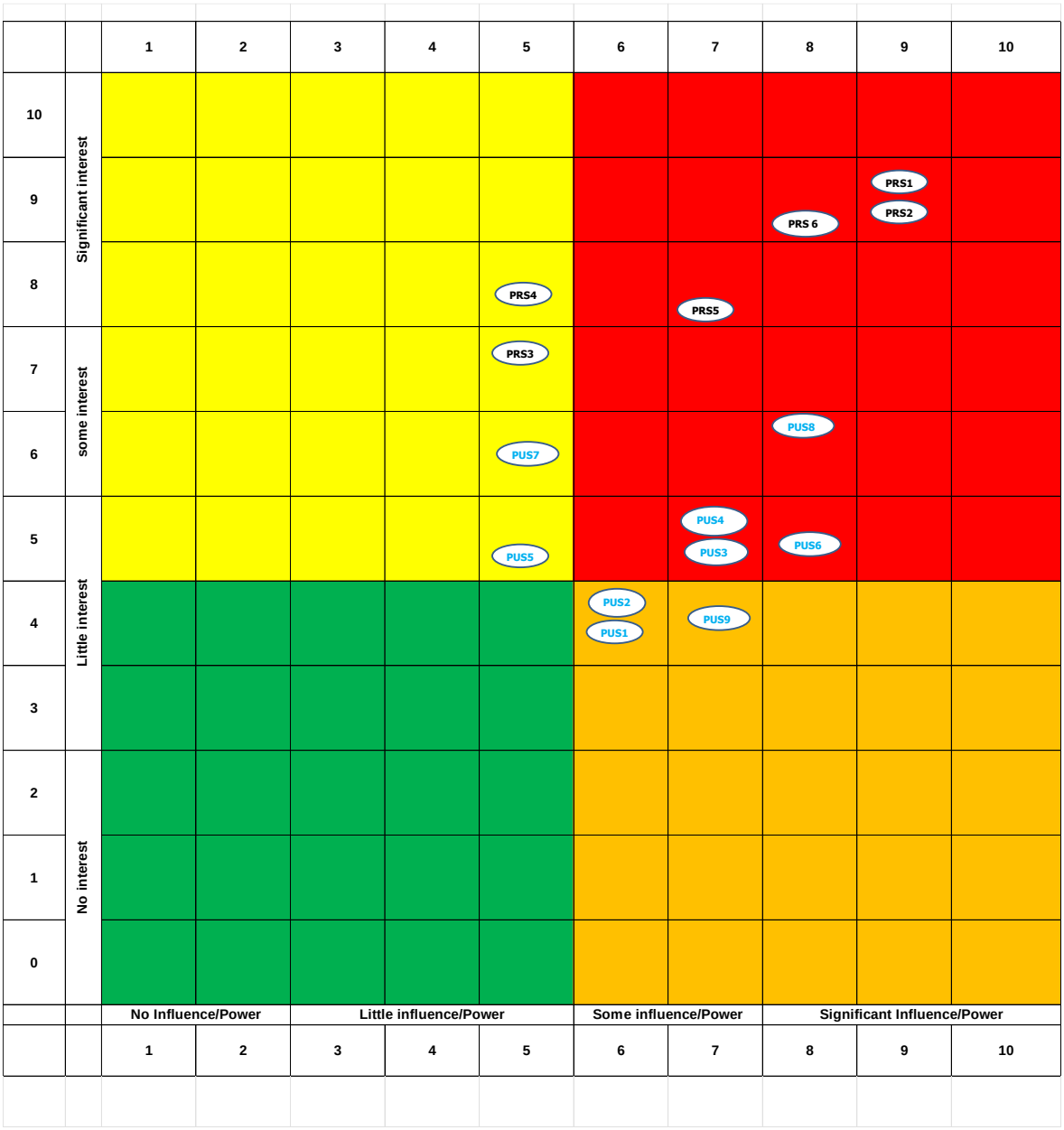


Figure 7-1: Communication strategy based on the stakeholder power/ interest matrix

The figure below shows the stakeholder mapping on the Influence/ Interest Matrix:

Figure 7-2: Power/Influence and Interest Matrix



Overleaf presents the findings of the stakeholder analysis for the proposed project. This is a live matrix that will be updated prior to the commencement of and during every phase of the proposed housing project improvements.

Power/Interest Rating Colour Scale

	Very Low
	Low
	Moderate
	High

Scale for Categorizing Influence/Power and Level of Interest

Category	**1-2**	**3-4**	**5-7**	**8-10**
Influence/Power	Very Low	Low	Moderate	High
Level of Interest	Very Low	Low	Moderate	High

Table 7-1: Stakeholder analysis and communication plan

ID	Stakeholder	Area of interest	Periods of Active Engagement	Influence /Power	Level of Interest	Method of communication
PRS 1.	IHS Investments	- In charge of the design of the proposed green affordable housing units - Undertakes asset management - Cooperation with Govt. agencies and all other stakeholders - Ensures compliance with Kenyan ESHS laws and EIB's Environmental and Social Standards	- Throughout the project lifetime	9	9	
PRS 2.	Lenders- (Investors in the Fund (IHSKenya)	- Envisions strategic fit with Lender's requirements - Ensures that the project fits in with Bank policies (e.g. E&S requirements) - Provides project financing	- Throughout the project lifetime	9	9	- Emails - Phone - Official letters - One on one meetings
PRS 3.	Neighbouring Establishments Residential Estates Schools & Churches	- Project affected - Impacts of the project - Proposed Mitigation Measures - Project Grievance Mechanism	- Preconstruction and construction phases	5	7	- Official Letters - Phone - One on One Meetings

ID	Stakeholder	Area of interest	Periods of Active Engagement	Influence /Power	Level of Interest	Method of communication
PRS 4.	Neighbouring Communities (Men, women, youth, community representatives) Vulnerable groups e.g. The unemployed The poor The physically and mentally disabled The elderly The Sick	- Available job and business opportunities - First priority for locals in employment - General impact of the project on the community and the environment - Economic improvement of the area - Beneficiaries of the IHS CSR programme - Project Grievance Mechanism	- Preconstruction and construction phases	5	8	- Public posters - Surveys and questionnaires - Public Meetings/Barazas
PRS 5.	Contractors + sub-contractors)	- Successful completion of the project - Compliance with Kenya's construction and	Preconstruction and construction phases	7	8	- Emails - Phone - One-on-one meetings - Contractual Agreements
PRS 6.	Residents/Unit owners	- Housing units built to standard - Costs of the units - Maintenance of the units	- Operations Phase	8	9	- Media announcements - Sale Agreements - Emails - Official letters

ID	Stakeholder	Area of interest	Periods of Active Engagement	Influence /Power	Level of Interest	Method of communication
PRS 7.	National Construction Authority	- Compliance with construction industry laws - Registration of the project	- Preconstruction and construction phases	6	3	- Emails - Official letters - Phone One on one meetings
PUS 1.	DOSHS	- Issues Workplace Registration certificate to the construction company (contractor) - Registers the site as a "construction site".	- Preconstruction and construction phases	6	3	- Emails - Official letters - Phone - EIA Report
PUS 2.	Nairobi City County-Department of Public Health	- Approval of design & building and construction plans for the project - Sanitary requirements for the housing units - Waste water disposal -	- Throughout the project's lifetime	6	4	- Emails - Official letters - Phone - One-on-one meetings - Project Design, architectural and structural plan - Application for approvals - ESIA Report
PUS 3.	Nairobi City County-Department of Urban Planning	- Approve building and construction plans for the project - Issue building permit for on-site housing units - Conduct periodic inspections of the project - Get approval of the "as-built" project at the end of the construction phase	- Preconstruction and construction phases	7	5	- Emails - Official letters - Phone conversations - One-on-one meetings - Project Design, architectural and structural plan

ID	Stakeholder	Area of interest	Periods of Active Engagement	Influence /Power	Level of Interest	Method of communication
		- Receives annual rates for the lease of the project footprint				- Application approvals - ESIA Report
PUS 4.	Nairobi City County-Department of Environment & Natural Resources	- Environmental and natural resource conservation	- Pre-construction and construction phases	6	4	- Emails - Official letters - Phone conversations - One-on-one meetings - Project Design, architectural and structural plan - ESIA Report
PUS 5.	National Government Administrative Officers (NGAOs, Chiefs, Asst. Chiefs)	- Community development and participation - Mobilization of Locally affected persons (neighbouring communities etc.) - Have an interest in the CSR Program	- Throughout the project's lifetime	5	5	- Official Letters - One-on-one meetings - Phone - Public/Baraza Meetings
PUS 6.	National Environment Management Authority (NEMA)	- Ensures compliance with environmental regulations - Grants or withdraws environmentally-related permits (such as EIA License) and monitors compliance with operations	- Preconstruction and construction phases	8	5	- Emails - Official letters - Phone - One-on-one meetings - ESIA Report - ESIA Licence

ID	Stakeholder	Area of interest	Periods of Active Engagement	Influence /Power	Level of Interest	Method of communication
		- Inspect and monitor the impact of the project on the environment - Imposes measures (Improvement Orders) to fulfil legal obligations				
PUS 7.	Water Resources Authority (WRA)	- Responsible for managing and regulating the use of water resources in the country - Authorization of drilling of a borehole and issuance of a water abstraction permit	- Pre-construction and construction phase	5	6	- Emails - Official Letters - Phone Calls - One-on-One meetings - ESIA Report
PUS 8.	Nairobi City Water and Sewerage Company (NCWSC)	**Provision of water and sanitation services** - Assess service capacity and advise on infrastructure needs. - Issue a no-objection/capacity confirmation for the project. - Approve and oversee water/sewer system installations - Manage and maintain water and sewer services after connection.	- **Throughout the project's lifetime**	8	6	- Emails - Phone calls - Official letters - One-on-one meetings - Applications for connection

7.5.3 Disclosure of Project Information

Dissemination of project information was done through both verbal discussions. The ESIA consultant team together with the IHS Project Team were able to provide stakeholders with information on:

- the purpose, nature, objectives, and scale of the project;
- potential adverse impacts and risks with regard to the environment, socio-economic setting, impact on safety, and security on the communities;
- the proposed mitigation measures;
- Potential benefits and enhancement measures;
- the available grievance mechanism; and
- The ESIA process

The following support materials were prepared for stakeholder dialogue:

Table 7-2: Materials used for stakeholder dialogue

Tools/Material	Contents	Usage
– **Public Posters**	- Prepared in both English and Swahili languages - Highlight of the proposed project - The ESIA requirements - Invitation to the Public Participation Meeting - Contact information through which comments/concerns on the proposed project can be submitted	- Placed in strategic venues within the project area accessible to the public i.e. the Area Chief's camp and the project site - NB: Posters announcing each of the three public meetings were displayed seven days in advance to inform the public of the upcoming sessions.
– **Stakeholder Invitation Letters**	– Contained a synopsis of the proposed project, including the project team – The EIA and stakeholder engagement process – An invitation to a stakeholder engagement meeting scheduled for specific stakeholder groups	– Hand delivered to the representatives' workplaces/residences for identified organizations/neighboring apartments



Plate 13: Public Posters erected at the Chief's Office & Project Site

7.6 Data Collection Tools

1. Focus Group Discussion Questionnaire

Structured questionnaires/guides were used to undertake FGDs to elicit their perception of the project i.e. expectations, opinions, and suggestions on the proposed project. Additionally, the questionnaires contained queries on roles, livelihoods, health issues, water challenges, business activities, etc.

2. Minutes Template

The views/concerns expressed by the stakeholders and all other discussions were captured and recorded through the minutes. The minutes also detailed how specific project team members who were available in the meetings to provide information on the proposed project responded to the issues raised.

3. General ESIA Questionnaire

A structured questionnaire was used to obtain detailed feedback from individual stakeholders regarding the proposed project. The questionnaire comprised sections aimed at capturing respondents' personal and stakeholder information, as well as their views on key environmental and social aspects of the project.

Specifically, it sought to gather insights on perceived project benefits, potential environmental and social impacts, and suggested mitigation measures.

4. Community Profile Questionnaire

A structured community profile questionnaire was used as part of the data collection tools to gather detailed information about the socio-economic and environmental characteristics of the project area. The questionnaire was administered by the Area Chief, who provided insights based on local knowledge and community experience. It comprised sections aimed at capturing information on demographics, land ownership, livelihoods, land use, community cohesion, public infrastructure, development priorities, and vulnerable groups. The tool was designed to provide a comprehensive understanding of the community's context and development needs to inform the Environmental and Social Impact Assessment (ESIA) process.

7.7 Stakeholder Consultations

Public engagement and stakeholder consultation is fundamental to an effective environmental and social impact assessment process and for the successful implementation of the proposed solar power plant project. It serves to promote mutual confidence and trust between the proponent and project stakeholders.

Public engagement is an on-going process; for the proposed housing units project, stakeholder consultation was initiated during the scoping phase, continued throughout the detailed ESIA process and will continue during the construction, operational and decommissioning phases of the project respectively. The approach to public engagement has been designed to promote meaningful, two-way communications between the proponent and the stakeholders.

As depicted in the Stakeholder Identification and Analysis, the stakeholder consultation was focused on engaging community residents, businesses, local/public authorities, community leaders, as well as other individuals or groups that express interest in the project. IHS is committed to effective and open consultation to ensure that potentially affected members of the public are fully aware of the project and have the opportunity to make their views known. The concerns will help ensure that all the important issues are considered in the environmental assessment.

7.7.1 Consultation and Message

According to the *Guidance Note for EIB Standard on Stakeholder Engagement, "*for projects with moderate E&S impacts and risks, a two-way dialogue with the affected stakeholders is needed. The promoter should organise an initial consultation (with the identified stakeholders) or an initial round of consultations (if it is more appropriate to have separate meetings with different categories of stakeholders), until significant differences have been resolved.

In consideration of the aforementioned EIB standards, during the EIA stage, the method adapted for consultation participatory process is highlighted overleaf. The following elements were carefully planned for each consultation activity:

- the message to convey to each group of stakeholders
- how stakeholders will be notified for upcoming meetings and the invitation process
- the choice of appropriate venue
- the preparation of tools to be used during consultation;
- the resources required to facilitate the consultation;
- how minutes will be written, recorded, and disclosed; and
- how grievances will be addressed

The public consultation program included:

- Preliminary consultations;
- Public (Baraza) Participation Meetings;
- Focus Group Discussions

It is important to note that stakeholder consultation is an ongoing process and further consultations will be conducted as the project progresses. Minutes and stakeholder logs of the meetings held during the public consultation and digital photographs taken during the meeting are appended at the end of this report.

7.8 Preliminary Consultations

A reconnaissance site visit to the proposed site was made by the Consultants on August 8th, 2024, to the project site in Keza-Riruta. The consultants established the boundaries of the project site and were also able to identify the neighbouring establishments in addition to the neighbouring residential estates and settlements.

The ESIA consultants prepared the Terms of References for the project which were submitted to NEMA on September 10th, 2024. Upon the review of the TORs, NEMA wrote back to the Proponent through a letter dated September 19th, 2024, giving the approval to undertake an EIA study for the proposed project. The decision to undertake a full EIA study was informed by the requirement for establishments of multi-dwelling housing developments exceeding 100 units which are categorized as ***high-risk projects*** and require elaborate inclusive public participation.

In preparation for the public barazas, the consultants established contact with the project area's Senior Chief (Mr. Joseph Murage). Under his direction, a meeting was held with the Assistant Chief of Riruta sub-location (Ms. Orpha Bosibori) on 23rd September 2025 to notify her of the planned public baraza meetings with communities in the project area.

It was agreed that mobilization of the attendees would be done through a). Word of mouth with the assistance of the Nyumba Kumi representatives, and b) through phone calls and text messages. The Chiefs were also requested to ensure that vulnerable members of the community, i.e., PWDs, widows, the elderly, the youth, etc, were invited to the meetings.

7.8.1 Public Notification of the Stakeholder Engagement Meetings

One-week notices were issued through the Area Chief, initiating a mobilization effort for community engagement. The notice, communicated through the local Assistant Chief and Nyumba kumi representatives, informed community members about the upcoming meetings via announcements at public gatherings and door-to-door visits, ensuring widespread awareness. Additionally, posters were erected at the Chief's office and the project site.

Letters were also delivered to establishments neighboring the proposed Green Affordable Housing Development, inviting them to participate in the scheduled public participation meetings. The objective was to ensure that immediate neighbors were adequately informed about the project and provided with an opportunity to present their views, comments, and recommendations.

The following institutions were formally invited:

• Havard Apartments

• Havard School-Riruta

• Greywoods Residency

• Jacaranda Homes

• Ndwaru Road Royal Academy

• Riruta Gardens

Stakeholders were also informed that, should they prefer an individual consultation to the public participation meetings, they could contact the consultants using the details provided in the letter to arrange a one-on-one meeting. All letters were hand-delivered to the respective establishments and duly received by authorized personnel.

Copies of the invitation letters and delivery acknowledgments are attached in Annex 10.

7.9 Public Baraza Meetings

Three public baraza meetings were held with neighboring communities, all conducted at the project site, which served as a convenient gathering point for the majority of the targeted stakeholders.

The meetings took place on October 7th, 2025, October 14th, and October 21st, 2025. The meetings were attended by a total of 151 individuals, including the project team.

Below is a summary of the attendance at the consultative meetings held in Riruta.

Table 7-3: Summary of the attendance at the consultative meetings held in Riruta

Villages Represented	Meeting Venue	Date	Participants	Male	Female	Total No.
Riruta Location Riruta Sub-location Riruta, Ndwaru Road, Satellite, Ngina Road, Ndurarua areas	Project Site	7th October 2025	-Local administration (Chief, Assistant Chief, Elders) -Community members (men, women, youth) - EHS Consultants team	28	42	70
		14th October 2025	-Local administration (Chief, elders) -Community members (men, women, youth) -EHS Consultants team	19	19	38
		21st October 2025	Local administration (Chief, elders) -Community members (men, women, youth) -EHS Consultants team	19	24	43
TOTAL				**66**	**85**	**151**

The meetings were also attended by the National Government Authority Officers in charge of the area, i.e., the Area Chiefs, together with the community leaders.

The Consultants (Environmentalist and Social Experts), together with the IHS Project Team, were in attendance to provide information to the public and to receive and address comments. Through verbal discussions, the barazas were presented with information on:

- Description of the project (project design, location, and technology);
- The requirements of the EMCA for new projects in Kenya;

- The Environmental Assessment Process;
- Potential environmental and social impacts associated with the proposed project.
- Proposed enhancement and mitigation measures for positive and negative impacts, respectively
- Grievance Redress Mechanism

Following the presentation on the proposed project, stakeholders were allowed to share their comments and express their views regarding their perceptions of the project.

The verbal discussions were done in both English and Swahili languages as it had been established through the participants and the Chiefs that the audience would be most comfortable with the two languages.

The respondents were able to comment on the project, highlight the potential positive and negative impacts of the project, and if they are for or against the project.

All substantive issues raised with the project team during the baraza were noted and responded to. The issues were then recorded in an Issues and Response Report.



Plate 14: Images of Baraza meetings with the community members

7.9.1 Identification and recording issues of concern

During the baraza meetings, different views and concerns were expressed by the participants. These views were captured and recorded through meeting minutes. Responses to the views and comments will be undertaken as part of the detailed environmental and social impact assessment. Table Table 7-4 shows a summary of the opinions expressed by various stakeholders during the meeting.

Table 7-4: Summary of Issues raised in the community meetings

Subject	Issue	Response
Housing Affordability & Acquisition	Inquiries on the affordability of the houses and whether they suit the financial capacities of local residents.	Units are designed to be affordable, targeted towards lower-middle-income earners. Pricing and purchase procedures will be shared through the project office once sales commence.
	Requests for purchase procedures and financing options, such as rent-to-own or hire purchase	A sales office will be established to provide details on pricing, payment plans, and partner banks. Rent-to-own or other financing modalities to be discussed during the sales phase.
	Inquiries on whether community groups jointly purchase housing units	A sales executive will manage the sales process, and group purchases can be explored at that stage.
Employment & Business Opportunities	Community members inquired about access to jobs (skilled and unskilled), including opportunities for youth, women, and the elderly.	Community members are encouraged to register with the area chief for prioritization. Contractors will identify suitable roles, including light duties for elderly residents..
	Requests for internship and technical employment opportunities (e.g., civil engineering, construction, electrical)	Students and skilled individuals should register through the chief's office. Project managers will liaise when opportunities arise.
	Interest in business tenders, including supply of construction materials, safety gear, and catering.	Contractors will procure goods/services as needed. Local businesses will be prioritized where possible. Proposals can be submitted for consideration during implementation.
	Can community members serve as sales agents or earn commissions through referrals?	Referrals are encouraged; for the Keza Mi-Vida Homes, successful referrals will attract a 3% commission once contracts with Mi Vida are signed.
Community Amenities & CSR Initiatives	Request for a boda boda shed and kiosk space within or near the project.	Boda boda pick-up/drop-off zone will be designated. Provision of CSR budget to respond to community needs. Vendors encouraged to set up outside the complex; any vendors inside must be vetted.

Subject	Issue	Response
	Request for the construction of a health facility.	Once residents settle, lobbying the government for a dispensary will be easier.
	Request to preserve cultural or natural elements such as the Mugumo tree.	The Mugumo tree will be preserved and integrated into a landscaped space with seating and play area.
Project Design & Implementation	Queries on housing types, sizes, and the number of units.	240 modern units: 144 one-bedroom (40 sqm) and 96 two-bedroom (60 sqm), designed to be eco-friendly and affordable.
	Questions on project timeline, start date, and duration.	Expected to begin early 2026 and take approximately 2 years to complete.
	Request for landscaping and limiting concrete coverage.	Green cover will be enhanced; two trees will be planted for every one removed. Landscaped areas integrated into design.
	Inquiry about the number of boreholes the contractor intends to sink, with concern that this could affect the production of existing boreholes in the area.	Borehole siting and approval is handled by the Water Resources Authority (WRA), which follows specific criteria before authorizing any new boreholes
	Whether the developer, in collaboration with the County Government, is undertaking the rehabilitation of the feeder road that will be used during construction.	Feeder roads are under the jurisdiction of the Kenya Urban Roads Authority (KURA), and any damage caused during construction will be repaired by the contractor as part of contractual obligations.
Environmental & Social Impacts	Concerns about vegetation clearance, stormwater, air pollution, and noise.	Mitigation measures in place: tree replanting, dust screens, erosion control, daytime construction hours, and waste management via licensed handlers.
	Queries about safety of construction within the community.	Community safety measures include fencing, signage, traffic marshals, emergency plans, and contractor compliance with EHS standards.
	How will climate change be addressed in construction?	Open ground-floor designs for stormwater flow, natural ventilation, solar energy, and sustainable building materials will be integrated.

7.10 Focus Group Discussions

Following the first public Baraza meeting held on October 7th, 2025, separate focus group discussions (FGDs) were conducted with women, youth, and the business people from the affected community (*****). Using open-ended questions, the FGDs explored:

- Expectations and suggestions for the proposed project: Participants shared their hopes and concerns regarding the project's potential impact on their lives and businesses;
- Community dynamics and challenges: Participants discussed their roles and contributions to society, economic activities, community development, land use, educational access, and existing challenges.

The specific feedback for the project's focus group discussions is provided below;

7.10.1 Feedback From The Youth

A Focus Group Discussion (FGD) was conducted with five youth representatives from the project area to capture their perceptions, expectations, and concerns regarding the proposed development. The discussion provided insights into how young people anticipate the project will affect their livelihoods, social environment, and economic opportunities.

The participants demonstrated a good understanding of the project objectives and actively contributed ideas on maximizing community benefits and minimizing potential negative impacts.

Understanding and Opinions

Participants expressed that the development symbolizes progress and modernization within the area. Many appreciated that the project will create employment opportunities, engage private security personnel, and enhance the overall visual and infrastructural quality of the neighborhood.

Respondents highlighted that the project is expected to promote local business growth, empower the youth through employment creation, and stimulate economic activity. Stakeholders urged the proponent to prioritize the employment of residents during project implementation. Overall, the project is perceived as a beneficial development that will bring both social and economic uplift to the community.

Perceived Benefits of the Proposed Development

Economic Benefits

The community anticipates that the project will open up new business opportunities and stimulate economic growth within the area. It is expected to create direct and indirect employment, uplift local enterprises, and enhance the circulation of money within the local economy. The development of affordable housing is also seen as a major step toward improving the community's economic resilience and overall standard of living.

Social and Community Benefits

Socially, the project is expected to improve security and reduce crime rates through better lighting, organized settlement patterns, and increased employment. The community foresees enhanced social cohesion, and an overall beautification of the area. Participants noted that the project will help uplift the neighborhood, strengthen community bonds, and improve key infrastructure such as Ndwaru Road.

Youth Focus Group Benefits and Expectations

Youth participants clearly understood the objectives of the project and viewed it as an opportunity for economic empowerment. Their expectations is that the project will improve the visual appearance of the area, create jobs, and inject resources into the local economy. They also expect it to enhance infrastructure and increase property and market values in the area, thereby uplifting the standard of living.

Negative Impacts and Concerns

Despite the positive outlook, several potential negative impacts were identified. These include noise and air pollution resulting from construction activities and improper waste disposal. There are also concerns related to security and privacy for nearby residents.

From the youth discussion, additional concerns were raised regarding air and dust emissions, which may cause health complications such as allergies. Participants were also concerned that the contractor might overlook residents in favor of external labor, resulting in community dissatisfaction. Furthermore, they feared that without upgrading existing facilities, there could be a strain on social services such as water and sanitation.

Mitigation and Enhancement Measures

Participants proposed a range of measures to minimize negative impacts and enhance project benefits:

Topic	Mitigation/Enhancement Measures
Construction Management	Restrict construction works to daytime hours to reduce disturbance. Sprinkle water regularly to suppress dust emissions.
Local Employment	Prioritize local residents in recruitment and casual work opportunities. Select a liaison officer from within the community. Include a youth representative as a project contact person, independent of the local administration.
Community Involvement	Keep the community informed on project progress through regular updates. Offer capacity-building sessions for youth on employment readiness and small enterprise development. Involve community representatives during project implementation to ensure inclusiveness.
Security	Improve street lighting and install CCTV cameras along nearby roads. Maintain collaboration with local authorities to ensure site security during construction
Infrastructure	Upgrade access roads leading to the project site.

	Provide designated Boda boda sheds for riders.

Overview of Community Issues

Youth Issues and Priorities

The youth identified unemployment, limited opportunities, and mental health challenges caused by societal pressures as their main issues. Their priorities include access to water storage tanks to support small-scale business activities such as foot-washing and other income-generating ventures.

Employment and Economic Status

Youth participants estimated that only about 15–20% of young adults hold formal, salaried positions, while approximately 50% are self-employed. The most common occupations include casual work such as Kazi Mtaani, kiosk operations, car wash services, and manual construction labor ("track"). They expressed interest in accessing technical (electrical, masonry) and professional (civil and architectural engineering) jobs through the project.

Drug and Alcohol Abuse

Drug and alcohol abuse was reported to be prevalent among the youth, leading to reduced job opportunities, low income circulation, and strain on local businesses. Participants observed that substance abuse has been increasing over time, especially as economic opportunities decline.

Health

The main health concerns raised by the youth included frequent cases of pneumonia and the common cold, which they attributed to environmental and living conditions.

Community Infrastructure and Involvement

Participants noted that current housing standards are low and that existing facilities, including the Ndaragun Sports Centre, require urgent upgrades. They emphasized the need for improved infrastructure and better service delivery.

Youth Participation and Consultation

The youth reported minimal involvement in community decision-making and felt largely excluded from key processes. However, they appreciated that the consultation process for this project was satisfactory and inclusive. They primarily receive information through social media platforms such as WhatsApp and Twitter and prefer to receive future project updates through SMS or WhatsApp messages.

Education

It was estimated that 90–100% of youth have completed secondary education, while 20–30% have received Technical or Vocational Education and Training (TVET). Challenges to education were largely attributed to drug and alcohol abuse. Vocational training opportunities are limited, although community members support education through local school committees.

Safety and Security

Participants generally feel safe within their current neighborhood, although theft, especially at night, was cited as a common crime. They believe that the new housing units will improve safety by reducing unemployment and providing legitimate sources of income.

Summary Table of Youth FGD Feedback

Theme	Key Concern/ Comment	Perceived Benefit / Impact	Recommended Mitigation / Action
Employment	Limited job opportunities for youth	Positive – Job creation and empowerment	Prioritize local youth in hiring; appoint youth liaison
Infrastructure	Poor roads and inadequate facilities	Positive – Improved access and amenities	Upgrade access roads; build Boda Boda sheds
Economy	Low business opportunities	Positive – Increased cash flow and business activity	Provide training and support for youth enterprises
Health	Exposure to dust during construction	Negative – Respiratory issues	Sprinkle water; restrict construction to daytime
Security	Night-time crime and safety concerns	Positive – Improved security through lighting and jobs	Install street lights and CCTV; maintain community patrols
Drug Abuse	High substance use among unemployed youth	Negative – Social instability	Support mentorship, training, and awareness programs
Education	Limited vocational training opportunities	Positive – Capacity building and education access	Offer scholarships and skill development programs
Communication	Lack of regular updates	Neutral – Desire for transparency	Share updates via WhatsApp/SMS; hold community meetings

Conclusion

The youth FGD participants expressed support for the proposed development, noting its potential to improve livelihoods, create employment, and enhance community ties. They emphasized the need for transparency, ongoing engagement, and prioritizing local residents in job opportunities. If implemented inclusively, the project is expected to offer social and economic benefits to both the youth and the broader community.

7.10.2 Feedback from the Women

During the focus group discussion, five female participants actively contributed with valuable insights. Out of the five, four were household heads (female-headed households)/ single-parents. The cause for single-parenthood is as a result of attributed to widowhood, single parenthood, or men neglecting household responsibilities.

General Opinions

- The women generally endorsed the project, viewing it as a golden opportunity that would enable them to provide for their homes through job and business opportunities.
- They anticipated that security would improve significantly due to the development.

- Participants were satisfied with the consultation process and with the proposed mitigation measures.
- They expressed no major concerns, trusting that environmental and social issues would be properly managed.

Expected Benefits and Opportunities

- Priority employment for local residents, particularly women.
- Opportunities for both skilled and unskilled labour during implementation.
- Income generation through supply and small-scale business activities.
- Enhanced community empowerment through job creation and inclusion.

Enhancement of Positive Impacts

- Prioritize locals in recruitment.
- Commit to environmental restoration, such as planting two trees for every one cut down.

Expectations

- The women expressed excitement and optimism about securing employment and business opportunities once project implementation begins.

Role of Women in the Community

Women in the community play a central role as caregivers, nurturers, and moral anchors within their families and the wider society. They are primarily responsible for the wellbeing of their households, providing care, guidance, and emotional support. However, gender disparities persist, with men and women not enjoying equal opportunities, particularly in employment and decision-making spaces. Women are often disadvantaged because they frequently have to leave work to attend to family emergencies, which limits their participation in formal employment.

Safety remains a major concern for women, with issues such as domestic violence and sexual assault aggravated by general insecurity within the area. Poor sanitation and blocked sewer lines further compound the community's challenges, especially during the rainy season when some landlords discharge sewage onto the roads. Despite these hardships, the women anticipate that the new housing units will enhance security through the installation of CCTV cameras. Women and girls also face broader social challenges, such as neglect and incidents of rape. Notably, four out of five households represented in the discussion were female-headed, a situation attributed to male neglect of family responsibilities and widowhood resulting from gang-related violence in the area.

Institutions, Community Development, and Access to Services

Local Groups and Representation

Women's groups in the area mainly focus on social welfare activities such as merry-go-rounds and table banking. Despite their active participation in these informal economic networks, women remain largely excluded from community-level decision-making, which continues to be dominated by men. Information on local developments is typically shared through the chief's office, limiting direct engagement with women on community issues.

Active Community Organizations

The area hosts several community-based organizations (CBOs) that support social development. The Youth Empowerment and Engagement Program (YEEP) promotes sports and talent development among young

people, while "**Kaa-Sober"** works to combat drug and substance abuse within the community. These organizations play a complementary role in enhancing social welfare and reducing vulnerability among residents.

Access to Services and Infrastructure

Access to essential services in the area remains limited. The community lacks a local hospital or dispensary, forcing residents to rely on the health facility located in Kawangware. The top three development priorities identified by women include;

1. Construction of a health dispensary;
2. establishment of a local market; and
3. upgrading of feeder roads.

They emphasized that improved access to these facilities would significantly enhance their livelihoods and well-being.

Economy and Income Generation

Economic opportunities for women in the community are mainly concentrated in small-scale businesses such as fruit and vegetable vending, as well as casual labour. Most households rely on these activities as their primary source of income. The proposed project is expected to create additional income-generating opportunities for women through casual jobs such as cleaning, food vending, and supplying goods during construction. However, participants expressed concern that the development could lead to increased rent and a general rise in the cost of living as the area becomes more developed and attractive.

Gender, GBV, and Conflict Resolution

Gender-Based Violence (GBV) remains a serious concern in the community. The most common forms of GBV include domestic violence and rape. Women reported that such cases are typically handled through the chief's office, local police stations, and nearby hospitals. Existing GBV support centers include Shofco and Dreams, which provide limited psychosocial and medical assistance to survivors. The participants expressed satisfaction with how GBV cases are currently managed, particularly through the chief's office, but also recommended that a dedicated GBV center be established within the community. They further proposed the introduction of regular GBV sensitization programs and the strengthening of grievance redress mechanisms to ensure timely response and justice for affected individuals.

Education, Literacy, and Training

Education for girls and women in the area is generally accessible, with schools located approximately three kilometers away from most households. The majority of women and girls are literate and value education highly. However, financial constraints remain a significant barrier, as many families struggle to pay even the subsidized school fees required for their children to attend school. Despite these challenges, women participate actively in school management committees, contributing to the oversight and development of local education programs.

Health

Healthcare services are mainly accessed through the Riruta Health Centre, which provides basic medical services that meet most of the community's needs. The leading health concerns affecting women and girls include HIV/AIDS, sexually transmitted infections (STIs), and vaginal infections. These issues tend to be more prevalent when schools are closed, as young people become more exposed to risky behaviour. Environmental challenges such as poor water quality and blocked sewers also affect community health.

Access to Water

The primary sources of water for domestic use are boreholes and piped water systems, with most households located approximately one kilometer from the nearest source. Many homes have direct water connections, while others rely on communal access points. The water is generally treated, clear, and odorless. However, contamination occurs during the rainy season due to sewer overflow and poor drainage systems. To supplement supply, households often harvest rainwater using drums and buckets, though there are no formal water resource management practices in place.

Sanitation, Hygiene, and Waste Management

Sanitation facilities in the community are inadequate. Most households use pit latrines, while others resort to open defecation. These facilities are often shared among several households and are not connected to a sewer system. Waste management is also poor, with most household waste openly dumped in the community, contributing to environmental pollution and health risks. The women recommended that the project incorporate proper waste collection systems and sanitation infrastructure to improve hygiene standards

Vulnerable Groups

The most vulnerable members of the community are **widows, children, and people living with disabilities**. Children are particularly at risk due to orphanhood from HIV/AIDS and other causes, while widows face hardship in the absence of male protection or income support. Persons with disabilities are also vulnerable because of limited employment opportunities. Vulnerable groups rely on assistance from community health workers and well-wishers for survival. The women suggested that the proposed project should prioritize providing employment and business opportunities to these groups to enhance their economic independence and social well-being..

Participation and Consultation Approaches

The women reported a positive experience during the consultation process and appreciated the opportunity to share their views. They were particularly interested in understanding the construction schedules and the recruitment procedures for available job opportunities. The participants recommended that project updates and information be shared through the chief's office, village elders, and Nyumba Kumi networks, as these are the most trusted and accessible communication channels within the community.

Summary Table of Women's FGD Feedback

Theme	Key Concern/ Comment	Perceived Benefit / Impact	Recommended Mitigation / Action
Employment	Women seek priority in job allocation	Positive – Empowerment and income growth	Prioritize women in skilled and unskilled employment
Noise & Dust	Noise and dust during construction	Negative – Nuisance and health risk	Use mufflers and water bowsers
Environment	Tree cutting and degradation	Positive – Cleaner environment	Plant two trees for every one cut down
Health	HIV/AIDS and STIs	Negative – Health burden	Provide health awareness programs

Water	Sewer contamination during rainy seasons	Negative – Unsafe water quality	Improve drainage and sewer systems
Sanitation	Poor toilets and open dumping	Negative – Health and hygiene risk	Construct proper waste and sanitation systems
Gender & GBV	Domestic violence and rape	Negative – Social vulnerability	Build GBV center and sensitize community
Education	Financial barriers	Negative – Low education access	Establish bursary or education support fund
Infrastructure	Lack of market and feeder roads	Positive – Improved access and trade	Upgrade feeder roads and build local market
Vulnerable Groups	Widows, orphans, PWDs	Positive – Social inclusion	Offer job opportunities for vulnerable persons
Communication	Poor information flow	Neutral – Desire for engagement	Provide updates via Nyumba Kumi and chief's office

Conclusion

Overall, the women expressed strong support for the proposed development, emphasizing its potential to improve their economic standing, family welfare, and community security. They recognized the project as an opportunity to uplift their living standards through access to employment, improved infrastructure, and enhanced social amenities. However, they also underscored the importance of inclusivity, recommending that local women, youth, and vulnerable groups be given first priority in job allocation. The participants further urged the proponent to uphold environmental conservation, provide adequate GBV response mechanisms, and ensure open communication throughout the project's implementation. With proper community engagement and consideration of these recommendations, the project is expected to generate long-term social and economic benefits for the women and the broader community.

7.10.3 Feedback from the Business Community

During the focus group discussion, five business people actively engaged. The purpose of the discussion was to understand business operations, perceptions of the proposed project, potential socio-economic impacts, and expectations from the development.

Perception of the Project

Participants confirmed that they fully understood the proposed project and expressed a positive attitude towards its implementation. They agreed that the project would boost local businesses in the area by attracting more customers and stimulating economic growth.

No negative impacts were identified during the discussion, and participants had no additional comments apart from noting that the "affordable" labelling of the project was misleading because the houses are not affordable for the average local resident from Riruta . They did not suggest any mitigation measures.

Trading Activities and Livelihoods

The participants were drawn from a range of small business operators, including butchers, food vendors, traders selling raw food, plastics, and gas. The group does not have a trading association.

Goods are transported mainly by motorbikes (Boda Bodas), which were described as fast and convenient for local deliveries.

Participants reported working long hours—from 7:00 a.m. to 11:00 p.m., seven days a week. Despite their efforts, they stated that business income is generally low and must be supplemented due to the current economic situation.

The main challenges identified in trading activities included:

- Low numbers of clientele.
- Customers taking goods on credit.
- Customers refusing to pay for goods taken on credit

They emphasized that the construction of the new housing units will positively impact the local economy, as it is expected to increase business activity and improve living standards in the area.

Impact on Business Operations

Participants acknowledged that construction activities may affect businesses due to traffic, increased noise, and dust. To minimize these impacts, they suggested that the contractor find an alternative access route for the construction vehicles.

They did not anticipate any major disruptions to customer foot traffic or delivery schedules during the construction phase.

Customer Base and Market Demand

The business community expects the new housing development to bring in more customers, especially women, who represent a significant portion of the consumer base.

Participants anticipate a shift in the customer profile toward a more middle-class clientele once the housing units are completed.

They also foresee an increase in demand for products and services, as new residents are likely to rely on nearby shops and markets for their daily needs.

Competition and Business Growth

Traders expect heightened competition as new businesses emerge following population growth and increased housing in the area.

However, they also noted a likelihood of business expansion, given the anticipated boost in local business activity and an enlarged customer base brought about by the housing project..

Community Impact

Participants highlighted several community-level benefits expected from the project. They mentioned that Corporate Social Responsibility (CSR) initiatives, such as the construction of business premises or grocery shops, would be highly beneficial.

They believe that the project will lead to a better business environment and a rise in property values in the surrounding area. Additionally, they identified improved infrastructure and enhanced security lighting as major benefits they hope to see implemented

Observations and Community Vulnerabilities

The meeting was well conducted, and participants were actively engaged. No challenges were reported regarding participation or organization.

The participants identified vulnerable groups within the community, including:

•Youth, particularly due to high unemployment levels.

•The elderly, who are financially and socially dependent.

•Individuals struggling with addiction, who face exclusion and economic marginalization.

These groups were considered at risk and in need of targeted support to benefit from employment or business opportunities associated with the project.

Conclusion

The business community expressed overall support and optimism regarding the proposed IHS housing project. They viewed it as a key opportunity to revitalize the local economy, enhance infrastructure, and increase business activity through an expanded customer base and improved urban amenities.



Plate 15: FGD with the Youth



Plate 16: FGD with the women



Plate 17: FGD with Business People

7.11 Feedback from the Public (General Questionnaires)

Stakeholder Consultation Summary

This section presents the opinions, perceived benefits, potential impacts, and recommendations gathered from the general public using the general questionnaire. A total of 20 residents were interviewed. The feedback reflects the community's general support for the project, with some concerns regarding environmental and social impacts during construction.

Stakeholder Opinions

Stakeholders expressed highly positive views about the proposed development, describing it as a major step toward area growth and improved living standards.

Key opinions included:

1. The project is viewed positively as a development initiative.
2. It will create employment opportunities and involve a private security team.
3. It will bring economic benefits and job opportunities to the community.
4. The project will help relocate people from slum areas into better housing conditions.
5. It will contribute to the overall development and modernization of the area.
6. The proponent should prioritize employment for people from the surrounding community.
7. It is seen as a source of business growth, job creation, and community empowerment.
8. The project will empower the youth by creating direct and indirect employment.
9. The overall consensus is that the project is good and beneficial for the community

Perceived Benefits of the Proposed Development

Stakeholders identified various benefits associated with the project, categorized into economic, social, and infrastructural gains.

Economic Benefits

1. Creation of business and job opportunities.
2. Upliftment of local businesses and stimulation of trade.
3. Development of affordable housing units.
4. Promotion of economic growth and improved livelihoods.

Social and community Benefits

1. Improved community security and safety.
2. Enhancement of living and working standards.
3. Overall area development and community progress.
4. Promotion of social cohesion and interaction.
5. Creation of a peaceful and organized neighborhood.
6. Beautification and improvement of the project surroundings.
7. Upgrading of Ndwaru Road and nearby infrastructure.
8. Reduction of crime and enhancement of security.
9. Increased prominence and importance of the project area

Potential Impacts of the Project

Stakeholders acknowledged that while the project offers many positive outcomes, several environmental and social concerns should also be addressed.

Positive Impacts

1. Improvement of overall security.
2. Upgrading of sewerage and drainage systems.
3. Availability of employment opportunities.
4. Facilitation of business growth and commercial activities.
5. Improvement of roads and installation of street lights.
6. Area growth to higher development standards.
7. Engagement of youth in community security and development.

Negative Impacts and Concerns

1. Noise pollution from construction activities.
2. Air pollution and dust emissions.
3. Improper waste disposal and dumping.
4. Security challenges during project construction.
5. Privacy concerns for residents living near the site.

Mitigation Measures and Recommendations

Stakeholders proposed several mitigation measures and recommendations to address the identified challenges and enhance project benefits.

Employment and Education

1. Give priority to local residents when offering employment.
2. Provide scholarships for children from the surrounding community.
3. Offer mentorship programs for students to promote skill development.

Infrastructure and Security

1. Install sufficient security lighting around the project site.
2. Restrict construction activities to daytime working hours.
3. Construct designated dumping sites for proper waste management.
4. Maintain community security throughout the project.
5. Build social or fitness halls to engage the youth.
6. Install road safety measures, including bumps and signage.
7. Construct a concrete boundary wall to enhance site security.
8. Preserve the area's environmental quality and cleanliness.

General and Social Measures

1. Maintain a proactive approach to mitigating potential negative impacts.
2. Employ qualified professional personnel during project implementation.
3. Support community development by constructing social facilities such as a hospital or police station.
4. Maintain adequate security inside and outside the project area.

Summary Table of General Public Feedback

Theme	Key Concern/ Comment	Perceived Benefit / Impact	Recommended Mitigation / Action
Employment	Need to prioritize residents for jobs	Positive – Job creation and youth empowerment	Hire local residents and appoint a youth liaison representative
Economic Growth	Business expansion and increased customers	Positive – Upliftment of local businesses	Support local trade and encourage CSR initiatives
Housing	Shortage of decent rental units	Positive – Improved and affordable housing	Develop affordable housing units with fair allocation
Infrastructure	Poor drainage, waste management, and road conditions	Positive – Upgraded roads, drainage, and lighting	Improve drainage, construct dumping

			sites, and install street lights
Environment	Dust, noise, and improper waste disposal	Negative – Air and noise pollution, environmental degradation	Restrict work to daytime hours, sprinkle water, and adopt proper waste disposal methods
Security	Crime and safety concerns during construction	Positive – Improved security through organized development	Install lighting, CCTV, and boundary wall; maintain community patrols
Community Engagement	Need for involvement and communication	Positive – Strengthened community relations	Conduct regular barazas and provide project updates

7.12 Corporate Social Responsibility/ Social Investment Opportunities

Corporate Social Responsibility helps the Project company by cultivating public trust and demonstrating standards and transparency in business operations. Community reaction to the company's behaviour can help achieve success or pull them out of business. CSR is titled to aid an organization's mission and guide what the company stands for and will uphold to its stakeholders.

It is recommended that IHS build relationships with the local community and take into account external perspectives. The Proponent is advised to:

I. Develop the CSR Plan: This will involve identifying the sustainable thematic areas. The community shared the following CSR suggestions;

- Construction of business premises/grocery shops
- Upgrade of the access road
- Construction of a health facility
- Provision of a designated boda boda shed

Therefore, the CSR program should focus on upgrading local infrastructure and uplifting livelihoods thematic areas and include an annual budget plan.

II. Delivering project-related Information: the proponent should endeavour to build a positive image by disseminating accurate information to the community and stakeholders about the proposed affordable housing project. They should hold regular meetings with the community to facilitate two-way communication.

III. The proponent should have an employment strategy with preference given first to the local community within the Mutuini area. Semi-skilled and unskilled jobs should be awarded to the local community residents and the environs. This will create a good rapport between the community and the proponent, which will ensure the smooth running of the project.

IV. Ensure regulatory compliance: The proponent should familiarize himself with EIB and Kenyan HSE-related laws and regulations. This will ensure that they manage the project in an environmentally safe manner and avoid friction with the community.

7.13 Post-ESIA Engagement

Corporate Social Responsibility helps the Project company by cultivating public trust and demonstrating standards and transparency in business operations. Community reaction to the company's behaviour can help achieve success or pull them out of business. CSR is titled to aid an organization's mission and guide what the company stands for and will uphold to its stakeholders.

The Project is committed to continuous engagement with stakeholders throughout the life of the Project, from the current stages of planning and design, through construction into operation, and eventually to closure and decommissioning.

Plans and activities implemented during the next stages of project planning and development will therefore feed into and inform on-going stakeholder engagement as the project moves into these stages, ensuring that two-way dialogue with those affected, both positively and negatively by the proposed project is maintained.

The aim will be to ensure that the project remains in contact with all interested parties and cognizant of their concerns, and that these are addressed in an effective and timely manner. At each stage, a detailed schedule of activities and events will be developed and widely disseminated so that people know how to interact with and participate in the Project.

In particular, post-ESIA stakeholder engagement is expected at the following stages:

- **Pre-construction phase:** Engage with key stakeholders—such as DOSHS, the National Construction Authority, and NCWSC to obtain the necessary project approvals.
- **Mobilization phase:** At this stage, information regarding the exact locations of specific Project infrastructure, detailed construction schedule, and expected construction team (including employment opportunities) will be shared with the Project stakeholders.
- **Construction phase:** Periodic Project updates, as well as any changes in planning, will be shared with Project stakeholders. There will also be the implementation of a worker and community grievance mechanism
- **Demobilization phase:** Notifying the stakeholders about the end of the construction activities and the closeout of outstanding construction phase-related grievances. This is also expected to mark the start of the occupancy phase.
- **Operations/Occupancy Phase:** Resident onboarding and orientation on environmental and social commitments, i.e., waste disposal, noise, security, and operationalization of the tenants' grievance mechanism.
- **Decommissioning Phase:** Inform stakeholders when the Project comes to an end, as well as plans for the Project Site.

8 CHAPTER 7: ANALYSIS OF ALTERNATIVES

8.1 Overview

This chapter presents an assessment of the project alternatives considered during the planning and design of the proposed Riruta IHS Housing Development. The analysis aims to demonstrate that the final selected option represents the most technically feasible, environmentally sound, socially acceptable, and economically viable configuration. The evaluation complies with Section 58 of EMCA (Cap. 387) and Regulation 18(1)(e) of the Environmental (Impact Assessment and Audit) Regulations, 2003 (Revised 2019), which require consideration of feasible alternatives. It also fulfills the requirements of EIB Environmental and Social Standards (ESS 1 and ESS 3) and the IFC Performance Standards, which emphasize early screening of location, design, and technological choices to minimize environmental and social risks.

The purpose of this analysis is to identify the most appropriate configuration that optimizes land use efficiency, minimizes environmental impacts, and maximizes social and economic benefits. The alternatives reviewed include:

- ✓ The no-project alternative;
- ✓ Site location alternatives;
- ✓ Design and layout alternatives;
- ✓ Technological and material alternatives;
- ✓ Water source alternatives;
- ✓ Wastewater management and disposal options;
- ✓ Alternatives in energy systems and efficiency; and
- ✓ Construction technology and materials alternatives.

The selection of the preferred alternative was guided by technical feasibility, compliance with the relevant county, national and international standards.

8.2 No-Project Alternative

The No-Project Alternative considers the scenario where the proposed development is not implemented and the land remains undeveloped in its current semi-disturbed condition. The site, covers approximately 1 acre within a rapidly urbanizing mixed-use zone characterized by residential apartments, small commercial enterprises, and institutional uses. At present, the site is vacant and exhibits minimal vegetation, dominated by grasses and a few shrubs, with a single mature Mugumo (*Ficus sycomorus*) tree retained for its ecological and cultural significance.

Under the no-project option, there would be no alteration to the existing site conditions. No vegetation clearing, excavation, or construction would take place. The current natural drainage pattern would remain unchanged, and there would be no generation of dust, solid waste, or construction noise. However, this apparent environmental neutrality masks long-term inefficiencies and opportunity losses. Without the project, the land would remain underutilized despite its strategic location in a well-serviced and zoned area. The absence of development would deny the area the environmental and socio-economic benefits associated with planned redevelopment; including improved drainage, landscaping, and controlled solid waste management. Unregulated dumping, erosion, and visual blight would likely continue as the site remains idle.

Economically, failure to implement the project would mean lost employment opportunities for an estimated 250–300 skilled and unskilled workers during construction and the loss of permanent management jobs during operation. The project's potential to inject capital into the local economy through material supply chains, transport, and service provision would also be foregone.

At a county and national level, the no-project scenario would hinder contribution to the Affordable Housing Programme under Kenya's BETA Agenda and Nairobi County's housing targets under the CIDP (2023–2027). The project's demonstration value as a green and resource-efficient urban housing model would also be lost. While the no-project alternative would avoid short-term construction-related impacts, it would perpetuate inefficient land use and constrain socio-economic progress in the Riruta area.

The alternative is therefore environmentally and socially undesirable compared to the proposed project.

8.3 Site location alternatives

The project location was determined after assessing several potential parcels within the Dagoretti South corridor, including Riruta, Satellite and Waithaka. Each site was screened based on land tenure, infrastructure readiness, environmental suitability, and planning compliance. The selected Riruta site along Ndwaru Road presented the most favorable combination of accessibility, availability of services, and compatibility with Nairobi County's urban planning framework.

Alternative sites in Waithaka and Satellite offered relatively lower land costs but lacked ready connections to sewer and power infrastructure, would have required longer trunk extensions, and in some cases were zoned for lower-density residential use. Such locations would increase both development costs and environmental footprints due to additional excavation, pipework, and vegetation clearance. In contrast, the Riruta parcel is within a well-developed mixed-use neighborhood and already serviced by NCWSC sewer, KPLC grid power, and a paved access road. The area is zoned for multi-dwelling residential development, and change-of-use approval from agricultural to residential has already been granted by the Nairobi City County Government.

The site also enjoys strong socio-economic integration, with existing schools, markets, and healthcare facilities within a 500-m radius, minimizing the need for new off-site infrastructure and supporting sustainable urban living. From an environmental perspective, the site is relatively flat and free of ecologically sensitive features apart from the Mugumo tree preserved in the design. There are no wetlands or watercourses within the property boundary. This minimizes earthworks and drainage modifications compared to alternative locations.

Therefore, based on infrastructure efficiency, planning alignment, and environmental manageability, the Riruta site was selected as the optimal and most sustainable location for the proposed housing project.

8.4 Design and Layout Alternatives

The design development phase for the Riruta IHS Housing Project considered several configurations to identify the most efficient, sustainable, and socially responsive form of development. The evaluation process took into account the constraints of the 1-acre parcel, the need to optimize usable space, and compliance with Nairobi City County's zoning standards for multi-dwelling residential buildings within Dagoretti South.

8.4.1 Comparison of Density Options

8.4.1.1 Low-Rise Development – 4 to 5 levels

This configuration was initially examined for its low visual impact and ease of construction. However, it would yield only about 70–80 housing units, which is far below the site's capacity. Such low density would result in uneconomical use of serviced urban land and fail to contribute meaningfully to Nairobi's affordable housing targets. The expansive footprint would also reduce green space, increase soil sealing, and leave minimal room for community amenities such as parking, children's play areas, and landscaped zones.

8.4.1.2 Medium-Rise Cluster – 9 to 11 levels

This option offered moderate density with an estimated 180–200 units. It involved multiple detached blocks with internal courtyards. While it improved ventilation and daylighting, it increased infrastructure duplication; separate foundations, utility runs, and service cores: - raising costs and reducing overall land efficiency. The fragmented open spaces also limited the integration of a coherent stormwater management system and communal recreational facilities.

8.4.1.3 High-Rise Vertical Configuration – 16 level L-Shaped Single Block

The selected design consolidates all 240 housing units into one L-shaped tower, combining both functional efficiency and environmental performance. This compact form minimizes the building footprint, freeing space for a central landscaped courtyard and Mugumo Park, preserving the mature fig tree as a cultural and ecological landmark. The high-rise configuration allows better stormwater control through unpaved areas, landscaped swales, and infiltration trenches. It also supports efficient internal circulation, lifts, and fire-safety egress systems compliant with the National Building Code (2024).

8.4.2 Rationale for the Selected Layout

The chosen 16 level L-shaped layout achieves an optimal balance between density, liveability, and climate resilience. The design minimizes land take, improves ventilation and natural lighting, and ensures adequate buffer between the building and adjacent developments. Vertical development also reduces horizontal utility lines (water, sewer, electricity), minimizing material use and cost.

From an environmental perspective, the reduced footprint supports stormwater attenuation measures, ensures compliance with environmental setback requirements, and allows inclusion of Sustainable Urban Drainage Systems such as permeable cabro pavements, soakaways, and infiltration trenches.

Socially, the layout provides communal green spaces, children's play areas, and accessible walkways, enhancing resident well-being and community interaction.

Therefore, the G+15 design is considered the most sustainable and cost-effective configuration, aligning with EMCA principles of efficient land use and IFC EDGE green building standards.

8.5 Technological and Material Alternatives

In line with the project's commitment to green, affordable, and climate-resilient housing, several technological and construction material options were critically analyzed during the project's conceptual and preliminary design phases. The analysis was guided by the principles of resource efficiency, structural suitability, embodied carbon reduction, and long-term operational sustainability, consistent relevant laws and standards[10].,

[10] EMCA Cap 387, EIB ESS, and IFC EDGE green building certification standards

8.5.1 Evaluation of Construction Technologies

8.5.1.1 Reinforced Concrete (RC) Frame Structure – Preferred Option

The RC frame system was selected as the most practical and resilient solution for the 16-storey configuration. It provides high structural strength, resistance to seismic loads, and long service life. The system is well understood in Kenya's construction sector, allowing local contractors and engineers to deliver the project using readily available skills and materials.

Foundation design is based on the site's geotechnical findings, which identified expansive black-cotton soils; this is addressed through raft and deep-strip foundations to achieve stability and reduce differential settlement.

8.5.1.2 Precast or Modular Construction

While prefabricated or modular systems offer time efficiency and reduced waste, they were found unsuitable for the Riruta site due to limited local production capacity for high-rise modules and transportation constraints along Ndwaru Road. The associated logistics and cost implications would undermine the project's affordability.

8.5.1.3 Steel Frame Construction

A steel superstructure offers strength and speed but was rejected because of high embodied energy, limited availability of certified structural sections locally, and increased fire-protection requirements. This option was therefore inconsistent with the project's cost and sustainability goals.

8.5.1.4 Alternative Walling and Partition Materials

The design integrates lightweight Autoclaved Aerated Concrete (AAC) and Expanded Polystyrene (EPS) panels for non-load-bearing partitions to improve insulation and reduce structural weight. These materials enhance thermal comfort and reduce embodied carbon compared to traditional masonry blocks.

8.5.2 Material Sustainability Measures

The selected materials prioritize resource efficiency and low-carbon construction, including the blended cement with reduced clinker content to cut CO_2 emissions by approximately 25%; reinforcement steel sourced from local recyclers, minimizing raw-ore extraction; low-VOC paints and adhesives, improving indoor air quality; and reflective roof coatings and insulation layers to reduce cooling loads.

These choices align with EIB ESS 3 on resource efficiency and pollution prevention, and contribute toward achieving IFC EDGE Certification, targeting at least 20% savings in energy, water, and embodied energy in materials.

8.6 Water Source Alternatives

Water supply is a critical consideration given intermittent service by the Nairobi City Water and Sewerage Company (NCWSC) in Dagoretti South. Various supply strategies were assessed to ensure adequate and sustainable service during both construction and operation phases.

8.6.1 Alternative Water Supply Options

8.6.1.1 NCWSC supply only

Relying solely on NCWSC was found unreliable due to regular rationing, which limits supply to a few days each week. While this option offers high-quality water and easy regulatory compliance, the intermittent supply could disrupt construction progress and resident comfort.

8.6.1.2 Private Borehole supply

Borehole abstraction was deemed technically feasible but environmentally and regulatorily sensitive. The Water Resources Authority discourages new abstractions in the area due to declining groundwater tables and the density of existing wells. This alternative would also increase project costs and require continuous water quality monitoring.

8.6.1.3 Hybrid NCWSC Supply with On-Site Storage – Selected Option

The preferred configuration involves direct connection to the NCWSC main along Ndwaru Road, supported by ground and rooftop storage tanks with a minimum capacity equivalent to three days' consumption.

This ensures continuous availability during rationing periods, improves water pressure management, and prevents service interruptions.

8.6.2 Water Efficiency and Quality Management

The project integrates low-flow plumbing fixtures, dual-flush toilets, and a rainwater collection system for non-potable uses such as irrigation and cleaning. The rainwater harvesting network channels roof runoff into filtered underground tanks, contributing to reduced reliance on municipal supply.

During operation, the system will be maintained under a Water Safety Plan (WSP) in compliance with WHO drinking water guidelines and EMCA (Water Quality) Regulations, 2024. This plan includes regular testing for pH, turbidity, fluoride, nitrates, and heavy metals to ensure potable quality.

The selected hybrid water solution thus guarantees supply resilience, regulatory compliance, and sustainable water use, meeting both EIB ESS 3 and IFC EDGE water-efficiency benchmarks.

8.7 Wastewater Management and Disposal Options

Effective wastewater management was a key design priority given the urban context and regulatory requirements under NEMA and NCWSC. The objective was to ensure full compliance with discharge standards and eliminate pollution risks to the surrounding environment.

8.7.1 Evaluated Alternatives

8.7.1.1 Septic Tanks / Soak Pits

Traditional systems were deemed unsuitable for the Riruta site. The area's expansive soils, high groundwater fluctuations, and dense population increase the risk of groundwater contamination. Additionally, septic systems require large land area, regular desludging, and are incompatible with multi-storey developments.

8.7.1.2 On-Site Packaged Wastewater Treatment Plant (MBBR System)

This system, while effective in treating effluent to near-reuse quality, was deemed unnecessary for the Riruta site because a municipal sewer line is already available along Ndwaru Road. Installing an on-site plant would result in redundancy, higher maintenance costs, and additional energy consumption.

8.7.1.3 Direct Connection to NCWSC Sewer – Preferred Option

The project will connect directly to the existing NCWSC trunk sewer, which currently serves Keza Apartments and other developments south of the site. This option eliminates the risk of effluent discharge, reduces operational burden, and fully aligns with Nairobi County's integrated infrastructure plan.

8.7.2 System Design and Pollution Control Measures

The design incorporates separate networks for greywater and blackwater, ensuring efficient flow management and preventing blockages. All wastewater will be conveyed through properly graded PVC sewer lines with inspection chambers and manholes at standard intervals. Grease traps will be installed in residential kitchens to intercept oils before discharge, reducing load on the municipal network. Connection works will be carried out under NCWSC supervision to ensure conformity with approved technical standards and prevent cross-contamination between stormwater and wastewater channels.

This approach offers maximum reliability, minimal environmental risk, and complete regulatory compliance with EMCA and Nairobi County Public Health requirements. It also supports the principles of EIB ESS 3 and IFC PS 3.

8.8 Alternatives in Energy Systems and Efficiency

Energy use is a core determinant of both operational cost and the project's overall environmental footprint. The Riruta IHS Housing Project seeks to achieve an operational energy reduction target of at least 35 percent relative to standard baseline apartments, consistent with IFC EDGE Certification and the EIB Climate Bank Roadmap (2021–2025).

The choice of energy system was therefore guided by three criteria: reliability and resilience under intermittent KPLC grid conditions common in Dagoretti South; reduction of GHG emissions and improved energy efficiency; and affordability and technical feasibility within an urban high-rise development..

8.8.1 Evaluated Energy Supply Alternatives

Three principal configurations were considered during design:

Table 8-1: Water supply constraints and demand

Alternative	Description	Advantages	Limitations	Evaluation Outcome
A. Grid-Only Supply	Full reliance on Kenya Power (KPLC) network.	Simple connection, low capital cost.	Grid unreliability, high tariff exposure, elevated GHG emissions, dependence on diesel backup during outages.	Rejected – Fails resilience and climate-alignment targets.
B. Solar-Only System	Stand-alone rooftop solar PV and solar-water-heating serving all units.	100 % renewable, very low emissions.	Insufficient roof area for full-load PV generation on 16-storey block; intermittent supply; high battery storage cost; technical maintenance demand.	Not Feasible – Roof/space constraints, high cost.
C. Hybrid Solar–Grid Integrated System	Combination of grid power, solar water-heating for each unit, limited PV for common areas, and acoustic diesel generator backup.	Reliable supply, high energy savings, reduced carbon footprint, meets IFC EDGE targets.	Moderate initial investment for solar and controls.	Preferred Option – Technically, economically, and environmentally optimal.

8.8.2 Rationale for the Selected Hybrid System

The selected Hybrid Solar–Grid Integrated System provides an optimal balance between reliability, efficiency, and environmental sustainability for a high-rise residential estate.

Reliability and Resilience: The Riruta area experiences intermittent grid interruptions averaging 2–4 hours weekly. A hybrid system ensures uninterrupted operation of lifts, pumps, lighting, and security systems. Backup power will be provided by an acoustically enclosed 250 kVA diesel generator with 100 % spill-proof containment to meet critical loads only—thereby limiting fuel use and emissions.

Energy Efficiency and Climate Alignment: Solar-Water Heating (SWH): Each residential unit will be served by a roof-mounted solar collector system meeting up to 80 % of domestic hot-water demand.

Solar PV Array: Roof-level photovoltaic panels will supply lighting for corridors, parking, and security systems.

Passive Architectural Design: The L-shaped tower is oriented along an east-west axis, reducing solar heat gain on façades while maximizing daylight penetration. Cross-ventilation design and reflective roof coatings further lower cooling needs.

Efficient Appliances and Lighting: LED luminaires, motion-sensor corridor lighting, and energy-efficient lifts will be installed. Collectively these measures are projected to achieve ≥ 35 % energy savings compared with a conventional baseline building.

Emission Reduction Performance: Based on a diversified load of approximately 450 kW, hybridization is expected to avoid around 280 t CO_2e per year, contributing to Kenya's Nationally Determined Contribution (NDC) target of 32 % GHG reduction by 2030.

Operation and Maintenance Plan: The energy system will be supported by a computerized Building Management System (BMS) monitoring grid draw, generator use, and solar contribution. This ensures optimal energy balancing, preventive maintenance scheduling, and accurate reporting for environmental audits required under EIB ESS 1..

8.8.3 Comparison of Energy System Alternatives

Evaluation Criterion	Grid-Only System	Solar-Only System	Hybrid Solar–Grid System (Selected)
Reliability during outages	Low	Medium	High
Capital Cost	Low	High	Moderate
Energy Savings	≤ 10 %	≥ 70 % (theoretical)	≥ 35 %
Emission Reduction	Minimal	High but intermittent	Consistent and measurable reductions
Compliance with IFC EDGE / EIB ESS 3	Partial	Partial / impractical	Full compliance
Technical Feasibility on High-Rise	Excellent	Limited	Excellent
Preferred Option	✗	✗	✓

8.8.4 Energy Efficiency Enhancement Measures

Beyond the primary energy system, several design-integrated features will contribute to continuous energy conservation during operation:

- High-performance glazing to limit solar gain while maximizing daylighting.
- Occupancy sensors in stairwells, corridors, and parking areas to eliminate idle power use.
- Elevator grouping and regenerative braking systems to recover kinetic energy.
- Pre-wiring for future EV-charging stations in compliance with the National Building Code (2024) requirement that at least 5 % of parking bays accommodate EV charging.
- Resident awareness programs under estate management to encourage responsible energy consumption.

8.8.5 Environmental and Economic Implications

The hybrid system's marginally higher upfront cost (approximately 10 – 12 % above conventional electrical design) is offset by lower operational energy bills and reduced generator runtime. The payback period for solar installations is estimated at 5–6 years, after which the project will realize net operational savings and contribute to long-term GHG mitigation. In environmental terms, the system directly supports low-carbon urban development, reduces dependence on fossil-fuel backup, and ensures compliance with Kenya's Energy Act (2019) and EIB ESS 5 – Climate Change Standard.

8.9 Alternatives in Construction Technology & Materials

Construction technology options were compared with respect to cost, material availability, and performance. A traditional reinforced concrete frame remains the most appropriate for local conditions. It leverages established Kenyan construction capacity, ensures durability on expansive soils, and provides cost predictability.

Emerging systems such as Insulated Concrete Forms or prefabricated modules were found to have potential environmental benefits but are constrained by limited technical expertise, higher costs, and longer import lead times. By combining optimized structural design, blended cement, efficient formwork reuse, and recycled steel, the project achieves more than 20% reduction in embodied energy, meeting EDGE and EIB thresholds for low-carbon construction.

This solution ensures structural stability, cost control, and sustainability, making it the preferred construction technology.

8.10 Conclusion

The alternatives analysis demonstrates that the chosen configuration the multilevel L-shaped residential block on the Riruta site, utilizing reinforced concrete frame construction, direct NCWSC connections, hybrid solar–grid power, and resource-efficient material; offers the best overall environmental, technical, and socio-economic performance.

It maximizes land use efficiency in an already serviced urban zone, minimizes environmental disturbance, supports local employment, and contributes directly to Nairobi County's sustainable housing targets. The selected approach aligns fully with EMCA Regulation 18(1)(e), EIB ESS 1, 3, and 5, and the principles of the IFC Performance Standards, ensuring a balance between development objectives, environmental stewardship, and community well-being.

9 CHAPTER 8: ANTICIPATED IMPACTS AND MITIGATION MEASURES OVERVIEW

9.1 Anticipated impacts

Four main factors were used to classify the potential effects of the proposed project on the environment, which may be positive or negative. The extent was assessed as being specific (on-site) or widespread, the magnitude was characterized as being major or minor, the duration as short-term or long-term, and the reversibility stated as being temporal or permanent. The probable environmental effects of the proposed project are compiled in Table 30 based on the data amassed during the desk and field studies.

Table 9-1: Impact analysis throughout the project cycle

Category	Impact description	Impact significance criteria	Project phase		
			Construction	Operation	Decommissioning
Positive	Optimal utilization of the land	Scale	Major positive,	Major positive,	
		Duration	Short term	Long term	
		Extent	On-site	On-site	
		Intensity	Temporal	Permanent	
	Promote sustainable urban development	Scale	Major positive,	Major positive,	
		Duration	Short term	Long term	
		Extent	On-site	Localised	
		Intensity	Temporal	Permanent	
	Income generation and employment	Scale	Major positive,	Major positive,	Minor positive
		Duration	Short term	Long term	Short term
		Extent	Localised	Localised	On-site
		Intensity	Temporal	Permanent	Temporal
	Provision of affordable housing & addressing the housing shortage	Scale		Major positive	
		Duration		Long term	
		Extent		Localised	
		Intensity		Permanent	
	Increase government revenue	Scale	Major positive	Major positive	Minor positive
		Duration	Short term	Long term	Short term
		Extent	Widespread	Widespread	Widespread
		Intensity	Temporal	Temporal	Temporal
	Creation of market for goods/services	Scale	Major positive	Major positive	Minor positive
		Duration	Short term	Long term	Short term
		Extent	On-site	Widespread	On-site
		Intensity	Temporal	Permanent	Temporal
	Improved security	Scale	Major positive	Major positive	Minor positive
		Duration	Short term	Long term	Short term
		Extent	On-site	Localised	On-site
		Intensity	Temporal	Permanent	Temporal
	Local skills enhancement / community capacity building	Scale	Moderate positive	Major positive	Moderate positive
		Duration	Short term	Long term	Long term
		Extent	Localised	Localised	Localised
		Intensity	Temporal	Permanent	Temporal

Category	Impact description	Impact significance criteria	Project phase		
			Construction	Operation	Decommissioning
	Social cohesion and community integration	Scale		Major positive	
		Duration		Long term	
		Extent		Localised	
		Intensity		Permanent	
Negative	Air pollution	Scale	Moderate negative	Minor negative	Moderate negative
		Duration	Short term	Short term	Short term
		Extent	On-site	On-site	On-site
		Intensity	Temporal	Temporal	Temporal
	Soil disturbance and erosion	Scale	Moderate negative	Minor negative	Moderate negative
		Duration	Short term	Short term	Short term
		Extent	On-site	On-site	On-site
		Intensity	Temporal	Temporal	Temporal
	Noise pollution	Scale	Moderate negative		Moderate negative
		Duration	Short term		Short term
		Extent	Localised		Localised
		Intensity	Temporal		Temporal
	Noise and Short-term Vibration Pollution	Scale: Duration:	Major negative		
		Extent	Localized (residential neighbors)		
		Intensity	Temporal		
	Alteration of Drainage and Stormwater Patterns	Scale	Major negative	Major negative	Minor negative
		Duration	Short term	Long term	Short term
		Extent	Widespread	Widespread	Widespread
		Intensity	Temporal	Temporal	Temporal
	Water Demand and Supply Stress	Scale	Major negative	Major negative	Major negative
		Duration	Short term	Long-term	Short term
		Extent	Widespread	Widespread	Widespread
		Intensity	Temporal	Temporal	Temporal
	Energy Demand and Efficiency	Scale	Major negative		Major negative
		Duration	Short term	Long term	Short term
		Extent	Widespread	Widespread	Widespread
		Intensity	Temporal	Temporal	Temporal
	Oil leaks and spills pollution	Scale	Minor negative		Minor negative
		Duration	Short term		Short term
		Extent	On-site		On-site
		Intensity	Temporal		Temporal
	Occupational & Public health safety	Scale	Major negative	Minor negative	Major negative
		Duration	Short term,	Long term	Short term
		Extent	On-site	On-site	On-site
		Intensity	Permanent	Permanent	Permanent
	Fire hazard	Scale	Minor negative	Major negative	Minor negative
		Duration	Short term,	Long term	Short term
		Extent	On-site	Localised	On-site

Category	Impact description	Impact significance criteria	Project phase		
			Construction	Operation	Decommissioning
		Intensity	Permanent	Permanent	Permanent
	Domestic Wastewater and Sanitation Management	Scale	Major negative	Major negative	Major negative
		Duration	Short term	Long term	Short term
		Extent	Localised	Widespread	Localised
		Intensity	Temporary	Temporary	Temporary
	Solid Waste Generation and Disposal	Scale	Major negative	Major negative	Major negative
		Duration	Short term	Long term	Short term
		Extent	On-site	On-site	On-site
		Intensity	Temporary	Temporary	Temporary
	Labour Influx, Security and Community Interaction	Scale	Major negative	Minor negative	Minor negative
		Duration	Short term	Long term	Short term
		Extent	Localised	Localised	Localised
		Intensity	Temporal	Temporal	Temporal
	Traffic management	Scale	Minor negative	Minor negative	Minor negative
		Duration	Short term	Long-term	Short-term
		Extent	Localised	Localised	Localised
		Intensity	Temporal	Temporal	Temporal
	Visual intrusion / landscape alteration	Scale	Moderate negative	Minor negative	Moderate negative
		Duration	Short term	Long term	Short term
		Extent	Localised	Localised	Localised
		Intensity	Temporal	Permanent	Temporal
	Gender-based violence / SEA–SH	Scale	Moderate negative	Minor negative	Moderate negative
		Duration	Short term	Long term	Short term
		Extent	Localised	Localised	Localised
		Intensity	Temporal	Temporal	Temporal
	Risk of exclusion of vulnerable groups	Scale	Minor negative	Minor negative	Minor negative
		Duration	Short term	Long term	Short term
		Extent	Localised	Localised	Localised
		Intensity	Temporal	Permanent	Temporal
	Climate change risk and GHG emissions	Scale	Moderate negative	Moderate negative	Moderate negative
		Duration	Long-term	Longterm	Long-term
		Extent	Widespread	Widespread	Widespread
		Intensity	Temporal	Permanent	Temporal
	Stormwater and Drainage Alteration	Scale	Moderate negative	Moderate negative	Moderate negative
		Duration	Shorterm	Longterm	Shorterm
		Extent	On-site /	Adjacent road	Widespread
		Intensity	Temporal	Permanent	Temporal
	Cumulative impacts	Scale	Moderate negative	Moderate negative	Moderate negative
		Duration	Longterm	Longterm	Longterm
		Extent	Widespread	Widespread	Widespread
		Intensity	Temporal	Temporal	Temporal

9.2 Anticipated positive impacts

9.2.1 Optimal utilization of the land

Land is a finite resource that is limited in quantity and cannot be created nor reproduced. However, the demand for land is rising along with the national population, putting strain on the amount of accessible land resources. The proposed project has incorporated efficient use of the available land (approx. 1 acre) into the design by constructing 240 affordable housing units. This approach minimizes land disturbance, preserving surrounding ecosystems and reducing the need for further vegetation clearance or habitat disruption. The proposed green affordable housing project will enhance optimal utilization of land, especially in Nairobi City County through various design and planning strategies that will maximize the efficiency of space and resources. Overall, the proposed project will concentrate housing, amenities, and services in a smaller footprint, and incorporating sustainable practices.

Description
Construction phase: • Apartments promote efficient land use in urban areas, reducing urban sprawl. • Multi-storey structures minimize land footprints. • Developers invest in efficient infrastructure systems and sustainable building practices, reducing environmental impact and promoting resource efficiency. • The developments encourage mass transit and reduce private vehicle ownership. *Occupation phase:* • Transforming underutilized land into a productive asset • Large number of residents in a small area promote efficient land use. • They offer affordable housing for individuals with varying income levels. • Proximity to commercial establishments and public transportation encourages residents to use these facilities & services.

9.2.2 Promote sustainable urban development

The proposed project exemplifies sustainable urban development by integrating environmental, social, and economic sustainability principles. By pursuing EDGE certification, the project demonstrates a commitment to resource efficiency, reducing energy and water consumption by adopting innovative design and materials.

This compact, high-density design optimizes land use, addressing urban sprawl challenges while maintaining a lower ecological footprint. The incorporation of green building practices, such as energy-efficient systems and water recycling initiatives, contributes to climate resilience, reducing greenhouse gas emissions and conserving natural resources.

Furthermore, affordable housing within an urban setting ensures inclusive growth by providing access to amenities and opportunities for low- and middle-income groups. The project fosters a socially cohesive environment, promoting equity and enhancing quality of life while aligning with Kenya's sustainable urban development agenda.

Description
Construction phase: • Adoption of green building practices reduces waste and optimizes materials use. • Sustainable practices, such as low-emission machinery, minimize air and noise pollution. • Local employment opportunities foster economic growth and community engagement. • Use of modern, sustainable construction techniques encourages technological advancement.

- Alignment with environmental policies ensures smoother approval processes.

Occupation phase:

- Lower operational costs through energy-saving designs and renewable energy use.
- Efficient water systems reduce consumption and enhance resource availability.
- Better indoor air quality and access to green spaces promote well-being.
- Affordable housing options enhance accessibility for diverse income groups.
- Modern, eco-friendly designs improve the neighbourhood's visual appeal.
- Lower utility bills for residents due to sustainable energy and water management systems.
- Compact development optimizes land use, preserving natural ecosystems.
- Sustainable features enhance the marketability and long-term value of the development by appealing to environmentally conscious buyers and renters.

9.2.3 Addressing the housing shortage in Nairobi City County

The proposed development increases the availability of quality, affordable housing in a rapidly urbanizing area, meeting the needs of middle and lower-income families who are often priced out of the housing market. Additionally, the affordability aspect ensures inclusivity, contributing to the government's efforts to reduce informal settlements and improve living standards. This initiative aligns with Nairobi's urban development goals and the broader national agenda of improving housing accessibility.

Description
Occupation phase: • Provision of 210 affordable housing units, reduces pressure on the housing market. • Provision of a variety of housing options, catering to diverse needs and preferences, from single professionals to families and retirees. • Promotion inclusivity by catering to middle and low-income families. • Offers safe, decent, and affordable living conditions, reducing informal settlements.

9.2.4 Employment and income generation

The proposed project is envisaged to generate direct and indirect employment opportunities for unskilled, semi-skilled and unskilled workers. Direct employment includes jobs for constructing the housing units during the construction phase. Indirect employment will be realized through increased business opportunities and spurred economic growth both at the local, regional and national levels through procurement of goods and services required for the project.

Creation of employment opportunities is mainly expected to benefit the unemployed people living within and around the project site. It was perceived to be the most important benefit of the project by the local communities. This will contribute to easing unemployment level in the area.

During the operations phase, local labour such as cleaners, gardeners, plumbers and security personnel will be required for maintenance and surveillance of the housing units.

Enhancement measures
• IHS will direct its Project Contractor to prioritize the local community in the project area in the allocation of job opportunities from the residents immediately neighbouring the project • IHS will also ensure opportunities for capacity building are afforded to the local communities to enable them to benefit from the available employment opportunities. This includes training in skills set required during the construction of the project

- Job advertisements will be made through mediums that are easily accessible to the local communities living near the proposed distribution line project.
- Where possible, expertise will be sourced locally then regionally and nationally before resorting to the engagement of international experts
- The recruitment selection process will seek to promote gender equality and the employment of women where possible.
- Management and enhancement measures for local employment will be included in the Project Contractor's labour and human resources plan.
- A Community Liaison Officer should be appointed from the local community and a Grievance Mechanism implemented in order for the local community to express any complaints or grievances with the construction process
- The Project Contractor will make a conscious effort to promote local business people in the procurement of goods and services to assist in providing more economic and employment opportunities for the local community.

9.2.5 Transfer of skills

During the construction phase of the project there will be enhanced interaction between the experts and hired locals in their areas of expertise.

Through employment of the locals during construction, various skills may be passed on to the community. This is likely due to the expected enhanced interaction between the experts and hired locals in their area of expertise. Such interactions are likely to result to skills transfer or enhancement.

These skills will be retained in the community and will increase the residents' employability where they will be able to secure jobs in other developments that will come up in the area.

Enhancement measures

- IHS should institute programs aimed at promoting and enhancing skills transfer between project experts and the local employees.
- IHS should establish a standard requirement for contracted firms to ensure transfer of skills. Such efforts will promote local capacity development and offer viable employment opportunities.
- IHS should envision strong collaboration with local institutions to ensure effective capacity building is affordable to the local communities.
- IHS and its contractors should effectively and continuously communicate the specific skills/expertise requirements to the local community prior to the construction and operational phases. In doing this, IHS should utilize easy to reach mediums for local community such as CLOs, community noticeboards, local administrator forums etc. .

9.2.6 Increase government revenue

Apartment buildings generate revenue for the county and national governments through various channels during construction and occupation phases. During the construction phase, developers obtain permits and licenses, which includes some fees paid to the issuing authority. In an ideal scenario, the value of the property is expected to increase over time, leading to higher property tax assessments. Certificate of occupancy, sales tax, employment taxes, and utility connections also generate revenue for the government. During the occupation phase, residential apartments contribute significantly to property tax revenue for local governments. Residents pay utility fees which generate additional revenue for the government. Sales tax revenue is generated by residents spending on goods and services in the local community.

Description
Construction phase: • Construction contractors require licenses generate licensing fees. • Developers obtain permits for construction generate revenue. • Employment opportunities and connection fees generate revenues. • Sales tax revenue is generated from construction expenditures. *Occupation phase:* • Property transfer taxes during units' sale is a key source of revenue to the government. • Residential apartments significantly contribute to property tax revenue. • Residents also spend on local goods and services which include taxes such as VAT. • Residents pay utility fees, taxes, and licenses, etc.

9.2.7 Local economic development

There are likely to be opportunities for local businesses to provide services and materials for the construction phase of the development. The local service sector will also benefit from the proposed development.

However, locally sourced materials and services may be limited due to availability. It is important that a fair and equal opportunity is provided when allowing local service providers to tender for work. As rightly perceived by the local communities, this will lead to secondary employment and the creation of small supporting businesses.

The project staff required will provide ready market for various goods and services, leading to several business opportunities for small-scale trades such as food vendors around the construction site

The economic multiplier effects from the use of local goods and service opportunities will include, but is not limited, construction materials and equipment and workforce essentials such as services, safety equipment, ablution, accommodation, transportation and other goods.

Also, the injection of income into the area in the form of wages will present an opportunity for the local economy and a boost of businesses in the area. With increased income comes additional income for expenditure on goods and services supplied. The intention is to maximize local labour employment opportunities, which is likely to have a positive impact on local communities and have downstream impacts on household income, education and other social aspects.

Increased tax revenue through direct and indirect taxes on goods and services will also stimulate the economic growth.

Description
Construction phase: • Developers pay service fees to engage architects, engineers, transportation companies, logistics, environmental consultants, utility companies, security firms, and safety consultants. • Developers purchase construction materials and equipment, boosting sales for suppliers and manufacturers. • Increased demand for construction materials and services stimulates the local economy. • Stimulation of economic activity in the area – workers/contractors spend money on goods and services in the community. • Catering services also benefit local businesses. This creates a market for local businesses and services.

Occupation phase:

- Apartment complexes organize events, support local artists, and generate revenue for utility providers and county government.
- Apartment residents contribute to the local economy by shopping, dining, healthcare, education, public transportation, fitness, maintenance, telecommunications, security, and entertainment.
- Apartment residents promote local businesses, such as restaurants, cafes, and food delivery services, which create a market for many businesses.
- Services like internet, cable TV, and telecommunications offered to apartments contribute to the telecommunications industry.

Enhancement measures

- A local procurement policy should be adopted by the developer and Contractor to maximize the benefit of the local economy.
- IHS will encourage the Project Contractor to source as many goods required for construction purposes economic opportunities are available or are created for the local community
- Communication and information programs will be used to manage expectations and target local service providers
- Tender documents will include guidelines for the involvement of local entrepreneurs, businesses and SMEs from the local sector

9.2.8 Improved security in the project area

The proposed residential project will significantly enhance security in the area by transforming the currently undeveloped land, characterized by dense bushes, scattered trees, and a penetrable or broken fence, into a well-planned and managed residential development. Securing the perimeter of the proposed site will eliminate hiding spots often associated with insecurity, reducing the likelihood of criminal activities. In addition, the proponent will hire security guards throughout the project's lifecycle to ensure a safe and secure environment for the proposed project.

Description
Construction & Operation phase: • The introduction of well-lit pathways, modern fencing, and controlled access points will improve monitoring and deter unauthorized entry. • Increased human activity within the residential complex will discourage illicit behaviour, creating a safer environment for residents and the surrounding community. • The installation of street lighting, security cameras, and on-site security personnel will further reinforce safety. • A safer environment fosters opportunity for local businesses and improves property value in the neighbourhood.

9.3 Anticipated negative impacts & mitigation measures

9.3.1 Biodiversity

Construction Phase

The construction of the Project will involve a wide range of activities that have the potential to affect biodiversity. The relevant activities of the Project likely to give rise to impacts on receptors are summarized in Table 9-1, along with the likely pathway of the impacts. The largest direct impact of habitat loss will occur at the initial site clearance stage. Indirect impacts have also the potential to occur from disturbance,

fragmentation, introduction or spread of invasive species, impacts to air quality, and runoff of sediments and pollution into surrounding areas. Overall, the impacts on flora and fauna is expected to be ***minor*** as the flora and fauna species found at the site are not listed in higher IUCN threat categories. However, the proposed development could lead to the loss of habitats, especially for the resident fauna identified and documented from the proposed site. Additionally, the expansion of the build environment within the Karen End site may lead to the displacement of species reliant on the proposed site. The construction activities may introduce pollutants such as heavy metals and sediments into soil and nearby water sources, affecting ecosystem health.

Table 9-2: Project activities during the construction phase and the likely pathways of potential impact

Activity	Pathway of Potential Impact
Vegetation clearance and topsoil strip for the construction area. Smaller areas of habitat loss will be incurred from the widening of an existing access road to the project site.	• Habitat loss. • Direct mortality of plants and animals. • Disturbance to habitats and species from noise, artificial lighting and human activity. • Introduction and spread of invasive species. • Impacts to air quality. • Runoff into surrounding habitats.
Earthworks, including changes to topography.	• Impacts to air quality. • Changes to hydrology. • Runoff into surrounding water courses. • Introduction and spread of invasive species. • Disturbance to habitats and species from noise, artificial lighting and human activity.
Induced access and population influx.	• Increased use of natural resources such as freshwater.

Operation Phase Impacts

The operation of the Project will involve a range of activities that have the potential to affect biodiversity. The relevant activities of the Proposed Project likely to give rise to impacts on receptors are summarised in Table 32, along with the likely pathway of the impacts.

Table 9-3: Project activities during the operation phase and the likely pathways of potential impact

Activity	Pathway of Potential Impact
Movement of people and ground vehicles.	• Impacts to air quality. • Disturbance.
Physical effects of the housing units	• Changes to hydrology and drainage. • Runoff of pollutants. • Changes to micro-climates • Spread of invasive species
Proposed mitigation measures	
Overall, the mitigation measures will implement the following activities during the construction and operation phases. During the construction phase, all the activities will aim to preserve key ecological features by modifying project design to retain significant green spaces, implement phased clearing to allow wildlife adaptation and re-establishment of displaced species; rehabilitate disturbed areas with native vegetation post-construction; and the contractor shall identify the number of trees that will be cut down/ vegetated areas. During the operation phase, the key activities shall include biodiversity monitoring and the establishment of compensatory conservation efforts, such as afforestation programs in nearby areas. *Construction phase*	

A Biodiversity Management Plan (BMP) will be developed and included as an appendix to the overarching Developer Contractor- Environmental and Social Management Plan (C-ESMP). The Contractor will then develop Construction Implementation Plans (CIPs), which will set out the detail of how their commitments will be met in alignment with the Developer C-ESMP. The C-ESMP will make specific reference to biodiversity fauna/flora protection measures. This will include the following:

- Employment of EHS Officers who will be responsible for implementation of the ESMP during construction;
- The construction footprint will be carefully surveyed prior to start of construction and measures will be in place to ensure construction activities do not extend beyond the boundary;
- Careful positioning of lighting during construction to ensure light spoil does not occur on surrounding vegetation;
- Use environmentally friendly construction materials and minimize the use of harmful chemicals.
- Ensure water is not abstracted from any water bodies.
- Remove organic top soil and store separately for use in restoration;
- Restore disturbed areas as soon as practicable to establish vegetation to protect from soil erosion
- The landscaping within the project site and area will primarily use native species of plants.
- Conduct weekly site inspections for signs of soil erosion or sediment runoff, and implement remediating actions immediately if any erosion or sediment runoff is identified;
- Prohibit direct discharges into water bodies, or storage of waste materials outside of designated storage areas;
- Burning of waste will be prohibited.

Occupation phase

- An EHS Officer to be employed by the Project to implement the long-term biodiversity monitoring.
- Restore the habitats destroyed during construction phase to ensure optimal ground cover and minimize erosion, dust, and invasive alien species.
- Create and maintain green spaces that residents can enjoy and maintain.
- Utilize native plant species in landscaping to promote biodiversity
- Implement water conservation measures to minimize water usage and protect aquatic ecosystems.
- Use outdoor lighting fixtures that minimize light pollution and disruption.
- Implement waste management practices to minimize waste generation.
- Engage with residents and community members to raise awareness about biodiversity.
- Encourage residents to participate in environmental conservation activities.
- Create and maintain green spaces that residents can enjoy and maintain.

9.3.2 Invasive species

Housing projects can introduce invasive species through land disturbance, invasive plant introduction, transportation networks, poor stormwater management, urbanization, fragmentation, landscape connectivity, and human behaviour. These practices can lead to the spread of invasive species, disrupting natural ecosystems and causing habitat fragmentation. The impact is minor as there is no anticipated large-scale invasion as the flora is confined to common exotics.

Proposed mitigation measures

Construction phase:

- Develop a site-specific invasive species management plan
- Implement erosion control measures, such as mulching and revegetation with native plant
- Clean construction equipment and vehicles before entering and leaving the construction site
- Source construction materials from reputable suppliers to minimize the risk of introducing invasive species.
- Raise awareness among workers about the importance of invasive species management.

Occupation phase:

- Use native plant species in landscaping to reduce the risk of introducing invasive species
- Implement invasive species monitoring and management programs
- Incorporate green infrastructure practices, such as rain gardens and vegetated swales
- Educate residents about the risks associated with invasive species.
- Encourage residents to use native plants in their gardens and landscapes.
- Implement regular monitoring programs to assess the presence of invasive species.

9.3.3 Carbon footprint

The major anticipated sources of carbon in the proposed project will cover both construction and operation phases. During the construction phase, emissions will be from the extraction, processing, and transportation of construction materials, including concrete, steel, wood, and insulation. On-site activities such as excavation, transportation of materials, and energy use for construction equipment and machinery will also be major contributors. During construction phase, the carbon footprints shall be from sources such as energy consumption for heating, cooling, lighting, and appliances in the building, including both electricity and fuel combustion. Other emissions are associated with water treatment and distribution, as well as wastewater treatment, including those from resident transportation, including commuting and travel, as well as goods and services delivery to the building.

Proposed mitigation measures

Construction phase

- Choose low-carbon building materials such as recycled steel, and low-impact concrete substitutes.
- Select materials sourced from nearby suppliers to reduce transportation emissions.
- Implement waste reduction strategies, such as salvaging and recycling construction materials
- Establish composting facilities to manage organic waste generated by residents and landscaping activities
- Create community gardens and green spaces to promote outdoor activities.
- Proper building orientation to make use of natural lighting and ventilation
- Installation of large windows for maximum utilisation of natural lighting and ventilation.

Occupation phase

- Enhance insulation, use energy-efficient windows, and seal air leaks to reduce heating and cooling loads.
- Install ENERGY STAR-rated appliances and LED lighting to lower electricity consumption.
- Install photovoltaic (PV) solar panels on rooftops to generate renewable electricity for the building.
- Use solar thermal systems to heat water for domestic use, reducing the need for fossil fuel-based water heaters.

9.3.4 E-wastes management

A significant environmental issue in a housing project is the generation of e-waste. In order to reduce detrimental effects on ecosystems, public health, and resource depletion, appropriate handling, recycling, and disposal techniques are essential. A circular economy and sustainable practices supported by increasing public knowledge of the advantages of recycling and managing e-waste can be considered as the best practice. During the construction phase, construction equipment and machinery can contribute to e-waste generation such as:

- Electrical Tools: Drills, saws, grinders, mixers, etc.
- Electronic Measuring Instruments: Laser levels, surveying equipment, etc.

During the operational phase, several sources can contribute to e-waste generation such as:

Household Appliances:

- Large Appliances: Refrigerators, washing machines, stoves, ovens, etc.
- Small Appliances: Microwaves, blenders, toasters, kettles, etc.
- Electronic Gadgets: Televisions, computers, laptops, tablets, smartphones printers, routers, modems etc.

Lighting and Electrical Equipment:

- Light Bulbs and Tubes: Incandescent, fluorescent, and LED bulbs.
- Electrical Wiring and Switches: Old and damaged wiring, switches, and sockets.

Communication Devices:

- Mobile Phones and Accessories: power banks, chargers, and damaged phones.

Electronic Toys and Games:

- Battery-Operated Toys: Remote-controlled cars, dolls, etc.
- Video Game Consoles and Accessories.

Proper disposal of e-waste is essential to prevent environmental contamination and recover valuable materials.

Proposed mitigation measures
Construction phase • Maintain an inventory of electronic equipment and devices used during construction to track usage and minimize surplus. • Consider leasing or renting electronic equipment instead of purchasing, especially for temporary needs, to reduce the volume of e-waste generated. • Prioritize the reuse of electronic equipment and devices from previous projects or within the construction site whenever possible. • Implement a waste management plan that includes separate collection and sorting of e-waste materials to facilitate recycling and prevent contamination. • Provide training to construction teams on the importance of proper e-waste disposal practices and the benefits of recycling. • Partner with certified e-waste recyclers to ensure proper disposal and recycling of electronic equipment and devices at the end of their lifecycle. *Occupation phase* • Encourage residents to maintain and repair electronic appliances and devices instead of replacing them when minor issues arise. • Provide information to residents about upgrade options and opportunities for extending the lifespan of electronic products through software updates or component replacement. • Establish community exchange programs where residents can donate or exchange their unwanted electronic devices with others, promoting reuse and reducing e-waste. • Partner with local charities or organizations that accept used electronic devices for refurbishment and redistribution to those in need. • Install convenient drop-off locations for residents to dispose of their electronic waste safely and responsibly.

- Encourage residents to dispose of e-waste responsibly, such as participating in manufacturer take-back programs, where electronic manufacturers accept their products for recycling or proper disposal at the end of their lifecycle. Also, through designated recycling centers or e-waste collection programs.

9.3.5 Stormwater and drainage alteration

During construction, clearing and compacting of soil may alter natural infiltration and increase surface runoff. If unmanaged, this may cause localized flooding or erosion along Ndwaru Road. During operation, impermeable surfaces, parking and roofs, could overload the existing storm drains unless adequately managed through design interventions.

Proposed mitigation measures

Construction phase:

- Integrate Sustainable Urban Drainage System components: permeable cabro paving, soakaways, infiltration trenches, and silt traps.
- Ensure all drains are lined and fitted with gratings to prevent clogging.
- Grade site gently to promote gravity flow toward designated outlets.
- Regularly clean drains and silt traps during and after construction.
- Maintain rooftop rainwater harvesting and storage tanks to intercept runoff.

Occupation phase:

- Maintain rooftop rainwater harvesting and storage tanks to intercept runoff.
- Monitor runoff quality into the stormwater drain annually (turbidity, sediment load).
- Landscape with native species that stabilise soils and enhance infiltration.

9.3.6 Dust & exhaust air pollution

During the construction phase of the housing blocks, earthworks, material movement, vehicle traffic and mobile plant operation will generate particulate matter (PM_{10}/$PM_{2.5}$) and exhaust emissions which may reduce air quality. With adjacent dense residential neighbourhoods in Riruta, dust deposition on homes and potential health symptoms (eyes, respiratory) could arise if unmanaged. Given the peri-urban nature of the site, background air-quality tends to be moderate, but dust uptakes on un-paved surfaces are a known local nuisance in the Nairobi area. The impact level of impact estimated to be Low to Moderate because the scale is limited about 1-acre site, activities are short-term, but proximity to sensitive receptors elevates the concern.

Proposed mitigation measures

Construction phase:

- Spray exposed surfaces and stockpiles with water or mist to suppress dust, particularly during dry or windy conditions.
- Cover trucks hauling loose material; enforce internal site speed limits (e.g., ≤ 20 km/h) to minimise dust.
- Maintain and service all construction vehicles and equipment; restrict engine idling time.
- Install wheel-wash at site exit and keep the exit clean to prevent dust transfer onto public roads.
- Deploy a dust-monitoring station at a down-wind boundary, log weekly dust deposition; if trigger levels exceeded, implement additional controls

Occupation phase:

- Maintain paved internal roads and parking areas to reduce re-suspension of dust.
- Use low-emission landscape machinery and enforce no open-burning of waste.
- Promote resident awareness to switch off vehicle engines when stationary and avoid unnecessary idling.

9.3.7 Soil disturbance and erosion

During the construction of foundations, roads, and utility trenches, extensive soil disturbance will occur through excavation, grading, trenching, and compaction. These activities strip protective topsoil and vegetation, leaving exposed surfaces susceptible to erosion by surface runoff, particularly during Nairobi's long and short rainy seasons (March–May and October–December). In the Riruta area, rainfall intensity and steep micro-slopes increase the risk of sediment transport to the north of the area, to the stormwater channel. Additionally, compaction by heavy machinery reduces infiltration, which can heighten surface runoff and flooding risk. If unmanaged, soil degradation can lower fertility for landscaping, clog on-site drains and downstream storm-water channels. The level of impact as moderate, localized but significant without mitigation.

Proposed mitigation measures

Construction phase:

- Sequence works to limit the area of exposed soil at any given time. Stabilize temporary cleared zones with vegetation, mulch, or geo-textile immediately after work.
- Stockpile and protect topsoil for reuse in landscaping; store stockpiles away from drainage paths.
- Install silt fences, interceptor drains, and sediment traps around the site perimeter to capture runoff and sediments before discharge.
- Grade the site to follow natural contours where possible to reduce runoff velocity.
- Inspect erosion-control installations after every heavy rainfall event and maintain as needed; record inspection results.

Occupation phase:

- Maintain healthy vegetative cover and grassed areas on embankments and within open spaces. Replace any bare or eroded patches promptly.
- Desilt and clean soak pits, storm drains, and drainage channels at least twice annually.
- Educate residents through the estate management committee on avoiding landscaping practices that expose bare soil or cause compaction.

9.3.8 Noise pollution

Noise and vibration during the construction period will arise from machinery operations (mixers, compressors, generators), heavy truck movement, hammering, and equipment loading/unloading. The Riruta area has nearby residences, learning institutions, and small businesses that may experience nuisance noise if construction extends beyond daylight hours. During operation, mechanical equipment such as standby generators, water pumps, and vehicle movements within the compound may contribute to background noise. Compliance with the Environmental Management and Coordination (Noise and Excessive Vibration Pollution) (Control) Regulations, 2009 (Legal Notice 61) is therefore required. The level of impact is low to moderate in the short-term, reversible and localized but of high sensitivity to adjacent receptors during construction..

Proposed mitigation measures
Construction phase: • Restrict noisy construction activities during daytime. • Erect suitable and adequate noise barriers during construction. • Inform neighbours on any construction works that produce much noise. • Maintain plant equipment in good condition (if present) • Sensitize drivers of construction machinery on effects of noise. • Provide all workers with appropriate noise protective gears. • Use construction equipment/machinery that meet noise emission standards. • Implement regular equipment maintenance to reduce any noisy malfunctions. • Encourage the use of low-noise construction practices and tools. • Implement noise monitoring programs to ensure they remain within the recommended limits as per the Environmental Management and Co-ordination (Noise and Excessive Vibration Pollution) (Control) Regulations, 2009. • Promptly address noise complaints from nearby residents. • Install solution-based sound proofing and sound absorption products including Rockwool Insulation, fiber Glass wool insulation, foam insulation, Green glue compound, acoustic panels, acoustic ceilings and related metal profiles to suite the proposed residential units during the operation phase. *Occupation phase:* • Enclose generator and pump plant rooms in sound-insulated structures; schedule any external maintenance during daytime only. • Enforce quiet hours (e.g., 22:00–06:00) via estate rules. • Landscape buffers (trees, shrubs) to help attenuate noise toward neighbouring homes • Encourage residents to report noise disturbances to building management. • Recommend residents to choose quieter appliances (washing machines, etc.) • Provide tips on noise reduction practices within apartments.

9.3.9 Water resources

Upon occupation, approximately 240 apartment units and shared amenities will increase daily water demand. The project relies primarily on supply from the Nairobi City Water and Sewerage Company (NCWSC), supplemented by an on-site borehole to be drilled at the site and rainwater harvesting. Inadequate planning could result in over-reliance on borehole extraction, lowering groundwater tables, or overburdening municipal supply; an issue common in peri-urban Nairobi where water scarcity is seasonal. Efficient water use and reuse are therefore essential for sustainability and cost management.

Proposed mitigation measures
Construction phase: • Source construction water from licensed vendors or storage tanks rather than abstracting directly from local boreholes. • Collect and store rainwater for non-potable use (dust suppression, mixing). • Record weekly water use and compare against set benchmarks. *Occupation phase* • Install water-efficient fixtures: dual-flush toilets, low-flow taps, and showerheads. • Harvest and store rooftop rainwater for use in landscape irrigation and cleaning. • Monitor and document per-apartment water consumption monthly; implement awareness campaigns where usage exceeds 125 L/person/day. • Conduct annual borehole recharge and abstraction assessments to ensure sustainable yield.

9.3.10 Energy resources

Apartment buildings can have significant impacts on energy resources during both the construction and occupation phases. The construction of apartment buildings requires energy for various processes, including on-site construction activities. The provision of temporary utilities, such as electricity and water, during construction contributes to increased energy use. Apartment buildings have a significant impact on energy resources during the occupation phase. The energy demand within apartment units for heating, cooling, lighting, appliances, and electronics can be substantial. Lighting in common areas and individual units can contribute to energy consumption. The proponents plans to introduce an enhance grid connection in coordination with KPLC to have a transformer in place, therefore there is no depletion risk, additionally, solar integration will be provided.

Proposed mitigation measures
Construction phase: • Consider integrating renewable energy sources like solar to generate on-site clean energy and reduce reliance on conventional grid electricity. • Incorporate key elements of energy-efficient design for the apartment • Proper planning of materials transportation will ensure that fossil fuels (diesel, petrol) are not consumed in excessive amounts. • Implement waste reduction to minimize energy associated with waste disposal. • Use energy efficient equipment during the construction works. • Minimize as much as possible electric loads created by mechanical equipment. • Train construction worker on energy-efficient construction practices e.g., switching off electrical equipment or appliances when they are not being used • Monitor energy use during construction and set targets for reduction of energy use *Occupation phase:* • Install occupancy sensors and daylight harvesting systems to automatically control lighting. • Use cool roofing materials and reflective surfaces to reduce heat absorption and lower cooling energy demand. • Consider installing sub-metering systems that allow residents to monitor their energy consumption. • Insulate hot water pipes and consider centralized or tank-less water heating systems for improved energy efficiency. • Conduct energy audits or assessments to identify areas where energy savings can be achieved within individual units and common areas. • Foster a sense of community responsibility for energy conservation by organizing energy-saving events and initiatives among residents.

9.3.11 Oil leaks and spills pollution

Potential oil and lubricant leaks or spills may occur during construction activities, primarily from fuel-powered machinery, mixers, and delivery trucks. These leaks can contaminate surface soils and, if poorly managed, may enter the storm-water network or the open stormwater drains along Ndawru to the immediate northern edge of the project site. During operation, the project will not involve any fuel storage or major mechanical installations other than standby generators and minor maintenance equipment; therefore, the risk of hydrocarbon contamination is limited and localised.

Given the small site area of about an acre, temporary nature of construction machinery use, and absence of bulk fuel or lubricant storage, the magnitude of potential hydrocarbon pollution is considered minor, with a low likelihood of occurrence. No long-term cumulative or off-site effects are anticipated. The impact is therefore classified as Low Relevance / Low Significance.

Proposed mitigation measures
Construction phase: • Develop and implement a spill prevention and response plan. • Train construction personnel on spill containment and clean-up processes. • Ensure proper storage of oils, fuels, and lubricants at the site i.e., in labelled containers and on hardstanding • Machinery site repair will be discouraged and repair work restricted to only approved garages • Undertake regular inspections of construction equipment for oil leaks. • Conduct routine maintenance to repair or replace worn-out parts. • Ensure ready availability and supply of spill response equipment. • Implement erosion control measures to prevent oil-contaminated runoff. • Incorporate oil separators in the drainage designs to remove pollutants from site runoff. • Regularly monitor the construction site for signs of oil pollution, including sheens on water surfaces or stained soil. *Occupation phase* • Provide convenient and secure disposal options for used oil. • Maintain a supply of spill clean-up materials and equipment. • Conduct routine inspections to identify and address issues before they become major problems. • Promote awareness among residents about the environmental impacts of oil pollution • Comply with all NEMA guidelines and regulations related to oil storage and handling. • Provide oil interceptors along the drains leading from car park and potentially oil risk areas during the landscaping works.

9.3.12 Public health & safety and occupational health & safety

Potential occupational health and safety risks during construction include minor injuries, exposure to dust or noise, and handling of tools and materials. During operation, residents may face low-level health risks associated with waste mismanagement or poor sanitation if maintenance lapses occur. The project is of small to moderate scale with well-defined safety provisions in the ESMP. No high-risk industrial processes are involved. Consequently, the public health and OHS risk is low relevance, short-term, and easily mitigated through standard site safety management.

Proposed mitigation measures
Construction phase: **(i) Workers** • All drivers and equipment operators shall undergo induction on safe fuel handling, spill prevention, and emergency response procedures. • Provide workers with spill-response kits, absorbent materials, and personal protective equipment. • Conduct routine inspection and maintenance of machinery to identify and fix oil leaks promptly. • Designate a paved, bunded refuelling area away from the drainage points and storm drains. • Ensure all waste oils and lubricants are collected in sealed, labelled containers and disposed of through a NEMA-licensed hazardous-waste handler. • Keep a Spill Register and Inspection Checklist as part of daily environmental supervision records.

(ii) Affected people and communities

- Clearly demarcate and fence refuelling and maintenance zones to prevent community access.
- Prevent run-off from construction zones into the public drainage or adjacent residential plots by using silt traps, bunds, and oil interceptors.
- In case of a spill, immediately contain and clean up, followed by soil removal if necessary, and notify NEMA and affected neighbours.
- Display spill emergency contact information and a reporting protocol at the site gate.
- Engage local residents through the GRM if accidental spills affect their property or access routes.

Occupation phase:

(i) Residents/occupants

- Ensure that all mechanical and equipment/electrical rooms such as generator housing, pump rooms etc., are bunded and fitted with oil interceptors to prevent discharge into drains.
- Implement a Preventive Maintenance Schedule for generators and pumps, including quarterly oil-leak checks and proper lubricant disposal.
- Post visible signage on safe handling and storage of maintenance oils within the facilities management office.
- Maintain records of used-oil collection and disposal through a licensed handler.
- Include environmental and safety orientation for building caretakers and residents' association representatives.

(ii) Local communities

- Ensure drainage outlets from the compound are all directed to the public sewer connection.
- Facilities management shall coordinate with Nairobi City County for inspection of drains and grease traps at least bi-annually.
- In the event of accidental spills during maintenance activities, immediate notification to County Environment Department and neighbouring residents will be required.
- Maintain a Community Environmental Hotline / GRM contact for reporting perceived contamination or drainage problems.

9.3.13 Fire safety and preparedness

Residential developments can have significant impacts on fire and security preparedness during both the construction and occupation phases. These impacts can vary based on factors such as project size, location, building design, and the level of planning and coordination involved. During construction, there is an increased risk of fires due to the presence of flammable materials, equipment, and hot work activities like welding and soldering. Defective cooking appliances, faulty electrical wiring and inadequate electrical insulation & earthing can increase the risk of fire hazards during the operational phase of the proposed green affordable housing project.

Proposed mitigation measures
Construction phase: • Provide temporary firefighting equipment (extinguishers, fire blankets) in site offices and workshops. • Training workers on firefighting, evacuation, and emergency response • Sensitize the workers on fire risks i.e. conduct regular fire drills • Adapt effective emergency response plans • Maintain/service firefighting equipment regularly • Store fuels and flammables in bunded areas away from ignition sources • Provide emergency numbers at strategic points • Designate a fire assembly point. • Implement electrical safety measures to prevent electrical accidents.

Occupation phase:

- Install fire alarms, detectors, hydrants, extinguishers, and emergency lighting systems in all buildings.
- Regularly inspect and maintain building electrical systems.
- Ensure that fire safety equipment is provided, in working order and periodically serviced; including smoke detectors, fire alarms, fire sprinkler systems, and clearly marked exit routes.
- Provide emergency numbers at strategic points
- Designate a fire assembly point.
- Conduct fire drills and educate residents about evacuation procedures.
- Provide sufficient firefighting equipment & train staff on its use
- Ensure the fire water reserve tank is always filled with water
- Carry out the statutory annual fire safety audit

9.3.14 Wastewater & sanitation

The proposed development will generate substantial will generate wastewater during both the construction and operational phases. Proper management of this wastewater is critical to prevent localized contamination and ensure compliance with Nairobi City County and NEMA discharge requirements. During the construction phase, wastewater will primarily originate from: Temporary worker welfare facilities, including mobile toilets and washrooms; cleaning of concrete mixers, tools, and formwork; and runoff from equipment washing areas that may contain oil, cement residues, and fine sediments.

During the operational phase, the completed development; comprising 240 residential apartments (144 one-bedroom and 96 two-bedroom units), a management office, landscaped grounds, and a refuse collection bay, will generate domestic wastewater mainly from toilets, kitchens, bathrooms, and laundry areas. The total daily effluent volume is estimated to closely match the project's average daily water consumption of approximately 70–75 m^3/day.

During operation, all domestic effluent will be discharged through a dedicated sewer network connected to the existing NCWSC trunk sewer along Ndwaru Road, which also serves the adjacent Keza Apartments and nearby residential buildings. The project design includes grease traps for kitchen wastewater and an internal inspection manhole system for routine maintenance. This approach ensures hygienic conveyance and prevents infiltration or blockages that could cause odour or leakage.

Proposed mitigation measures

Construction phase:

- Provide adequate portable sanitation units for construction workers and ensure regular servicing by licensed waste handlers.
- Prevent discharge of any wastewater into open drains or onto the ground surface.
- Designate and line an equipment cleaning area with oil interceptors to prevent hydrocarbons entering drains.
- Direct all wastewater from completed buildings to the NCWSC sewer connection through a properly designed internal drainage system.
- Install grease traps at all kitchen outlets before sewer discharge.
- Conduct routine inspection and maintenance of the internal sewer network to prevent blockages and leakages.
- Ensure that effluent discharge complies with NEMA and NCWSC standards for biochemical oxygen demand (BOD), total suspended solids (TSS), and oil and grease levels.
- In case of future utility interruptions, provide temporary effluent storage or diversion options to prevent uncontrolled discharge.
- Install adequate, gender-segregated portable toilets or mobile latrine units (ratio: 1 per 20 workers).

- Locate sanitation units at least 3-6 m from any drainage channel.
- Ensure handwashing facilities (with soap and water) are provided at every sanitation point.
- Install grease traps in kitchen drains.
- Conduct regular maintenance and inspection of the internal sewer network.
- Prohibit discharge of any wastewater—domestic, chemical, or process—onto open ground, storm drains.
- Designate an impermeable, bunded cleaning area for equipment to avoid seepage of cement-laden water.
- Store hazardous materials (paints, solvents, lubricants) on impermeable floors within bunded zones, away from drainage lines.
- Provide spill containment kits and train workers on spill response procedures.
- Assign an Environmental, Health and Safety (EHS) Officer to supervise sanitation management and maintain daily records of facility condition and cleaning frequency.
- Keep disposal manifests and receipts from licensed wastewater handlers.
- Conduct monthly site inspections jointly with the Environmental Consultant and Contractor representative.
- Conduct induction sessions for all workers on hygiene, sanitation practices, and pollution prevention.
- Display visible posters promoting safe hygiene near sanitation areas (in English and Kiswahili)..

Occupation phase

- Engage a certified wastewater treatment operator for plant management.
- Conduct quarterly internal audits of plant performance and record findings.
- Maintain clear separation between stormwater drainage and wastewater collection systems to prevent cross-contamination.
- Sample and test treated effluent monthly in an accredited laboratory for key parameters (BOD, COD, TSS, pH, nitrates, phosphates, and E. coli).
- Maintain an Effluent Monitoring Register with date, parameter, results, and corrective action for exceedances.
- Submit quarterly compliance reports to NEMA and the Water Resources Authority (WRA), as per licence conditions.
- Dewater sludge in a closed drying bed or geobag system; prevent overflow or leakage.
- Dispose of dried sludge at a licensed site (e.g., Dandora) or via an authorized NEMA handler; retain manifests.
- Reuse treated effluent for non-contact applications:
- Landscape irrigation, lawn maintenance, or pavement washing.
- Toilet flushing (through dual plumbing systems).
- Install backflow preventers to prevent contamination of potable water systems.
- Monitor irrigation schedules to prevent overwatering and runoff.
- Design aeration zones and sludge storage with proper ventilation and covers to minimize odour.
- Plant vegetative screens (e.g., vetiver grass, papyrus) around the treatment plant to enhance aesthetics and act as biofilters.
- Regularly remove scum, grease, and debris from treatment chambers.
- Develop and implement an Operation and Maintenance (O&M) Manual and Emergency Response Plan (ERP) for system failure, pump malfunction, or overflow incidents.
- Maintain a full inventory of spare parts (pumps, blowers, filters) and emergency power backup (generator).
- Record all repairs, inspections, and servicing in a logbook.
- Assign a Facility Environmental Manager responsible for compliance monitoring, reporting, and liaison with NEMA.
- Conduct refresher training for operators and management staff on plant operation, safety, and reporting procedures.
- Sensitize residents on responsible wastewater generation practices (e.g., avoid dumping grease, oil, or solids into sinks/toilets).

9.3.15 Solid wastes

The proposed development will generate both construction-phase waste and operational (domestic) waste. During construction, waste will include: Excavated spoil and surplus soil; Concrete residues, formwork timber, packaging (cement bags, plastic sheeting), and metal offcuts; Food waste from workers and small-scale domestic refuse.

During operation, each household will generate an estimated 2–3 kg of waste daily, primarily organic matter, plastics, paper, glass, and metals. If not properly segregated, collected, and disposed of through licensed handlers, this waste can lead to odour, vermin, littering, clogged drainage, and visual pollution. Currently, Riruta and Satellite experience sporadic municipal waste collection and occasional illegal dumping. The project's location within an urban corridor requires a private waste management system integrated with NEMA-licensed handlers, effective resident participation, and consistent waste audits.

Proposed mitigation measures
Construction phase: • Provide separate labelled containers/skips for: (a) General waste (food, packaging); (b) Recyclables (metal, plastic, glass); and (c) Hazardous waste (paint containers, used oils, rags). • Locate storage bins on impermeable concrete floors, under covered sheds. • Reuse excavated soil for backfilling, levelling, or landscaping. • Recycle formwork timber, scrap metal, and packaging materials. • Return unused or defective materials to suppliers where possible. • Engage NEMA-licensed waste transporters and maintain collection manifests and disposal receipts. • Prohibit open burning, burying, or dumping on-site. • Dispose non-recyclable waste at designated Nairobi County sites (e.g., Dandora landfill). • Conduct weekly site inspections and toolbox talks on housekeeping and waste handling. • Assign an Environmental Officer to monitor daily waste management performance. *Occupation phase:* • Provide labelled bins per block: Organic, Recyclable, and General waste. • Set up central collection areas with washable concrete floors, water points, and drainage. • Require waste to be bagged and sealed before transfer. • Partner with recyclers for plastics, paper, and glass recovery. • Compost organic waste from households and landscaping for use within the estate. • Implement a Resident Recycling Incentive Scheme (rebates, awareness days). • Contract a licensed waste management company for scheduled collection. • Maintain collection logs and disposal certificates. • Inspect collection points daily to prevent odour and littering. • Conduct semi-annual solid waste management awareness campaigns. • Perform annual waste audits as per NEMA guidelines to assess segregation efficiency.

9.3.16 Sustainable availability of natural resources

The construction of the green affordable housing project necessitates the extraction of raw materials like timber, stone, sand, and minerals. This process can lead to deforestation, soil erosion, and habitat loss. The processing and manufacturing of construction materials often require significant energy consumption, contributing to greenhouse gas emissions and climate change. Water is essential for various construction activities, including concrete mixing, cleaning equipment, and landscaping. Excessive water usage can strain local water resources. Water is also required for domestic purposes during the occupation phase such as drinking, cooking, and sanitation. Increased water demand from multi-family projects can exacerbate water scarcity issues.

Proposed mitigation measures
Construction phase: • The proponent and/or contractor should source construction materials such as sand, ballast and hard core from registered quarry and sand mining firms, whose projects have undergone satisfactory environmental impact assessment/audit and received NEMA approval. such firms are expected to apply acceptable environmental performance standards, the negative impacts of their activities at the extraction sites are considerably well mitigated. • Implementing recycling and waste diversion programs during construction to minimize the amount of waste sent to landfills. • Using sustainable building materials with low environmental impact, such as recycled or locally sourced materials, reduces resource extraction, energy used for extraction & transportation; and also reduces waste. • The proponent and/or contractor should only order for what will be required through accurate budgeting and estimation of actual construction requirements. This will ensure that materials are not extracted or purchased in excessive quantities to minimise wastage. • The proponent and/or contractor should ensure that wastage, damage or loss of materials at the construction site is kept minimal, as wastage would lead to additional demand for and extraction or purchase of materials. • Implementing water-efficient fixtures, such as low-flow toilets and faucets, and utilizing drought-resistant landscaping techniques reduce water consumption. • Incorporating passive design principles such as orientation, insulation, and natural ventilation minimizes the need for heating and cooling. *Occupation phase:* • Installing solar panels to provide on-site renewable energy generation, reducing reliance on fossil fuels. • Selecting energy-efficient appliances and lighting fixtures lowers electricity consumption and utility bills for residents. • Using native plant species in landscaping.

9.3.17 Increased Pressure on Social Amenities

The addition of approximately 240 households with an estimate of over 900 residents, will increase population density and consequently demand for local infrastructure and services: - particularly water supply, sewerage, waste management, healthcare, schools, and local access roads. Riruta Ward is a rapidly urbanizing area, where community infrastructure such as clinics and feeder roads is already overstretched. If uncoordinated, the development could compound existing congestion, lower service levels, and cause social dissatisfaction. However, the project also offers opportunities to improve urban services and community facilities through coordinated infrastructure and social investment. The residual impact is low with net-positive improvement to local amenity if coordinated effectively.

Proposed mitigation measures
Construction phase: • The Phase construction and occupancy to align with infrastructure capacity (water, sewer, drainage). • Obtain written consent from NCWSC for water supply connection and from the County for waste disposal. • Provide on-site borehole, rainwater harvesting, and solar backup to minimize strain on existing systems. • Maintain temporary site utilities (power, toilets, canteen) separate from public amenities. • Establish communication with Dagoretti South Sub-County Offices and the Mutuini Ward Administrator on project timelines and service needs.

Occupation phase:

- Form a Joint Infrastructure Committee (Resident liaison) to address service performance.
- Coordinate with NCWSC and KPLC for network maintenance and capacity upgrades.
- Provide internal green spaces, parking, and recreational areas to reduce pressure on external community facilities.
- Support local education and health initiatives through Corporate Social Responsibility (CSR) partnerships.
- Conduct annual assessments on key indicators (water pressure, sewer overflow, road condition).
- Report findings to County and NEMA during annual audits.

9.3.18 Security and social impacts

Construction sites in urban environments may attract theft, vandalism, and social tension with neighbouring residents. Labour influx can lead to minor conflict, loitering, or informal vending. During operation, increased traffic and human activity may raise security risks if not managed through controlled access and surveillance. However, once occupied, the project can enhance neighbourhood safety through lighting, controlled entry, and 24-hour surveillance.

Proposed mitigation measures

Construction phase:

- Register and badge all site personnel; deny access to unregistered workers or visitors.
- Install perimeter fencing and secure site access points.
- Deploy security guards for 24-hour surveillance and controlled entry.
- Maintain a logbook for all vehicles, visitors, and deliveries.
- Coordinate with local police and Nyumba Kumi community policing for joint patrols.
- Prohibit on-site accommodation for workers to minimize night-time activities.
- Establish grievance channels for community concerns.

Occupation phase:

- Establish a Resident Security Committee and hire trained private security personnel.
- Install CCTV cameras at entry gates, corridors, and parking zones.
- Ensure adequate street lighting and motion-sensitive security lights.
- Introduce biometric or card-based entry systems for residents.
- Conduct quarterly joint patrols with local law enforcement.
- Maintain a 24-hour emergency contact line and security incident register.

9.3.19 Traffic and movement patterns

The proposed project is strategically located along Ndwaru Road, approximately 250 metres west of Naivasha Road and 500 metres north of Dagoretti Road. The road is a fully tarmacked, two-lane urban collector route in good condition, serving residential, institutional, and light commercial traffic. Its direct linkage to Naivasha Road and the Waiyaki Way provides excellent regional connectivity.

While the site's accessibility is advantageous, construction and operational activities will generate additional vehicular movements that could temporarily or permanently alter local traffic and movement patterns if not properly managed.

During construction, the movement of heavy vehicles transporting materials (cement, aggregates, steel, and machinery) and removal of excavated material will increase traffic volumes along Ndwaru Road and its

connecting corridors. These increased truck movements may cause: Temporary congestion near the project access junction due to slow maneuvering or queuing of delivery trucks; Dust emissions from unpaved shoulders and site exits; Safety risks to pedestrians, school children, cyclists, and other vulnerable road users; Degradation of road surface and drainage channels due to overloading or poor wheel cleaning; and Traffic conflicts arising from inadequate signage, poorly timed deliveries, or unregulated site entry/exit activities.

Upon commissioning, the development will generate an estimated over 300 vehicle trips daily, including residents, visitors, and service vehicles. Without structured circulation and adequate parking provision, increased vehicular activity could cause: Localized congestion at the estate entrance and along Ndwaru Road; Unauthorized or on-street parking, obstructing pedestrian paths; Reduced traffic flow efficiency at the Naivasha–Ndwaru junction during peak hours; and Safety risks for pedestrians and cyclists, particularly in the absence of designated crossings and speed management.

Proposed mitigation measures

Construction phase:

- Prepare and implement a Traffic Management Plan (TMP) detailing routing, delivery schedules, speed limits, driver discipline, and accident response procedures.
- Schedule heavy deliveries and haulage operations during off-peak hours (09:00–16:00) to minimize disruption to local traffic.
- Designate approved haulage routes to avoiding minor residential roads and schools.
- Stagger material deliveries to prevent clustering of trucks or idling near the site entrance.
- Construct temporary on-site loading and unloading bays to prevent vehicles from parking or queuing on the public road.
- Deploy trained flagmen/marshals to guide trucks entering and exiting the site safely.
- Maintain a wheel-wash bay at the exit to prevent mud and debris deposition on Ndwaru Road.
- Provide adequate turning radii and visibility splays to ensure safe access and egress.
- Install temporary traffic signage and speed restriction signs (max. 20 km/h) near the construction gate.
- Provide temporary traffic cones, barriers, and reflective delineators to separate construction and public traffic.
- Install rumble strips and flashing beacons near the site entrance to slow vehicles.
- Enforce routine vehicle inspections to ensure all trucks and plant equipment are roadworthy (brakes, tyres, lights).
- Prohibit unnecessary idling; ensure engines are turned off when stationary.
- Enforce strict speed limits and no-overtaking rules near the site entrance.
- Maintain a logbook of all construction vehicle movements and deliveries.
- Notify local residents, businesses, and institutions in advance of periods of heavy vehicle movement.
- Establish a traffic grievance mechanism (community hotline and notice board) to report safety incidents or disruptions.
- Maintain clear pedestrian access corridors along Ndwaru Road throughout construction.
- Provide temporary walkways and signage for pedestrians and cyclists to safely bypass construction zones.
- Conduct road surface maintenance and regular sweeping to minimize dust and loose debris.

Occupation phase:

- Implement a one-way internal circulation system with clearly marked entry and exit routes to reduce conflicts.
- Provide directional markings, arrows, and signage to guide resident and visitor vehicles.
- Incorporate turning lanes within the estate access to facilitate safe movement of vehicles.
- Provide adequate on-site parking in line with Nairobi County standards and the TIA recommendations (≈0.45 bays per unit), including visitor and service bays.
- Prohibit on-street parking along Ndwaru Road and enforce access control through estate security personnel.
- Designate separate loading/unloading bays for service and emergency vehicles.
- Construct 2.0-metre-wide paved walkways along the frontage and within the estate to ensure safe pedestrian movement.

- Install raised zebra crossings, rumble strips, and reflective speed humps at high-traffic points.
- Integrate bicycle racks and safe storage areas within the parking court to promote cycling.
- Enforce an internal speed limit of 10 km/h through signage and speed humps.
- Install reflective road markings, lane identifiers, and wayfinding signs across internal driveways.
- Provide adequate lighting along driveways and walkways for nighttime visibility.
- Maintain street signage and road furniture to ensure visibility and prevent driver confusion.
- Designate boda boda and taxi drop-off bays near the entrance to discourage roadside parking.
- Ensure clear pedestrian connectivity from the estate to nearby Naivasha Road matatu stops.
- Coordinate with KURA and the county government to implement the TIA's recommended intersection upgrades at the Naivasha–Ndwaru junction, including lane re-channelization, signage improvement, and signal optimization to improve Level of Service during peak hours.
- Conduct annual traffic and parking audits during operation to assess vehicle flow, occupancy rates, and safety performance.
- Review internal layouts and signage periodically to incorporate user feedback and evolving traffic trends.

9.3.20 Gender-Based Violence-SEA and SH

Construction projects in peri-urban environments such as Riruta attract temporary and semi-skilled labour, often male-dominated, which can alter community dynamics. Increased social interaction between workers and the local population (particularly women, youth, and minors) may expose vulnerable individuals to risks of sexual exploitation, harassment, and gender-based violence (GBV/SEA-SH). Potential drivers include unequal power relations, transactional sex, alcohol misuse, and lack of awareness or accountability frameworks. Such incidents can damage community trust and the project's social licence to operate. During operation, although the risk level decreases significantly, ongoing vigilance is necessary. Maintenance staff, security guards, domestic workers, and residents must operate within an environment that safeguards against sexual harassment and promotes gender equality. The EIB's ESS 7 and ESS 9 require the project to adopt preventive, corrective, and survivor-centred approaches.

.**Proposed mitigation measures**

Construction phase:

- Develop and implement a GBV/SEA–SH Prevention and Response Plan, integrated into the Contractor's EHS Plan.
- Require all staff to sign an Individual Code of Conduct prohibiting sexual harassment, exploitation, or abuse, and clearly outlining sanctions.
- Conduct mandatory induction training for all site workers on GBV/SEA–SH awareness, respectful behaviour, gender sensitivity, and grievance procedures.
- Refresh training every six months and ensure inclusion of supervisory and security staff.
- Collaborate with local gender officers, hospitals, Health Centre, and CBOs to conduct GBV prevention campaigns targeting both workers and local residents.
- Include female representatives in community liaison meetings to improve dialogue and monitoring.
- Establish confidential reporting channels (dedicated hotline, anonymous complaint boxes).
- Ensure reports are handled discreetly by a trained Gender and Social Safeguards Officer.
- Maintain referral pathways for survivors to medical, psychosocial, and legal support services.
- Assign a Gender and Social Officer within the project management team.
- Maintain a register of awareness sessions, attendance, and reported cases.

Occupation phase:

Provide minimum

- Integrate anti-GBV/SEA–SH provisions into the Residents' Association bylaws and property management contracts.
- Maintain secure and well-lit communal areas, staircases, and parking zones to prevent opportunistic offences.
- Display GBV hotline numbers, emergency contacts, and grievance procedures in notice boards and communal spaces.
- Conduct annual sensitization forums with residents and estate staff, emphasizing gender equality and reporting channels.
- Enforce screening and background checks for all staff; security, maintenance, and janitorial.
- Include SEA–SH obligations and response clauses in employment and service provider contracts.
- Partner with local health centres and GBV response units for survivor referral and counselling.
- Maintain confidentiality and zero tolerance for retaliation against complainants.

9.3.21 Risk of Exclusion of Vulnerable Individuals

A considerable risk is the potential for the exclusion of Vulnerable Groups (VMGs) such as the PWDs, the women, the unemployed youth and the elderly, etc . The vulnerable groups' participation and inclusion could be disadvantaged based on social identity which may be across dimensions of gender, age, disability, and socio-economic status.

During the baseline studies, the consultants, with the help of the community members, identified those considered vulnerable in the community include:

1. Persons Living with Disabilities (PWDs)
2. The Elderly
3. The Poor
4. The widows/ Female-Headed Households
5. Unemployed Youth
6. Low-Income Households
7. Domestic workers
8. Children (in single-parent households)

Proposed mitigation measures

- Consultations with the different vulnerable groups identified to ensure that;
  - ✓ The vulnerable groups are aware of the project and its impacts
  - ✓ The vulnerable groups can benefit from the project
- Provide support to their (vulnerable groups) participation arrangements in the project
- Commit to open and transparent communication and engagement from the beginning and have a considered approach in place
- Regularly monitor performance in engagement
- Ensure the vulnerable people are represented in the community-led committees i.e. Labour Recruitment Committee, CSR committee
- Implement affirmative action in employment
- Implement the existing grievance redress mechanism.

9.3.22 Cultural heritage and Archaeological Heritage

No known cultural, historical, or archaeological resources are present within or near the project area. The site is a previously developed parcel within Riruta's residential zone. Given the disturbed nature of the site and absence of recorded heritage features, the likelihood of encountering cultural artefacts is very low. The impact is therefore low relevance and limited to chance-find scenarios.

Mitigation measures
Pre-construction phase: • A detailed topographic survey has been conducted, detailed mapping all-natural features. This survey aims to inform the project's design and layout, preservation of existing trees will be prioritised as much as possible. • The proponent shall ensure that provisions for managing chance finds, defined as cultural heritage encountered unexpectedly during project implementation, are in place and included in contracts, as appropriate. *Construction phase:* The Contractor is responsible for familiarizing themselves with the following "Chance Finds Procedures", in case culturally valuable materials are uncovered during excavation; and awareness training on chance find to the workers: • Conduct pre-construction briefing for all workers on the importance of preserving potential cultural or archaeological materials. • Integrate a Chance-Find Procedure into the contractor's environmental management plan. • In the event of a discovery, immediately stop work within a 10 m radius of the find, secure the area, and notify the Project Manager and National Museums of Kenya. • Resume work only after written clearance by NMK and NEMA. • Maintain a record of any chance finds, even if determined to be of no significance. • Prohibit the removal, damage, or sale of any artefacts by site workers or visitors. • Ensure periodic supervision by the EHS Officer during earthworks to detect any unusual artefacts or features.

9.3.23 Social pathologies, including HIV/AIDS

HIV and AIDS remains a major challenge in Kenya as well as in Nairobi County. The epidemic continues to adversely impact on all spheres of the County; economic, social and health sectors. As of the most recent data, Nairobi County has one of the highest prevalence rates of HIV/AIDS in Kenya. According to the Kenya HIV Estimates Report 2023, approximately 6.3% of adults aged 15–64 in Nairobi are living with HIV. In terms of absolute numbers, this translates to over 200,000 people living with HIV (PLHIV) in Nairobi. The project construction will improve the economic status of some of the people employed thus increasing the disposable income with the probability of indulgence in substance abuse and using the money to solicit for sex.

During site clearance, it is expected that a lot of dust will be generated from cutting down of the vegetation which will impact on the neighboring residents. Additionally, construction vehicles driving on the dirt road and mixing of concrete for construction will also generate dust. This could lead to exacerbating illnesses of the upper respiratory tract i.e. asthma. However, the site preparation which will likely generate the most dust, will be for a short period of time.

Vector breeds in all types of polluted domestic water such as drains, ponds and stagnant streams. Solid waste, human waste and wastewater will be generated from the construction site. In addition, there will be other wastes arising from construction activities of the project facilities. These wastes may contribute to the rise of vector borne diseases if proper disposal mechanisms are not put in place.

Proposed mitigation measures
Construction phase: **(ii) Workers and Community** • Implement an HIV/AIDS and STI Awareness Programme for all workers and interested community members, coordinated through the local health centre. • Provide Voluntary Counselling and Testing (VCT) opportunities at least once during the construction period. • Disseminate Information, Education and Communication (IEC) materials on disease prevention in both English and Kiswahili. • Enforce a Worker Code of Conduct prohibiting sexual harassment, exploitation, or transactional sex with community members. • Prohibit drug and alcohol use on site; conduct random spot checks if necessary. • Provide on-site welfare facilities (water, sanitation, first aid, rest shelters) to reduce off-site social interaction risks. • Collaborate with County Public Health Officers and community-based organisations (CBOs) to deliver outreach sessions. **(ii) Affected people and communities** • Include health and behavioural awareness in weekly toolbox talks. • Promote non-discrimination for workers living with HIV/AIDS. • Maintain disciplinary procedures for violations related to misconduct or substance abuse. *Occupation phase:* **(ii) Resident and Community Health Promotion** • Integrate public health awareness campaigns within the residents' association, addressing hygiene, STI prevention, and responsible social behaviour. • Encourage collaboration with nearby health facilities for periodic screening and community health programs. • Ensure that the facility management team enforces zero tolerance to substance abuse within the premises. • Provide youth and community engagement programs such as sports, and community cleanup activities; to promote social cohesion and reduce deviant behaviour. • Maintain estate security and access control to reduce illicit activities within and around the development.

9.3.24 Social Cohesion and Integration

The proposed IHS housing Project is located within Riruta Ward, a mixed residential and peri-urban settlement characterized by socio-economic diversity. The area comprises both formal and informal employment sectors, with a significant proportion of residents engaged in casual construction work, domestic labour, and small-scale trade. According to local consultations and data from the Nairobi CIDP 2023–2027, youth unemployment and underemployment remain key challenges in Dagoretti South. During the construction phase, the project will generate various employment opportunities for skilled, semi-skilled, and unskilled workers. However, previous experiences in similar developments within Nairobi show that unskilled labour tends to be sourced locally, whereas skilled and technical staff are often drawn from other counties. This can generate tensions between local residents and incoming workers, particularly if locals perceive unequal job allocation, wage disparities, or preferential procurement practices.

In addition, the temporary influx of non-local workers could alter local social dynamics, increase competition for accommodation, and create pressure on community facilities. If unmanaged, these socio-economic differences can erode social cohesion and cause resentment among the host community. During the operational phase, new residents moving into the estate will increase population density and introduce

socio-cultural diversity, potentially creating both positive and negative outcomes. On one hand, this offers opportunities for community integration, business linkages, and shared urban amenities; on the other, it may lead to social segregation or limited interaction between existing Riruta residents and new estate occupants, particularly if community engagement and inclusivity are not prioritized. Effective management of labour recruitment, local procurement, and social interaction will be key in ensuring equitable benefit-sharing, community acceptance, and sustained social harmony.

Proposed mitigation measures
Construction Phase • Develop and implement a Local Employment and Labour Management Plan as part of the project's Human Resource and E&S Management Plan. • Prioritize the hiring of local residents, for unskilled and semi-skilled positions. • Coordinate recruitment through the Area Chief's Office, local youth and women's groups, and the Ward Administrator to ensure fairness and transparency. • Advertise job opportunities publicly (e.g., local noticeboards, chief's office, and churches) to avoid nepotism or elite capture. • Ensure all employment adheres to the Employment Act (2007), including fair wages, non-discrimination, and equal pay for equal work. • Maintain an open GRM for workers to report labour-related complaints, including recruitment bias or unfair dismissal. • Document all recruitment, training, and payroll records for audit and monitoring. • Provide basic technical and safety training for unskilled local workers before deployment. • Offer mentorship programs where local apprentices can learn from skilled tradesmen (e.g., masons, electricians, plumbers). • Engage in periodic on-the-job training sessions to enhance local skill levels and employability post-project. • Implement a Local Procurement Policy giving preference to SMEs based in Dagoretti South for supply of goods, materials, and services. • Maintain an updated register of local suppliers and track procurement expenditure to demonstrate benefit-sharing. • Prioritize local hiring for ancillary services. • Conduct social orientation and code-of-conduct briefings for all non-local workers to respect local customs, property, and community norms. • Enforce a Worker Code of Conduct that prohibits discrimination, harassment, or offensive behaviour towards host community members. • Prohibit worker camps within the community; instead, provide designated accommodation near the project site with supervision and hygiene facilities. • Hold regular community liaison meetings (monthly during peak construction) to share updates on employment, procurement, and construction progress. • Establish a CLO responsible for stakeholder engagement and grievance resolution. • Address grievances within 14 days and provide written feedback to the complainant. • Record grievances related to labour, noise, or social concerns in a grievance register. *Occupation Phase* • Facilitate periodic engagement forums between new estate residents and the existing Riruta community to encourage social integration and mutual understanding. • Establish a Community Integration Committee comprising estate representatives, local residents, and County officials to coordinate CSR and joint projects. • Partner with Riruta-based institutions (churches, youth groups, women's associations) for social events and environmental clean-up activities. • Continue giving preference to local service providers for facility maintenance, landscaping, waste management, and security contracts.

- Maintain training partnerships for youth on technical trades and estate management roles.
- Operate an Estate Social Grievance Mechanism for residents and neighbouring community members to raise social issues.
- Conduct an annual social audit assessing the level of local engagement, procurement, and satisfaction.
- Report results to NEMA during annual environmental audit submissions.
- Promote inclusive community events such as open days, tree planting, or cultural festivals to strengthen bonds between residents and the Riruta community.
- Encourage establishment of a Residents' Association with gender, age, and vulnerability representation.

9.4 Climate Change Risk, Vulnerability & Greenhouse Gas (GHG) Assessment

Climate change is an increasingly important consideration for urban housing projects in Nairobi County. The city faces recurrent flooding, increasing temperatures, and prolonged dry periods that directly affect water supply, drainage capacity, and energy demand. According to the Kenya Meteorological Department (2023) and the World Bank Climate Knowledge Portal (2024), Nairobi has experienced a mean annual temperature increase of about 1.2–1.4°C over the past four decades, alongside more intense short-duration rainfall events. These climatic shifts have contributed to periodic flash floods along low-lying corridors such as Dagoretti, Waithaka, and Riruta, where urban development has outpaced drainage infrastructure capacity.

The proposed Riruta IHS Housing Project, located off Ndwaru Road in Dagoretti South Sub-County, sits within a moderately urbanized upland area with gentle slopes and clayey soils. While the site is not within a floodplain, heavy rainfall events can result in temporary surface ponding if drainage systems are not adequately designed. Climate variability may also affect long-term water availability and increase building cooling demand; factors that have been integrated into the project's adaptive design and sustainability framework.

9.4.1 National and Institutional Context

This climate change and GHG assessment aligns with Kenya's national and institutional frameworks, including:

- Climate Change Act (2016): Provides the legal framework for national climate governance, adaptation, and low-carbon development.
- National Climate Change Action Plan (NCCAP 2018–2030): Prioritizes integration of climate resilience in infrastructure, energy efficiency, and urban planning.
- Kenya's Updated Nationally Determined Contribution (NDC, 2020): Commits to a 32% reduction in GHG emissions by 2030 compared to the business-as-usual scenario.
- EIB Climate Bank Roadmap (2021–2025): Requires alignment of financed projects with the Paris Agreement, emphasizing avoidance of carbon lock-in.
- IFC Performance Standard 3: Mandates assessment of energy use, resource efficiency, and GHG emissions in construction and operation phases.

9.4.2 Project-specific climate risk and vulnerability analysis

The Riruta site and its surrounding Dagoretti South catchment face moderate climate risks primarily associated with rainfall intensity, stormwater runoff, and urban heat accumulation. Historical climate data and projections are summarized in the below Table 9-4;[11]

Table 9-4: Climate change exposure and observed trends

Parameter	Observed / Projected Change	Relevance to Project
Temperature	Mean annual temperature rise of ~1.3°C observed (1980–2020); projected increase of 0.5–1.5°C by 2050.	May increase cooling energy demand and indoor heat stress if unmitigated.
Rainfall	Increasing rainfall variability and intensity, particularly during March–May and October–December seasons.	Short-duration high-intensity rainfall can cause surface runoff and local flooding if drainage is inadequate.
Drought Frequency	Prolonged dry spells (Jan–Mar, Jun–Sept) occurring every 3–4 years.	Reduced reliability of NCWSC supply and lowered groundwater recharge, stressing domestic water use.
Extreme Events	Flash floods reported along Dagoretti–Waithaka–Riruta corridor due to poor stormwater infrastructure.	May affect access roads and local drainage, though site elevation moderates flood risk.

9.4.3 Exposure and sensitivity

The project's exposure to climate risks is classified as moderate, influenced by its urban setting and reliance on external water and power utilities.

Key sensitivity factors include: Impermeable surfaces (roofs, parking, roads) that increase surface runoff potential; black-cotton soils with low permeability, increasing vulnerability to temporary ponding; intermittent NCWSC water supply, which may worsen during drought periods; dependence on grid electricity that may be intermittently disrupted during extreme weather events;

Despite these sensitivities, the site benefits from; elevated terrain providing natural drainage gradient; absence of nearby open streams; and a serviced urban environment with accessible NCWSC sewer and KPLC infrastructure.

9.4.4 Project-specific adaptive capacity and design integration

The project incorporates multiple design measures to strengthen adaptive capacity and reduce climate-related vulnerability:

1. ***Drainage and stormwater management***

Integration of a Sustainable Urban Drainage System (SuDS) including lined drains, infiltration trenches, and permeable cabro paving. Storage of runoff in attenuation tanks to regulate discharge during heavy rainfall events.

2. ***Water security and efficiency***

Dual-source water system (NCWSC main + potential borehole connection) with minimum three-day storage capacity. Rainwater harvesting system for irrigation and cleaning, and Installation of low-flow taps, and dual-flush toilets.

[11] World Bank Climate Data (2021); KMD (2020); NCCAP (2018–2030)

3. Energy and thermal regulation:

Solar water-heating systems and energy-efficient LED lighting; Passive design features: optimal orientation, shading elements, and cross-ventilation; and High-albedo roofing and reflective façades to mitigate heat accumulation.

4. Landscape and green infrastructure

Incorporation of Mugumo Park (central preserved fig tree and green courtyard) as a cooling and infiltration zone; and Planting of indigenous, drought-tolerant species to enhance evapotranspiration and improve microclimate.

The project's adaptive capacity is rated High, and the residual climate vulnerability is Low to Moderate, manageable through continuous monitoring and maintenance of the implemented systems.

9.4.5 Key climate-related risks and mitigation measures

he main climate risks relevant to the Riruta housing development are summarized below, alongside appropriate adaptation and mitigation strategies.

Table 9-5: Key climate-related risks

Impact / Risk	Description / Relevance	Mitigation & Adaptation Measures
Heat Stress / Urban Heat Island Effect	Higher urban surface temperatures due to dense development and limited vegetation.	- Apply reflective paint and high-albedo roofing. - Design buildings for cross-ventilation and natural cooling. - Landscape with indigenous shade trees and lawns. - Integrate rooftop gardens and vegetated courtyards. - Use light-colored external finishes.
Water Supply Stress / Drought Risk	Prolonged dry spells and rationing of NCWSC supply may affect domestic water availability.	- Install rainwater harvesting on all roofs - Use dual-source water supply system with licensed borehole (WRA permit). - Equip units with low-flow fixtures. - Promote water-saving behavior among residents.
Flooding and Stormwater Overload	Short-duration, high-intensity rainfall can exceed drainage capacity, causing temporary ponding.	- Construct SuDS with infiltration trenches, soakaways, and attenuation tanks. - Maintain routine drain inspection and de-silting. - Ensure proper site grading toward drainage channels. - Maintain minimum 10% green open space for infiltration.
Energy Demand and GHG Emissions	Increased cooling energy use and embodied carbon in construction materials.	- Integrate solar water heating and rooftop solar PV. - Utilize locally sourced, low-carbon materials. - Achieve ≥20% EDGE energy savings target. - Promote efficient lighting and appliance use. - Conduct periodic energy audits.
Loss of Green Cover and Carbon Sink	Construction reduces natural vegetation and local carbon sequestration potential.	- Maintain and protect the existing mature Mugumo tree as central green park. - Reforest boundary areas with native trees. - Maintain minimum 5% tree cover requirement under County by-laws. - Engage residents in periodic tree-planting drives.

9.4.6 Greenhouse Gas (GHG) Emission Assessment

(i) Sources and Phases of Emissions

The following tables provide an overview of the project's GHG emission sources, estimated magnitudes, and corresponding mitigation measures. The proposed project, designed to EDGE certification standards, incorporates numerous carbon-reducing features; including solar integration, efficient lighting, green materials, and waste reuse, thereby maintaining a low-carbon footprint consistent with the EIB Climate Bank Roadmap and Kenya's NDC.

Table 9-6: Sources and phases of emissions

Phase	Main GHG Sources	GHG Type
Construction Phase	Use of diesel-powered machinery and transport; embodied carbon in cement, steel, and aggregates.	CO_2, N_2O
Operational Phase	Electricity consumption for lighting, lifts, and water pumping; wastewater treatment energy; resident energy use.	CO_2
Indirect / Avoided	Reuse of treated wastewater and solar energy reduces GHG intensity.	Emission savings

(ii) Estimated Magnitude

Table 9-7: Estimated magnitude

Source	Est. Annual GHG Emissions (tCO_2e/year)	Comment / Assumptions
Construction Equipment and Transport	250–350	Based on diesel consumption ≈120,000 L over construction period.
Embodied Carbon in Materials	2,000	Based on embodied CO_2 in concrete (300 kg CO_2/m^3) and steel.
Operational Electricity	600/year	Based on 0.4 kg CO_2/kWh × 1.5 million kWh/year.
Total Project Life-Cycle GHG Estimate	2,850–3,000	Below IFC reporting threshold (25,000 tCO_2e/year).

Note:

This project is considered a low-emitting development under EIB and IFC guidelines but must still integrate mitigation and monitoring actions to align with the Paris Agreement.

(iii) GHG reduction and low-carbon measures

Proposed mitigation measures
Construction Phase
• Source low-clinker cement and recycled steel to reduce embodied carbon.
• Use electric or hybrid machinery where feasible.
• Optimize logistics to minimize fuel use and idling time.
• Adopt on-site batching plants with dust suppression and energy efficiency measures.
• Use local materials to reduce transport emissions.
Occupation Phase
• Install solar water heating systems and ensure rooftop PV-readiness.
• Implement energy-efficient lighting (LED) and motion sensors in all communal spaces.
• Enforce green building practices under the Kenya Green Building Society (KGBS) framework.
• Promote waste segregation and composting to reduce methane from organic waste.
• Encourage green mobility through bicycle storage and electric vehicle charging points.
Offset and Monitoring
• Establish a carbon footprint monitoring plan within the annual environmental audit.
• Maintain a GHG register recording fuel, electricity, and material use.
• Offset unavoidable emissions through tree planting in collaboration with Nairobi City County.

(iv) Climate change adaptation and resilience measures

Proposed mitigation measures
Construction Phase • Install temporary drains, silt fences, and sedimentation basins to prevent runoff. • Implement Erosion and Sediment Control Plan (ESCP) integrated with site management. • Optimize material reuse and rainwater collection for dust suppression. • Incorporate energy- and water-efficiency awareness into site toolbox talks. ***Occupation Phase*** • Integrate Nature-Based Solutions such as green roofs, bioswales, and rain gardens to increase infiltration and cooling. • Design stormwater systems with attenuation tanks, soak pits, and permeable surfaces for peak rainfall (1:100-year event). • Landscape with drought-tolerant native species to minimize irrigation water use. • Implement Building Energy Management Systems (BEMS) to monitor electricity and water use in real-time. • Conduct annual maintenance of stormwater infrastructure, filters, and green spaces.

9.4.7 Institutional and monitoring framework

The table below outlines the institutional framework and indicators for monitoring climate resilience, energy efficiency, GHG management, and biodiversity protection. It defines roles, responsibilities, and reporting frequency for compliance with EIB ESS 5, NCCAP 2018–2030, and Kenya's Green Economy Strategy (2016).

Table 9-8: Institutional and Monitoring Framework

Measure	Responsible Entity	Frequency	Indicator / Target
GHG Monitoring (Energy & Fuel)	Environmental Manager	Annual	kWh/unit, L of fuel used, tCO_2e/year
Energy Efficiency Audit	Facility Management / KGBS Auditor	Annually	≥20% energy saving (EDGE target)
Water Use Monitoring	Estate Manager	Quarterly	≤125 L/person/day consumption
Flood Resilience Monitoring	Contractor (Construction) / Facility Manager (Operation)	Quarterly	Functionality of drainage and basement flow channels
Biodiversity Audits	Environmental Consultant	Annually	No. of indigenous trees planted and survival rate
Climate Adaptation Review	E&S Consultant / NEMA	Every 3 years	Updated climate risk assessment and action plan

9.4.8 Residual Impact

The table below presents the expected residual significance of key climate-related impacts after implementing all proposed mitigation, adaptation, and monitoring measures. The design's elevated semi-basement concept, green energy integration, and nature-based drainage systems collectively reduce the project's vulnerability to extreme rainfall, heat stress, and water scarcity, while maintaining a low GHG footprint consistent with EIB and Kenya's climate targets.

Table 9-9: 8.4.8 Residual impact- post mitigation

Impact Area	Residual Significance	Confidence Level	Key Resilience Indicator
Flooding / Drainage	Low	High	Effective flow through semi-basement & bioswales
Heat Stress / Energy Demand	Low	High	Reduced indoor temperature by natural ventilation and reflective roofs
Water Scarcity / Drought	Low	High	≥25% reduction in potable water demand via reuse
GHG Emissions	Low	High	20–25% reduction from EDGE certification
Biodiversity and Ecosystem Services	Low	High	Functional sensate with >80% vegetation survival
Community and Infrastructure Resilience	Low	High	Stable operations under extreme climate events

9.4.9 Conclusion

The IHS housing project has been designed and will be managed to ensure resilience to climate risks and compliance with Kenya's and EIB's low-carbon development requirements. Through integration of energy efficiency, stormwater management, green infrastructure, and water reuse systems, the project achieves low vulnerability, low emissions, and high adaptive capacity. With continuous monitoring, the development will remain climate-compatible and environmentally sustainable over its operational life cycle.

10 CHAPTER 9: OCCUPATIONAL SAFETY & HEALTH AND GRIEVANCE REDRESS MECHANISM

10.1 Overview

This Chapter outlines the Occupational Safety and Health (OSH) framework and the GRM applicable to the proposed IHS Karen End Green affordable housing project. It provides a structured approach for identifying, managing, and mitigating occupational and community health and safety risks throughout the project's construction and operational phases, in compliance with the OSHA, 2007, EMCA, Cap 387, and EIB ESS 9; ESS 7. The Chapter further establishes the project's GRM as a transparent, accessible, and responsive system for addressing worker and community concerns promptly, in line with EIB stakeholder engagement and accountability requirements.

10.2 Introduction

Construction activities associated with the proposed housing project will involve excavation, structural works, mechanical and electrical installations, and landscaping within a confined urban site adjacent to an active community. Construction workers face elevated risks of injury due to working at height, operating heavy machinery, exposure to noise and dust, and interaction with vehicle traffic on the access road. Occupational safety management will therefore prioritize the protection of workers, site visitors, neighbouring community members, and subcontractors through effective planning, training, supervision, and compliance monitoring.

Typical hazard categories include:

- Slips, trips, and falls from height.
- Struck-by and caught-in-between incidents from machinery.
- Electrical and mechanical hazards.
- Dust, noise, and vibration exposure.
- Fire, explosion, and gas risks.
- Ergonomic and manual handling risks.
- Vehicle–pedestrian interaction risks.

The goal is to achieve zero incidents, promote a safety culture, and align with EIB's *Do No Significant Harm* principle.

10.3 Principles of OSH

The OSH management system for the Karen End project shall be guided by three interrelated principles, isk Identification, Risk Communication, and Risk Management- supported by continuous supervision and legal compliance under OSHA (2007).

- *Risk Identification and Assessment:* Conduct task-specific risk assessments for each phase; excavation, scaffolding, formwork, MEP installation, and finishing works, to determine exposure pathways and affected personnel.
- *Risk Communication:* Use multilingual safety signage and daily briefings to ensure workers understand hazards and control measures. Information shall be disseminated through toolbox talks, posters, and electronic messaging for supervisors.
- *Risk Management:* Implement mitigation through engineering controls (barriers, ventilation), administrative controls (rotations, supervision), and PPEs.

A site Safety Officer registered by DOSHS shall oversee OSH implementation, inspection, and incident documentation.

10.4 Relevant occupational safety and health guidelines

The proposed project will follow the OSH guidelines for construction sites in Kenya. These guidelines are essential to ensure the safety and well-being of workers, visitors, and the public. These guidelines are typically established and enforced by government authorities, such as the Directorate of Occupational Safety and Health Services (DOSHS) under the Kenya Ministry of Labour and Social Protection. Table 34 summarizes the guidelines.

Table 10-1: relevant occupational safety and health applicable to the project

Guideline	Description
Legal framework	The proponent and the contractor shall familiarize themselves with Kenyan OSH laws and regulations, such as OSHA 2007, to understand the obligations as an employer or contractor.
Site planning and design	The proponent and contractor shall conduct a comprehensive risk assessment before commencing construction to identify potential hazards and plan safety measures accordingly. Ensure that the site layout, access roads, and egress routes are designed for safe movement of personnel, equipment, and materials. Ensure scaffolding, hoists, and materials storage areas. Designate separate pedestrian and vehicular routes within the confined site.
Site access and security	The contractor shall control access to the construction site to prevent unauthorized entry and implement security measures to protect construction materials and equipment from theft and vandalism. Coordinate with Ndwariu Road traffic control for safe entry and exit. Install reflective warning signage and flagmen during deliveries.
Safety training and awareness	The contractor shall provide safety induction and training for all workers and visitors before they enter the construction site; and conduct regular safety briefings and toolbox talks to raise awareness of potential hazards and safe work practices. Conduct SEA/SH-sensitive induction training integrating worker code of conduct, GBV awareness, and cultural sensitivity.
Personal protective equipment (PPE):	The contractor shall ensure that all workers have access to and wear appropriate PPE, such as helmets, safety vests, gloves, and safety footwear, and provide specialized PPE for specific tasks or environments, such as respiratory protection for dusty areas. Include specialized PPE such as harnesses, reflective vests, hearing protection, and respirators for high-noise or dusty zones.

Guideline	Description
Emergency procedures	The contractor shall develop and communicate clear emergency procedures, including evacuation plans, assembly points, and first aid stations, and ensure that all workers are familiar with the emergency procedures and know how to respond in case of an incident. Integrate flood or extreme rainfall response into the Emergency Plan.
Safe work practices	The proponent and the contractor shall enforce safe work practices, such as the use of fall protection equipment for work at heights, proper scaffolding, and safe equipment operation, and prohibit unsafe behaviours, such as horseplay or working under the influence of alcohol or drugs.
Hazardous materials and waste management	The contractor shall properly store, handle, and dispose of hazardous materials and waste in compliance with local regulations, and label hazardous materials and provide Material Safety Data Sheets (MSDS) as necessary.
Machinery and equipment safety	Regularly inspect and maintain construction machinery and equipment to ensure they are in safe working condition, and train equipment operators and restrict access to heavy machinery areas.
Traffic safety	Develop a Traffic Management Plan (TMP) addressing internal circulation and community interface.
Health and hygiene	The contractor to provide access to clean drinking water, sanitary facilities, and handwashing stations for workers, and promote good hygiene practices to prevent the spread of diseases, especially in crowded work areas. Ensure mobile toilets and potable water stations are located on impermeable bases and emptied by licensed handlers.
Risk mitigation:	The contractor to: • Implement fall protection measures, guardrails, and safety nets for work at heights. • Control noise and dust pollution to protect workers and the surrounding community. • Conduct regular safety audits and inspections to identify and rectify potential hazards.
Reporting and investigation	The contractor to: • Establish a clear system for reporting accidents, near misses, and safety concerns. • Investigate incidents to determine their root causes and implement corrective actions.
Consultation and involvement	The contractor to: • Encourage worker involvement and consultation on safety matters, as they often have valuable insights. • Appoint a safety committee or representative if applicable.
Contractor management	Require subcontractors to submit Job Hazard Analyses (JHAs) and adhere to the Principal Contractor's Safety Plan.

10.5 Applicable EIB guidelines on construction safety, emergency procedures and action plan

The EIB Environmental and Social Standard 9 (Health, Safety and Security) requires project proponents to prevent adverse impacts on workers, communities, and assets through structured, proactive management.

For the Karen End project, these provisions will be integrated into the CESMP and EPRP.

Table 10-2: Summary of applicable EIB guidelines for housing construction projects

EIB guideline	Description
Regulatory compliance	The proponent and the contractor to ensure that all construction activities comply with the safety and construction regulations of Kenya. These regulations cover aspects such as worker safety, environmental protection, and emergency preparedness. Comply with the provision of OSHA 2007 and EMCA Cap 387.
Traffic and Community Safety	Implement a Traffic Marshal Program for managing heavy vehicle movement during material delivery via the Ndwaru Road access.
Safety management system	The proponent and the contractor to develop and implement a comprehensive safety management system that includes safety policies, procedures, and practices specific to the construction project. This system should be aligned with recognized safety standards and best practices.
Labour Influx and Worker Welfare	Include accommodation standards and SEA/SH prevention as part of site safety culture.
Hazard identification and risk assessment	The proponent and the contractor to conduct a thorough assessment of potential hazards and risks associated with the construction project. This should include identifying safety risks for workers, residents or nearby communities, and the environment.
Monitoring and Auditing	Require monthly third-party EHS audits to verify compliance with EIB and Kenyan OSH legislation.
Emergency response plan	The proponent and the contractor to develop a detailed emergency response plan that outlines the procedures to follow in case of accidents, fires, natural disasters, or other emergencies on the construction site. This plan should include evacuation procedures, communication protocols, and responsibilities of key personnel.
Training and Awareness	The proponent and the contractor to ensure that all personnel involved in the construction project receive appropriate safety training and are aware of the emergency procedures. Training should cover topics such as the proper use of personal protective equipment (PPE), first aid, and evacuation drills.
Safety Equipment and PPE	The proponent and the contractor to provide necessary safety equipment and personal protective gear to workers, such as helmets, gloves, safety glasses, and high-visibility clothing. Provide suitable and well maintained PPEs to all visitors and ensure they are utilized at all times and in the right manner. These include safety boots, helmets, dust masks, gloves and googles.

EIB guideline	Description
Environmental protection	The proponent and the contractor to implement measures to protect the environment during construction, such as sediment and erosion control, proper disposal of hazardous materials, and adherence to environmental regulations.
Reporting and documentation	The proponent and the contractor to maintain records of safety incidents, near misses, and emergency drills. Regularly review and analyse safety performance to identify areas for improvement.
Communication	The proponent and the contractor to: • Establish clear communication channels and protocols for reporting safety concerns and emergencies. • Ensure that all workers have access to emergency contact information. Place visible and readable signs to control the movement of vehicles and notify motorists, workers and pedestrians at and around in the site. • 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.
Third-party audits and inspections	The proponent and the contractor to conduct regular safety audits and inspections to assess compliance with safety and environmental standards. Third-party experts may be engaged for this purpose.
Continual improvement	• The proponent and the contractor to promote a culture of safety and continual improvement by conducting post-incident reviews, addressing safety issues promptly, and implementing corrective actions. • The proponent and the contractor to conduct regular refresher training sessions and drills on how to handle emergencies and accidents at site.
Regulatory compliance with EIB guidelines	The proponent and the contractor to ensure that all safety and emergency procedures align with the EIB's specific guidelines and requirements for construction projects funded by the bank.

10.6 Grievance redress system

The proponent shall establish a GRM to provide a structured process for receiving, evaluating, and resolving complaints from workers, residents, suppliers, and neighbouring communities. The proponent shall establish a two-tier GRM; one for workers-: internal and one for external stakeholders (community, suppliers, and authorities). The GRM will aim for resolution within 30 working days and ensure accessibility through verbal, written, or electronic channels

The GRM will: Be accessible, transparent, gender-sensitive, and free of charge; aim to resolve grievances within 30 working days; maintain confidentiality and protection from retaliation; and provide feedback to the complainant at each stage.

Channels of Access

- On-site grievance drop box (anonymous option).

- GRM hotline and dedicated email.
- Written forms available at the site gate and local chief's office.
- Verbal submission through Community Liaison Officer (CLO).

All grievances shall be logged, categorized (e.g., safety, employment, environmental, SEA/SH, access), and tracked to closure. Monthly GRM reports shall be included in environmental monitoring submissions to NEMA and EIB.

Table 10-3: EIB guidelines for grievance redress

Mechanism	Description
Transparency and accessibility	The proponent/contractor to ensure that information about the GRM is easily accessible to affected communities, stakeholders, and project participants. This includes providing information on how to submit complaints, the process for handling grievances, and contact details for responsible personnel.
Grievance submission	The proponent/contractor to: • Establish clear procedures for submitting grievances. Grievances can be submitted in writing, via email, or through designated points of contact. • Provide options for anonymous reporting to protect the identity of those who may fear reprisals.
Initial assessment	The proponent/contractor to, upon receipt of a grievance, conduct an initial assessment to determine its validity, relevance, and potential impact on the project and affected parties.
Confidentiality and protection	The proponent/contractor to: • Maintain confidentiality throughout the grievance redress process to protect the privacy and safety of those submitting complaints. • Establish safeguards against retaliation or intimidation of complainants.
Grievance resolution channels	The proponent/contractor to offer multiple channels for grievance resolution, including informal and formal mechanisms. Informal mechanisms may include direct negotiation and mediation, while formal mechanisms may involve an official grievance committee or ombudsman.
Timely response	The proponent/contractor to: • Respond to grievances promptly and within a reasonable timeframe. • Set specific deadlines for acknowledging receipt and providing a substantive response.
Impartiality and independence	The proponent/contractor to ensure the independence and impartiality of the grievance redress process. Complaints should be handled by individuals or bodies that are not directly involved in the project's implementation.
Documentation and tracking	The proponent/contractor to: • Maintain comprehensive records of all grievances, including the nature of the complaint, the actions taken, and the outcomes. • Use a tracking system to monitor the progress of each grievance and to ensure follow-up and closure.
Resolution and remediation	The proponent/contractor to:

Mechanism	Description
	• Based on the findings of the grievance process, take appropriate actions to resolve the issue and mitigate any adverse impacts. • Provide remedies or compensation to affected parties as necessary and in accordance with EIB policies and project agreements.
Communication	The proponent/contractor to: • Keep affected parties informed about the status and progress of their grievances. • Disseminate information on grievance outcomes to relevant stakeholders, maintaining transparency in the resolution process.
Escalation	The proponent/contractor to establish an escalation mechanism for unresolved grievances, allowing complainants to seek external review or arbitration if they are not satisfied with the project's response.
Learning and improvement	The proponent/contractor to: • Continuously monitor and evaluate the effectiveness of the grievance redress mechanism. • Use lessons learned from past grievances to improve project management practices and prevent similar issues in future projects.

10.6.1 Project's grievance redress mechanism

IHS Investments Ltd recognizes that effective stakeholder engagement and timely grievance resolution are critical to maintaining community trust and compliance with EIB standards.

The project GRM will address grievances arising during construction and operation phases, covering:

- Workers and contractors (internal grievances).
- Neighbouring community members and public institutions (external grievances).
- Future tenants and residents of IHS housing units.

The GRM operates on the following principles:

- *Transparency and Fairness* – Clear, documented process in accessible language.
- *Accessibility* – Open to all stakeholders, with verbal or written submission options.
- *Timeliness* – Acknowledgement within 5 days; resolution within 30 working days.
- *Confidentiality* – Identities protected unless disclosure is legally required.
- *Non-Retaliation* – Complainants safeguarded against victimization or loss of employment.
- *No Cost* – The mechanism is free and publicly accessible.

10.6.2 Stages of the Grievance Process

1. *Receiving and Recording:* Complaints logged by the EHS Officer or CLO.
2. *Assessment and Investigation:* Verify validity and determine responsible unit.
3. *Resolution:* Develop corrective or compensatory actions.
4. *Feedback:* Communicate outcome to complainant.

5. *Monitoring and Review:* Quarterly review to detect patterns and systemic issues.

Separate mechanisms will be maintained for workers, community, and future tenants, all feeding into a central project GRM database managed by IHS's Environmental and Social (E&S) Department.

Annual reviews shall evaluate the GRM's effectiveness and integrate lessons learned into the project's ESMS.

The GRM shall be reviewed annually in coordination with NEMA audits, DOSHS inspections, and community liaison feedback to ensure continuous improvement and compliance with both national and EIB accountability frameworks.

10.6.3 Summary

The Occupational Safety and Health and Grievance Redress Mechanism framework for the IHS Riruta Housing Project provides a comprehensive structure for safeguarding worker welfare, promoting safe site operations, ensuring community protection, and maintaining transparent engagement with all stakeholders.

Through adherence to Kenyan legal frameworks, EIB Environmental and Social Standards, and best international construction safety practices, the project demonstrates its commitment to:

- Achieving zero harm in construction and operation.
- Promoting worker dignity, inclusion, and wellbeing.
- Maintaining transparent, culturally appropriate grievance handling.
- Building community trust and operational sustainability.

11 CHAPTER 10: ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN (ESMP)

11.1 Overview

The Environmental and Social Management Plan (ESMP) for the proposed residential project covers anticipated negative effects, mitigating actions, roles, expenses, and trackable indicators. This ESMP guarantees the efficacy of activities to improve environmental quality by considering all stages of development; construction, occupation and decommissioning. Environmental monitoring involves measurement of relevant parameters, at a level of details accurate enough, to distinguish the anticipated changes. Monitoring aims at determining the accurate parameter measurement is necessary for environmental monitoring in order to spot expected changes and assess how well environmental quality-improving initiatives are working.

The proponent acknowledges that the proposed project activities will have some impacts on the biophysical and social environment. Thus, the focus will be on reducing the negative impacts and maximizing the positive impacts associated with the project activities through a continuous improvement programme. It is noteworthy that key factors and processes may change through the lifecycle of the proposed green affordable housing project and considerable provisions have been made for dynamism and flexibility of the ESMP. As such, the ESMP is a dynamic tool that is subject to a regular regime of periodic review and improvement.

11.2 ESMP for the construction phase

Table 11-1: ESMP during construction phase

Impact	Proposed mitigation measures	Responsibility	Frequency	Estimated cost (Kshs)
Biodiversity	• Preserve existing native vegetation on the site outside the project footprint. • Implement erosion control measures to prevent soil erosion and sedimentation of nearby water bodies. • Use environmentally friendly construction materials and minimize the use of harmful chemicals.	Proponent Contractor Workers	Routine inspection	50,000
Stormwater and drainage alteration	• Integrate Sustainable Urban Drainage System components: permeable cabro paving, soakaways, infiltration trenches, and silt traps. • Ensure all drains are lined and fitted with gratings to prevent clogging. • Grade site gently to promote gravity flow toward designated outlets. • Regularly clean drains and silt traps during and after construction. • Maintain rooftop rainwater harvesting and storage tanks to intercept runoff.	Contractor Workers	Daily inspection	60,000
Invasive species	• Develop a site-specific invasive species management plan • Implement erosion control measures, such as mulching and revegetation with native plant • Clean construction equipment and vehicles before entering and leaving the construction site • Source construction materials from reputable suppliers to minimize the risk of introducing invasive species. • Raise awareness among workers about the importance of invasive species management.	Proponent Contractor Workers Drivers	Routine inspection	150,000
Climate Change & GHG Risk/ Carbon Footprint	• Use low-carbon materials; • prioritize local suppliers; • track fuel and electricity use; • install solar site lighting; • reuse excavated material; • maintain log of GHG-reducing measures.	Proponent / Contractor	Throughout project	125,000

Impact	Proposed mitigation measures	Responsibility	Frequency	Estimated cost (Kshs)
Carbon footprints	• Choose low-carbon building materials such as recycled steel, and low-impact concrete substitutes. • Select materials sourced from nearby suppliers to reduce transportation emissions. • Implement waste reduction strategies, such as salvaging and recycling construction materials • Establish composting facilities to manage organic waste generated by residents and landscaping activities • Create community gardens and green spaces to promote outdoor activities.	Proponent Contractor	Throughout the construction phase	125,000
E-waste	• Maintain an inventory of electronic equipment and devices used during construction to track usage and minimize surplus. • Consider leasing or renting electronic equipment instead of purchasing, especially for temporary needs, to reduce the volume of e-waste generated. • Prioritize the reuse of electronic equipment and devices from previous projects or within the construction site whenever possible. • Implement a waste management plan that includes separate collection and sorting of e-waste materials to facilitate recycling and prevent contamination. • Provide training to construction teams on the importance of proper e-waste disposal practices and the benefits of recycling. • Partner with certified e-waste recyclers to ensure proper disposal and recycling of electronic equipment and devices at the end of their lifecycle.	Proponent Contractor	Routine inspection	100,000
Air pollution	• Enclose the site with dust-proof net during construction • Undertake careful screening of construction site to contain and arrest dust. • Encourage construction workers to turn off engines when not in use. • Forbid idling automobiles at the construction site. • Undertake dust control measures such as using dust suppressants. • Cover construction materials to reduce airborne dust particles. • In dry situations, spray water in the excavated portions being constructed. • Maintain in good condition all the equipment and machinery. • Minimize the use of heavy machinery that generates dust. • Regulate the operation and speed of construction vehicles. • Store materials in covered areas to prevent off-gassing.	Proponent Contractor Workers Drivers	Daily inspection Routine maintenance	275,000

Impact	Proposed mitigation measures	Responsibility	Frequency	Estimated cost (Kshs)
	• Use modern construction equipment compliant with low emission standards. • Undertake regular sprinkling of water on dusty areas and access roads • Using efficient machines with low emission technologies • Ensure compliance with EMCA (Air Quality) Regulations 2024.			
Soil disturbance	• Undertake well-managed excavations and compact loose soils • Install adequate and proper storm water drainage structures • Undertake landscape works upon the completion of construction works • Provide adequate soil erosion control and conservation structures • Stabilize slopes and exposed soil with vegetation as part of restoration • Use construction techniques that minimize soil compaction • Designate specific areas for soil stockpiling and storage. • Cover stockpiled soil to prevent erosion and sediment runoff. • Develop and implement a siltation and erosion control plans. • Monitor and maintain all erosion control measures during construction	Proponent Contractor	Random inspection	135,000
Noise and excessive vibrations	• Erect suitable and adequate noise barriers during construction. • Inform neighbours on any construction works that produce much noise. • Maintain plant equipment in good condition (if present) • Sensitize drivers to construction machinery on effects of noise. • Provide all workers with appropriate noise protective gears. • Use construction equipment/machinery that meet noise emission standards. • Implement regular equipment maintenance to reduce any noisy malfunctions. • Encourage the use of low-noise construction practices and tools. • Implement noise monitoring programs to ensure they remain within the limits. • Promptly address noise complaints from nearby residents. • Install solution-based sound proofing and sound absorption products on the buidling walls • Comply with EMCA (Noise and excessive vibration) Regulations 2009	Proponent Contractor Workers Drivers	Random inspection Routine maintenance	1,750,000
Water resources	• Implement sediment control measures to prevent downstream water pollution • Install sediment and oil separators to remove pollutants from site runoff	Contractor Workers	Daily inspection	75,000

Impact	Proposed mitigation measures	Responsibility	Frequency	Estimated cost (Kshs)
	• Ensure that stormwater management systems are installed and functional • Apply prudent water use management avoiding unnecessary wastage • Undertake water demand analysis. • Recycling of water at the construction phase where possible • Harvest rainwater and use water from the borehole to supplement water from NCWSC			
Energy resources	• Calculate power supply requirements and monitor usage. • Incorporate key elements of energy-efficient design for the apartment • Implement waste reduction to minimize energy associated with waste disposal. • Consider integrating renewable energy sources like solar for lighting & heating. • Use energy efficient equipment during the construction works. • Train construction worker on energy-efficient construction practices.	Contractor Workers	Daily inspection	3,000,000
Oil pollution	• Maintenance of construction vehicles to be carried out at the contractor's yard (off the site) • Develop and implement a spill prevention and response plan. • Train construction personnel on spill containment and clean-up processes. • Ensure proper storages of oils, fuels, and lubricants at the site. • Undertake regular inspections of construction equipment for oil leaks. • Conduct routine maintenance to repair or replace worn-out parts. • Ensure ready availability and supply of spill response equipment. • Implement erosion control measures to prevent oil-contaminated runoff. • Install sediment basins/silt fences to capture sediment-laden runoffs from the site. • Regularly monitor the construction site for signs of oil pollution.	Proponent Contractor	Routine inspection & maintenance	75,000
Public health, occupational health and safety	• Workers to be adequately insured against accidents. • Develop a comprehensive site safety plan that outlines safety procedures • Conduct regular safety meetings and training sessions for construction workers. • Require all construction workers to wear appropriate PPE • Ensure proper training and supervision for workers engaged in elevated work. • Identify and properly manage hazardous materials on the construction site. • Implement electrical safety measures to prevent electrical accidents.	Proponent Contractor Workers	Weekly inspection	30,000,000

Impact	Proposed mitigation measures	Responsibility	Frequency	Estimated cost (Kshs)
	• Establish fire safety procedures (fire extinguishers, emergency exits, etc.) • Develop and communicate emergency response plans. • Implement measures to control noise and dust levels to protect workers. • Train staff/workers on occupational health and safety. • Ensure use of standard construction materials and to the specifications. • Sensitize staff on social/health issues such as drugs. • Post strategically the Occupational Safety and Health Act, 2007 Abstract. • Keep record of emergency service telephone Police, Fire brigade, Ambulance, etc. • Provide first aid kits at strategic places in the site			
Fire safety and preparedness	• Undertake training on firefighting, evacuation, and emergency response • Sensitize the residents on fire risks i.e. conduct regular fire drills • Adapt effective emergency response plans • Maintain/service firefighting machinery regularly • Provide emergency numbers at strategic points • Designate a fire assembly point. • The site will be registered by DOSHS as a workplace. • Implement electrical safety measures to prevent electrical accidents. • Establish fire safety procedures (fire extinguishers, emergency exits, etc.) • Train staff/workers on fire safety. • Post strategically the Occupational Safety and Health Act, 2007 Abstract. • Install firefighting facilities following County's Fire Masters requirements approval. • Develop and adapt a (fire) emergency response plan for the project • Ensure that all firefighting equipment are regularly maintained and serviced. • Provide fire hazard signs such as 'No Smoking' sign	Contractor Proponent Workers	Weekly inspection	300,000
Wastewater	• Provide adequate portable sanitation units for construction workers and ensure regular servicing by licensed waste handlers. • Prevent discharge of any wastewater into open drains or onto the ground surface. • Designate and line an equipment cleaning area with oil interceptors to prevent hydrocarbons entering drains.	Proponent Contractor	Routine inspection & maintenance	2,050,000

Impact	Proposed mitigation measures	Responsibility	Frequency	Estimated cost (Kshs)
	• Direct all wastewater from completed buildings to the NCWSC sewer connection through a properly designed internal drainage system. • Install grease traps at all kitchen outlets before sewer discharge. • Conduct routine inspection and maintenance of the internal sewer network to prevent blockages and leakages. • Ensure that effluent discharge complies with NEMA and NCWSC standards for biochemical oxygen demand (BOD), total suspended solids (TSS), and oil and grease levels. • In case of future utility interruptions, provide temporary effluent storage or diversion options to prevent uncontrolled discharge. • Install adequate, gender-segregated portable toilets or mobile latrine units (ratio: 1 per 20 workers). • Locate sanitation units at least 3-6 m from any drainage channel. • Ensure handwashing facilities (with soap and water) are provided at every sanitation point. • Install grease traps in kitchen drains. • Conduct regular maintenance and inspection of the internal sewer network. • Prohibit discharge of any wastewater—domestic, chemical, or process—onto open ground, or storm drains. • Designate an impermeable, bunded cleaning area for equipment to avoid seepage of cement-laden water. • Store hazardous materials (paints, solvents, lubricants) on impermeable floors within bunded zones, away from drainage lines. • Provide spill containment kits and train workers on spill response procedures. • Assign an Environmental, Health and Safety (EHS) Officer to supervise sanitation management and maintain daily records of facility condition and cleaning frequency. • Keep disposal manifests and receipts from licensed wastewater handlers. • Conduct monthly site inspections jointly with the Environmental Consultant and Contractor representative. • Conduct induction sessions for all workers on hygiene, sanitation practices, and pollution prevention.			

Impact	Proposed mitigation measures	Responsibility	Frequency	Estimated cost (Kshs)
	• Display visible posters promoting safe hygiene near sanitation areas (in English and Kiswahili)..			
Solid waste	• Develop a comprehensive waste management plan and procedures. • Set up designated areas on the site for sorting solid wastes. • Contract a NEMA licensed waste management firm for disposal. • Provide containers for construction waste segregation. • Regularly empty and clean waste containers to prevent overflows and littering. • Safely store and label hazardous construction materials. • Encourage the reuse of materials that minimize waste generation. • Promote on-site crushing and recycling of concrete and masonry waste. • Regularly monitor waste management practices to ensure compliance. • Designate an area for temporarily holding waste materials • Segregation of wastes at the source for ease of handling and disposal • Regular inspection and maintenance of the drainage system to avoid blockage • Dispose all solid wastes in accordance with the EMCA (Waste Management) Regulations, 2024.	Proponent Contractor Workers	Weekly inspection	67,000
Visual Intrusion / Landscape Alteration	• Use site hoarding, • maintain site cleanliness, • preserve existing vegetation, and • undertake progressive landscaping.	Contractor, Proponent.	Routine inspection.	2,000,000.
Security and social impacts	• Establish a secure perimeter around the construction site. • Install lightings and surveillance cameras at key points around the construction site. • Consider using security containers or storage units. • Construction work timings shall only be as per NEMA licensing conditions • Develop and communicate an emergency response plan. • Install & display signage indicating the presence of surveillance cameras. • Ensure compliance with local security regulations and permit requirements. • Ensure security staff are trained in emergency response procedures. • Implement access control systems to allow only authorized people to the site • Mark tools and equipment with identification to discourage theft.	Contractor Proponent	Daily inspection	2,000,000

Impact	Proposed mitigation measures	Responsibility	Frequency	Estimated cost (Kshs)
	• Require all workers and visitors to sign in and wear identification badges. • Secure construction equipment/materials to prevent theft or vandalism. • Store construction materials in locked and secure areas to prevent theft. • Use motion-activated lights for added security during night-time hours. • Use signage to communicate restricted access to unauthorized personnel. • Hire security guards to monitor movement in and out for both day and night time			
Traffic management	• Prepare and implement a Traffic Management Plan (TMP) detailing routing, delivery schedules, speed limits, driver discipline, and accident response procedures. • Schedule heavy deliveries and haulage operations during off-peak hours (09:00–16:00) to minimize disruption to local traffic. • Designate approved haulage routes to avoiding minor residential roads and schools. • Stagger material deliveries to prevent clustering of trucks or idling near the site entrance. • Construct temporary on-site loading and unloading bays to prevent vehicles from parking or queuing on the public road. • Deploy trained flagmen/marshals to guide trucks entering and exiting the site safely. • Maintain a wheel-wash bay at the exit to prevent mud and debris deposition on Ndwaru Road. • Provide adequate turning radii and visibility splays to ensure safe access and egress. • Install temporary traffic signage and speed restriction signs (max. 20 km/h) near the construction gate. • Provide temporary traffic cones, barriers, and reflective delineators to separate construction and public traffic. • Install rumble strips and flashing beacons near the site entrance to slow vehicles. • Enforce routine vehicle inspections to ensure all trucks and plant equipment are roadworthy (brakes, tyres, lights). • Prohibit unnecessary idling; ensure engines are turned off when stationary. • Enforce strict speed limits and no-overtaking rules near the site entrance.	Proponent Contractor Drivers	Daily inspection	1,500,000

Impact	Proposed mitigation measures	Responsibility	Frequency	Estimated cost (Kshs)
	• Maintain a logbook of all construction vehicle movements and deliveries. • Notify local residents, businesses, and institutions in advance of periods of heavy vehicle movement. • Establish a traffic grievance mechanism (community hotline and notice board) to report safety incidents or disruptions. • Maintain clear pedestrian access corridors along Ndwaru Road throughout construction. • Provide temporary walkways and signage for pedestrians and cyclists to safely bypass construction zones. • Conduct road surface maintenance and regular sweeping to minimize dust and loose debris.			
Conflict with neighbours	• Establish a grievance redress mechanism that is easy to access for stakeholders (workers & community members/general public) to report their concerns • Ensure that the GRM incorporates existing local dispute-resolution mechanisms • Sensitize the community and workers on the GRM and encourage them to make use of it • Ensure the GRM is functional, culturally appropriate, and accessible to all stakeholders • Ensure GRM provides for confidential reporting of particularly sensitive social aspects such as GBV as well as anonymity for those who wish to report anonymously. • Continuous communication between the developers and the stakeholders on the progress of the project and its effects	Proponent	Continuous communication	45,000
Social pathologies, including HIV/AIDS	• The contractor will undertake sensitization of the HIV /AIDs AND STD awareness e.g. by use of posters etc.; • - Encourage workers to go for HIV voluntary counselling, testing and referral services; • - Contractor to institute HIV/AIDS awareness program and implemented as part of the Health and Safety Management Plan targeting both workers and the local community; • - The Contractor shall institute HIV/AIDS awareness and prevention campaign amongst his workers for the duration of the contract.	Contractor	Throughout the construction period	250,000

Impact	Proposed mitigation measures	Responsibility	Frequency	Estimated cost (Kshs)
Gender-Based Violence-SEA and SH	• Creating awareness to workers on the need to refrain from SEA/SH incidences • Mandatory awareness creation for workers on required lawful conduct in the community and legal consequences for failure to comply with laws • Mandatory signing and implementation of code of conduct for the workers • Creation of partnership or liaison with specialized actors in GBV who can respond appropriately in case of any incidence (provide contacts to community) • Ensure a survivor centered approach in responding to SEA/SH incidences i.e., decision to report lies with the survivor or the guardian in case of a minor. • Contractor to provide established referral pathway including police station with a gender desk for handling SEA/SH cases and also free toll numbers/hot lines for reporting GBV • The contractor will also facilitate any survivor who decides to take legal action by referring them to the nearest established legal support facility that offers legal support to GBV survivors. • Ensure Confidential reporting and responding to SEA/SH cases if reported; • Encourage reporting of all SEA/SH incidences to the chief or the grievance redress committee members	Contractor	Throughout the construction period	50,000
Risk of Exclusion of Vulnerable Groups i.e. PLWDs elderly, poor, widows etc.	• Conduct engagement sessions with the identified vulnerable groups through focus group discussions to ensure that; • The vulnerable groups are aware of the project and its impacts • The vulnerable groups can benefit from the project • Provide support to their (vulnerable groups) participation arrangements in the project • Commit to open and transparent communication and engagement from the beginning and have a considered approach in place • Regularly monitor performance in engagement • Ensure the vulnerable people are represented in the community-led committees i.e. Labour Recruitment Committee, CSR committee • Implement affirmative action in employment • Implement the existing grievance redress mechanism	Proponent	Continuous communication	Company Stakeholder Engagement Budget
Cultural heritage	• Prioritizing the preservation of the existing trees as possible.	Proponent, Contractor	Throughout the construction period	73,500

Impact	Proposed mitigation measures	Responsibility	Frequency	Estimated cost (Kshs)
	• Provisions for managing chance finds are in place and included in contracts, as appropriate. • Implement Chance Finds Procedures.			
Cumulative Impacts	• Engage County engineers on utility capacity, • synchronize drainage works with nearby estates, and • participate in joint waste collection contracts.	Proponent / County Liaison.	Quarterly review	150,000

11.3 ESMP for the operation phase

Table 11-2: ESMP during occupation phase

Impact	Proposed mitigation measures	Responsibility	Frequency	Estimated cost (Kshs)
Biodiversity	• Utilize native plant species in landscaping to promote biodiversity • Implement water conservation measures to minimize water usage and protect aquatic ecosystems. • Use outdoor lighting fixtures that minimize light pollution and disruption to nocturnal wildlife. • Implement waste management practices to minimize waste generation. • Engage with residents and community members to raise awareness about biodiversity.	Proponent Occupants	Periodic inspection	150,000
Stormwater and drainage alteration	• Maintain rooftop rainwater harvesting and storage tanks to intercept runoff. • Monitor runoff quality into the public stormwater drainage channell annually (turbidity, sediment load). • Landscape with native species that stabilise soils and enhance infiltration.	Proponent Occupants	Periodic inspection	50,000
Invasive species	• Use native plant species in landscaping to reduce the risk of introducing invasive species • Implement invasive species monitoring and management programs • Incorporate green infrastructure practices, such as rain gardens and vegetated swales • Educate residents about the risks associated with invasive species.	Proponent Occupants	Periodic inspection	50,000

Impact	Proposed mitigation measures	Responsibility	Frequency	Estimated cost (Kshs)
	• Encourage residents to use native plants in their gardens and landscapes. • Implement regular monitoring programs to assess the presence of invasive species.			
Carbon footprints	• Enhance insulation, use energy-efficient windows, and seal air leaks to reduce heating and cooling loads. • Install ENERGY STAR-rated appliances and LED lighting to lower electricity consumption. • Install photovoltaic (PV) solar panels on rooftops to generate renewable electricity for the building. • Use solar thermal systems to heat water for domestic use, reducing the need for fossil fuel-based water heaters.	Proponent Occupants	Periodic inspection	1,150,000
E-waste	• Encourage residents to maintain and repair electronic appliances and devices instead of replacing them when minor issues arise. • Provide information to residents about upgrade options and opportunities for extending the lifespan of electronic products through software updates or component replacement. • Establish community exchange programs where residents can donate or exchange their unwanted electronic devices with others, promoting reuse and reducing e-waste. • Partner with local charities or organizations that accept used electronic devices for refurbishment and redistribution to those in need. • Install convenient drop-off locations for residents to dispose of their electronic waste safely and responsibly. • Encourage residents to participate in manufacturer take-back programs, where electronic manufacturers accept their products for recycling or proper disposal at the end of their lifecycle.	Proponent Occupants	Periodic inspection	85,000
Air pollution	• Undertake regular cleaning of dust prone areas such as driveways and corridors • Design and construct apartments with proper ventilation systems. • Use low-VOC paints, finishes, and furnishings to minimize indoor air pollution. • Implement smoking restrictions or designate smoking areas. • Offer educational programs and resources to residents on indoor air quality. • Encourage residents to engage restoration environmental restoration activities.	Proponent Occupants	Routine maintenance	100,000

Impact	Proposed mitigation measures	Responsibility	Frequency	Estimated cost (Kshs)
	• Comply with EMCA (Air Quality regulations) 2024			
Noise and vibration Pollution	• Undertake annual noise monitoring to adhere to acceptable standards. • Sensitize occupants on minimal permissible noise levels • Encourage residents to report noise disturbances to building management. • Promote the use of carpeting to reduce impact noise between units. • Recommend residents choose quieter appliances (washing machines, etc.) • Provide tips on noise reduction practices within apartments. • Comply with EMCA (Noise and excessive vibration pollution control) Regulations 2009	Proponent Occupants	Periodic inspection	65,000
Changes in hydrology/ Impended drainage	• Promote sustainable green spaces that minimize the need for irrigation. • Ensure proper management of wastes to prevent storm-water contamination • Ensure no wastewater is discharged into the environment, not unless it is in compliance with the Environmental Management and Co-ordination (Water Quality) Regulations, 2024 • Foster a sense of community responsibility for storm-water management. • Ensure proper maintenance of drainage structures • Encourage residents to maintain their vehicles to prevent oil/chemical leaks. • Undertake regular inspection and maintenance of water harvesting facilities • Collect excess storm water into underground tanks for reuse e.g. car washing	Proponent	Routine inspection & maintenance	125,000
Water resources	• Install water efficient appliances • Encourage residents to use low-flow fixtures & promptly repair leaks. • Implement greywater recycling systems where feasible for reuse. • Sensitize occupants to reduce water wastage e.g. by reusing where applicable • Harvest rainwater and use water from the borehole to supplement water from NCWSC • Undertake regular maintenance of all water components	Proponent Occupants	Periodic Inspection Routine maintenance	1,500,000
Energy resources	• Install occupancy sensors and daylight harvesting systems to automatically control lighting based on occupancy and natural light levels. • Use cool roofing materials and reflective surfaces to reduce heat absorption and lower cooling energy demand.	Proponent Occupants	Periodic inspection Routine maintenance	1,500,000

Impact	Proposed mitigation measures	Responsibility	Frequency	Estimated cost (Kshs)
	• Consider installing sub-metering systems that allow residents to monitor their energy consumption. • Insulate hot water pipes and consider centralized or tank-less water heating systems for improved energy efficiency. • Conduct energy audits or assessments to identify areas where energy savings can be achieved within individual units and common areas. • Foster a sense of community responsibility for energy conservation by organizing energy-saving events and initiatives among residents. • Switch off electrical appliances when not in use. • Use energy efficient electrical appliances and fixtures such as LED bulbs and Energy Star appliances to ensure that the residential project meets stringent energy efficiency and sustainability standards. • Use of solar energy as alternative energy supply for the project			
Oil pollution	• Implement strict protocols for oil storage in the apartments. • Provide convenient and secure disposal options for used oil. • Maintain a supply of spill clean-up materials and equipment. • Promote awareness among residents about the environmental impacts of oil pollution • Comply with all NEMA guidelines and regulations related to oil storage and handling. • Provide oil interceptors from car parks during landscaping works.	Proponent Occupants	Periodic inspection Routine maintenance	75,000
Public health, occupational health and safety	• Regularly inspect and maintain building systems (plumbing, electrical, etc.). • Address maintenance issues promptly to prevent accidents. • Ensure that fire safety equipment is in working order. • Conduct fire drills and educate residents about evacuation procedures. • Maintain proper ventilation systems to ensure good indoor air quality. • Educate residents about personal safety practices. • Provide convenient waste disposal facilities for residents. • Regularly test/maintain the water supply to ensure it meets quality standards. • Address plumbing issues promptly to prevent waterborne contaminants. • Sensitize residents on environmental management	Proponent Occupants	Routine inspection	75,000

Impact	Proposed mitigation measures	Responsibility	Frequency	Estimated cost (Kshs)
	• Provide fully equipped First Aid Kits & train staff on its use			
Fire safety and preparedness	• Regularly inspect and maintain building electrical systems. • Ensure that fire safety equipment is in working order and periodically serviced. • Ensure the fire water reserve tank is always filled with water • Conduct fire drills and educate residents about evacuation procedures. • Provide fully equipped First Aid Kits & train staff on its use • Provide escape routes/emergency exits in the buildings • Provide emergency numbers at strategic points • Carry out the statutory annual fire safety audit	Proponent Occupants	Routine inspection	90,000
Wastewater	• Engage a certified wastewater treatment operator for plant management. • Conduct quarterly internal audits of plant performance and record findings. • Maintain clear separation between stormwater drainage and wastewater collection systems to prevent cross-contamination. • Sample and test treated effluent monthly in an accredited laboratory for key parameters (BOD, COD, TSS, pH, nitrates, phosphates, and E. coli). • Maintain an Effluent Monitoring Register with date, parameter, results, and corrective action for exceedances. • Submit quarterly compliance reports to NEMA and the Water Resources Authority (WRA), as per licence conditions. • Dewater sludge in a closed drying bed or geobag system; prevent overflow or leakage. • Dispose of dried sludge at a licensed site (e.g., Dandora) or via an authorized NEMA handler; retain manifests. • Reuse treated effluent for non-contact applications: • Landscape irrigation, lawn maintenance, or pavement washing. • Toilet flushing (through dual plumbing systems). • Install backflow preventers to prevent contamination of potable water systems. • Monitor irrigation schedules to prevent overwatering and runoff. • Design aeration zones and sludge storage with proper ventilation and covers to minimize odour.	Proponent Occupants	Periodic inspection Routine maintenance	1,550,000

Impact	Proposed mitigation measures	Responsibility	Frequency	Estimated cost (Kshs)
	• Plant vegetative screens (e.g., vetiver grass, papyrus) around the treatment plant to enhance aesthetics and act as biofilters. • Regularly remove scum, grease, and debris from treatment chambers. • Develop and implement an Operation and Maintenance (O&M) Manual and Emergency Response Plan (ERP) for system failure, pump malfunction, or overflow incidents. • Maintain a full inventory of spare parts (pumps, blowers, filters) and emergency power backup (generator). • Record all repairs, inspections, and servicing in a logbook. • Assign a Facility Environmental Manager responsible for compliance monitoring, reporting, and liaison with NEMA. • Conduct refresher training for operators and management staff on plant operation, safety, and reporting procedures. • Sensitize residents on responsible wastewater generation practices (e.g., avoid dumping grease, oil, or solids into sinks/toilets). .			
Solid wastes	• Educate residents about the proper handling and disposal of hazardous materials. • Encourage residents to reduce waste generation through practices like bulk purchasing. • Organize community clean-up events to promote responsible waste disposal. • Establish a regular waste collection schedule to prevent overflowing bins and littering. • Undertake regular inspection and maintenance of the drainage system to avoid blockage • Dispose all wastes in accordance with the Sustainable Waste Management Act 2022 and EMCA (Waste Management) Regulations, 2024.	Proponent Contractor Workers	Weekly inspection	83,000
Security and social impacts	• Develop evacuation plans for emergencies educate residents on the same. • Ensure that outdoor areas, pathways, and parking lots are well-lit. • Establish community watch programs for residents (*Nyumba Kumi initiative*). • Implement access control systems for residents and visitors. • Install emergency call boxes to allow residents to request assistance quickly. • Maintain landscaping to eliminate potential hiding spots for intruders.	Proponent Occupants	Periodic inspection Routine maintenance	550,000

Impact	Proposed mitigation measures	Responsibility	Frequency	Estimated cost (Kshs)
	• Maintain visitor logs or guest registration systems to track visitors. • Engage services of security guards to man the premises day and night • Install CCTV cameras at strategic points for enhanced security. • Place alarms around the site and establishing emergency response procedures • Place hotline numbers on strategic places • Sensitize occupants on security precautions			
Traffic management	• Implement a one-way internal circulation system with clearly marked entry and exit routes to reduce conflicts. • Provide directional markings, arrows, and signage to guide resident and visitor vehicles. • Incorporate turning lanes within the estate access to facilitate safe movement of vehicles. • Provide adequate on-site parking in line with Nairobi County standards and the TIA recommendations (≈0.45 bays per unit), including visitor and service bays. • Prohibit on-street parking along Ndwaru Road and enforce access control through estate security personnel. • Designate separate loading/unloading bays for service and emergency vehicles. • Construct 2.0-metre-wide paved walkways along the frontage and within the estate to ensure safe pedestrian movement. • Install raised zebra crossings, rumble strips, and reflective speed humps at high-traffic points. • Integrate bicycle racks and safe storage areas within the parking court to promote cycling. • Enforce an internal speed limit of 10 km/h through signage and speed humps. • Install reflective road markings, lane identifiers, and wayfinding signs across internal driveways. • Provide adequate lighting along driveways and walkways for nighttime visibility. • Maintain street signage and road furniture to ensure visibility and prevent driver confusion. • Designate boda boda and taxi drop-off bays near the entrance to discourage roadside parking.	Proponent	Routine maintenance	220,000

Impact	Proposed mitigation measures	Responsibility	Frequency	Estimated cost (Kshs)
	• Ensure clear pedestrian connectivity from the estate to nearby Naivasha Road matatu stops. • Coordinate with KURA and the county government to implement the TIA's recommended intersection upgrades at the Naivasha–Ndwaru junction, including lane re-channelization, signage improvement, and signal optimization to improve Level of Service during peak hours. • Conduct annual traffic and parking audits during operation to assess vehicle flow, occupancy rates, and safety performance. • Review internal layouts and signage periodically to incorporate user feedback and evolving traffic trendc.			
Complaints from Tenants and community members	• Sensitize the tenants on the GRM and encourage them to make use of it • Ensure the community and tenants' GRMs are functional and accessible to all stakeholders • Ensure GRM provides for confidential reporting of particularly sensitive social aspects as well as anonymity for those who wish to report anonymously. • Provide communication channels between the development's administration, service providers and the tenants	Proponent	Continuous communication	45,000
Visual Intrusion / Aesthetics	• Maintain façade design consistency, • repainting schedules, and • green belt upkeep.	Property Manager / Residents Association	Annual inspection	200,000
Climate Change & GHG Risk	• Maintain PV systems; • track energy/water use; • implement 3-yearly resilience review; • maintain green infrastructure.	Proponent / Estate Manager	Annual	1,150,000
Cumulative Infrastructure Impacts	• Liaise with County on shared systems; • monitor NCWSC/solid waste capacity; • submit periodic utility reports.	Proponent / Estate Manager	Annual review	150,000
Social Cohesion & Integration	• Establish community forums, • Nyumba Kumi engagement, and • communal recreation activities.	Proponent / Residents Association	Quarterly	100,000

Impact	Proposed mitigation measures	Responsibility	Frequency	Estimated cost (Kshs)
Exclusion of Vulnerable Groups	• Maintain accessible facilities (ramps, lifts, signage), • ensure representation in resident committee, • conduct annual inclusion audit	Estate Manager / E&S Officer	Annual audit	75,000

11.4 ESMP for the decommissioning phase

Note: A decommissioning and rehabilitation plan will be undertaken and submitted to NEMA at least three months prior to decommissioning and in line with the Environmental Management and Coordination Act Cap 387.

Table 11-3: ESMP during Decommissioning phase

Impact	Proposed mitigation measures	Responsibility	Frequency	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 daytime only • Comply with EMCA (Noise and excessive vibration pollution control) Regulations 2009	Proponent Contractor NEMA inspectors	Daily inspection	2,000,000
Air pollution	• Dust suppression with water sprays on dusty areas • Careful screening of construction site to contain and arrest construction related dust • Ensure demolition equipment are well maintained to reduce exhaust emission	Proponent Contractor NEMA inspectors	Daily inspection Routine maintenance	275,000
Noise and excessive vibrations	• Demolition activities to be restricted to daytime (8am to 5pm) • Use of Suppressors on noisy equipment during demolitions • Workers in the vicinity or involved in high level noise to wear PPEs. • Comply with EMCA (Noise and excessive vibration pollution control) Regulations 2009	Proponent Contractor Workers NEMA inspectors	Routine inspection & maintenance	157,000
Health and safety of workers	• All workers to wear PPEs e.g. helmets, safety boots and ear muffs • All workers be sensitized before demolition begins, on how to control accidents. • Accordingly, adherence to safety procedures will be enforced.	Contractor Workers Proponent	Daily monitoring	234,000

Impact	Proposed mitigation measures	Responsibility	Frequency	Estimated Cost (KShs)
	• All workers will be adequately insured against accidents.	NEMA inspectors		
Solid and liquid waste	• Ensure proper solid waste disposal and collection facilities • Refuse collection vehicles will be covered to prevent scatter of wastes by the wind. • Demolition wastes to be collected by a licensed operator to avoid illegal final dumping. • All persons involved in refuse collection shall be in full protective attire. • Dismantling all fixtures and equipment of the internal sewer system	Contractor Proponent NEMA inspectors	Daily monitoring	528,000
Re-vegetation and comprehensive landscaping	• Put in place an appropriate re-vegetation program to restore the site • During the re-vegetation period, ensure appropriate surface water runoff controls; • Monitoring and inspection of the area for indications of erosion will be conducted • Signs restricting access will be posted to minimize disturbance to newly-vegetated areas;	Contractor Proponent	Random inspection & monitoring	249,000
Conflict with neighbours & Workers	• Sensitize the workers on the GRM and encourage them to make use of it • Ensure the GRM is functional, culturally appropriate, and accessible to all stakeholders • Continuous communication between the developers and the stakeholders on the progress of the decommissioning works and its effects	Proponent	Continuous communication	45,000
Oil Pollution	• Designate refueling zone with spill trays; • train staff in spill control; • remove contaminated soils properly	Contractor / NEMA Inspector	Routine inspection.	80,000
Visual Restoration / Site Rehabilitation	• Restore landscape contours; • plant indigenous vegetation; • ensure final grading consistent with surroundings	Contractor / Proponent	Final inspection	250,000
Cumulative Waste Disposal Pressure	• Coordinate debris disposal with licensed County landfill or recycler; • avoid illegal dumping	Contractor / County Environment Department	Continuous during demolition	120,000

11.5 Summary of pre-mitigation significance during construction phase

The construction phase is associated with temporary environmental and social impacts mainly related to site clearance, excavation, material transport, and the influx of labour. The table below summarises the pre-mitigation and residual significance levels based on the impact evaluation and Environmental and Social Management Plan (ESMP).

All significant negative impacts can be effectively mitigated through the measures provided under the Construction Phase ESMP (Table 11-1).

Table 11-4: Pre-Mitigation and Residual Impact Significance – Construction Phase

Impact	Pre-Mitigation Significance	Residual Impact Significance (Post-Mitigation)
Air pollution (dust, exhaust)	Moderate negative	Minor negative
Soil disturbance and erosion	Moderate negative	Minor negative
Noise and vibration	Moderate negative	Minor negative
Alteration of Drainage and Stormwater Patterns	Moderate negative	Minor – low negative
Changes in hydrology and drainage	Moderate negative	Minor negative
Water resources (use and pollution)	Moderate negative	Minor negative
Energy consumption and GHG emissions	Moderate negative	Minor negative
Oil leaks and spills	Minor – moderate negative	Minor negative
Occupational and public health and safety	Moderate negative	Minor negative
Fire safety and preparedness	Minor negative	Minor negative
Wastewater generation	Moderate negative	Minor negative
Solid waste management	Moderate negative	Minor negative
Security and social impacts	Moderate negative	Minor negative
Traffic and movement	Moderate negative	Minor negative
Gender-Based Violence / SEA–SH risks	Moderate negative	Negligible – low negative
Risk of exclusion of vulnerable groups	Minor negative	Negligible
Cultural heritage / chance finds	Minor negative	Negligible
Visual intrusion / landscape alteration	Minor negative	Negligible
Cumulative infrastructure impact	Moderate negative	Minor negative

11.5.1 Key Mitigation and Enhancement Measures

To address the more significant impacts during the construction phase, the Proponent and the Contractor shall:

- ✓ Comply with the EMCA (Air Quality) Regulations 2024 and implement site-specific dust suppression measures.
- ✓ Undertake managed excavation and effective drainage control to minimize erosion and runoff.
- ✓ Restrict noisy activities to daytime hours and ensure compliance with EMCA (Noise and Excessive Vibration) Regulations 2009.
- ✓ Ensure that an EIA assessment is done for proposed borehole and obtain NEMA land WRA abstraction licence.
- ✓ Adopt low-carbon construction materials, local sourcing, and energy-efficient practices to reduce GHG emissions.
- ✓ Enforce occupational health and safety protocols under OSHA 2007; ensure full PPE use and daily toolbox talks.
- ✓ Implement site security measures, worker identification, and lighting systems to protect both workers and the community.
- ✓ Operationalize a Grievance Redress Mechanism (GRM) and ensure confidential reporting channels for SEA/SH cases.
- ✓ Apply the Chance Finds Procedure for cultural or archaeological items.
- ✓ Apply inclusive labour practices with quotas for women, youth, and persons with disabilities.
- ✓ Coordinate drainage and utility works with Nairobi City County to mitigate cumulative impacts.

11.5.2 Conclusion

All adverse impacts are temporary and have been mitigated to acceptable levels. Residual effects are assessed as minor or negligible, and the project is considered environmentally and socially acceptable for implementation.

11.6 Summary of pre-mitigation significance during operational phase

During operation, the project's impacts relate to increased occupancy, waste generation, water and energy use, and community interactions. The table below summarizes the significance of potential impacts prior to mitigation and after implementing the measures defined under the Operation Phase ESMP (Table 11-2).

Table 11-5: Pre-Mitigation and Residual Impact Significance – Operation Phase

Impact	Pre-Mitigation Significance	Residual Impact Significance (Post-Mitigation)
Air pollution (indoor / ambient)	Moderate – minor negative	Minor negative
Noise and vibration	Minor negative	Minor negative
Changes in hydrology and drainage	Moderate negative	Minor negative
Water resources (supply and demand)	Moderate negative	Minor negative
Energy efficiency / GHG emissions	Moderate negative	Minor negative
Biodiversity management	Moderate negative	Negligible
Oil pollution (parking and service areas)	Moderate negative	Minor negative
Wastewater and sanitation	Moderate negative	Minor negative
Solid waste management	Moderate negative	Minor negative
Fire safety and preparedness	Minor negative	Negligible
Public and occupational health and safety	Minor negative	Negligible
Security and social impacts	Minor negative	Negligible – positive
Traffic management and parking	Minor negative	Minor negative
Visual aesthetics / urban character	Minor negative	Negligible
Inclusion of vulnerable groups (PWDs, elderly, women)	Minor negative	Negligible
Social cohesion and integration	Minor negative	Negligible – positive
Cumulative infrastructure impact	Moderate negative	Minor negative
Community grievance and engagement	Minor negative	Negligible – positive

11.6.1 Key Mitigation and Enhancement Measures

To manage operational-phase risks, the Proponent and Estate Management will:

- ✓ Comply with EMCA (Air Quality, Noise, Water Quality, and Waste Management) Regulations 2024.
- ✓ Maintain the wastewater treatment system connection to NWSC line and ensure periodic effluent quality monitoring.
- ✓ Implement rainwater harvesting, low-flow fixtures, and greywater reuse to reduce water demand.
- ✓ Maintain solar PV systems and energy-efficient lighting to reduce operational GHG emissions.

- ✓ Conduct annual safety and fire drills; ensure hydrants and extinguishers are functional.
- ✓ Enforce waste segregation and collection by NEMA-licensed transporters; promote recycling.
- ✓ Maintain landscaping vegetation using indigenous plants.
- ✓ Operate a 24-hour security system and promote Nyumba Kumi community safety initiatives.
- ✓ Maintain the Grievance Redress Mechanism for residents and neighbours, ensuring timely resolution and transparency.
- ✓ Uphold inclusivity by ensuring accessibility (ramps, signage) and representation of vulnerable groups in estate management.
- ✓ Conduct periodic climate resilience reviews to adjust drainage and green-infrastructure performance.
- ✓ Coordinate with Nairobi City County and NCWSC to manage cumulative infrastructure and service demands.

11.6.2 Conclusion

Implementation of the above measures ensures that the project's residual operational impacts are minor or negligible, while positive impacts; such as affordable housing, employment, improved security, and enhanced urban aesthetics, remain significant and sustainable. The project complies with EIB ESS 3, ESS 5, ESS 7, and ESS 9, and contributes positively to Nairobi's climate-resilient urban housing goals.

12 CHAPTER 11: CONCLUSION AND RECOMMENDATIONS

12.1 Conclusion

The ESIA for the proposed IHS Karen End Green Affordable Housing Project concludes that the project is environmentally and socially acceptable, contingent upon the full implementation of the proposed mitigation and monitoring measures.

The project is anticipated to yield substantial positive impacts, including:

- ✓ Increasing the supply of affordable housing in Nairobi City County, aligning with the National Housing Policy and Sustainable Development Goal 11;
- ✓ Generating employment and income-generating opportunities during both construction and operation;
- ✓ Stimulating local supply chains for construction materials, services, and utilities; and
- ✓ Enhancing urban safety, security, and socio-economic development in the Riruta-Satellite area.

Identified potential negative impacts; such as soil disturbance, air and noise pollution, increased traffic, strain on utilities, and social risks including GBV and SEA/SH; are assessed to be localized, temporary, and reversible.

Comprehensive mitigation measures and monitoring frameworks, detailed in the Environmental and Social Management Plan, have been established to ensure compliance with relevant regulatory and performance standards, including:

- ✓ The Environmental Management and Coordination Act (Cap 387) and its subsidiary regulations (2024);
- ✓ The Occupational Safety and Health Act (2007);
- ✓ The Water Act (2016) and Water Resources Authority (WRA) guidelines (borehole drilling);
- ✓ The Physical and Land Use Planning Act (2019); and
- ✓ The European Investment Bank (EIB) Environmental and Social Standards (ESS 1–10) and the EIB Climate Bank Roadmap (2021–2025).

The proponent, IHS Kenya Ltd, has demonstrated a commitment to sustainable construction, circular waste management, climate adaptation, and social inclusivity. Provided all ESMP measures are implemented as planned, residual impacts are expected to be minor to negligible, with significant long-term socio-economic benefits.

In conclusion, the project is considered environmentally and socially viable, contributing directly to sustainable urban development, affordable housing delivery, and Kenya's climate-resilient growth agenda.

12.2 Recommendations

To ensure effective implementation, compliance, and sustainability, the following recommendations are made:

ESMP Implementation and Compliance

The Proponent shall fully integrate all mitigation, monitoring, and management measures from the ESMP into project tender documents, contracts, and supervision schedules to ensure enforceability. The project shall comply with all national and county regulations, including EMCA, OSHA, and NEMA licence conditions. All requisite permits must be obtained prior to construction commencement.

Environmental and Social Monitoring

A qualified Environmental, Health, and Safety Officer and a Community Liaison Officer (CLO) shall be designated to oversee daily supervision, manage grievances, and report to NEMA and EIB. Quarterly environmental and social performance audits shall be conducted throughout the project lifecycle.

Drainage and Stormwater Management

Given the urban, gently sloping nature of the Riruta site and its proximity to Ndwaru Road, there is no active riparian or natural stream corridor within the project boundaries. Stormwater will therefore be managed through engineered infrastructure integrated into the project design.

Occupational Health and Safety

All contractors shall adhere to the Occupational Safety and Health Act (2007) and EIB ESS 9. This includes providing adequate Personal Protective Equipment (PPE), emergency response training, first-aid facilities, and accident insurance for all workers.

Social Safeguards and Inclusion

The Gender-Based Violence (GBV) and Sexual Exploitation and Abuse/Sexual Harassment (SEA/SH) prevention plan shall be implemented, including training, Codes of Conduct, and confidential reporting. Inclusive hiring policies and accessible facility design shall be maintained per EIB ESS 7.

Climate Change and Resource Efficiency

Energy-efficient lighting, solar water heating, and rainwater harvesting systems shall be adopted in line with the EIB Climate Bank Roadmap. Periodic reviews of climate resilience and GHG reduction performance shall be conducted.

Community Engagement and Grievance Redress

A transparent and accessible Grievance Redress Mechanism (GRM) shall be maintained for workers and community members. Regular engagement with local stakeholders is essential to address concerns and sustain project support.

Site Restoration and Decommissioning

Post-construction, the site shall be rehabilitated through landscaping, revegetation with native species, and drainage works to restore ecological balance. A detailed Decommissioning Plan must be submitted to NEMA prior to project closure.

Final Recommendation

Based on the ESIA findings, Centric Africa Limited identifies no environmental or social impediment to the project's approval, provided all committed mitigation and monitoring measures are implemented as specified. The project is therefore recommended for a NEMA licence and EIB financing approval, as it aligns with Kenya's Vision 2030, the Nairobi County Integrated Development Plan, and international best practices for sustainable development.

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ANNEXURE

Annex 1: Proponent's Certificate of Registration & KRA Pin

Annex 2: Firm of Experts NEMA License

Annex 3: Land Ownership Document

Annex 4: Photographic Presentation

Annex 5: Change of Use Approval

Annex 6: Proposed Site Plans

Annex 7: Bill of Quantities

Annex 8: Water Analysis Test Report

Annex 9: Baseline Ambient Air Quality, Noise Levels & Vibrations Measurement report

Annex 10: Public Participation Records

- Annex 10-A: Meeting Minutes & Attendance Lists
- Annex 10-B: Questionnaires
- Annex 10-C: Community Profile Checklist
- Annex 10-D: FGD Records

Annex 11: MEP Survey Report

Annex 12: GHG emissions calculations

Annex 13: Traffic Impact Impact Assessment Report

Annex 14: IHS GRM

Annex 15: NEMA-Approved ESIA ToR

Annex 1: Proponent's Certificate of Registration & KRA Pin



No. **PVT-PQ1ABYVW**

CERTIFICATE OF INCORPORATION

I hereby **CERTIFY** that,

IHS AZIZI DEVELOPMENT LIMITED

a **PRIVATE LIMITED COMPANY** is on this date 25 July, 2025 Incorporated under the Companies Act, 2015.

Registrar Of Companies

This is a system generated certificate

Annex 2: Firm of Experts NEMA License

EAE 23064550

FORM 7 (r.15(2))

NATIONAL ENVIRONMENT MANAGEMENT AUTHORITY(NEMA)

THE ENVIRONMENTAL MANAGEMENT AND CO-ORDINATION ACT

ENVIRONMENTAL IMPACT ASSESSMENT/AUDIT (EIA/EA) PRACTICING LICENSE

License No : NEMA/EIA/ERPL/23521

Application Reference No: NEMA/EIA/EL/30140

M/S **Centric Africa Limited**
(individual or firm) of address
P.O. Box 102081 - 00101 Nairobi

is licensed to practice in the capacity of a (Lead Expert/Associate Expert/Firm of Experts) **Firm of Experts** registration number **7112**

in accordance with the provision of the Environmental Management and Coordination Act Cap 387.

Issued Date: **4/9/2025** Expiry Date: **12/31/2025**

Signature.....

(Seal)
Director General
The National Environment Management Authority

P.T.O.

ISO 9001 : 2015 Certified

Annex 3: Land Ownership Document

Form LRA 21 (r.31(2))

REPUBLIC OF KENYA

THE LAND REGISTRATION ACT

THE LAND REGISTRATION (GENERAL) REGULATIONS, 2017

Serial Number 0000881

REPUBLIC OF KENYA

Certificate of Title

Title No. NAIROBI/BLOCK66/6004

Area 1.17 HA (APPROXIMATE)

This is to certify that

KANARE LIMITED 52 - PVT-AAAGPO7 AND VIRGINIAH WANJIKU KAMUYU 48 ID NO. 32148302

is (are) now registered as the absolute proprietor(s) of the land comprised in the above-mentioned title, subject to the entries in the register relating to the land and such of the overriding interests set out in section 28 of the Land Registration Act as may for the time being subsist and affect the land.

GIVEN under my hand and the seal of the NAIROBI Land Registry this 8th day September 23, 20

Registrar

Name

Signature

EDITION: 1	PART A: PROPERTY SECTION	
OPENED: Apr 24, 2023		
REGISTRATION UNIT	EASEMENTS, ETC	NATURE OF TITLE
NAIROBI		ABSOLUTE
REGISTRATION SECTION		
RIRUTA SATELLITE		
BLOCK NO.		
NAIROBI/BLOCK66		
PARCEL NUMBER		
6004		
APPROXIMATE AREA		
1.17 HECTARES		
CADASTRAL MAP SHEET NO		
2& 6		
CADASTRAL PLAN NO.		
USER:		

PART B: PROPRIETORSHIP SECTION

ENTRY NO.	ENTRY DATE	NAME OF REGISTERED PROPRIETOR	ADDRESS AND DESCRIPTION OF REGISTERED PROPRIETORS	REMARKS AND CONSIDERATION	SIGNATURE OF REGISTRAR
9	24-04-2023	CERTIFICATE OF TITLE		CONVERTED FROM DAGORETTI/ RIRUTA/6004 ISSUED	
10	08-09-2023	KANARE LIMITED PVT AAAGP07 (52%) AND VIRGINIAH WANJIKU KAMUYU ID NO. 32148302 (48%)	RECTIFICATION OF SHARES		
11	08-09-2023	CERTIFICATE OF TITLE ISSUED			

PART C: ENCUMBRANCES SECTION

ENTRY NO.	ENTRY DATE	NATURE OF ENCUMBRANCE	FURTHER PARTICULARS	SIGNATURE OF REGISTRAR

ardhisasa
Shamba Laka, Hati Safi

R. A. Okwany

Land Registrar

REPUBLIC OF KENYA

THE LAND REGISTRATION ACT

THE LAND REGISTRATION (GENERAL) REGULATIONS, 2017

Serial Number 0000881

REPUBLIC OF KENYA

Certificate of Title

ardhisasa
Shamba Leka, Hati Safi!

4R956V6IW7

No. 0000881

GPK (L) 068—2m—7/2022

REPUBLIC OF KENYA

IN THE MATTER OF THE OATHS AND STATUTORY DECLARATIONS ACT (CAP. 15)

STATUTORY DECLARATION

I, VIRGINIAH WANJIKU KAMUYU, an adult of sound mind and of Post Office Box Number 21017 – 0050505, NAIROBI, **DO HEREBY MAKE OATH AND DECLARE** as follows:

THAT:

1. I am a Director of Kanare Limited **(Kanare),** a limited liability company incorporated in Kenya under Company Number PVT-AAAGPO7 and therefore duly authorized to make this Statutory Declaration on behalf of Kanare. Annexed hereto and marked **VWK-1A** and **VWK-1B** are copies of Kanare's Certificate of Incorporation and a recent Certificate of Official Search in respect of Kanare, respectively.
2. Kanare and I, in my personal capacity, are the registered proprietors, as tenants in common, of all that parcel of land situated in the County of Nairobi in the Republic of Kenya containing by measurement approximately one point one seven (1.17) hectares and comprised in Title Number Nairobi/Block66/6004 (the **Property**). Annexed hereto and marked **VWK-2** is a copy of the Property's title.
3. Pursuant to an Agreement for the Sale and Purchase of the Property dated June 09, 2025 between Kanare and myself as vendors and Keza Development LLP (**Keza**) a limited liability partnership registered in Kenya under Registration Number LLP-G81Q5ZB as purchaser, the Property is in the process of being transferred to Keza (the **Transaction**). Annexed hereto and marked **VWK-2A, VWK-2B** and **VWK-2C** are copies of Keza's Certificate of Incorporation, a recent Certificate of Official Search in respect of Keza, and a copy of the duly executed instrument of transfer in respect of the Property, respectively.
4. Kanare and I understand that Keza has entered into an agreement with IHS (Kenya) Limited (**IHS**), a limited liability company incorporated in the Republic of Kenya under Company Number PVT-PJUQ5AL, pursuant to which IHS will develop a section of the Property, being the section comprising approximately an acre from the side touching Ndwaru Road (the **Ndwaru portion**).
5. In light of the Transaction, Keza will have exclusive rights to the use of the Property and may grant other persons the right to access and develop the Property, in respect of the Ndwaru portion.
6. Pursuant to Keza granting IHS the right to access and develop the Ndwaru portion, Kanare and I confirm that IHS is duly authorized to procure the necessary approvals and permits from relevant authorities in connection with its agreement with Keza.
7. Kanare and I confirm that we have no objection to IHS procuring the approvals and permits described above.
8. I make this declaration conscientiously, believing the same to be true, and in accordance with the Oaths and Statutory Declarations Act.

SIGNED at NAIROBI this 30th day of July, 2025

BY:

VIRGINIAH WANJIKU KAMUYU] .....

]

Before Me:]

DAVID KIMANI NJUGUNA
ADVOCATE &
COMMISSIONER FOR OATHS
P. O. Box 46800 - 00100,
NAIROBI

COMMISSIONER FOR OATHS]

I CERTIFY that the above-named **VIRGINIAH WANJIKU KAMUYU** appeared before me on the 30th day of July, 2025 and being known to me/identified by ID/PP No. ..... respectively, acknowledged the above signatures or marks to be his and that he had freely and voluntarily executed this instrument and understood its contents.

DAVID KIMANI NJUGUNA
ADVOCATE &
COMMISSIONER FOR OATHS
P. O. Box 46800 - 00100,
NAIROBI

Signature and Designation of Person Certifying

VIRGINIAH WANJIKU KAMUYU] .....

as Director of **KANARE LIMITED**]

Before Me:]

DAVID KIMANI NJUGUNA
ADVOCATE &
COMMISSIONER FOR OATHS
P. O. Box 46800 - 00100,
NAIROBI

COMMISSIONER FOR OATHS]

I CERTIFY that the above-named **VIRGINIAH WANJIKU KAMUYU** being a director of **KANARE LIMITED** appeared before me on the 30th day of July, 2025 and being known to me/identified by ID/PP No. ..... respectively, acknowledged the above signatures or marks to be his and that he had freely and voluntarily executed this instrument and understood its contents.

DAVID KIMANI NJUGUNA
ADVOCATE &
COMMISSIONER FOR OATHS
P. O. Box 46800 - 00100,
NAIROBI

Signature and Designation of Person Certifying

Drawn by:
KN LAW LLP
Advocates & Notaries Public
5th Floor, The Pavilion
Westlands, Lower Kabete Road
P.O. Box 27547 – 00100
NAIROBI

Annex 4: Photographic Presentation





View of public baraza meeting for the first meeting





View of public baraza meeting for the second meeting



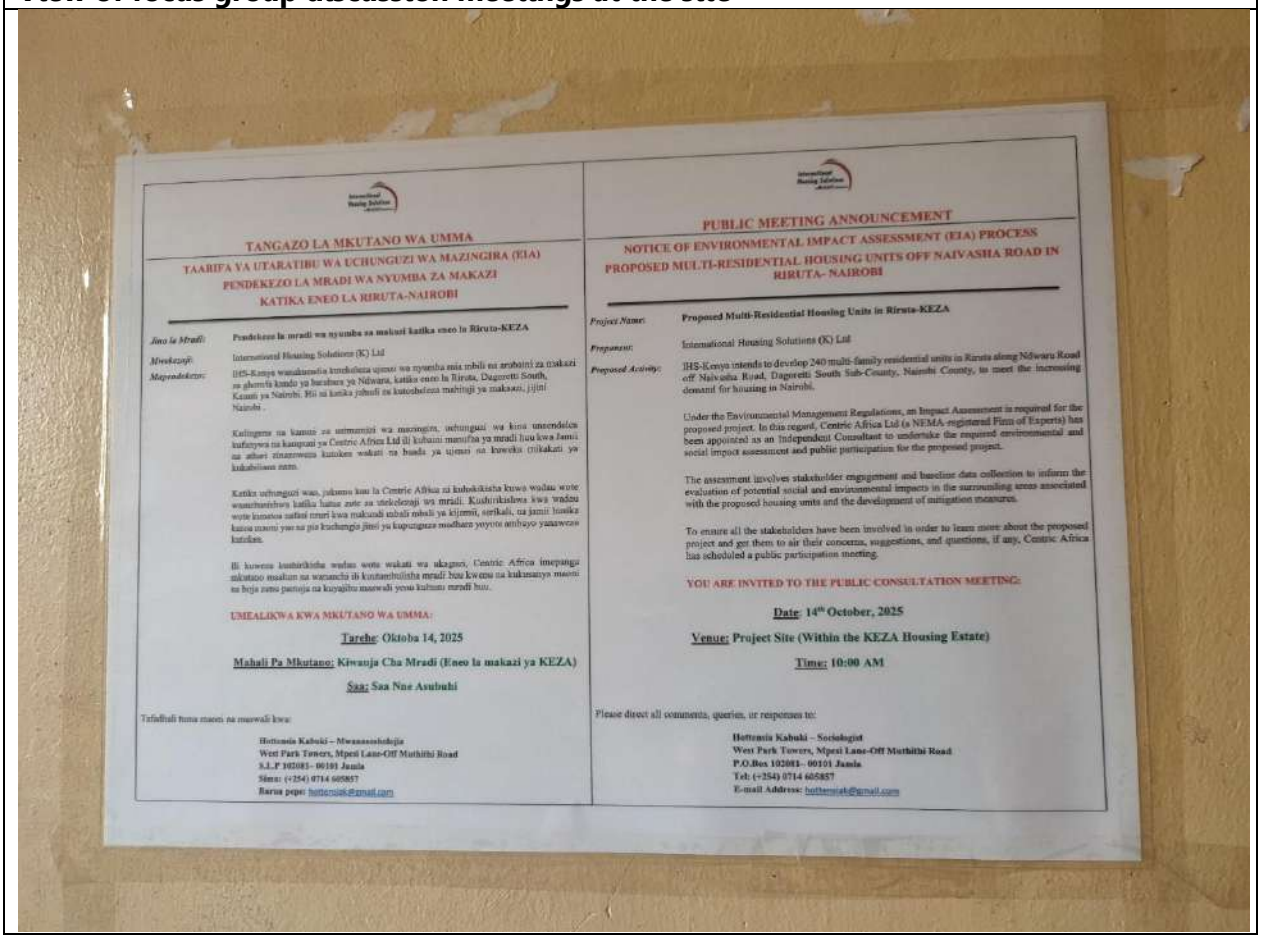


View of public baraza meeting for the third meeting





View of focus group discussion meetings at the site



TANGAZO LA MKUTANO WA UMMA

TAARIFA YA UTARATIBU WA UCHUNGUZI WA MAZINGIRA (EIA)
PENDEKEZO LA MRADI WA NYUMBA ZA MAKAZI
KATIKA ENEO LA RIRUTA-NAIROBI

Jina la Mradi: **Pendekezo la mradi wa nyumba za makazi katika eneo la Riruta-KEZA**

Mwekezaji: International Housing Solutions (K) Ltd

Mapendekezo: IHS-Kenya wanakusudia kutekeleza ujenzi wa nyumba mia mbili na arobaini za makazi za ghorofa kando ya barabara ya Ndwaru, katika eneo la Riruta, Dagoretti South, Kaunti ya Nairobi. Hii ni katika juhudi za kutosheleza mahitaji ya makazi, jijini Nairobi .

Kufuatana na kanuni za usimamizi wa mazingira, uchunguzi wa kina unaendelea kufanywa na kampuni ya Centric Africa Ltd ili kubaini manufaa ya mradi huu kwa Jamii na athari zinazowezia kutokea wakati na baada ya ujenzi na kuweka (tiikakati ya kukabiliana nazo.

Katika uchunguzi wao, jukumu kuu la Centric Africa ni kuhakikisha kuwa washiriki wote wanaohusika katika hatua zote za utekelezaji wa mradi. Kushirikishwa kwa wadau wote kunatoa nafasi nzuri kwa makundi mbali mbali ya kijamii, serikali, na jamii husika katoa maoni yao na pia kuchangia jinsi ya kupunguza madhara yoyote ambayo yanaweza kutokea.

Ili kuweza kushirikisha wadau wote wakati wa ukagnzi, Centric Africa imepanga mkutano maalum na wanaoishi ili kuutambulisha mradi huu kwenu na kukusanya maoni na hoja zenu pamoja na kuyajibu maswali yenu kuhusu mradi huu.

UMEALIKWA KWA MKUTANO WA UMMA:

Tarehe: Oktoba 14, 2025

Mahali Pa Mkutano: Kiwanja Cha Mradi (Eneo la makazi ya KEZA)

Saa: Saa Nne Asubuhi

Tafadhali tuma maoni na maswali kwa:

Hottensia Kabuki – Mwanasosholojia
West Park Towers, Mpesi Lane-Off Muthithi Road
S.L.P 102085- 00101 Jamia
Simu: (+254) 0714 605857
Barua pepe: hottensiak@gmail.com

PUBLIC MEETING ANNOUNCEMENT

NOTICE OF ENVIRONMENTAL IMPACT ASSESSMENT (EIA) PROCESS
PROPOSED MULTI-RESIDENTIAL HOUSING UNITS OFF NAIVASHA ROAD IN
RIRUTA- NAIROBI

Project Name: **Proposed Multi-Residential Housing Units in Riruta-KEZA**

Proponent: International Housing Solutions (K) Ltd

Proposed Activity: IHS-Kenya intends to develop 240 multi-family residential units in Riruta along Ndwaru Road off Naivasha Road, Dagoretti South Sub-County, Nairobi County, to meet the increasing demand for housing in Nairobi.

Under the Environmental Management Regulations, an Impact Assessment is required for the proposed project. In this regard, Centric Africa Ltd (a NEMA-registered Firm of Experts) has been appointed as an Independent Consultant to undertake the required environmental and social impact assessment and public participation for the proposed project.

The assessment involves stakeholder engagement and baseline data collection to inform the evaluation of potential social and environmental impacts in the surrounding areas associated with the proposed housing units and the development of mitigation measures.

To ensure all the stakeholders have been involved in order to learn more about the proposed project and get them to air their concerns, suggestions, and questions, if any, Centric Africa has scheduled a public participation meeting.

YOU ARE INVITED TO THE PUBLIC CONSULTATION MEETING:

Date: 14th October, 2025

Venue: Project Site (Within the KEZA Housing Estate)

Time: 10:00 AM

Please direct all comments, queries, or responses to:

Hottensia Kabuki – Sociologist
West Park Towers, Mpesi Lane-Off Muthithi Road
P.O.Box 102085- 00101 Jamia
Tel: (+254) 0714 605857
E-mail Address: hottensiak@gmail.com





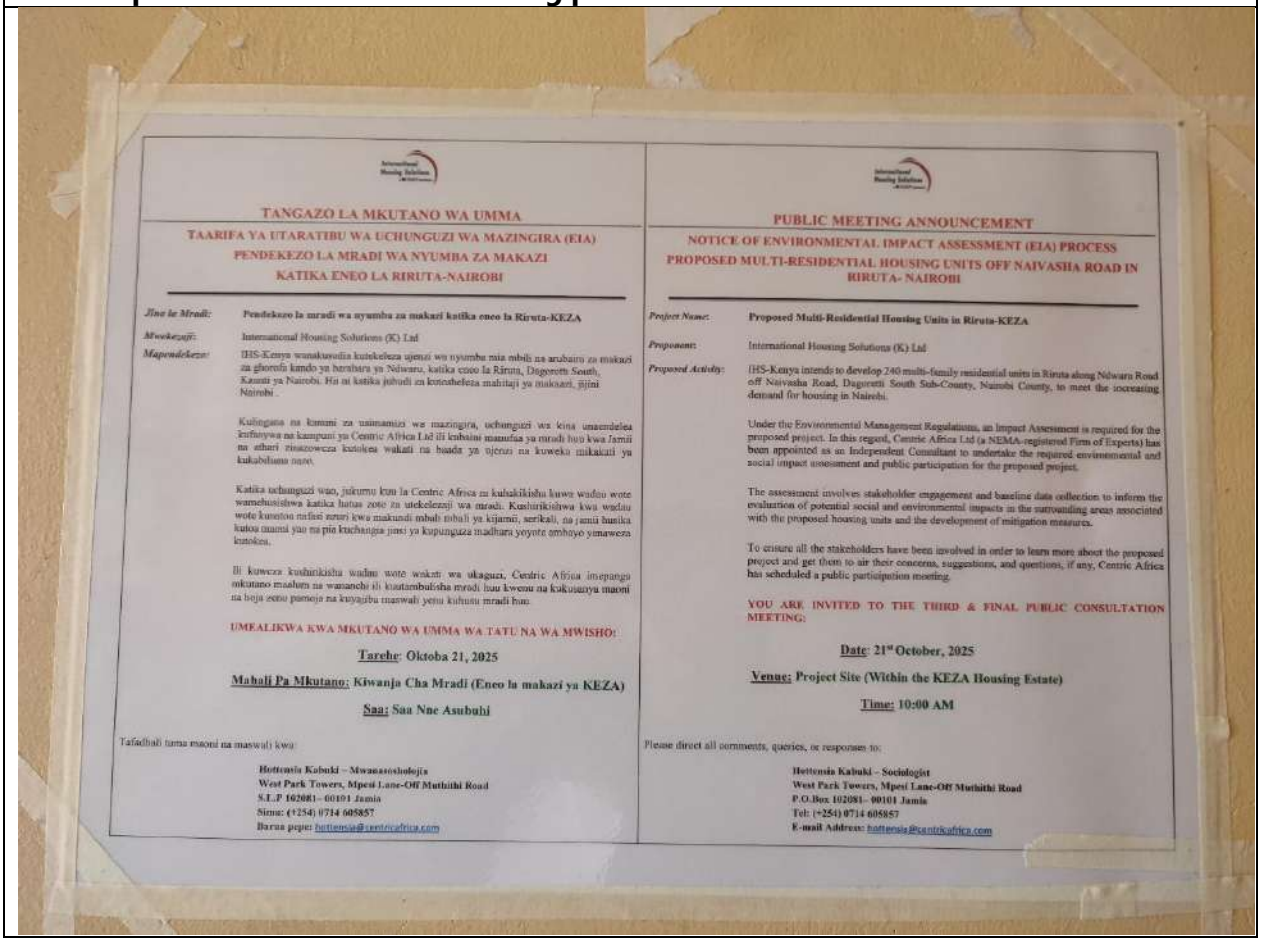
View of posters for the first meeting posted at the site area and chief's office







View of posters for the second meeting posted at the site area and chief's office



TANGAZO LA MKUTANO WA UMMA

TAARIFA YA UTARATIBU WA UCHUNGUZI WA MAZINGIRA (EIA)
PENDEKEZO LA MRADI WA NYUMBA ZA MAKAZI
KATIKA ENEO LA RIRUTA-NAIROBI

Jina la Mradi: **Pendekezo la mradi wa nyumba za makazi katika eneo la Riruta-KEZA**

Mwekezaji: International Housing Solutions (K) Ltd

Mapendekezo: IHS-Kenya wanakusudia kutekeleza ujenzi wa nyumba nne mbili za ardhini za makazi za ghorofa kando ya barabara ya Ndwaru, katika eneo la Ririta, Digoretti South, Kaunti ya Nairobi. Ha ni katika juhudi za kutosheleza mahitaji ya makazi, jijini Nairobi.

Kufuatana na kanuni za usimamizi wa mazingira, uchunguzi wa kina unaendelea kufanywa na kampuni ya Centric Africa Ltd ili kubaini manufaa ya mradi huu kwa Jamii na athari zinazoweza kutokea wakati na baada ya ujenzi na kuweka mikakati ya kukabiliana nazo.

Katika uchunguzi wao, jukumu kuu la Centric Africa ni kuhakikisha kuwa wadau wote wamehusishwa katika hatua zote za utekelezaji wa mradi. Kushirikishwa kwa wadau wote kunatoa nafasi zetu kwa makundi mbali mbali ya kijamii, serikali, na jamii husika kutoa maoni yao na pia kuchangia jinsi ya kupunguza madhara yoyote yanayoweza kutokea.

Ili kuweza kushirikisha wadau wote wakati wa ukaguzi, Centric Africa imepanga mkutano maalum na wananchi ili kuutambulisha mradi huu kwenu na kukusanya maoni na hoja zenu pamoja na kuyajibu maswali yenu kuhusu mradi huu.

UMEALIKWA KWA MKUTANO WA UMMA WA TATU NA WA MWISHO:

Tarehe: Oktoba 21, 2025

Mahali Pa Mkutano: Kiwanja Cha Mradi (Eneo la makazi ya KEZA)

Saa: Saa Nne Asubuhi

Tafadhali tuma maoni na maswali kwa:

Hottensia Kabuki – Mwanasosholojia
West Park Towers, Mpesi Lane-Off Muthithi Road
S.L.P 102081– 00101 Jamia
Simu: (+254) 0714 605857
Barua pepe: hottensia@centricafrica.com

PUBLIC MEETING ANNOUNCEMENT

NOTICE OF ENVIRONMENTAL IMPACT ASSESSMENT (EIA) PROCESS
PROPOSED MULTI-RESIDENTIAL HOUSING UNITS OFF NAIVASHA ROAD IN RIRUTA- NAIROBI

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Proponent: International Housing Solutions (K) Ltd

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The assessment involves stakeholder engagement and baseline data collection to inform the evaluation of potential social and environmental impacts in the surrounding areas associated with the proposed housing units and the development of mitigation measures.

To ensure all the stakeholders have been involved in order to learn more about the proposed project and get them to air their concerns, suggestions, and questions, if any, Centric Africa has scheduled a public participation meeting.

YOU ARE INVITED TO THE THIRD & FINAL PUBLIC CONSULTATION MEETING:

Date: 21st October, 2025

Venue: Project Site (Within the KEZA Housing Estate)

Time: 10:00 AM

Please direct all comments, queries, or responses to:

Hottensia Kabuki – Sociologist
West Park Towers, Mpesi Lane-Off Muthithi Road
P.O.Box 102081– 00101 Jamia
Tel: (+254) 0714 605857
E-mail Address: hottensia@centricafrica.com





View of posters for the third meeting posted at the site area and chief's office

Annex 5: Change of Use Approval

FORM PLUPA/DC/8 **SN: SUB-011650**

City Hall Way, City Hall
www.nairobi.go.ke

P.O.Box 30075-00100
Nairobi, KENYA

NAIROBI CITY COUNTY

THE PHYSICAL AND LAND USE PLANNING ACT (No. 13 of 2019)

Registered Number of Application **PLUPA-COU-001799-N**

NOTIFICATION OF APPROVAL OF APPLICATION

TO **Kanare Limited**

Through **Eric K. Mumbi**
Physical Planner, Reg. No: 0191

Your application number as above, submitted on **24th, January 2024**

For permission to carry out **Change Of Use - New** from **Agricultural** to **Multi dwelling units (Apartments)** on

L.R. / Parcel No **DAGORETTI/RIRUTA/6004 (NAIROBI BLOCK 66/6004)** with Coordinates **-1.2803, 36.7337**

Situated in **Dagoretti-Riruta, Riruta** in **Dagoretti South** Sub-county

Along **OFF NAIVASHA ROAD** has been **APPROVED** on **14th, February 2024**

By the Urban Planning Technical Committee tabled under Item No **61**

For the reasons/subject to the conditions appended overleaf.

Date **14th, February 2024**

For CECM Built Environment and Urban Planning

CC:
The National Land Commission, Nairobi
The Land Registrar
The Director General - Physical and Land Use Planning, Nairobi
The Director of Surveys, Nairobi
The Secretary, State Department of Lands, Ministry of Lands & Physical Planning

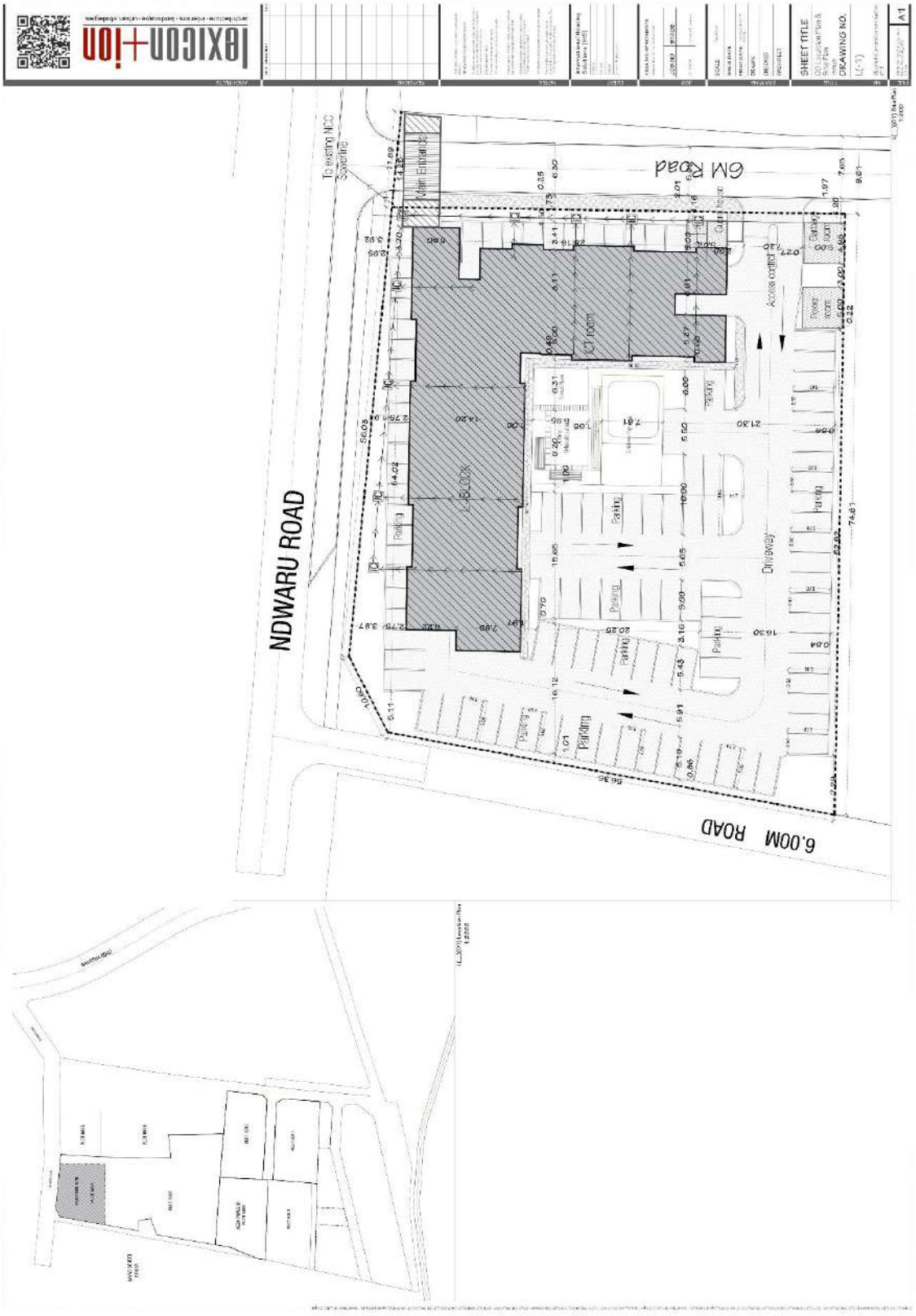
PLUPA-COU-001799-N **SN: SUB-011650**

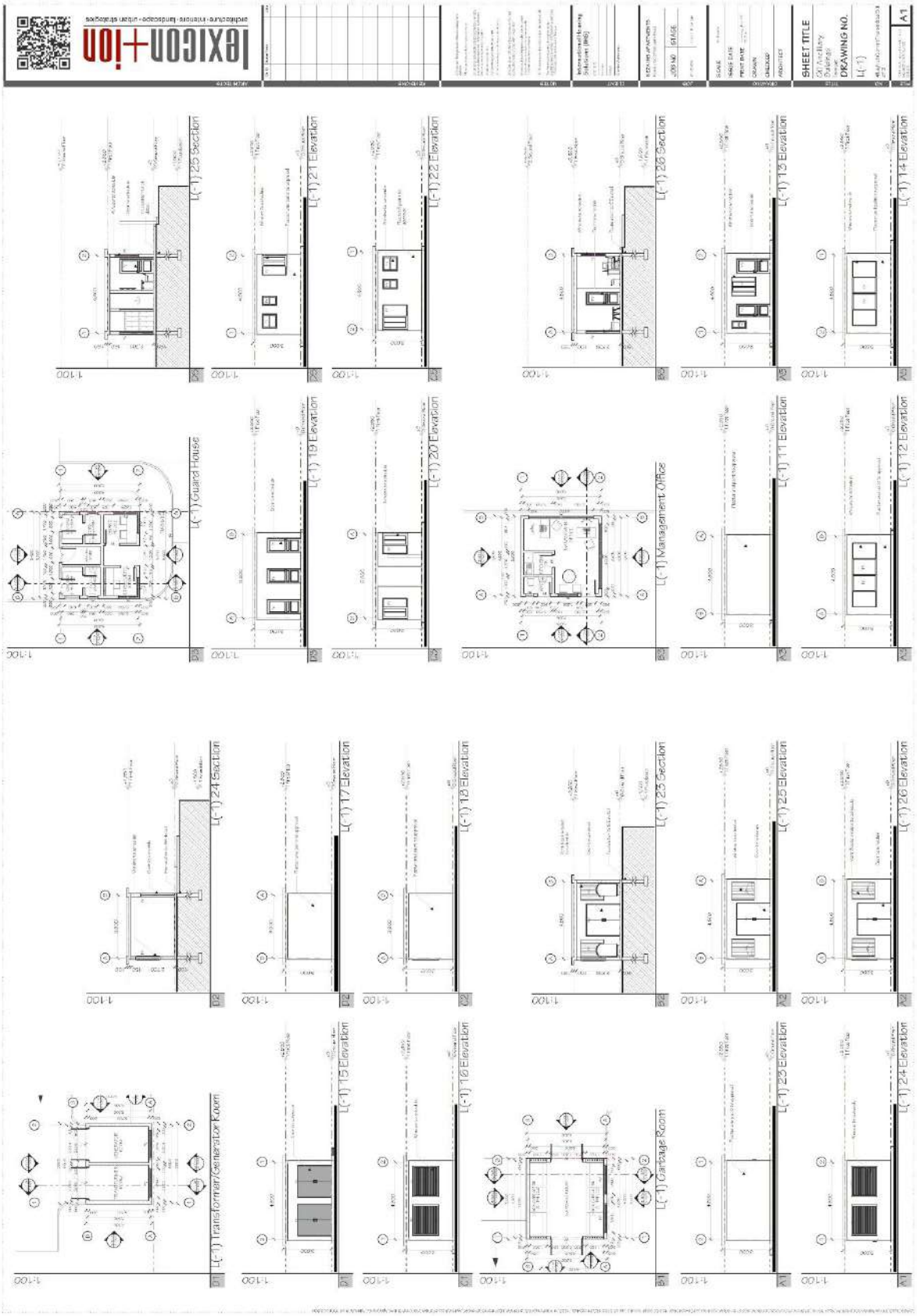
Conditions for approval: -

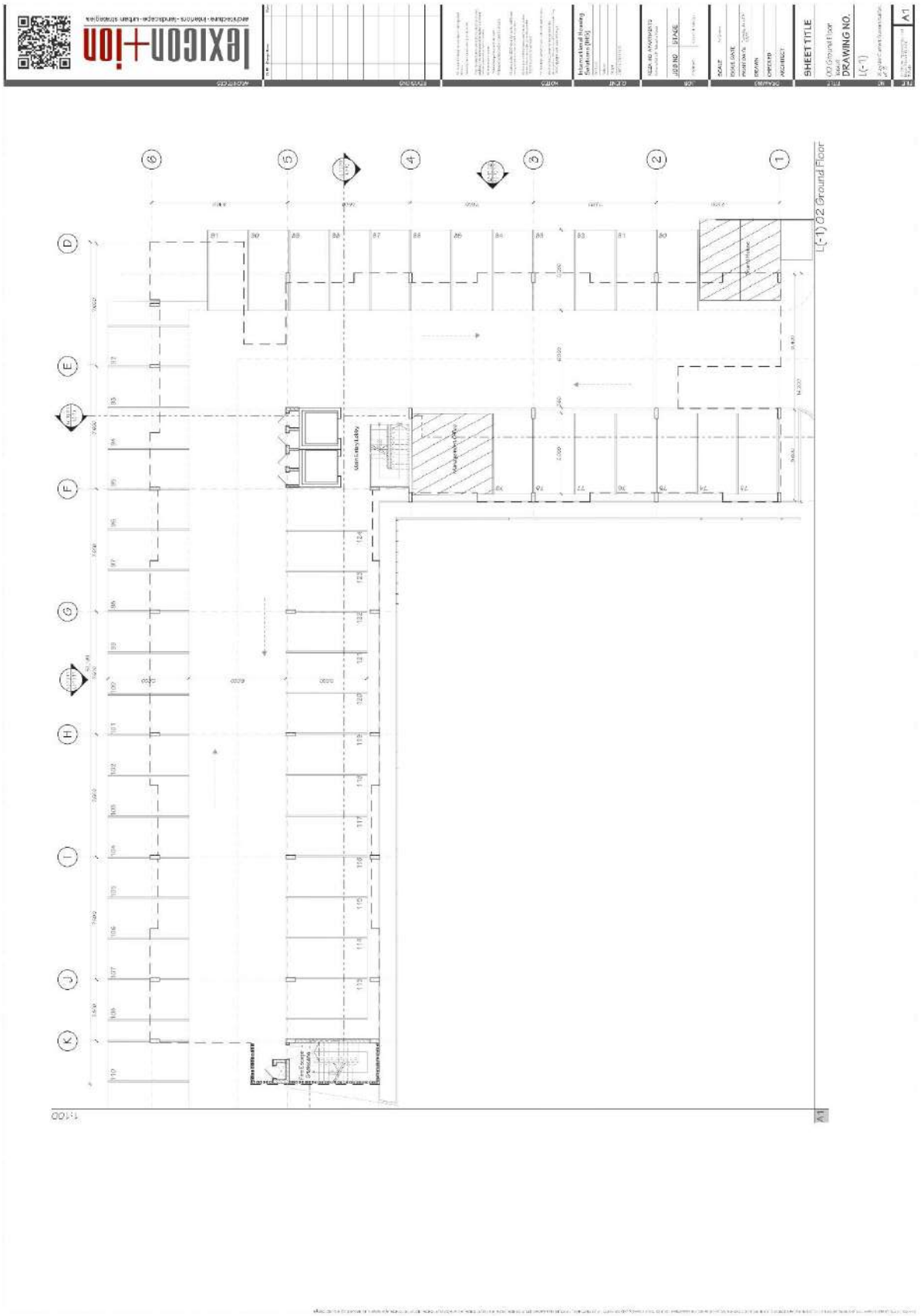
a. Submission of satisfactory building plans within two years and completion of construction within three years otherwise the approval lapses.
b. Payment of revised ground rent as will be determined by the Director of Valuation, Ministry of Lands and Physical Planning.
c. Payment of revised rates as will be determined by the Director Valuation & Property Management - Nairobi City County.
d. Subject to the plot not constituting part of the disputed public/private utility land/allocations.
e. Subject to compliance with Sections 56, 57, 58 and 59 of the Physical and Land Use Planning Act.
f. Subject to compliance with the approved zoning policy.
g. Subject to undertaking an EIA and obtaining NEMA License before commencement of any works.
h. Subject to provision of appropriate setback(s) as per the rezoning plan.
i. Subject to provision of adequate and functional on-site parking to the satisfaction of Director of Roads, Public Works & Transport.
j. Subject to the proposed development maintaining the requisite of 3m, 6m, 9m building line as per the statutes.
k. Subject to the development maintaining the residential character and densities of the area.

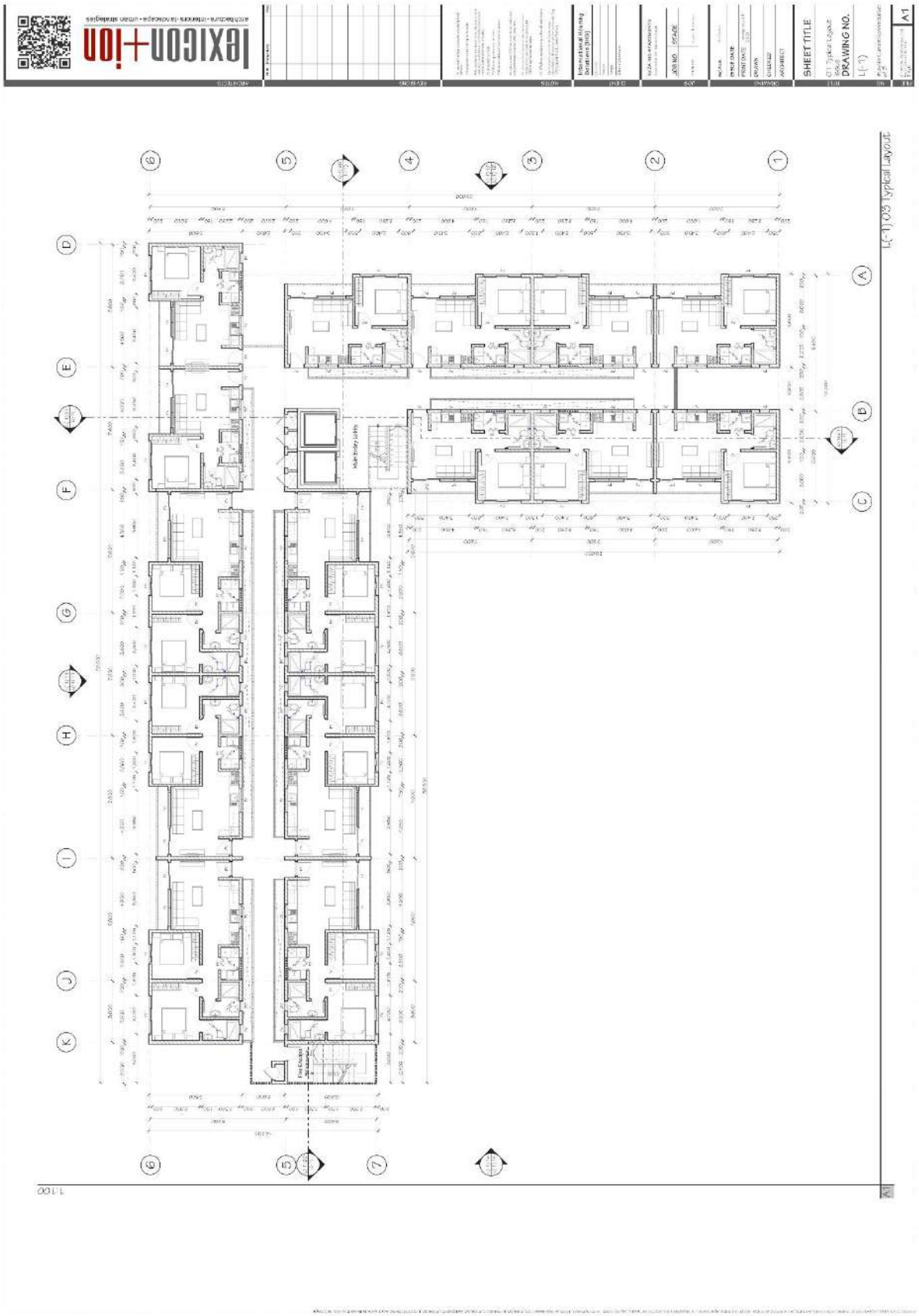


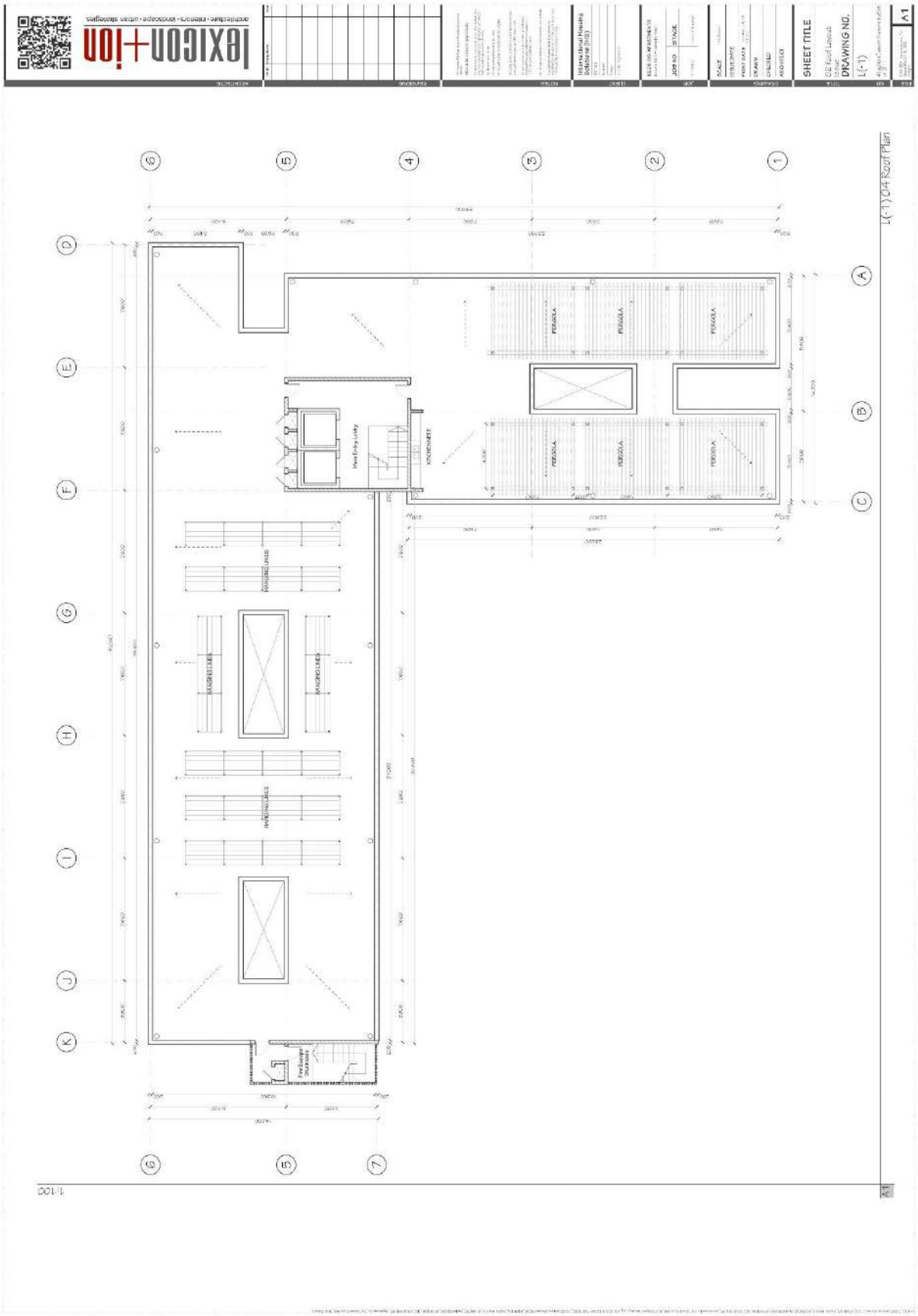
Annex 6: Proposed Site Plans



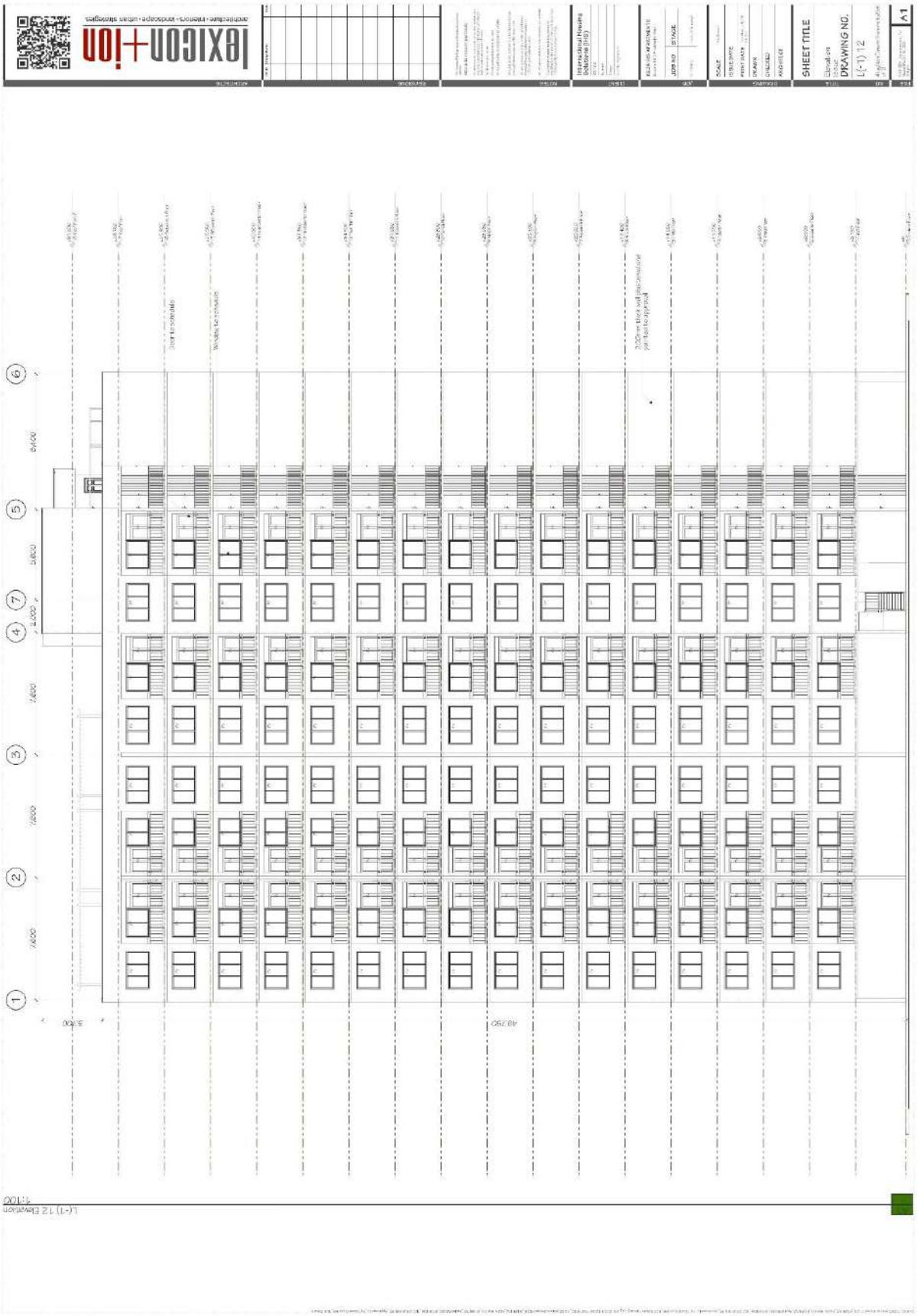

SHEET TITLE
DRAWING NO.
L(-1) 25 Section
L(-1) 21 Elevation
L(-1) 22 Elevation
L(-1) 26 Section
L(-1) 13 Elevation
L(-1) 14 Elevation
L(-1) Guard House
L(-1) 19 Elevation
L(-1) 20 Elevation
L(-1) Management Office
L(-1) 11 Elevation
L(-1) 12 Elevation
L(-1) 24 Section
L(-1) 17 Elevation
L(-1) 18 Elevation
L(-1) 23 Section
L(-1) 25 Elevation
L(-1) 26 Elevation
L(-1) Transformer/Generator Room
L(-1) 15 Elevation
L(-1) 16 Elevation
L(-1) Garbage Room
L(-1) 23 Elevation
L(-1) 24 Elevation

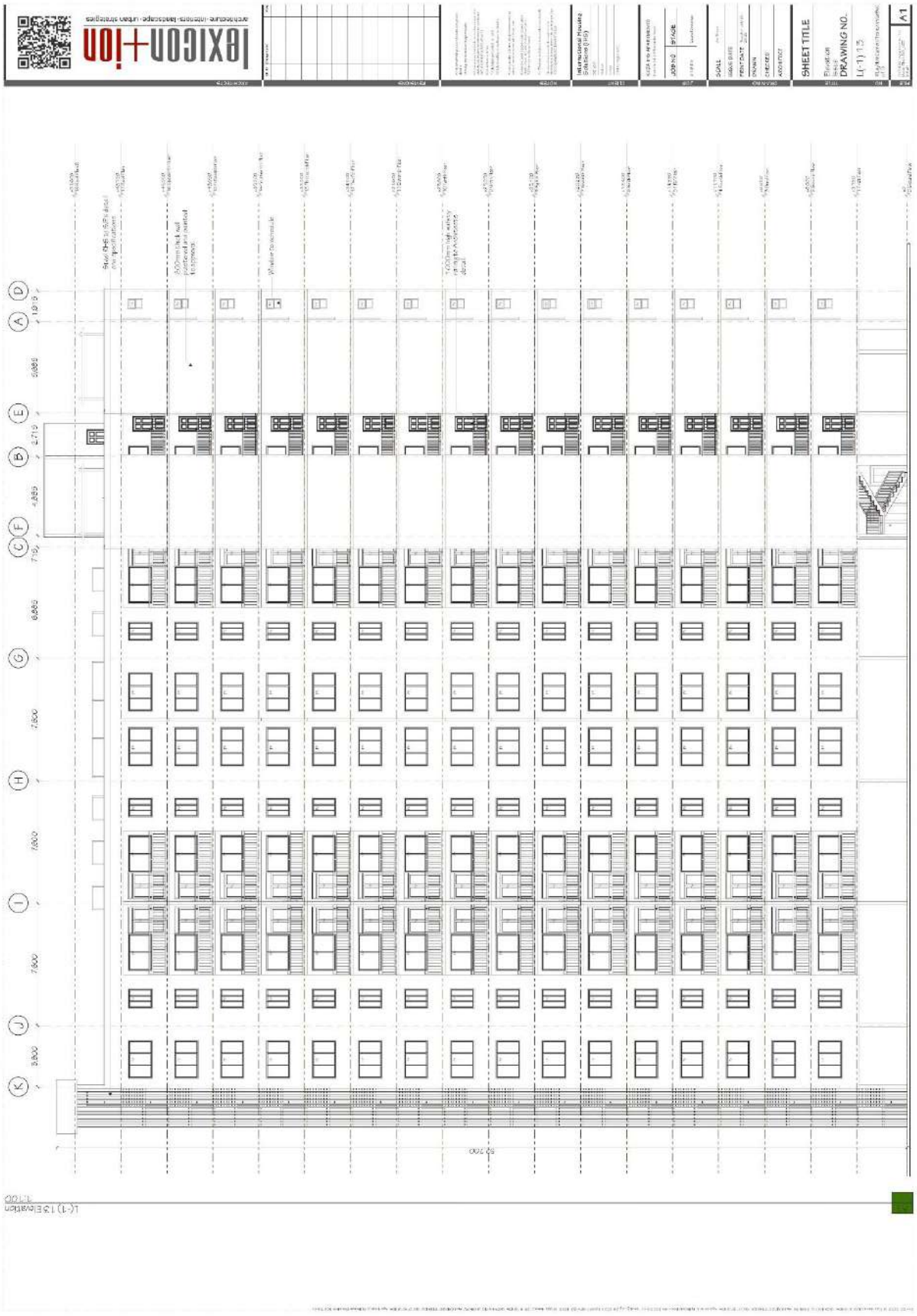

SHEET TITLE
L(-1) 02 Ground Floor
DRAWING NO.
L(-1)
A1

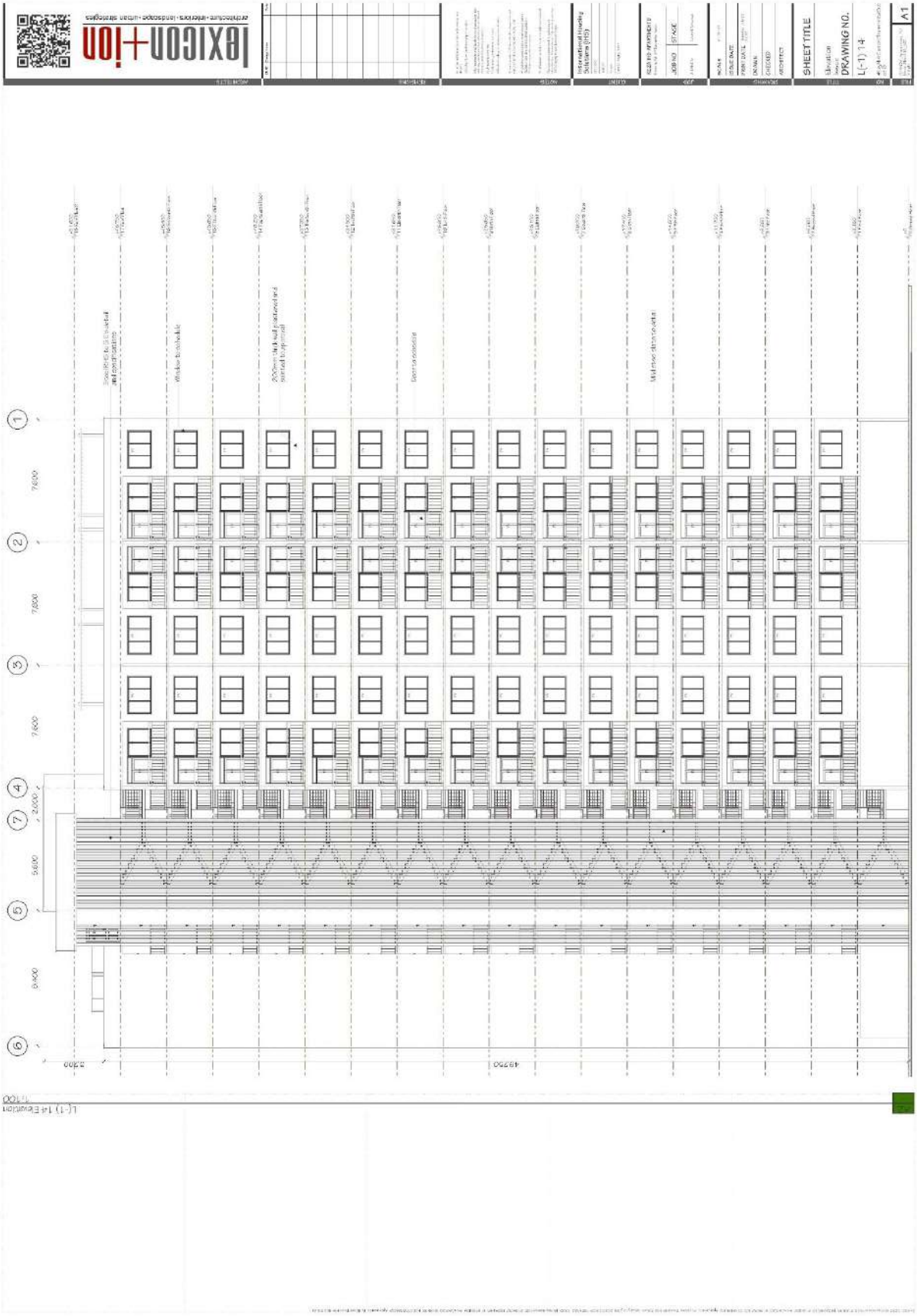

SHEET TITLE
DRAWING NO.
L(-1)
A1


SHEET TITLE
DRAWING NO.
L(-1)
L(-1) 04 Roof Plan
PERGOLA
KITCHENETTE
HANGING LINES

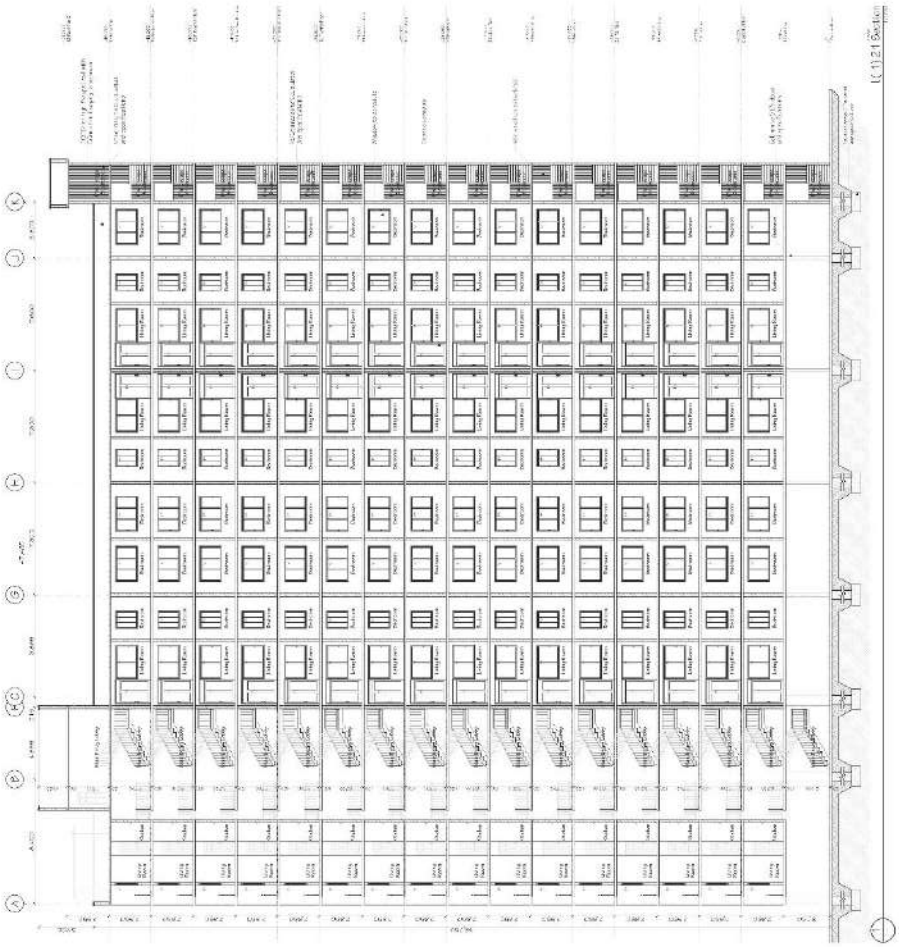

lexicon+ion
SHEET TITLE
DRAWING NO.
A1


SHEET TITLE
DRAWING NO.
L(-1) 12
A1

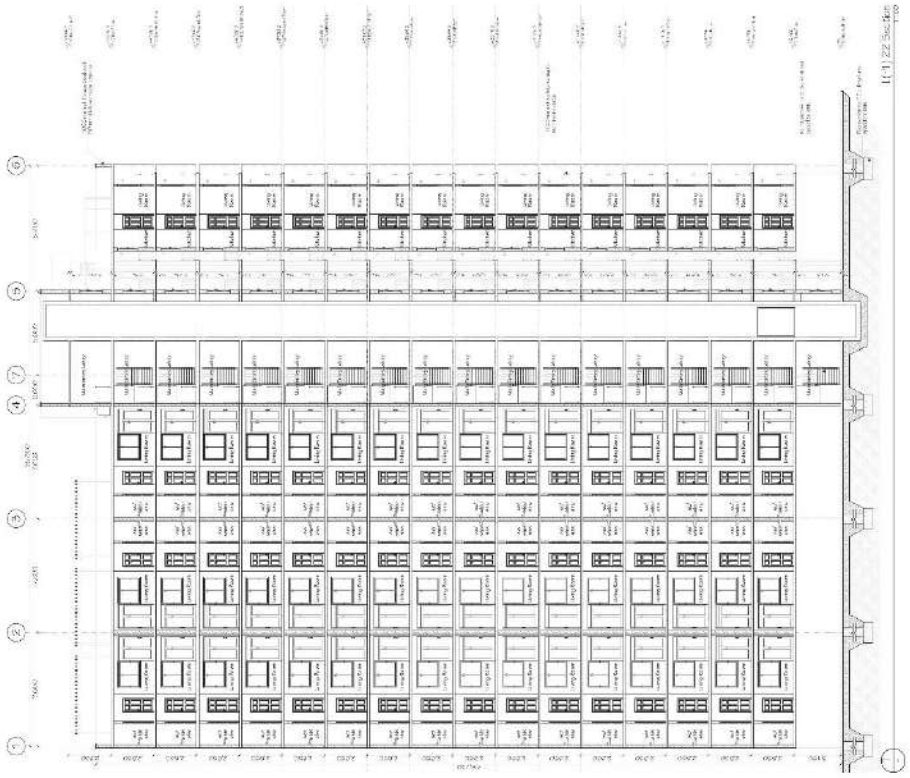

SHEET TITLE
DRAWING NO.
L(-1) 15
A1
L(-1) 13 Elevation
1:100


SHEET TITLE
DRAWING NO.
L(-1) 14
A1


lexicon+ion
SHEET TITLE
DRAWING NO.
A0




lexicon+ion
SHEET TITLE
DRAWING NO.
A0



Masterplan with view of the neighbouring project areas





Annex 7: Bill of Quantities

SPEQ CONSULTING

PROPOSED GREEN AFFORDABLE HOUSING SCHEME

ON PLOT L.R. NO. XXX - RIRUTA KEZA, NAIROBI

FOR

INTERNATIONAL HOUSING SOLUTIONS KENYA

BILL OF QUANTITIES

Issued by:
Qs. Kenneth Kimathi (Reg. Q783)
for SPEQ Consulting Limited
ken@speqconsulting.com
0726541625

03 November 2025

SPEQ CONSULTING LIMITED
03 NOV 2025
REG. No 2990
P. O. Box 74 - 00300, NAIROBI.

Proposed Green Affordable Housing Scheme
On Plot L.R. No. XXX - Riruta Keza, Nairobi
Bill of Quantities
Main Summary
Monday, 3 November 2025

ITEM	ELEMENT DESCRIPTION	AMOUNT (KSHS)
1.00	**MAIN WORKS**	**524,194,780**
1.01	SUBSTRUCTURES CONSTRUCTION	11,332,580
1.02	REINFORCED CONCRETE FRAME	190,659,940
1.03	WALLING & PARTITIONS	35,165,550
1.04	ROOF CONSTRUCTION AND FINISHES	4,007,400
1.05	DOORS	58,426,000
1.06	WINDOWS	29,609,080
1.07	EXTERNAL FINISHES	24,711,680
1.08	INTERNAL WALL FINISHES	45,538,300
1.09	FLOOR FINISHES	42,390,220
1.10	CEILING FINISHES	24,863,400
1.11	JOINERY & FITTINGS	53,644,700
1.12	PROFIT & ATTENDANCE	2,563,953
1.13	BWIC WITH SPECIALIST WORKS	1,281,977

3/11/2025.

SPEQ CONSULTING LIMITED
03 NOV 2025
REG. No 299Q
P.O. Box 74 - 00300, NAIROBI.

2

Proposed Green Affordable Housing Scheme
On Plot L.R. No. XXX - Riruta Keza, Nairobi
Bill of Quantities
Main Summary
Monday, 3 November 2025

SPEQ CONSULTING

ITEM	ELEMENT DESCRIPTION	AMOUNT
2.00	**EXTERNAL WORKS**	**41,763,640**
2.01	EXCAVATIONS & BULK EARTHWORKS	11,380,400
2.02	DRIVEWAYS & WALKWAYS	6,246,050
2.03	BOUNDARY WALL & GATES	9,748,250
2.04	STORM WATER DRAINAGE	4,950,900
2.05	FOUL WATER DRAINAGE	925,200
2.06	ANCILLARY BUILDINGS	3,840,000
2.07	UNDERGROUND WATER TANK	4,672,840
3.00	**PRIME COST ALLOWANCES**	**128,197,660**
3.01	PILE FOUNDATION CONSTRUCTION	30,832,120
	MECHANICAL SERVICES INSTALLATIONS	
3.02	Plumbing, Drainage & Fire Fighting Installations, Mechanical Services PC Sun	43,280,635
	ELECTRICAL INSTALLATIONS	
3.03	Electrical Installations	47,284,905
	LIFTS INSTALLATIONS	
3.04	Lifts Installations	6,800,000

3/11/2025.

SPEQ CONSULTING LIMITED
03 NOV 2025
REG. No 2990
P.O. Box 74 - 00300, NAIROBI

3

Proposed Green Affordable Housing Scheme
On Plot L.R. No. XXX - Riruta Keza, Nairobi
Bill of Quantities
Main Summary
Monday, 3 November 2025

ITEM	ELEMENT DESCRIPTION	AMOUNT
4.00	**PROVISIONAL SUMS**	**10,750,000**
4.01	EXTERNAL FURNITURE	500,000
4.02	SOFT LANDSCAPING	1,000,000
4.03	MANAGEMENT ROOM FIT OUT	1,000,000
4.04	PLAY AREA EQUIPMENT AND FINISHES	2,500,000
4.05	ROOF PERGOLA	2,000,000
4.06	HANGING LINES	1,000,000
4.07	FIRESTOP INSTALLATIONS	1,000,000
4.08	ICT AND ELECTRICAL MANHOLES AND COVERS	500,000
4.09	STATUTORY AND NON STATUTORY SIGNAGES	500,000
4.10	MEP BUILDERS WORKS	750,000
	SUB-TOTAL I (Excluding P&G and Contingencies)	**704,906,080**
5.00	**PRELIMINARIES & GENERAL**	**13,000,000**
	SUB-TOTAL II (Excluding Contingencies)	**717,906,080**
6.00	**CONTINGENCY SUM ALLOWANCE**	**5,000,000**
	ESTIMATED TOTAL CONSTRUCTION COST	**722,906,080**

3/11/2025.

SPEQ CONSULTING LIMITED
03 NOV 2025
REG. No 2990
P. O. Box 74 - 00300, NAIROBI

4

PRACTISING CERTIFICATE FOR QUANTITY SURVEYING FIRMS

Pursuant to the Architects & Quantity Surveyors Act Cap 525

SPEQ CONSULTING LTD (299Q)

is duly registered to provide Quantity Surveying services

From **1st July 2025** to **30th June 2026**

Registrar

serial no. PCQSF/16/25-26

SPEQ CONSULTING LIMITED P.O. Box 74 - 00300 NAIROBI. REG. No 299Q

03 NOV 2025 *Date*

1st July 2025

PROPOSED AFFORDABLE HOUSING ON L.R. NO. KAJIADO/KITENGELA/[illegible] FOR IHS KENYA NAIROBI KEZA SOLUTIONS PLOT

3/11/2025.

Annex 8: Water Analysis Test Report

REPUBLIC OF KENYA

MINISTRY OF WATER, SANITATION AND IRRIGATION

KENYA WATER INSTITUTE

When replying please quote

KEWI/CTS /F012/REV 00

PHYSICAL/CHEMICAL WATER ANALYSIS REPORT

Description of Sample: **Borehole Water** Sampling Date: **03/09/2025**

Sample No: **RL 142/2025** Date Received: **04/09/2025**

Source: **Keza Apartment; Riruta- Nairobi** Submission Form: **142**

Purpose of Sampling: **Domestic** Customer Contact: **0722 888 891**

Submitted by: **Water for the World** Client Name: **Kanare Ltd**

PARAMETERS	UNIT	RESULTS	WHO STANDARDS	KS EAS-12:2018) STANDARDS
pH	pH scale	8.03	6.5-8.5	6.5-8.5
Colour	Hazen	15.0	Max 15	Max 15
Turbidity	N.T.U	4.87	Max 5	Max 5
Total Alkalinity as $CaCO_3$	mg/l	58.0	Max 500	Max 500
Conductivity (25° C)	µS/cm	266	Max 2500	Max 1500
Iron as Fe^{2+}	mg/l	**0.35**	Max 0.3	Max 0.3
Calcium as Ca^{2+}	mg/l	ND	Max 100	Max 150
Magnesium Mg^{2+}	mg/l	21.38	Max 100	Max 100
Total Hardness as $CaCO_3$	mg/l	88.0	Max 500	Max 300
Chloride as Cl^-	mg/l	19.0	Max 250	Max 250
Nitrate as No_3^-	mg/l	0.704	Max 10	Max 45
Fluoride as F^-	mg/l	**2.25**	Max 1.5	Max 1.5
Manganese as Mn	Mg/l	0.012	Max 0.3	Max 0.1
Sulphate as So_4^{-2}	mg/l	3.0	Max 450	Max 400
Total Dissolved Solids as ions	mg/l	164.92	Max 1500	Max 1000
Carbon Dioxide as Co_2	mg/l	4.0	-	Not applicable
Ammonia as NH_3	mg/l	ND	Max 0.2	Max 0.5

ND: Not Detected

COMMENT/ REMARKS: The sample performed as shown.

This Report refers to a privately submitted sample, and all details in respect of the source and test results of similar products are not verified or confirmed.

Signature.....Date.16-9-2025.....

For Director

Kenya Water Institute

Water Quality Laboratory

*The results contained herein apply only to particular sample(s) tested whose specific tests carried out as detailed in the Test Report. No extract abridgement from a Test Report may be published or used to advertise a product without the consent of the **Director, KEWI***

KENYA WATER INSTITUTE KEWI DIRECTOR P.O. BOX 60013, NAIROBI

Nairobi Campus
Ole Shapera Avenue, Nairobi South C,
P. O. BOX 60013 – 00200, NAIROBI
Mobile: 0722207757
E-mail: info@kewi.or.ke

Chiakariga Campus
P.O BOX 12-60215,
Marimanti.
Mobile: 0729 009104,
Email: chiakariga@kewi.or.ke

Kitui Campus
P.O BOX 1514-90200
Kitui
Mobile: 0707 566395
Email: kitui@kewi.or.ke

Kisumu Campus
P.O BOX 7825-40100
Kisumu
Mobile: 0746212708
Email: kisumu@kewi.or.ke

Kenya Water Institute @kewi_kenya www.kewi.go.ke

Annex 9: Baseline Ambient Air Quality, Noise Levels & Vibrations Measurement report

BASELINE REPORT FOR AIR QUALITY, NOISE LEVELS & VIBRATION MEASUREMENTS FOR THE PROPOSED CONSTRUCTION OF RESIDENTIAL APARTMENTS AT RIRUTA KEZA HOUSING DEVELOPMENT.

SUBMITTED BY:

CENTRIC AFRICA LTD,

WESTPARK TOWERS, MPESI LANE,

NAIROBI KENYA.

OFFICE NO 508, 5TH FLOOR.

PREPARED BY:

POLUCON SERVICES KENYA LIMITED

P.O. BOX 99344 – 80107

MOMBASA, KENYA.

NYATI ROAD OFF LINKS ROAD

MONITORING DATE(S):

30TH OCTOBER 2025

REPORT REFERENCE NO.:

2025140105498

Polucon At your service	**CLIENT:** CENTRIC AFRICA LTD **TITLE:** BASELINE AMBIENT AIR QUALITY, NOISE LEVELS, & VIBRATIONS MEASUREMENT REPORT **REPORT NO: 2025140105498** **REVISION: 00**

REPORT QA/QC

REVISION	DATE	PREPARED	REVIEWED	APPROVED
00	19-11-2025	Robert Kanyi	Gilbert Ngetich	Rashid Bendera
01				
02				
03				

COMPANY STAMP	SIGNATURE		

CLIENT REPRESENTATIVE

DATE	NAME	COMPANY	SIGNATURE & STAMP

Disclaimer: This document is issued by Polucon Services Kenya Limited under its Terms and Conditions of Service available upon request. Any holder of this document is advised that information contained hereon reflects the Polucon Services Kenya Limited's findings at the time of its intervention only and within the limits of Client's instructions. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful, and offenders may be fully prosecuted of the law.

REPORT DETAILS

REPORT TITLE	BASELINE REPORTS FOR AIR QUALITY MEASUREMENTS NOISE & VIBRATIONS LEVELS FOR THE PROPOSED CONSTRUCTION OF RESIDENTIAL APARTMENTS.
REPORT REFERENCE	2025140105498
NAME & ADDRESS OF THE MEASUREMENT AND TESTING FIRM.	POLUCON SERVICES KENYA LIMITED P.O. BOX 99344 – 80107 MOMBASA, KENYA. NYATI ROAD OFF LINKS ROAD
OPERATOR & ADDRESS	CENTRIC AFRICA LTD, WESTPARK TOWERS, MPESI LANE, NAIROBI KENYA. OFFICE NO 508, 5TH FLOOR.
MEASUREMENT SITE	RIRUTA, DAGORETI SOUTH SUB COUNTY NAIROBI COUNTY.
MEASUREMENT DATE (S)	**30TH October 2025**
REPORT DATE	**19th November 2025**
STATUS	**DRAFT REPORT**

EXECUTIVE SUMMARY

Polucon Services Kenya Limited, a laboratory designated by the National Environment Management Authority (NEMA), was commissioned by CENTRIC AFRICA LTD to conduct a comprehensive baseline assessment for the proposed Construction of residential apartments at Riruta along Ndwaru Road- Off Naivasha Road. The primary objective of the assessment was to establish baseline conditions for ambient air quality, noise & vibration levels within the proposed site. Findings of the study are expected to form the benchmark upon which subsequent measurements will be based.

Ambient Air quality

Measurement of ambient air quality was conducted within the proposed project site and around the proposed project site/adjacent to the nearest Riruta residential area. The state-of-the-art OCEANUS -1000 was deployed for measurement of particulate matter and gaseous parameters. The levels of both gaseous and particulate matter complied with the air quality guidelines set by the World Health Organization (WHO) and the limits established by the EMC (Air Quality) Regulation of 2014. This compliance indicates that the ambient air quality at the proposed project site was within acceptable standards/conditions.

Table 0-1: Average Gaseous and particulate matter results against EMC and WHO limits

Measurement location	Temp ^{o}C	Hum %	Wind Direction	Wind Speed	$PM_{2.5}$ ($\mu g/m^3$)	PM_{10} ($\mu g/m^3$)	CO (mg/m^3)	SO_2 (ug/m^3)	NO_2 (ug/m^3)	NO (ug/m^3)	O_3 (ug/m^3)
Next to the Proposed Project Entrance /Gate.	23.7	61.4	NE	10 km/h	18.0	22.0	BDL	BDL	0	0	0
Within Project site	22.2	59.8	NE	10 km/h	19.0	21.0	BDL	BDL	0	BDL	0
WHO Ambient air guidelines, 2005		-	-	-	25	50	-	20	-	-	-
EMC (Air Quality) regulation 2014			-	-	75	150	5	125	100	80	150

Noise Level Measurement

Noise level measurement was conducted at two locations: Within project site and
Close to entrance area. Ndwaru Residential Road Measurements were conducted for 40mins at each location. Average results of LAeq were compared against EMC (Noise and Excessive vibration diurnal limits) and WHO guidelines for community noise. The two locations had noise levels surpassing EMC limits but within the WHO limits

Table 0-2: Average noise levels against EMC and WHO limits

Location	LAeq (dB)	LA (max)	LA (min)
Within the project site	56.9	76.0	49.7
Close to the Entrance Area /Ndwaru Road	58.3	67.4	49.4
EMC limits	**55.0**	**	**
WHO Limits	**70.0**	**	**

Vibration levels

Determination of vibration levels was conducted using a vibration meter at locations similar to those of noise level measurement. The exercise involved determination of acceleration, velociLOREty and displacement. Average results for each location were compared to limits set in the EMC (noise and excessive vibration) Regulation 2009 and found to comply.

Table 0-1: Average noise levels against EMC and WHO limits

Location	Acceleration (mm/s2)	Velocity (mm/s)	Displacement (mm)
Close to the Entrance Area /Ndwaru Road	0.02	0.2	0.003
Within Project site	0.04	0.5	0.003
EMC Limits	**-**	**5mm/s**	-

Baseline environmental measurement (air quality, noise levels and vibrations) results show that the existing conditions within and around the proposed project site have no negative effects to the environment. The contractor is therefore recommended to implement the following measures to manage effects of pollution during project implementation phase.

- Identify and control pollution from the source at locations likely to have high production.
- Monitor environmental conditions periodically to assess changes and effectiveness of measures implemented to manage pollution.

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ABBREVIATIONS AND ACRONYMS

EMC	Environmental Management and Co ordination
dBA	Decibels (A) weighted
DO	Dissolved oxygen
EMC	Environmental Management and Coordination
GPS	Geographic Positioning System
COD	Chemical Oxygen Demand
LAeq	Equivalent noise
LAmin	Minimum Sound Level
LAmax	Maximum Sound Level
NEMA	National Environment Management Authority
CO	Carbon Monoxide
$PM_{2.5}$	Particulate Matter (<2.5 microns)
PM10	Particulate Matter (<10 microns)
O3	Ozone
Temp	Temperature
NTU	Nephelometric Turbidity units
NO_2	Nitrogen Dioxide
NO	Nitrogen (I) Oxide
Ug/m^3	Micro Gram per Cubic Metre
Mg/m^3	Milligram per Cubic Metre
RMS	Root Mean Square
ppb	Parts per billion

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1 AMBIENT NOISE LEVELS

1.1 BACKGROUND INFORMATION ON AMBIENT NOISE MEASUREMENT

Baseline ambient noise levels measurement was conducted for the proposed construction of residential apartments at Riruta Keza Housing development. Recognizing the inherent environmental implications and the need for meticulous planning, this report aims to establish a baseline understanding of the existing acoustic conditions at locations surrounding the project area. As the construction activities unfold, this baseline will serve as a crucial reference point to evaluate and mitigate potential noise impacts on terrestrial environments, ensuring a harmonious coexistence within the Riruta area and around the maiden housing project (Phase 1). Through rigorous data collection and analysis, this report contributes to the project's commitment to environmental stewardship and sustainable development practices.

Noise, which is commonly described as undesired sound, is typically characterized by its intensity, frequency, periodicity (continuous or intermittent), and duration. Sound is created by the air pressure changes resulting from vibration (Thompson, 1994).

1.2 SCOPE OF WORK

The scope of work as agreed with the client includes.

- Baseline noise level measurement for LAmax, LAmin and LAeq for selected measurement location.
- Correlating the data against the EMC (Noise and Excessive vibration) regulation 2009 limits.

1.3 OBJECTIVE OF QAURTELY NOISE LEVELS MEASUREMENT

- To measure diurnal noise levels at the selected locations
- To correlate the noise obtained data with the Excessive Noise & Vibrations (EMC) Regulations of 2009.
- To document the findings of the study in a comprehensive report, which will be used to determine the noise levels for compliance.
- To utilize the documented report for future correlation during project construction phase.

1.4 MEASUREMENT METHODOLOGY

The Noise measurements were carried as per the ISO 1996 Parts 1, 2 and 3 standards, entailing the following:

- Inspection of the vicinity and the implicated activities
- Verification/Calibration of the sound level meter before and after the measurements.

Meteorological conditions during the measurement- Measurements of temperature, wind speed and relative humidity were taken before the noise level measurements. The ISO 1996 does not define the

length of the measuring period and only advises on the measuring time that covers the changes in operation of the noise source. A series of short-term measurements were conducted at representative measurement locations. These allowed the nature, character and dominant noise sources surrounding and within the Study Area to be identified. Measurements were in duration of 10 to 20 minutes and recorded the following parameters - LAeq, LAmax, and LAmin, L90 and L10. Noise levels are expressed in decibels, A-weighted sound pressure level (dBA). The measurement results are expressed as follows:

The following instruments were used during the measurement:

Noise Meter: A Type 1, Data logging, precision impulse, integrating sound level meter, with a microphone (and windshield) mounted on a tripod at 1.5m above the ground level and >3m from any façade. Noise level measurement was conducted approximately 2 meters from any sound-reflecting objects, including walls and trees.

1.5 MEASUREMENT TOOLS, MATERIALS AND EQUIPMENT

- Sound Level meter TES 1358C
- Geographical Positioning System
- Digital camera
- Calibration Certificates

1.6 REGULATORY FRAMEWORK RELEVANT TO NOISE EMISSION AND EXPOSURE LIMITS

The legislative controls relevant to noise emissions associated with any development is outlined in legal notice no. 61 the Environmental Management and Coordination (Noise and Excessive

1.6.1 Environmental Management and Coordination (Noise and Excessive Vibration Pollution) (control) Regulations, 2009

The Kenyan Environmental Management and Coordination (Noise and Excessive Vibration Pollution) (Control) Regulations, 2009 were established to regulate and control noise and excessive vibration pollution in order to protect the environment and public health.

The regulations provide guidelines for the acceptable noise and vibration levels in different environments, including residential, commercial, and industrial areas. They also outline the responsibilities of various stakeholders, including developers, property owners, and regulatory authorities, in managing and controlling noise and vibration pollution. Under these regulations, any person who generates noise or vibration beyond the acceptable levels is required to take measures to reduce the pollution, including using noise reduction equipment and controlling the time and

duration of noise or vibration. The regulations also establish penalties for non-compliance, which may include fines, suspension or revocation of licenses, or imprisonment.

Overall, the Kenyan Environmental Management and Coordination (Noise and Excessive Vibration Pollution) (Control) Regulations, 2009 aim to promote sustainable development by ensuring that noise and vibration pollution is effectively managed and controlled to minimize their negative impacts on the environment and public health.

Table 1-1 EMCA Legal Notice 61. First Extract Schedule

ZONE		*Sound Level Limits dB (A)* L_{eq}, *14 h*		*Noise Rating Level (NR)* L_{eq}, *14 h*	
		DAY	NIGHT	DAY	NIGHT
A	Silent Zone	40	35	30	25
B	Place of worship	40	35	30	25
C	Residential: Indoor Outdoor	45 50	35 35	35 40	25 25
D	Mixed Residential (with some commercial and places of entertainment)	55	35	50	25
E	Commercial	60	35	55	25

1.6.2 World Health Organization Guidelines for Community Noise

Community noise (also called environmental noise, residential noise or domestic noise) is defined as noise emitted from all sources except noise at the industrial workplace. Main sources of community noise include road, rail and air traffic, industries, construction and public work, and the neighborhood. Health-based guidelines on community noise can serve as the basis for deriving noise standards within a framework of noise management. Key issues of noise management include abatement options; models for forecasting and for assessing source control action; setting noise emission standards for existing and planned sources; noise exposure assessment; and testing the compliance of noise exposure with noise emission standards.

Figure 1-1: WHO guideline value for community Noise

Specific Environments	Critical Health effect(s)	LAeq (dBA)	Time base	LAmax (dB)
Industrial, commercial shopping and traffic areas, indoors and outdoors	Hearing impairment	70	24	110

*The project site can generally be categorized under the Zone of "***Industrial, commercial shopping and traffic areas, indoors and outdoors.**"

1.7 RESULTS OF THE FINDINGS

1.7.1 Noise Levels

Table 1-2: Diurnal noise average results against EMC and WHO limits

Location	LAeq (dB)	LA (max)	LA (min)
Close to the Entrance Area /Ndwaru Road	56.9	76.0	49.7
Within the Project Site	58.3	67.4	49.4
EMC limits	**55.0**	**	**
WHO Limits	**70.0**	**	**

1.8 GRAPHICAL REPRESENTATION

1.8.1 Average Noise Levels results

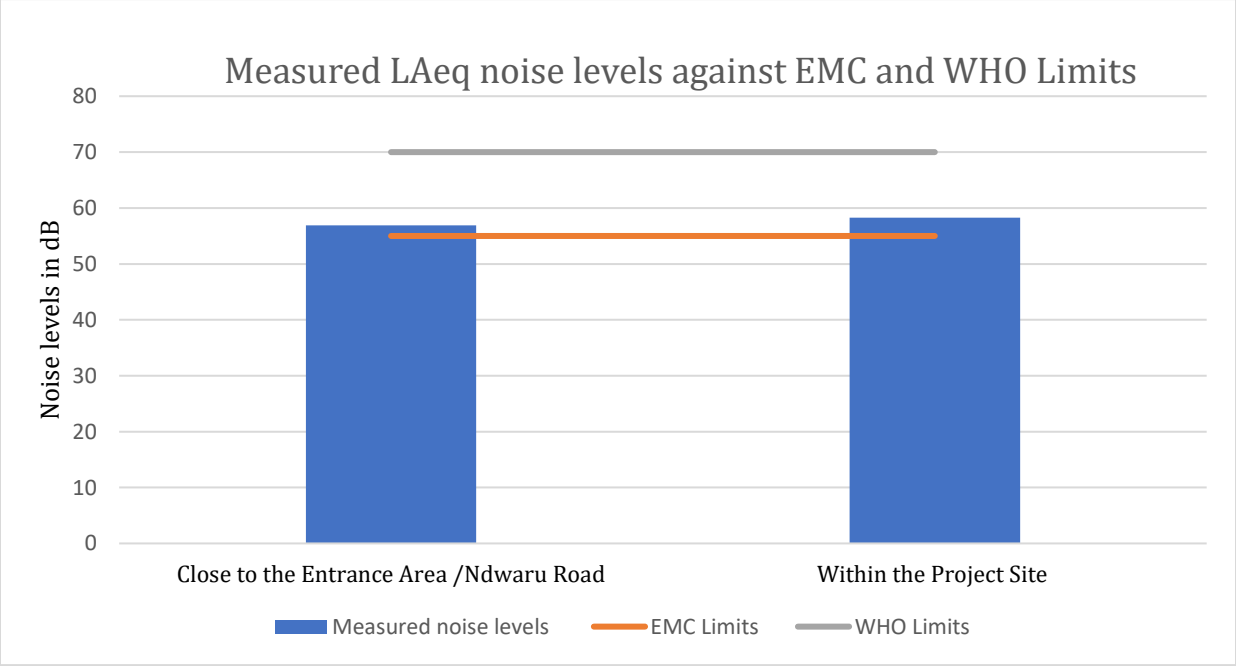


Figure 1-2 Average LAeq against EMC (Noise & Excessive Vibrations) Regulations, 2009 and WHO Noise Guidelines.

1.9 DISCUSSION OF RESULTS

The average noise levels results were compared against the established noise standards outlined in the World Health Organization (WHO) and the EMC (Noise and Excessive Vibrations) Regulation 2009.

The correlation revealed that the two locations had average noise levels that surpassed the EMC diurnal limits in the two locations. Upon comparison with WHO limits the average noise levels complied with stipulated limits.

The highest average noise levels were recorded at the closest to the project site entrance. The measured noise levels within the above-mentioned area could be attributed to the vehicular movement and site preparation of the entrance gate.

1.9.1 Conclusion

Baseline noise level measurement was conducted conclusively for the recommended locations within proposed site. All the study objectives were met during the assessment. Average noise levels surpassed the EMC limits but complied with WHO limits.

2 VIBRATION LEVELS MEASUREMENT

2.1 BACKGROUND INFORMATION ON VIBRATION

This baseline ground vibration report assumes a pivotal role in the comprehensive assessment of the proposed construction of residential apartments within Riruta, Dagoretti south along Ndwaru road Nairobi. This report is designed to establish a foundational understanding of the existing ground vibration as a result of the construction activities. Findings of the report are expected to guide the proponent on effective strategies that localize ground vibrations within the project site. Ground vibrations, in particular, are a type of mechanical oscillation that can be felt or heard when energy is transferred to the ground from a vibrating source. The potential impact of ground vibrations on nearby structures and the environment has led to increased interest and concern about vibration measurement and control.

2.2 MEASUREMENT OBJECTIVES

- To measure Vibration levels at the selected measurement location and the results to be correlated against EMC (Noise Excessive Vibration), Regulations, 2009.
- To document the findings in a comprehensive report which will form the benchmark upon which subsequent measurements will be based.

2.2.1 MEASUREMENT LOCATION

Measurement of vibration levels was conducted at the boundary of the project site towards the nearest residential area, and within the project site. GPS locations and description of measurement locations is given below.



2.2.2 TOOLS AND EQUIPMENT

- Vibration meter
- GPS
- Digital camera

2.3 MEASUREMENT METHODOLOGY

Vibration levels were assessed using a Vibration Meter connected to a sensor, which was carefully spiked into the ground to measure acceleration, velocity, and displacement ranges. Measurements were recorded for 40 minutes each. Additionally, the surveyor evaluated and documented the characteristics of the surrounding area that could have influenced the measurement results hence accounted for all fluctuations recorded during the exercise.

2.4 LEGISLATION AND GUIDELINES

2.4.1 THE ENVIRONMENTAL MANAGEMENT AND COORDINATION (NOISE AND EXCESSIVE VIBRATION POLLUTION) (CONTROL) REGULATIONS, 2009

The EMC (Noise and Excessive Vibrations) Regulations, 2009 state that it is prohibited for any individual to create excessive vibrations that cause annoyance, disturbance, injury, or endanger the comfort, health, safety of others and the environment, unless otherwise stated in the regulations. Additionally, creating excessive vibrations that exceed 0.5 centimeters per second beyond any source property boundary or 30 meters from any moving source is also prohibited, unless otherwise provided. Any person found violating these provisions of the regulation is committing an offense.

Table 2-1: Typical acceptable vibration levels at 20Hz

Criteria and Relevant Standard	RMS / Peak	Acceptable Velocity Limits	Equivalent Acceleration at 20 Hz
Structural integrity (DIN4150)	Peak	10 mm/s	1.26 m/s^2
Machine service ability (AS2625)	RMS	1.8 mm/s	0.23 m/s^2
Human comfort (AS2670)	RMS	0.1 m/s	0.1 m/s^2

Table 2-2 : Regulation for Vibrations Measurement

	ACCELERATION	VELOCITY	DISPLACEMENT
FREQUENCY RANGE	1Hz-100Hz	3Hz-1kHz	3Hz-500Hz
LEVEL RANGE (FS)	1	10.0	0.100
RMS/EQP-P/EQPEAK	RMS	EQ-PEAK	EQP-P
Min	0.01m/s^2=60dB	0.1m/s	0.001mm
KENYA REGULATION		Regulation 0.5cm/s=5mm/s	

2.5 RESULTS AND DISCUSSIONS

Vibration measurement was conducted at two receptor locations surrounding the proposed project site. Table below details a summary of results for all the locations at the time of measurement.

Table 2-3 Average Results for Vibration Measurements

Location	Acceleration (mm/s2)	Velocity (mm/s)	Displacement (mm)
Close to the Entrance Area /Ndwaru Road	0.02	0.2	0.003
Within Project site	0.04	0.5	0.003
EMC Limits	**-**	**5mm/s**	-

2.6 GRAPHICAL REPRESENTATION AND DISCUSSION

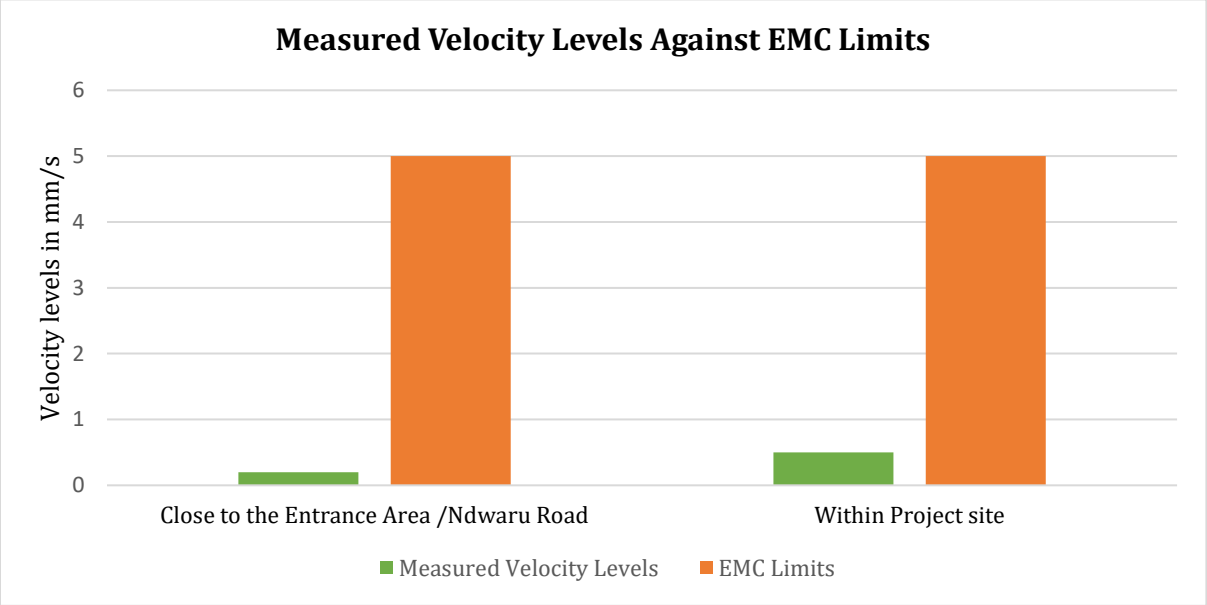


Figure 2-1 Measured velocity against EMC (Noise and Excessive Vibrations) Regulations, 2009

The measurement of vibration levels was carried out at two locations; one surrounding the proposed project site and point two, within the project site. The average results for each location were compared against the regulatory standards outlined in the EMC (Noise and Excessive Vibration) Regulation of 2009 and found to comply with stipulated limits.

It is worth noting that there was no notable human activity that could have led to significant vibration levels and this is evident by the vibration results achieved during measurements.

2.7 CONCLUSION

All the measurement objectives were met during the study. Average velocity levels for the two measurement locations were compared against the limits set in the EMC (Noise and Excessive vibration and) Regulation and found to comply with set limits. The baseline vibration results achieved do not interfere with the human comfort at receptor locations surrounding the proposed project site.

3 AMBIENT AIR QUALITY MEASUREMENT

3.1 BACKGROUND INFORMATION ON BASELINE AMBIENT AIR QUALITY MEASUREMENT

Centric Africa Ltd provide consulting services in various fields including research, environmental assessment and auditing and convening and facilitating dialogues for development agencies, Government ministries, private sector and Non-Governmental Organizations (NGO).

Baseline ambient air quality measurement was therefore commissioned Centric Africa Ltd to document a comprehensive baseline ambient air quality at the proposed project site. The study was to show how the intended construction operations will influence the quality of air at this location. The study findings were to assist the company in determining the benchmarks for subsequent monitoring exercises and further inform the proponent on viable control measures for adoption to minimize environmental impacts from the project site.

3.2 SCOPE OF WORK

The scope of work as agreed with the client involved:

- Conducting baseline Air Quality measurements at selected locations within the project site
- Collecting ambient air data at selected measurement locations
- Correlate the finding to the EMC (Air Quality), Regulations, 2014 and WHO ambient air quality guidelines for Compliance.

3.3 OBJECTIVE OF AIR QUALITY MEASUREMENT

- To measure the concentration of main Particulate Matter and Gaseous parameters at the project site.
- To correlate the findings with Environmental Management and Coordination (Air Quality), Regulations, 2014 to ascertain for Compliance.
- To document the baseline findings in a comprehensive report which will later be used as a basis to monitor and assess the environmental conditions.

3.4 MEASUREMENT METHODOLOGY

Ambient air quality measurement methodologies vary depending on parameters (analyte of interest) to be monitored as well at the set objectives of the measurement. It's fundamental that real time and accurate data is collected so that the reported findings can form the basis upon which decision making and environmental audit of project activities can be made. This data can particularly be desirable for air quality effect assessments involving modelling since it enables modelled concentrations for the monitored parameters. This process enables greater confidence to be placed in model predictions.

3.4.1 Active and Continuous Sampling for Gaseous and Particulate Parameters

Measurement of ambient air quality was conducted using AQM 09 Air Quality Monitor system. Based on advanced sensor technology, the AQM 09 integrates the main ambient gases and meteorological parameters.

Measurements for Nitrogen Oxides, Carbon monoxide and Sulfur dioxide were done using the gas sensitive electrochemical methods of active and continuous sampling. The gas sensitive electrochemical sensors generate nano-amp currents proportional to the gas concentration. AQM uses low noise electronics to capture these signals resulting in low detection levels.

Ozone, Hydrocarbons and Carbon Monoxide were measured using a gas sensitive semiconductor sensor. The sensor uses proprietary sensing material, built-in automatic baseline correction and interference rejection. This combination results in ppb resolution and a highly linear response.

The AQM 09 has a laser particle counter (LPC) for Particulate Matter (PM) measurements. It uses optimized signal processing using low noise electronics, it has algorithms that are added to correct for interferences, e.g., humidity. The equipment was mounted at about 1 – 2 M above the ground surface.

3.4.2 Meteorological Parameters Measurement techniques

As part of the ambient air quality measurement, meteorological parameters were measured. Temperature and humidity were measured on site while windspeed and direction were obtained from online from the Meteorological department. The following techniques were employed:
Temperature & humidity were measured using the AQM 09 Air quality Monitor station series which houses temperature and humidity sensors. Temperature was measured by way of a highly accurate Air Chip 3000 while humidity was measured using a capacitive humidity sensor (accuracy < 0.8 % / 0.1 K). To keep the effects of external influences (e.g., solar radiation) as low as possible, the sensors were in a ventilated housing with radiation protection.

3.5 MEASUREMENT TOOLS, EQUIPMENT AND MATERIALS

- OCEANUS -1000 Monitoring Equipment
- Geographic Positioning System (GPS)
- Digital camera
- Calibration certificates

3.5.1 Description of the Measurement Location

Measurement points were selected at locations within proposed construction site. Point selection was based on the size of the area, and proximity to nearby sensitive receptors.

Table 3-1: Measurement locations

NO.	SITE NAME	DESCRIPTION	ONGOING ACTIVITIES
1	Close to the Entrance Area /Ndwaru Road	Measurement point was located close to the proposed entrance to the site	• Movement of site officials/Vehicles at the entrance to the site.
2	Within Project site	Measurement location was positioned within the proposed project site central position	• No notable activity ongoing within this area.

3.6 RATIONALE FOR MEASUREMENT SELECTION

3.6.1 Carbon Monoxide

Carbon monoxide is a product of incomplete combustion of carbon fuel containing limited oxygen supply. In construction sector, emission of CO can result from gasoline and petrol-powered machinery movement or general operations. CO results in limited absorption of oxygen within the respiratory system, when inhaled by humans, hence can cause death.

3.6.2 Oxides of Nitrogen

The oxides of nitrogen (NO_X) comprise nitric oxide (NO) and Nitrogen Dioxide (NO_2).
Oxides of Nitrogen are generated from combustion systems due to high pressures and temperatures, leading to oxidation of nitrogen with oxygen, both present in the air.

3.6.3 Particulate Matter

Particulate matter refers to is small particles that are classified as PM_{10}, $PM_{2.5}$ or $PM_{0.1}$ depending on their size. These particles have a diameter of less than 10 µm, 2.5 µm and 0.1 µm respectively; particles smaller than 0.1 µm are also called ultrafine particles (UFPs). The combustion of diesel and heavy fuel oil leads to a high amount of PM emissions. PM also develops when certain pollutants meet other substances.
The smaller the particles, the worse the effect on human health. Inhalation of inhalable particulate matter pose a great health risk. These tiny particles get into the lungs and are small enough to pass through tissues and enter the blood stream. They can then trigger inflammations which eventually cause heart and lung failures. The World Health Organization estimates that long term exposure to PM2.5 is associated with an increase in the risk of cardiopulmonary mortality by 6–13% per 10 µg/m3 of PM2.5. (Aeroqual, 2022).

3.6.4 Sulphur Dioxide

Sulphur dioxide is a colorless gas with a strong choking odor. It is produced from burning fossil fuels and smelting of mineral ores such as copper, aluminum, zinc and lead. SOx (Oxides of Sulphur) comprehend a family of different chemical compounds characterized by the presence of Sulphur and Oxygen. In nature, these emissions are typically produced by volcanoes. They have harmful effects on the human body, as they stimulate nasal and throat nerves causing respiratory problems especially in asthmatic individuals.

3.6.5 Ozone

Ozone is a highly oxidative compound formed in the lower atmosphere from gases (originating to a large extent from anthropogenic sources) by photochemistry driven by solar radiation. Owing to its highly reactive chemical properties, ozone is harmful to vegetation, materials, and human health. In the troposphere, ozone is also an efficient greenhouse gas. A small amount of ozone does occur naturally at ground level. Most of the ozone that is found near the ground comes from vehicle exhaust and emissions from factories, power plants, and refineries. Elevated exposures to ozone can affect sensitive vegetation and ecosystems, including forests, parks, wildlife refuges and wilderness areas. Ozone can harm sensitive vegetation during the growing season.

3.6.6 Wind Speed & Direction

The wind direction at a given time determines the general area into which a mass of gas or a cloud of particles will move. The wind speed closely specifies how rapidly the contaminant will advance into that area. Other things being equal, the concentration at a point downwind from the source will be inversely proportional to the wind speed. In rough terrain it cannot be assumed that the wind direction and speed near the source govern the subsequent motion of the contaminant. Hills may deflect the air flow either horizontally or vertically or both, the amount of deflection depending on the vertical stability of the atmosphere. In valleys the wind carrying a pollutant tends to flow either up or down valley, following its meanderings. The deeper the valley the more pronounced this channeling effect is. (Hewson, 1956).

3.6.7 Temperature

Temperature and sunlight (solar radiation) play an important role in the chemical reactions that occur in the atmosphere to form photochemical smog from other pollutants. Favourable conditions can lead to increased concentrations of smog.

3.6.8 Humidity

Like temperature and solar radiation, water vapor plays an important role in many thermal and photochemical reactions in the atmosphere. As water molecules are small and highly polar, they can bind strongly to many substances. If attached to particles suspended in the air, they can significantly increase the amount of light scattered by the particles. If the water molecules attach to corrosive gases, such as sulfur dioxide, the gas will dissolve in the water and form an acid solution that can damage health and property.

3.6.9 Rainfall

Rainfall normally washes particulate matter out of the atmosphere and dissolves gaseous pollutants. Removing particles improves visibility. Where there is frequent high rainfall, air quality is generally

better. If the rain dissolves gaseous pollutants, such as sulfur dioxide, it can form acid rain resulting in potential damage to materials or vegetation.

3.7 LEGISLATIVE & GUIDELINES

3.7.1 The Environmental Management Coordination (Air Quality), Regulations), 2014.

The Kenya Air Quality Regulations 2014 impose limit values as detailed in the SPECIAL ISSUE Kenya Gazette Supplement No.41, Legislative Supplement No.15, Legal Notice No. 34, compliance with the objectives (prevention, control and abatement of air pollution to ensure clean and healthy ambient air) is a legal requirement in Kenya. Statutory requirements relevant to this study **FIRST SCHEDULE** are detailed in Table 3-2 below.

Table 3-2 Ambient Air Quality Tolerance Limits

	Pollutant	Time weighted Average			
	-	-	Industrial area	Residential, Rural & Other area	Controlled areas***
1	Sulphur Oxides (SOx)	24 hours**	125 µg/m^3	80 µg/m^3	30 µg/m^3
2	Oxides of Nitrogen (NOx)	24 hours	150 µg/m^3	80 µg/m^3	30 µg/m^3
3	Nitrogen Dioxide	24 hours	100 µg/m^3	0.1 ppm	-
4	Respirable particulate matter (<10 µg/m^3) (RPM)	24 hours**	150µg/Nm^3	100µg/Nm^3	75µg/Nm^3
5	$PM_{2.5}$	24 hours	75 µg/m^3	-	-
6	Carbon monoxide / carbon dioxide	8 Hours	5 mg/m^3	2.0 mg/m^3	1.0 mg/m^3
7	Hydrogen Sulphide	24 hours**	150 µg/m^3	-	-
8	Non-methane hydrocarbons	Instant peak	700 ppb	-	-
9	Total VOC	24 hours**	600 µg/m^3	-	-
7	Ozone	8 hours	120 µg/m^3	1.25 ppm	-

Note: (-) denotes that limits are not available in the EMC (Air Quality) Regulations, 2014

The table above is an excerpt of the FIRST SCHDEULE of the EMC (Air Quality) Regulations, 2014

3.7.2 World Health Organization (WHO) 2005 Air Quality Guideline

The WHO air quality guidelines are designed to offer guidance in reducing the health impacts of air pollution. These guidelines are intended to inform policymakers and to provide appropriate targets for a broad range of policy options for air quality management in different parts of the world. The new information included in this update of the Air quality guidelines relate to four common air pollutants: Particulate matter (PM), ozone (O_3), Nitrogen dioxide (NO_2) and Sulfur dioxide (SO_2). These are also listed in Table 4.1 of (IFC 2007).

Table 3-3: WHO Air Quality Guidelines

Parameter	Averaging period	Guideline value in ug/m^3
Sulphur Dioxide (SO_2)	24 – hour 10 minutes	125 (Interim target 1) 50 (Interim target 2) 20 (Guideline) 500 (Guideline)
Nitrogen Dioxide (NO_2)	1 – year 1-hour	40 (Guideline) 200 (guideline)
Particulate Matter (PM_{10})	1-year 24-hour	70 (Interim target 1) 50 (Interim target 2) 30 (Interim target 3) 20 (Guideline) 150 (Interim target 1) 100 (Interim target 1) 75 (Interim target 1) 50 (Guideline)
Particulate Matter ($PM_{2.5}$)	1-year 24-hour	35 (Interim target 1) 25 (Interim target 2) 15 (Interim target 3) 10 (Guideline) 75 (Interim target 1) 50 (Interim target 1) 37.5 (Interim target 1) 25 (Guideline)
Ozone	8-hour daily Maximum	160 (Interim target 1) 100 (guideline)

Source: (World Health Organisation, 2005)

In addition to guideline values, interim targets are given for each pollutant. These are proposed as incremental steps in a progressive reduction of air pollution and are intended for use in areas where pollution is high. These targets aim to promote a shift from high air pollutant concentrations, which have acute and serious health consequences, to lower air pollutant concentrations. If these targets were to be achieved, one could expect significant reductions in risks for acute and chronic health effects from air pollution. Progress towards the guideline values should, however, be the ultimate objective of air quality management and health risk reduction in all areas.

3.8 MEASUREMENT RESULTS

The section below summarizes the air quality measurement results for each parameter.

Table 3-4: Air quality measurement average results

Measurement location	Temp °C	Hum %	Wind Direction	Wind Speed	$PM_{2.5}$ (µg/m³)	PM_{10} (µg/m³)	CO (mg/m³)	SO_2 (ug/m³)	NO_2 (ug/m³)	NO (ug/m³)	O_3 (ug/m³)
Close to the Entrance Area /Ndwaru Road	23.7	61.4	NE	10 km/h	18.0	22.0	BDL	0.50	2	1	0
Within Project site	22.2	59.2	NE	10 km/h	12	21.0	BDL	BDL	1	BDL	0
WHO Ambient air guidelines, 2005		-	-	-	25	50	-	20	-	-	-
EMC (Air Quality) regulation 2014 limits			-	-	75	150	5	125	100	80	150

3.9 GRAPHICAL REPRESENTATION

3.9.1 Particulate Matter ($PM_{2.5}$)

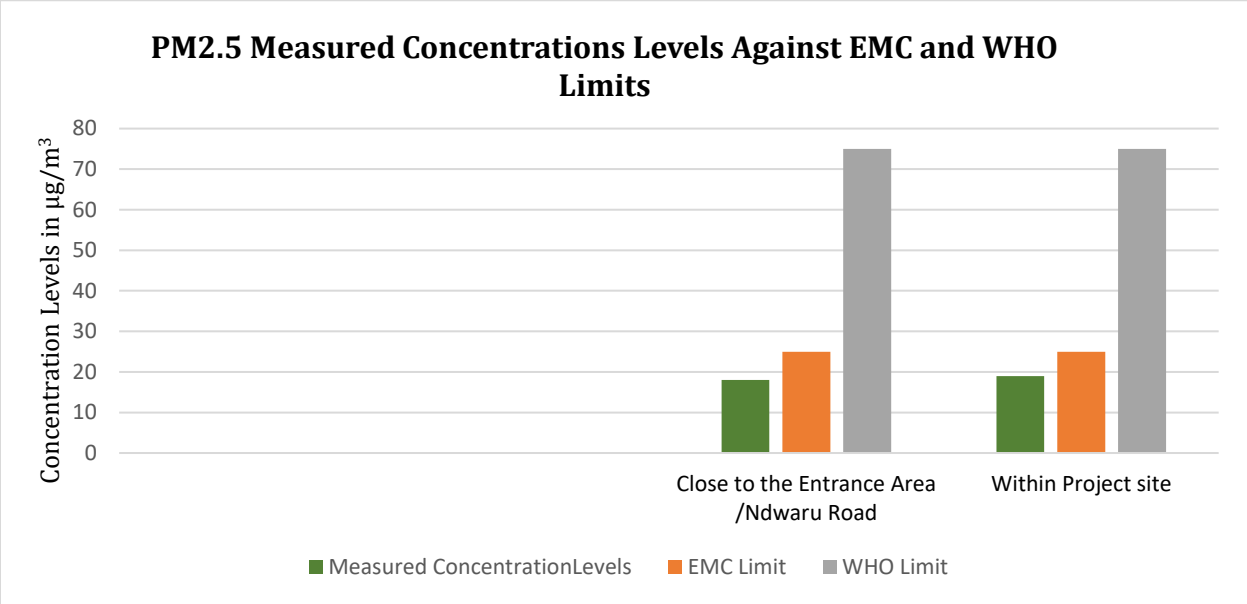


Figure 3-1 Average $PM_{2.5}$ results against WHO air quality guidelines and EMC (Air Quality), Regulations, 2014

3.9.2 Particulate Matter (PM_{10})

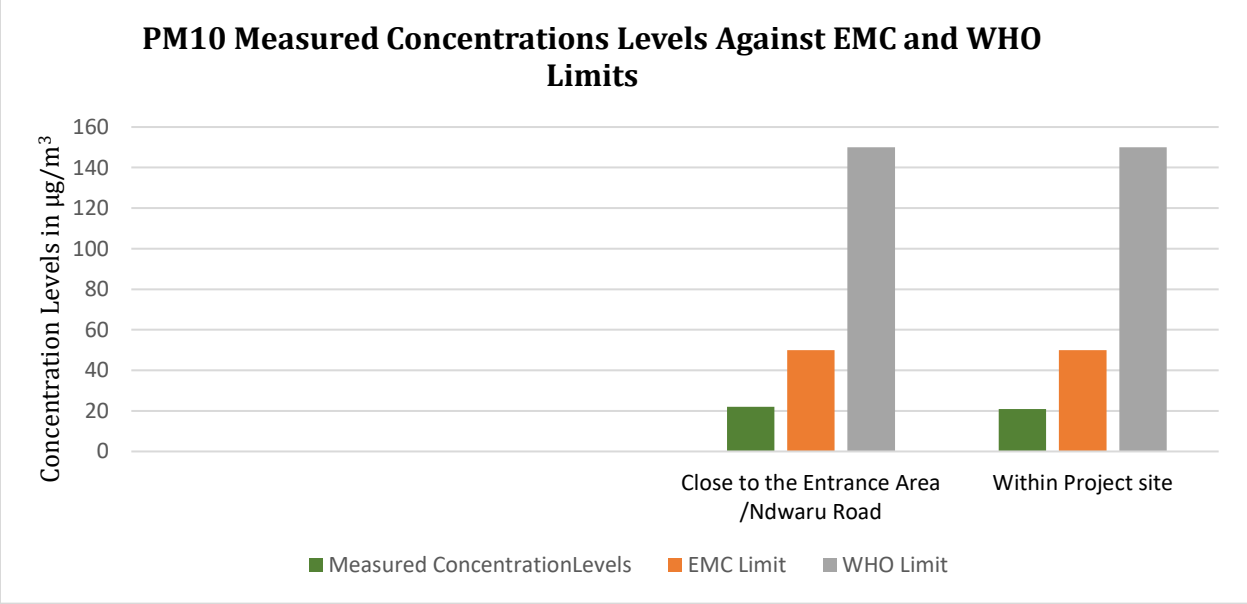


Figure 3-3 Average PM_{10} results against WHO air quality guidelines and EMC (Air Quality), Regulations, 2014

3.9.3 Ozone

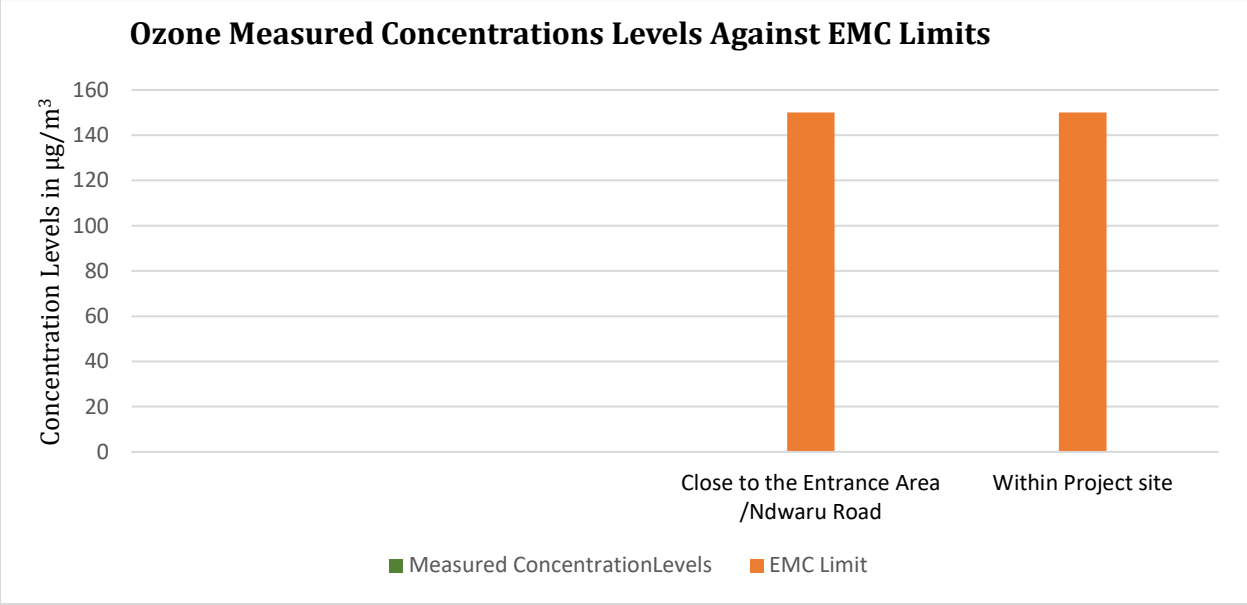


Figure 3-4 Average ozone results against EMC (Air Quality), Regulations, 2014

3.9.4 Discussion of Results

The comprehensive ambient air quality assessment was conducted at two locations, outside and within the proposed project site for both gaseous and particulate matter parameters. Notably, all the predetermined objectives were successfully met during the measurement period.

All the gaseous and particulate matter parameters complied with limits set in the EMC (Air quality) regulation 2014 and WHO ambient air quality guidelines.

3.9.5 Conclusion

Results of all the gaseous and particulate matter parameters complied with both EMC (Air quality) Regulation 2014 and WHO limits for all the measurement locations.

4 REFERENCES

I. Environmental Management and Coordination (Excessive noise and vibration) regulations of 2009
II. World Health Organization Guidelines for Community Noise.
III. Environment, Water and Natural Sources Ministry. (2014). Environmental Management Cordination (Air Quality) Regulations. Nairobi: The Government Printer

ANNEXES

ANNEX I: PHOTOGRAPHIC REPORT



Vibrations Measurements



Noise Measurements



Air Quality Measurements

ANNEX II: CALIBRATION CERTIFICATES



HENAN OCEANUS

Calibration Certificate

"Gas detection made simple"

This *Certificate of Calibration and Test* confirms our continued commitment to product quality and reliability

Material Tested

Model Name. : OC-1000
Serial No. : 00240379391
Date : March 3, 2025
Calibration Gas : Fresh air

SO2	0-20PPM
NO2	0-20PPM
CO	0-1000PPM
O3	0-5PPM
PM	0-999UG/M3

Test Result

	Gas Type				
	SO2	NO2	CO	O3	PM
Functional Test					
Start up	Pass	Pass	Pass	Pass	Pass
Self diagnosis	Pass	Pass	Pass	Pass	Pass
Zero Calibration	Pass	Pass	Pass	Pass	Pass
Span Calibration	Pass	Pass	Pass	Pass	Pass
Alarm Test					
First alarm	Pass	Pass	Pass	Pass	Pass
Second alarm	Pass	Pass	Pass	Pass	Pass
Response time for T90	25seconds	25seconds	25seconds	25seconds	25seconds
Accuracy(Value/Test gas)	19.99/20	19.99/20	999.9/1000	4.99/5	998/999
Low battery alarm	Pass	Pass	Pass	Pass	Pass
Data logger Test					
Data logging	Pass				

Tested by

QC PASS 01

HENAN OCEANUS

Certificate of Calibration and Test

"Gas detection made simple"

This *Certificate of Calibration and Test* confirms our continued commitment to product quality and reliability

Material Tested

Model Name.	: OC-1000
Serial No.	: 00240379390
Date	: March 4, 2025
Calibration Gas	: Fresh air
	H2S 0-100PPM
	VOC 0-10PPM

Test Result

	Gas Type H2S	Gas Type VOC
Functional Test		
Start up	Pass	Pass
Self diagnosis	Pass	Pass
Zero Calibration	Pass	Pass
Span Calibration	Pass	Pass
Alarm Test		
First alarm	Pass	Pass
Second alarm	Pass	Pass
Response time for T90	25seconds	25seconds
Accuracy(Value/Test gas)	99.99/100	9.99/10
Low battery alarm	Pass	Pass
Data logger Test		
Data logging		Pass

Tested by

QC PASS 01

Verification Code: KEBS#13187

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2025-05-30

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REQUESTED BY:	POLUCON SERVICES (K) LIMITED
ADDRESS :	P.O. BOX 99344-80107 MOMBASA
EQUIPMENT:	SOUND LEVEL METER
TYPE/MODEL :	NL-52
SERIAL NO. :	687075
MANUFACTURER:	RION
MICROPHONE TYPE:	UC-59
MICROPHONE S/NO.:	25028
LABORATORY :	ACOUSTICS AND VIBRATION - NP 15
DATE :	2025-05-23
CERTIFICATE NO.:	KEBS/MET/19/15/3/12/48
STICKER S/NO.:	MET/15/25/03/0003

1.0. STANDARDS AND REFERENCE EQUIPMENT USED

- Multifunction acoustic calibrator, B&K, Type 4226, S/No. 2532059
- Signal generator B&K type 1051 S/No. 2431664
- B& K Inline capacitor WA 0302-B 15 pF S/No. 2487479
- Reference attenuator, B&K, -20 dB, S/No. ZF 0023

2.0. METROLOGICAL TRACEABILITY

This calibration certificate documents traceability to the National measurement standards, and to the units of measurement realized at KEBS, or other recognized national standards laboratories according to the International System of Units (SI). KEBS is a signatory of the CIPM Mutual Recognition Arrangement (CIPM MRA) and where there is no published Calibration and Measurement Capabilities (CMCs), KEBS has documented the traceability of the standard equipment used in 1.0 above.

3.0. CALIBRATION PROCEDURE

The Sound Level Meter was calibrated using Kenya Bureau of Standards Laboratory Procedure MET/15/CP/02: *Sound level meter calibration* and in accordance with the requirements of IEC60651, IEC 60804 and IEC 61672-3:2013.

Prepared By: **Collins Taiti** Date: **2025-05-23**

Checked By: **Samuel Gacheru** Date: **2025-05-30**

Signed :.....

DN: cn=Samuel Gacheru, o=KEBS, ou=Manager Electrical Metrology, email=gacherus@kebs.org, c=KE
Date: 2025.05.30 11:27:08 +03'00'

For: Director Metrology and Testing

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4.0. CALIBRATION RESULTS

4.1 INDICATION AT CALIBRATION CHECK FREQUENCY

Calibrator Frequency (Hz)	Calibrator level (dB)	SLM reading before adjustment (dB)	SLM reading after adjustment (dB)	Uncertainty (dB)
1000	94.1	93.6	94.1	0.2

4.2 ACOUSTICAL SIGNAL TESTS OF A - FREQUENCY WEIGHTING

Frequency (Hz)	Expected Sound pressure (dB)	SLM Reading (dB)	Deviation (dB)	Acceptable Tolerance (dB)	Uncertainty (dB)
125	78.0	78.3	0.3	±1.5	0.3
1000	94.1	94.1	0.0	±1.1	0.2
8000	93.2	89.9	**-3.2**	+2.1;-3.1	0.3

4.3 ACOUSTICAL SIGNAL TESTS OF C - FREQUENCY WEIGHTING

Frequency (Hz)	Expected Sound pressure (dB)	SLM Reading (dB)	Deviation (dB)	Acceptable Tolerance (dB)	Uncertainty (dB)
125	93.9	94.3	0.4	±1.5	0.3
1000	94.1	94.1	0.1	±1.1	0.2
8000	91.3	88.0	**-3.3**	+2.1;-3.1	0.3

4.4 ELECTRICAL SIGNAL TESTS OF A - FREQUENCY WEIGHTING

Frequency (Hz)	Expected Sound pressure (dB)	SLM Reading (dB)	Deviation (dB)	Acceptable Tolerance (dB)	Uncertainty (dB)
63	48.8	49.0	0.2	±1.5	0.4
125	58.9	58.9	0.0	±1.5	0.4
250	66.4	66.4	0.0	±1.4	0.4
500	71.8	71.8	0.0	±1.4	0.4
1000	75.0	75.0	0.0	±1.1	0.4
2000	76.2	76.2	0.0	±1.6	0.4
4000	76.0	75.9	-0.1	±1.6	0.4
8000	73.9	73.9	0.0	+2.1;-3.1	0.4
16000	68.4	67.0	-1.4	+3.5;-17.0	0.4

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4.5 ELECTRICAL SIGNAL TESTS OF C-FREQUENCY WEIGHTING

Frequency (Hz)	Expected Sound pressure (dB)	SLM Reading (dB)	Deviation (dB)	Acceptable Tolerance (dB)	Uncertainty (dB)
63	74.2	74.4	0.2	±1.5	0.4
125	74.8	75.0	0.2	±1.5	0.4
250	75.0	75.1	0.1	±1.4	0.4
500	75.0	75.0	0.0	±1.4	0.4
1000	75.0	75.0	0.0	±1.1	0.4
2000	74.8	74.8	0.0	±1.6	0.4
4000	74.2	74.2	0.0	±1.6	0.4
8000	72.0	72.0	0.0	+2.1;-3.1	0.4
16000	66.5	65.1	-1.4	+3.5;-17.0	0.4

4.6 ELECTRICAL SIGNAL TESTS OF Z - FREQUENCY WEIGHTING

Frequency (Hz)	Expected Sound pressure (dB)	SLM Reading (dB)	Deviation (dB)	Acceptable Tolerance (dB)	Uncertainty (dB)
63	75.0	75.2	0.2	±1.5	0.4
125	75.0	75.1	0.1	±1.5	0.4
250	75.0	75.1	0.1	±1.4	0.4
500	75.0	75.0	0.0	±1.4	0.4
1000	75.0	75.0	0.0	±1.1	0.4
2000	75.0	74.9	-0.1	±1.6	0.4
4000	75.0	74.9	-0.1	±1.6	0.4
8000	75.0	74.9	-0.1	+2.1;-3.1	0.4
16000	75.0	75.0	0.0	+3.5;-17.0	0.4

4.7 FREQUENCY AND TIME WEIGHTINGS AT 1 KHz

Function	Expected Level (dB)	SLM Reading (dB)	Deviation (dB)	Acceptable Tolerance (dB)	Uncertainty (dB)
A Fast	94.0	94.0	0.0	±0.3	0.2
A Slow	94.0	94.0	0.0	±0.3	0.2
A LAEQ	94.0	93.9	-0.1	±0.3	0.2
C Fast	94.0	93.9	-0.1	±0.3	0.2
Z Fast	94.0	94.0	0.0	±0.3	0.2

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4.8 LEVEL LINEARITY ON THE REFERENCE LEVEL RANGE

Test Level (dB)	SLM Reading (dB)	Deviation (dB)	Acceptable Tolerance (dB)	Uncertainty (dB)
40.0	40.0	0.0	±0.6	0.3
41.0	41.0	0.0	±0.6	0.3
42.0	42.0	0.0	±0.6	0.3
43.0	43.0	0.0	±0.6	0.3
44.0	44.0	0.0	±0.6	0.3
45.0	45.0	0.0	±0.6	0.3
46.0	46.0	0.0	±0.6	0.3
47.0	46.9	-0.1	±0.6	0.3
48.0	48.0	0.0	±0.6	0.3
49.0	49.0	0.0	±0.6	0.3
54.0	54.0	0.0	±0.6	0.3
59.0	59.0	0.0	±0.6	0.3
64.0	64.0	0.0	±0.6	0.3
69.0	69.0	0.0	±0.6	0.3
74.0	74.0	0.0	±0.6	0.3
79.0	79.0	0.0	±0.6	0.3
84.0	84.0	0.0	±0.6	0.3
94.0	89.0	0.0	±0.6	0.3
99.0	99.0	0.0	±0.6	0.3
104.0	104.0	0.0	±0.6	0.3
109.0	109.0	0.0	±0.6	0.3
114.0	114.0	0.0	±0.6	0.3
115.0	115.0	0.0	±0.6	0.3
116.0	116.0	0.0	±0.6	0.3
117.0	117.0	0.0	±0.6	0.3
118.0	118.0	0.0	±0.6	0.3
119.0	119.0	0.0	±0.6	0.3
120.0	120.0	0.0	±0.6	0.3

4.9 LEVEL LINEARITY INCLUDING THE LEVEL RANGE CONTROL

Range	Test Level (dB)	SLM Reading (dB)	Deviation (dB)	Acceptable Tolerance (dB)	Uncertainty (dB)
30-120	94.0	94.0	0.0	±1.1	0.3
30-120	35.0	35.1	0.1	±0.6	0.3

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4.10 TONEBURST RESPONSE

Function	Duration	Expected level (dB)	SLM Reading (dB)	Deviation (dB)	Acceptable Tolerance (dB)	Uncertainty (dB)
LAF	Steady state	117.0	117.0	0.0	±0.8	0.3
LAF - MAX	200.0	116.0	116.0	0.0	±0.8	0.3
	2.0	99.0	99.1	0.1	±1.3	0.3
	0.3	90.0	90.9	0.9	+1.3;-3.3	0.3
LAS - MAX	200.0	109.6	109.6	0.0	±0.8	0.3
	2.0	90.0	90.1	0.1	±1.3	0.3
Exposure	200.0	110.0	110.0	0.0	±0.8	0.3
	2.0	90.0	90.1	0.1	±1.3	0.3

4.11 HIGH LEVEL STABILITY

Function	Target Level (dB)	SLM initial reading (dB)	SLM final reading (dB)	Deviation (dB)	Acceptable Tolerance (dB)	Uncertainty (dB)
Fast	119.0	119.0	119.0	0.0	±0,4	0.3
Slow	119.0	119.0	119.0	0.0	±0,4	0.3
Averaged	119.0	119.0	119.0	0.0	±0,4	1.3

5.0. REMARKS

5.1 Calibration was conducted at a temperature of **(23 ± 1) °C**, relative humidity of **(50 ± 10) %RH** and pressure of **(840 ± 5) mbar.**

5.2 The reference for the dB scale is sound pressure level of 20 µPa at 1 kHz.

5.3 The readings in **bold** in sections **4.2** and **4.3** exceeded the permitted tolerance for type 1 sound level meters.

5.4 The uncertainty of measurement has been determined in accordance with Publication JCGM 100:2008 "*Evaluation of measurement Data-Guide to the expression of uncertainty in measurement*" and represents the expanded value after multiplying by a coverage factor of 2 for a level of confidence of 95 %.

5.5 This certificate is valid until **May 2026.**

.....End.....

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2025-08-28

Calibration Certificate

REQUESTED BY :	**POLUCON SERVICES (K) LIMITED - MOMBASA**
ADDRESS :	**P.O. BOX 99344 - 80107, MOMBASA, KENYA.**
EQUIPMENT :	**VIBRATION METER**
TYPE /MODEL :	**VM-82**
SERIAL NO. :	**34326889**
MANUFACTURER :	**RION**
LAB NAME. :	**ACOUSTICS AND VIBRATION - NP 15**
DATE :	**2025-08-28**
CERTIFICATE NO.	**KEBS/MET/19/15/3/12/49**
STICKER No. :	**MET/15/25/05/0002**

1.0 CALIBRATION PROCEDURE

1.1 The Vibration meter was calibrated using Kenya Bureau of Standards Laboratory Procedure MET/15/CP/03: Vibration Meter Calibration.

2.0 STANDARDS AND REFERENCE EQUIPMENT USED

2.1 Calibration system CS18 with a standard uncertainty of 0.25% over the frequencies selected

2.2 PCB 301A10 accelerometer with a standard uncertainty of 0.2% for the frequencies selected

3.0 METROLOGICAL TRACEABILITY

This calibration certificate documents traceability to the national measurement standards, and to the units of measurement realized at KEBS, or other recognized national standards laboratories according to the International System of Units (SI). KEBS is a signatory of the CIPM Mutual Recognition Arrangement (CIPM MRA) and where there is no published Calibration and Measurement Capabilities (CMCs), KEBS has documented the traceability of the standard equipment used in 2.0 above.

4.0 VALIDITY

The validity of this calibration certificate expires on 2026-08-28.

Calibrated by: **Taiti Wachira Collins** Date: **2025-08-28**

Checked by: **Samuel Gacheru** Date: **2025-09-10**

Signed:

For: Director Metrology and Testing.

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4.0 MEASUREMENT RESULTS

4.1 Frequency Response

Frequency (Hz)	Reference Reading (m/s²)	DUT Reading (m/s²)	Deviation (%)	uncertainity (%)
5.0	1.4	1.4	2.5	1.2
7.1	1.4	1.4	1.3	1.2
10.0	3.5	3.5	1.0	1.2
14.1	3.5	3.6	2.1	1.2
20.0	3.5	3.6	1.6	1.2
28.2	7.1	7.1	0.4	1.2
39.8	7.1	7.1	0.3	1.2
56.2	7.1	7.1	0.3	1.2
79.4	14.2	14.0	-1.1	1.2
112.2	14.2	14.0	-1.1	1.2
158.5	14.2	14.0	-1.1	1.2
223.9	35.4	35.0	-1.1	1.2
316.2	35.4	35.0	-1.2	1.2
446.7	35.4	35.0	-1.1	1.2
631.0	35.4	34.0	-4.0	1.2
891.3	35.4	35.0	-1.1	1.2
1258.9	35.4	34.0	-3.9	1.2
1778.3	35.4	35.0	-1.0	1.2
2000.0	35.4	35.0	-1.0	1.2
3000.0	35.4	37.0	4.6	1.2
4500.0	35.4	38.0	7.5	1.2

4.4 Range Linearlity at 160Hz

Range (Hz)	Reference Reading (m/s²)	DUT Reading (m/s²)	Deviation (%)	uncertainity (%)
160.0	1.4	1.4	-1.1	1.2
160.0	1.4	1.4	-1.1	1.2
160.0	3.5	3.5	-1.1	1.2
160.0	3.5	3.5	-1.1	1.2
160.0	3.5	3.5	-1.1	1.2
160.0	7.1	7.0	-1.2	1.2
160.0	7.1	7.0	-1.1	1.2
160.0	7.1	7.0	-1.1	1.2
160.0	14.2	14.0	-1.1	1.2
160.0	14.2	14.0	-1.1	1.2

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5.0 REMARKS

5.1 Calibration was conducted at a temperature of (23 ± 1)°C, relative humidity of (54 ± 10)%RH and pressure of (838 ± 5) mbar.

5.2 The sensor was mounted by screwing back to back with the reference sensor using a torque of 2.0 Nm

5.3 The uncertainty of measurement has been determined in accordance with Publication JCGM 100:2008 "Evaluation of measurement data-Guide to the expression of uncertainty in measurement" and represents the expanded value after multiplying by a coverage factor of 2 for a level of confidence of 95 %.

.....End.....

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Annex 10: Public Participation Records

Annex 10-A : Meeting Minutes & Attendance Lists

PROPOSED MULTI-RESIDENTIAL UNITS IN KEZA-RIRUTA, BY IHS (K) LTD

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT

ASSISTANT CHIEF
KIRUTA SUB-LOCATION
RIRUTA LOCATION
Date:

ATTENDANCE SHEET-LIST OF PARTICIPANTS

Activity:	Public Stakeholder Meeting.	**Date:**	7th October 2025
Stakeholders:	Riruta Community Members / Consultants	**Venue:**	Mi Keza - Riruta

	Name	Organization	Designation	Telephone No.	Email Address	Signature
1.	Jane Kimani	Centric Africa	Social Safeguards	0710386851	shirow.kimani95@gmail.com	
2.	[illegible]	[illegible]				
3.	G'ELIMO KIPCHUMBA	LEXICON PLUS LTD	ARCH	0708859854	chelin@lexicondesigns.co	
4.	Nimrod Murathi	Mi vida	project Manager	0759642554	nmr@mividahomes.com	
5.	JAMES OJO	GATH C.E.	Project C/S Engineer	0724366135	james@gathkenya.com	
6.	Abigail Kimosop	Mi Vida	Project Manager	0711433035	ak@mividahomes.com	
7.	Daniel Chumo	Centric Africa	E&S safeguards	0718068517	daniel@centricafrica.com	
8.	HOTTENSIA W. KABUKI	Centric Africa	E&S safeguards.	0720826705	hottensia@centricafrica.com	Hkabuki
9.	Beatrice N. Karanja	IHS Kenya	ESG	0711175131	bkaranja@ihsinvestments.co.ke	
10.	GICHERU KIMANI	GAMMA DELTA LTD	MEP ENGINEER	0722521766	gicheru@gammadelta.co.ke	

PROPOSED MULTI-RESIDENTIAL HOUSING UNITS IN RIRUTA BY IHS (K) LTD

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT

ASSISTANT CHIEF
KIRUTA SUB-LOCATION
RIRUTA LOCATION
Sign.....
Date.....

ATTENDANCE SHEET-LIST OF PARTICIPANTS

Activity:	Public Stakeholder Meeting	**Date:**	7th October 2025
Stakeholders:	Riruta Community Members	**Venue:**	Keza - Riruta.

	Name	Tick (√)		Location/Village	Occupation	Telephone No.	Email Address	Signature
		M	F					
1.	MARY Muthoni		✓	Ndwaru	Business	0706214535		MARY
2.	KIMOTHY GITURU	✓		NDWARU	NO	0706214535		KIMOTHY
3.	Jane Miri		✓	Ndwaru	Business	0729659096		wairimu
4.	Fridah Miri		✓	Ndwaru	Business		Fridahwambui@gmail.com	
5.	Wanyama Brian	✓		Ndwaru	NO	0115765907	Wanyamabrian@gmail.com	
6.	Jacinta Sirindi		✓	Ndwaru	Business	28392931		
7.	BRADLEY MILTON	✓		Ndwaru	No	4116172	N/A	
8.	MARY KIMANI		✓	NDWARU	NO	0726975410		
9.	Ibrahim Mwangi	✓		NDURARUA	Driver	0723537778	Ibrangumwangi766@gmail.com	
10.	Joyce Wanjeri		✓	Ndwaru	NO	0790120371		

International Housing Solutions

CENTRIC AFRICA

PROPOSED MULTI-RESIDENTIAL HOUSING UNITS IN RIRUTA BY IHS (K) LTD

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT

ASSISTANT CHIEF RIRUTA SUB-LOCATION RIRUTA LOCATION Sign.

ATTENDANCE SHEET-LIST OF PARTICIPANTS

Activity:	Public Stakeholder Meeting.	**Date:**	7th Octber Date: 2025
Stakeholders:	Ruta Community Members	**Venue:**	Kezo - Riruta.

	Name	Tick (√) M	Tick (√) F	Location/Village	Occupation	Telephone No.	Email Address	Signature
1.	Gideon Ngisia	✓		Satellite	B/s	0726847647		
2.	Abigael Pendo		✓	Cabby Center	civil engineer	0793294022	Pendoabgael@gmail.com	
3.	Catherene Wanjiru		✓	Riruta	BIS	0758283132		
4.	Beth Njanja		✓	Riruta		0706923425		
5.	margaret Wanjiru		✓	Riruta	Cooker/chef	0726446227		
6.	Maureen Gaki		✓	Riruta	Receptionist.	0742649502	Maureengaki787@gmail.com	
7.	Kevin Nzusyo	✓		Riruta	BIS	0724284813	Kevinmzusyo@gmail.com	
8.	Vydia Akinyi		✓	Riruta	BIS	0746194011		
9.	Joseph kibira	✓		Riruta	N/A	0727494433	NZUSYO57a.gmail.com	
10.	Marcus Miller	✓		Kal/Riruta	N/A	0702857582		

International Housing Solutions

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PROPOSED MULTI-RESIDENTIAL HOUSING UNITS IN RIRUTA BY IHS (K) LTD

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT

ASSISTANT CHIEF
KIRUTA SUB-LOCATION
RIRUTA LOCATION
Sign:

ATTENDANCE SHEET-LIST OF PARTICIPANTS

Activity:	Public Stakeholder Meeting	**Date:**	7th October 2025
Stakeholders:	Riruta Community Members	**Venue:**	Keza - Riruta.

	Name	Tick (√) M	Tick (√) F	Location/Village	Occupation	Telephone No.	Email Address	Signature
1.	Wangui Nyambura		✓			0757504377		
2.	DENNIS OMBATI	✓		NDWARU Road.	Bss.	0726548503		
3.	Eugene Teler	✓		NDWARU Road		0720616706		
4.	Baxton Ngang'a	✓		Ndwaru Road		0720371625		
5.	NOBATH DIVA		✓	NGINA Road	BUSSINESS	0711417961		
6.	Seran mukina		✓	Salette		0114424368		
7.	Betty Katindi		✓	Kawangware	Business	0704779575		
8.	DALTON MUJA	✓		Ndwaru		0727138536		
9.	Ruth wairimu		✓	satellite		0716769307		
10.	Ruth Sibagaya.		✓	Satelitte	B/s	0708366827		

PROPOSED MULTI-RESIDENTIAL HOUSING UNITS IN RIRUTA BY IHS (K) LTD

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT

ASSISTANT CHIEF
KIRUTA SUB-LOCATION
RIRUTA LOCATION
Sign.....
Date.....

ATTENDANCE SHEET-LIST OF PARTICIPANTS

Activity:	Public Stakeholder Meeting	**Date:**	7th October 2025
Stakeholders:	Riruta Community Members	**Venue:**	Keza - Riruta

	Name	Tick (√) M	Tick (√) F	Location/Village	Occupation	Telephone No.	Email Address	Signature
1.	Lucy Warugeru N		✓	Ndwaru Road	BUSSINES	0724596995	LucyNdoroge-bs@gmail.com	
2.	Josphine Wairimu		✓	Ndwaru Road		0715644283	Josphine@gmail.com	
3.	LEAH GATHONI		✓	NDARU ROAD	BUSSINESS	0717880 3		
4.	PAUL GICHOHI	✓		NDWARU	Studeal	0726349617	K/A	
5.	PAU GITURA	✓		NDWARU		0719683020		
6.	Agnes Irungu		✓	Ndwaru	Business	0724996532		
7.	Benson Mwangi	✓		Ndwaru	Architect	0768-678-177	N/A	
8.	Julius Gasemi	✓		"		0706314269		
9.	Maera Bonface Onderi	✓		Ndwaru	Business	0790670 6	N/A	
10.	Beintallis mulanda	✓		Ndwaru rd		0759916882	mulandaseintallis	

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PROPOSED MULTI-RESIDENTIAL HOUSING UNITS IN RIRUTA BY IHS (K) LTD

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT

ASSISTANT CHIEF
KIRUTA SUB-LOCATION
KIRUTA LOCATION
Sign:.....
Date: 2025

ATTENDANCE SHEET-LIST OF PARTICIPANTS

Activity:	Public Stakeholder Meeting	**Date:**	7th October 2025
Stakeholders:	Riruta Community Members	**Venue:**	Keza - Riruta

	Name	Tick (√) M	Tick (√) F	Location/Village	Occupation	Telephone No.	Email Address	Signature
1.	Margaret Imbugi		✓	Satellite	N/A	0117059692		
2.	Maureen Achieng		✓	Kabiria	N/A	0715143314		
3.	Margaret Wangari		✓	Kabiria	N/A	0715934592		
4.	Ruth Mutoka		✓	Nyakinywa Road	N/A	0712742980		
5.	Anne Mbula		✓	Ngina road	N/A	0729438796		
6.	Sarah Muoki		✓	ngina road	N/A	0114291557		
7.	Edith Ufoki		✓	ngina road	N/A	0729154559		
8.	Teresia Wangeci		✓	Ngina road	N/A	0797902000		
9.	Jane Wangari		✓	Satellite	N/A	0721367245		
10.	Monicah Wambui		✓	Satellite	N/A	0712157477		

PROPOSED MULTI-RESIDENTIAL HOUSING UNITS IN RIRUTA BY IHS (K) LTD

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT

ASSISTANT CHIEF
KIRUTA SUB-LOCATION
RIRUTA LOCATION
Sign:
Date: 7th October 2025

ATTENDANCE SHEET-LIST OF PARTICIPANTS

Activity:	Public Stakeholder Meeting.	**Date:**	7th October 2025.
Stakeholders:	Rinta Community Members / Consultation.	**Venue:**	KEZA - RIRUTA.

	Name	Tick (√) M	Tick (√) F	Location/Village	Occupation	Telephone No.	Email Address	Signature
1.	Monica Ndungu		✓	Kabiria	N/A	0768928109		
2.	FLORINE KINYA		✓	Kabirica	N/A	0714760644		
3.	Rita Mwamburi		✓	Satellite	N/A	0710106427		
4.	BONVONSAGE WEST	✓		Kabiria	N/A	0717263 48		
5.	Diana Njomo		✓	Kabiria	N/A	0795613123	diana njomo@gmail	
6.	Chavez Obiri	✓		Riruta	N/A	0727652337		
7.	JOASH OSEKO	✓		Riruta	N/A	0740404672		
8.	Marcus miller	✓		Kabiria	N/A	0702357582		
9.	Annet Wambui		✓	Rirut		0742877294		
10.	John Kimani	✓		Riruta	N/A	0705913211		
11.	JAMES KAMAMO	✓		RIRUTA	CHIEFS OFFICE	0723 559269	JKa62011@gmail.com	

PROPOSED MULTI-RESIDENTIAL UNITS IN KEZA-RIRUTA, BY IHS (K) LTD

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT

ATTENDANCE SHEET-LIST OF PARTICIPANTS

Activity:	Focus Group Discussion	**Date:**	7th October 2025
Stakeholders:	Women	**Venue:**	Keza - Rinta.

	Name	Organization	Designation	Telephone No.	Email Address	Signature
1.	Leah Gathoni			0717798803		
2.	Joyce Wamgari			0790120341		
3.	maureen Achieng			0715143314		
4.	mary mathoni			0706214535		MARY
5.	Edith Njoki			0720154551		
6.						
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International Housing Solutions
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PROPOSED MULTI-RESIDENTIAL HOUSING UNITS IN RIRUTA BY IHS (K) LTD

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT

ATTENDANCE SHEET-LIST OF PARTICIPANTS – FGD YOUTH

Activity:	FGD YOUTH	**Date:**	7TH OCTOBER 2025
Stakeholders:	YOUTH	**Venue:**	

	Name	Tick (√)		Location/Village	Occupation	Telephone No.	Email Address	Signature
		M	F					
1.	IRUNGU MWANGI	✓		NDURARUA	Driver	0723537778	irungumwangi196@gm	
2.	Paul Gichohi			Ndwaru	Student	0726349617	—	
3.	Reintallis Mulanda	✓		Ndwaru Rd		0759916887	mulandareintallis	
4.	Bradely Mihon	✓		Ndwaru	—	41161172	—	
5.	Benson Luis Mwangi			Ndwaru	Architect	0768-678-177	—	
6.								
7.								
8.								
9.								
10.								

ASSISTANT CHIEF
RIRUTA SUB-LOCATION
RIRUTA LOCATION
Sign.....
Date: 7/10/25

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PROPOSED MULTI-RESIDENTIAL HOUSING UNITS IN RIRUTA BY IHS (K) LTD

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT

ATTENDANCE SHEET-LIST OF PARTICIPANTS

Activity:	Community Stakeholder Meeting.	**Date:**	14th October 2025
Stakeholders:	Rinta Community Members	**Venue:**	Keza - Rinta

	Name	Tick (√)		Location/Village	Occupation	Telephone No.	Email Address	Signature
		M	F					
1.	Peter Muiki	✓		RIRUTA	CONSTRUCTION	0742811142		
2.	MARY Muthoni		✓	RIRUTA		0706214535		MARY
3.	Margaret Imbugi		✓	Riruta		0117059692		
4.	ORPHA [illegible]		✓	RIRUTA	[illegible] A - CHCF	0724888959		
5.	Bonface Mukuta	✓		RIRUTA		0743572646		
6.	Boncon Luis Mwangi	✓		Riruta	Architect	0768-678-177		
7.	DALTON Muya	✓		Ndiuni		0727738536		
8.	SUAIDA NABWIRE		✓	BIRUIN		0701135512		
9.	Michael Muyia	✓		Riruta	Painter	0795668426		
10.	Margaret Kiamuyu		✓	Riruta	B/woman	0726444227		

ASSISTANT CHIEF
RIRUTA SUB-LOCATION
RIRUTA LOCATION
Sign.....
Date.....

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PROPOSED MULTI-RESIDENTIAL HOUSING UNITS IN RIRUTA BY IHS (K) LTD

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT

ATTENDANCE SHEET-LIST OF PARTICIPANTS

Activity:	Community Stakeholder Meeting.	**Date:**	14th October 2025
Stakeholders:	Riruta Community Members.	**Venue:**	Keza - Riruta

	Name	Tick (√) M	Tick (√) F	Location/Village	Occupation	Telephone No.	Email Address	Signature
1.	Munir Mwanthi	✓		RIRUTA NDWARUA	Self Employed	0723557775	irungumwangi76@g	
2.	Nicholas Musita	✓		Ndwaru RB.	C.H.P	0714038001	MusitaNicholas8394@	
3.	Wangui Nyambura		✓	RIRUTA		0757504377	-	
4.	Paul Ndungi	✓		Riruta	Community Leader	0703256120	-	
5.	ANNE NGAMAU.		✓	NDWARU	S/EMP.	0723888841	29053/UNA	
6.	FELIX JAMES KAMIANA	✓		CHIEFS OFFICE	Community Leader	0723589269	jKSL2010@gmail.com	
7.	NORAH DIYA.		✓	NGINA 2D	BUSINESS	0711417964		
8.	DENNIS NYABUTO	✓		NDWARU Road	Business	0726654003	dennisnyabutoyan	
9.	Benjamin N. Nyabuto	✓		Ndwaru Road	Business	0748693995		
10.	STEPHEN MBOGO	✓		KKY Nga C	Business	0794857738	N/A	

PROPOSED MULTI-RESIDENTIAL UNITS IN RIRUTA BY IHS (K) LTD

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT

ATTENDANCE SHEET-LIST OF PARTICIPANTS

Activity:	Community Stakeholder Meeting	**Date:**	14th October 2025
Stakeholders:	Riruta	**Venue:**	Keza - Riruta

	Name	Organization	Designation	Telephone No.	Email Address	Signature
1.	Jane Wanjiru Kimani	Centric	Social Safeguards	0710386851	shirow.kimani95@gmail.com	
2.	Daniel Chumo	Centric Africa Ltd	ESS Safeguards	0718068517	daniel@centricafrica.com	
3.	HOTTENSIA W.	Centric	SS Specialist	0720826705	hottensia@centricafrica.com	
4.	Nimrod Murerthi	Mi Vida	project Manager	0759642554	nmn@mividahomes.com	
5.	Abigail Kimosop	Mi Vida	Project Manager	0711433035	ak@mividahomes.com	
6.	Beatrice K. Njoki	IHS Kenya	ESG Manager	0711175131	bkaranja@ihsinvestmentsgroup.co.ke	
7.	Spices Restaurant	Nancy	Director	0725820021	Nancy.spices@yahoo	
8.						
9.						
10.						

ASSISTANT CHIEF
RIRUTA SUB-LOCATION
RIRUTA LOCATION
Date.....

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CENTRIC AFRICA

PROPOSED MULTI-RESIDENTIAL HOUSING UNITS IN RIRUTA BY IHS (K) LTD

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT

ATTENDANCE SHEET-LIST OF PARTICIPANTS

Activity:	Community Stakeholder Meeting.	**Date:**	14th October 2025
Stakeholders:	Rirute Community Members.	**Venue:**	Keza - Riruta

	Name	Tick (√) M	Tick (√) F	Location/Village	Occupation	Telephone No.	Email Address	Signature
1.	Lawrance Nguhi	✓		Riruta	Plumber	0748446531		
2.	Dicinci Njamo		✓	RIRUTA		0795613123		
3.	Ruth Makas		✓	Riruta	Business	0712742980		
4.	Monicah Wambui		✓	BILUTA	BUSINESS	0712157[illegible]		
5.	Abigael Pendo		✓	cabby center	unemployment	0793294082	Pendoabgael@gmail.com	
6.	PAUL CIFURA	✓		RIRUTU		0719685020		
7.	Samuel mwene	✓		Riruta	unemployed	0716117096		
8.	JANEFFER KIHATO		✓	RIRUTA	unemployment	0712480132		
9.	Jane Wangari		✓	Riruta	Unemployment	0721367245		
10.	PAUL GICHOHI	✓		RIRUTA	Student	0726349417	N/A	

ASSISTANT CHIEF
RIRUTA SUB-LOCATION
RIRUTA LOCATION

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PROPOSED MULTI-RESIDENTIAL HOUSING UNITS IN RIRUTA BY IHS (K) LTD

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT

ATTENDANCE SHEET-LIST OF PARTICIPANTS

Activity:	Community Stakeholder Meeting.	**Date:**	14th October 2025
Stakeholders:	Riruta Community Members.	**Venue:**	Keza - Riruta

	Name	Tick (√)		Location/Village	Occupation	Telephone No.	Email Address	Signature
		M	F					
1.	Marcus Miller	✓		Riruta	climate work	0702357582		mmk
2.								
3.								
4.								
5.								
6.								
7.								
8.								
9.								
10.								

ASSISTANT CHIEF
KIAMUNA SUB-LOCATION
RIRUTA LOCATION
Signature.....
Date.....

PROPOSED MULTI-RESIDENTIAL UNITS IN RIRUTA BY IHS (K) LTD

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT

ASSISTANT CHIEF
KIBUTA SUB-LOCATION
RIRUTA LOCATION
Signature ..... Date .....

ATTENDANCE SHEET-LIST OF PARTICIPANTS

Activity:	Public Stakeholder Meeting	**Date:**	21st October 2025
Stakeholders:	Consultants	**Venue:**	Keza - Riruta

	Name	Organization	Designation	Telephone No.	Email Address	Signature
1.	ORPHA AROBA	NGAO SNR A-CHIEF	SNR A-CHIEF	0724888959	orphaaroba@gmail.com	
2.	Jane Kimani	Centric Africa	Social Safeguards	0710386851	shirow.kimani93@gmail.com	
3.	Philip Mutuku	Mi Vida	Project Manager	0708874089	pmr@mividahomes.com	
4.	AMMAH MBULA			0729438790		
5.	Abigail Kimosop	Mi vida	Project Manager	0711433035	ak@mividahomes.com	
6.	Daniel Chumo	Centric Africa Ltd	ESS Safeguards	0718065517	daniel@centricafrica.com	
7.	HOTTENSIA W. KABUKI	Centric Africa Ltd	Social Safeguards	0720826705	hottensia@centricafrica.com	Kabuki
8.						
9.						
10.						

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PROPOSED MULTI-RESIDENTIAL HOUSING UNITS IN RIRUTA BY IHS (K) LTD

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT

ATTENDANCE SHEET-LIST OF PARTICIPANTS

ASSISTANT CHIEF
KIRUTA SUB-LOCATION
KIRUTA LOCATION
Sign:
Date:

Activity:	Community Stakeholder Meeting.	**Date:**	21st October 2025
Stakeholders:	Riruta Community Meeting.	**Venue:**	Keza - Riruta

	Name	Tick (√) M	Tick (√) F	Location/Village	Occupation	Telephone No.	Email Address	Signature
1.	Catherene Wanjiku		f	Riruta		0768283132		Cw.
2.	Betty Katindi		F	Riruta		0704779575		
3.	Edith Njoki		F	Riruta		0729954559		
4.	Ruth Makau		F	Riruta		0712742980		
5.	Judy Nduku		F	Riruta		0702896550		
6.	Kimonye QITURA		F	Riruta		0706214535		Kgitura
7.	MARY muthoni		F	Riruta		0706214535		MARY
8.	Ruth wairimu		F	Riruta		0716769307		
9.	DORCAS MAKHANU		F	Riruta		0704204612		
10.	Margaret Wangari		F	Riruta		0745936592		

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CENTRIC AFRICA

PROPOSED MULTI-RESIDENTIAL HOUSING UNITS IN RIRUTA BY IHS (K) LTD

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT

ASSISTANT CHIEF
NIRUTA SUB-LOCATION
RIRUTA LOCATION

ATTENDANCE SHEET-LIST OF PARTICIPANTS

Activity:	Community / Public Stakeholder Meeting.	**Date:**	Keza - Riruta.
Stakeholders:	Riruta Community Members	**Venue:**	21st October 2025

	Name	Tick (√) M	Tick (√) F	Location/Village	Occupation	Telephone No.	Email Address	Signature
1.	FELIX JAMES KAMAMO	✓		RIRUTA	Chief's Office	0723559269	jkeb2010@gmail.com	
2.	DALTON MUSA	✓		Ndwuru	Technician	0727135536		
3.	Pendo Abigael	✓		Cabby Center	Building Trail	0793894022	Pendoabgael@gmail.com	
4.	Sarah mukinu	✓		Cabby Center		0114424368		
5.	Elizabeth munyao	✓		Ndwaru		011700331		
6.	maureen Achieng	✓		RIRUTA		0715143314		
7.	Peter muikia	✓		RIRUTA		0742811142		
8.	Harrison Njoroge	✓		Riruta		0715073851	Njorogeharrison@gmail.com	
9.	wangui nyambura		✓	Riruta		0757504377		
10.	Margaret Imbuqi		✓	Riruta	building and construction	011705692		

PROPOSED MULTI-RESIDENTIAL UNITS IN RIRUTA BY IHS (K) LTD

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT

ASSISTANT CHIEF
RIRUTA SUB-LOCATION
RIRUTA LOCATION
Signature
Date

ATTENDANCE SHEET-LIST OF PARTICIPANTS

Activity:	Public Participation Meeting.	**Date:**	21st October 2025
Stakeholders:	Riruta Community Members. (OCCUPATION)	**Venue:**	Keza - Riruta.

	Name	Organization	Designation	Telephone No.	Email Address	Signature
1.	NORAH DIHA	BUSINESS	RIRUTA	0711417964	N/A	
2.	JARED MALINGU	BUSINESS	RIRUTA	0735500026	N/A	
3.	PAUL GICHOTH	Save me from Me	RIRUTA	0726346617	N/A	
4.	Bernard Mwangi	Business	Riruta	0726851794	N/A	
5.	Paul Nduugu	" "	"	0703256120	"	
6.	PAU CATURA		RIRUTA	0719683020		
7.						
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10.						

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PROPOSED MULTI-RESIDENTIAL UNITS IN KEZA-RIRUTA, BY IHS (K) LTD

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT

ASSISTANT CHIEF
KIRUTA SUB-LOCATION
RIRUTA LOCATION
Signature
Date

ATTENDANCE SHEET-LIST OF PARTICIPANTS

Activity:	Community Stakeholder Meeting.	**Date:**	21st October 2022
Stakeholders:	Riruta Community Meeting (OCCUPATION)	**Venue:**	Keza - Riruta.

	Name	Organization	Designation	Telephone No.	Email Address	Signature
1.	Rita Mkamburi			0710106427	ritamkamburi950@gmail.	
2.	Moses Sailus Kenalwale			0740265863	Moseskinalwale254@ym	
3.	ANJELA WAMUYU KAHIGA	WAITRESS		01164825 17	angelakahiga@gmail.com	
4.	Centrine Indiazi			0706282435	Centrine indiazi@gmail.com	
5.	Knight Nabalayo			0718690234	Knightnabalayo@gmail.com	
6.	Esther Mukwana Kitui			0724665637	NIA	
7.	Deborah Onsoti	Human Resource Management		0700557684	Onsotideborah@gmail.com	
8.	Joseph Kibira			0727494433		
9.	Kevin Nzuzo			0712428813	Kevinnzuzo@gmail.com	
10.	MICHAEL MUYIA	PAINTER		0795668426	MykeyMuyia@gmail	

MINUTES OF MEETING PREPARED BY:

Jane Wanjiru, Environmental & Social Expert, Centric Africa Limited

MINUTES OF MEETINGS REVIEWED BY:

REPRESENTATIVE OF	NAME AND TITLE	SIGNATURE	DATE
IHS INVESTMENTS			
CENTRIC AFRICA			
LOCAL ADMINISTRATION			

These minutes are considered to be an accurate recording of all items discussed. Written notices of discrepancies, errors or omissions must be given within seven (7) days, otherwise the minutes will be accepted as written.

Minutes of ESIA Stakeholder Consultation meeting

Project	Proposed Green Affordable Housing Units at Keza-Riruta by IHS (K) Ltd		
Project Number		**Date**	7th October, 2025
Time	11:42 am – 12:40 pm	**Venue**	Keza-Riruta
Chairperson	Ms. Orpha Bosibori- Asst. Chief- Riruta Sub-Location - (Assisted by Ms. Hottensia Kabuki)		
Participants	Please refer to the Appendix for the attendance list (* no. of participants)		
Agenda	1. Introduction 2. ESIA Process 3. Description of the Proposed Project 4. Potential E&S Impacts 5. Q&A		

SUBJECT RAISED

1 WELCOMING REMARKS & INTRODUCTIONS

The meeting was called to order at 11:42 am by the area chief, who requested Margaret to open the meeting with a word of prayer. She then welcomed all attendees and expressed appreciation for their time and engagement in the Environmental and Social Impact Assessment process for the proposed multi-residential housing units at Keza - Riruta. She went on to invite Mrs. Hottensia Kabuki to take over the meeting, who invited the ESIA team to introduce themselves.

Each of the ESIA team members introduced themselves, followed by a brief introduction from key project team representatives.

S/No	Name	Profession	Organization/County
1.	G. Elimo Kipchumba	Development Manager	Lexicon
2.	Beatrice Karanja	ESG Specialist	International Housing Solutions (K) Ltd
3.	Daniel Chumo	Environmental Specialist	Centric Africa Limited
4.	Hottensia Kabuki	Social Safeguard Specialist	Centric Africa Limited
5.	Jane Kimani	Social Safeguard Specialist	Centric Africa Limited
6.	Nimrod Mureithi	Mi Vida	Project Manager
7.	James Ojoi	Gath	Project Engineer
8.	Abigail Kimosop	Mi Vida	Project Manager
9.	Gicheru Kimani	Gamma Delta	MEP Engineer

Minutes of meeting

2	**PROJECT OVERVIEW**
	Mr. Elimo Kipchumba, a development manager from Lexicon team, presented a detailed overview of the design for the proposed Multi-Residential Housing Units at Keza - Riruta. The development will consist of approximately 240 modern apartments. The blocks will offer 144 one-bedroom units and 96 two-bedroom units The apartments will be a mix of 1-bedroom and 2-bedroom units, designed as follows: • **1-bedroom units (40 sq.m.)** – 144 units. • **2-bedroom units (60 sq.m.)** – 96 units IHS aims to market these units to lower-middle-income renters seeking environmentally friendly homes in a prime location. The design prioritizes energy efficiency and environmental sustainability, aligning with green building principles. Mr. Kipchumba highlighted that the project aims to achieve Level 3 EDGE (Excellence in Design for Greater Efficiencies) Certification—the highest level under the program—demonstrating a strong commitment to sustainability. This certification requires substantial reductions in energy consumption, water usage, and embodied energy in construction materials. To meet these standards, the development will incorporate sustainable features such as solar energy systems, rainwater harvesting, and natural ventilation. Beyond sustainability, the project also focuses on affordability, ensuring that high-quality, eco-friendly living spaces are available at competitive prices to meet the rising demand for affordable urban housing. The design promotes a sense of community through well-planned layouts that include shared green spaces, recreational areas, and pedestrian pathways, all while maximizing space efficiency and maintaining residents' privacy.
3	**ESIA PROCESS- (POTENTIAL ENVIRONMENTAL & SOCIAL IMPACTS)**
	Ms. Hottensia Kabuki, the project's social safeguard specialist, explained more about the project. She delivered a description of the environmental and social assessment and its significance to the proposed project, emphasizing the legal necessity to engage all important stakeholders affected by a proposed project prior to development. This is established in the Environmental Management and Coordination Act (EMCA) of 1999. Mr. Chumo, an Environmental Specialist, provided a detailed overview of the ongoing Environmental and Social Impact Assessment (ESIA) for the IHS Riruta project. He highlighted the primary positive and negative impacts identified thus far, along with the recommended mitigation measures to minimize adverse effects. **Positive Impacts:** 1. **Optimal Land Utilization**: The project maximizes the use of the available land, addressing the growing need for housing while ensuring efficient land use. 2. **Promotion of Sustainable Urban Development**: The design incorporates energy efficiency and green building principles, with the project seeking green certification, including EDGE certification. 3. **Addressing Housing Shortages**: The development aligns with the government's agenda to provide affordable housing, supporting the fourth medium-term plan (2022-2027) and Kenya's Vision 2030. 4. **Employment and Income Generation**: The project will create jobs during both the construction and operational phases, stimulating the local economy. 5. **Creation of a Market for Goods and Services**: New residents will drive demand for local goods and services, benefiting the surrounding community. 6. **Improved Security**: Security measures such as CCTV, lighting, and security personnel will be implemented, enhancing safety in the area. **Negative Impacts and Mitigation Measures:** 1. **Shift in Species and Vegetation Clearance**: o Some vegetation clearance will be necessary. To mitigate this, trees removed will be replaced at a ratio of 1:2, focusing on drought-resistant and indigenous species. o The riparian reserve and biodiversity in the area will be preserved. Selected trees within the plot will remain and be integrated into the green spaces. 2. **Noise and Air Quality Impacts** (During Construction):

	○ **Noise**: Use of noise-dampening equipment, mufflers, and acoustic enclosures will be recommended. Construction work will be scheduled during daytime to minimize disturbances. ○ **Air Quality**: Dust screens will be installed, and equipment will be fitted with diesel particulate filters. Dust control measures will also be applied to access roads. 3. **Solid Waste and Wastewater Management**: ○ Waste will be managed in line with legal regulations, with waste reduction, reuse, and recycling emphasized. Licensed waste contractors will be engaged. ○ Wastewater will not be discharged into nearby rivers. Wastewater will be separated from stormwater, contained on-site, and handled by licensed waste handlers. 4. **Soil Erosion and Stormwater Management**: ○ Sediment and erosion control measures will be implemented. Cleared vegetation will be used as mulch to reduce soil erosion. ○ Drainage channels and stormwater management systems will be incorporated to prevent flooding and facilitate proper water infiltration. 5. **Water and Energy Conservation**: ○ Rainwater harvesting systems, greywater recycling, and solar energy for hot water systems will be integrated to minimize water and energy demand. ○ Energy-efficient lighting and water-conserving fixtures will be used to reduce consumption. 6. **Community Health and Safety**: ○ Proper site planning and demarcation will be implemented to protect the surrounding community during construction. Safety signage, traffic marshals, and emergency preparedness plans will be in place to manage risks such as fires and security incidents. 7. **Climate Change Adaptation**: ○ The project will incorporate climate resilience features, including open ground-floor structures to allow stormwater flow and prevent obstruction. Sustainable construction materials with proper thermal insulation and natural ventilation will be used to reduce energy demand for cooling and heating
	Ms. Hottensia, also emphasized that these impacts and mitigation measures are being carefully assessed to develop a comprehensive Environmental and Social Management Plan (ESMP) for the project.

4. COMMENTS, QUESTIONS, OBSERVATIONS

Following the consultants' presentation on the proposed project, members were given the opportunity to comment and share their views on the project.

NO.	ISSUES/COMMENTS/ RECOMMENDATIONS	RESPONSES
1.	**Orpha Bosibori- Asst. Chief- Riruta Sub-Location** • She inquired about the affordability of the houses, noting that most community members live in iron sheet structures and would prefer houses that match their financial capacity.	**Abigail Kimosop-Project Manager- Mi Vida Homes** • She stated that the investors were building affordable houses, but more information on the cost would be shared through their office.
2.	**Wangui Nyambura** • She inquired about the types of employment opportunities community members could access from the project, such as housekeeping roles	**Beatrice Njoki -ESG Specialist- IHS** • She responded by encouraging the participants to visit the Chief's office and register their names, explaining that the project managers would coordinate with the Chief's office once employment and business opportunities became available.
3.	**Dennis Ombati - Businessman** • He mentioned that he is a boda boda rider and expressed interest in obtaining tenders to supply construction materials.	
4.	**Monicah Wambui** • She enquired on the possibility of getting work opportunities as the project is being implemented**.**	
5.	**Margret Mbugi** • She requested to be considered for employment as a cleaner during occupancy of the units	
6.	**Irungu Mwangi – Driver** • He enquired whether boda boda riders could be built for a decent boda boda shed as part of the project's CSR initiative.	**Beatrice Njoki -ESG Specialist- IHS** • She stated that it was a good suggestion and noted that the project investors, in consultation with the Chief, would further deliberate on it based on the available project budget for CSR activities.
7.	**Pendo Abigael - Civil Engineer**	**Beatrice Njoki -ESG Specialist- IHS** • She encouraged students looking for internship opportunities to register themselves through the office of the chief. She explained that

	• She enquired on whether students who had studied building and construction and civil engineering could get jobs or internship opportunities from the project. • She also enquired on whether the affordable houses being built were a part of the government houses being built by Boma Yangu.	the project managers would liaise with the Chief's office when such opportunities became available. **Daniel Chumo -Environmental Specialist – Centric Africa** • He clarified that the project was a private project and not a government project.
8.	**Mama Njoki/ Lucy Waruguru – Businesswoman** • She mentioned that there are no health facilities in the area and requested that consideration be given to constructing one as part of the CSR initiatives.	**Abigail Kimosop-Project Manager- Mi Vida Homes** • She explained that support for the construction of a health facility would largely depend on the available CSR (Corporate Social Responsibility) budget and the priorities aligned with the project's objectives. She further explained that with such infrastructural developments, it would be easier to lobby the government to establish a dispensary or hospital, given the expected increase in population.
9.	**Joyce Wangari** • She enquired on whether she could be employed as a sales agent to sell the houses once they were already constructed.	**Beatrice Njoki -ESG Specialist- IHS** • She encouraged her to reach out to the project management team once the project had been completed so that they could see the possibility of engagement as a sales agent.
10.	**Beth Njanja** • She inquired about the procedure for acquiring a housing unit once the apartments are completed.	**Abigail Kimosop-Project Manager- Mi Vida Homes** • She informed the participants there is an existing office where she can obtain information regarding the purchase price and procedure.

VOTE OF THANKS

The area chief thanked the community members for attending the public participation exercise, stating that it was important for all stakeholders to be involved before the implementation of any project.

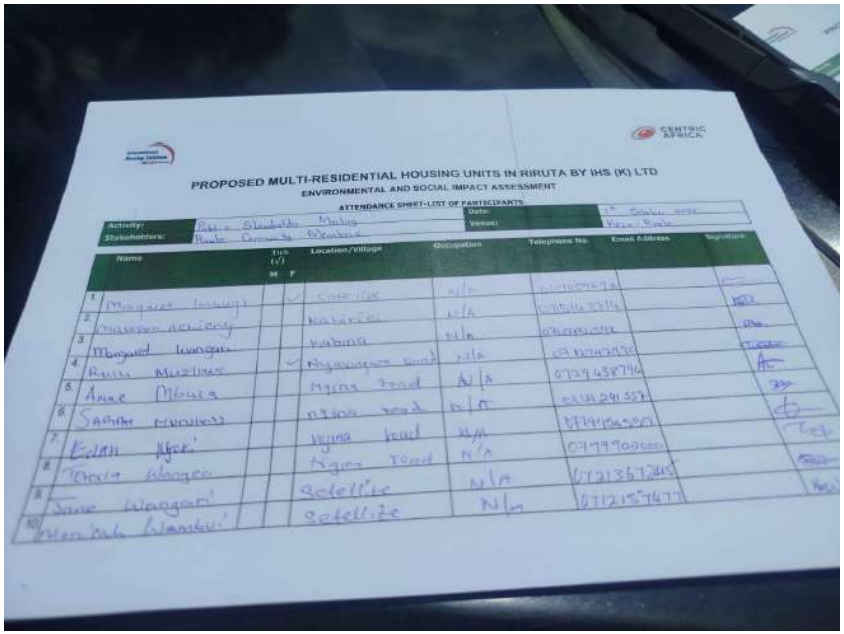
The project team thanked the participants for taking the time to attend the meeting. The meeting ended with a word of prayer from one of the community members.

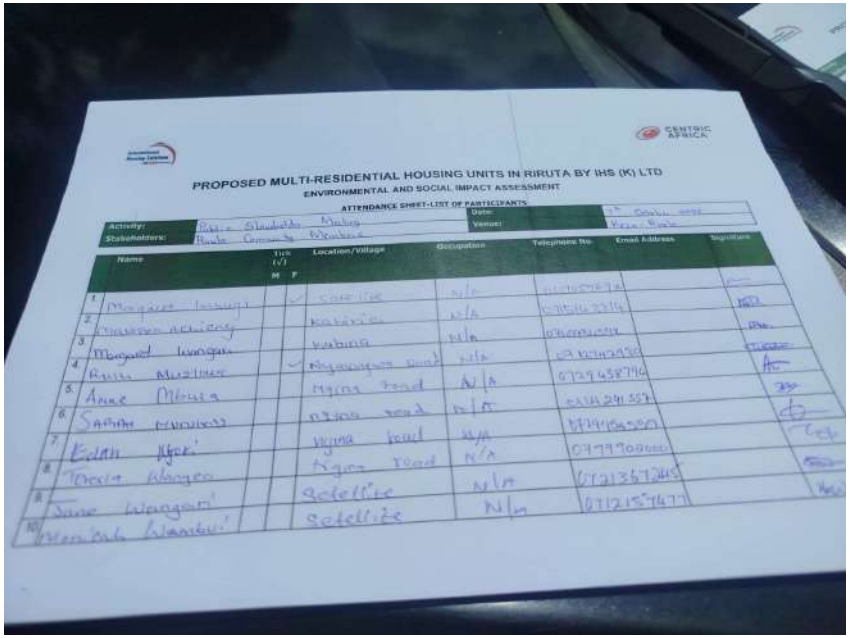
Follow-up actions

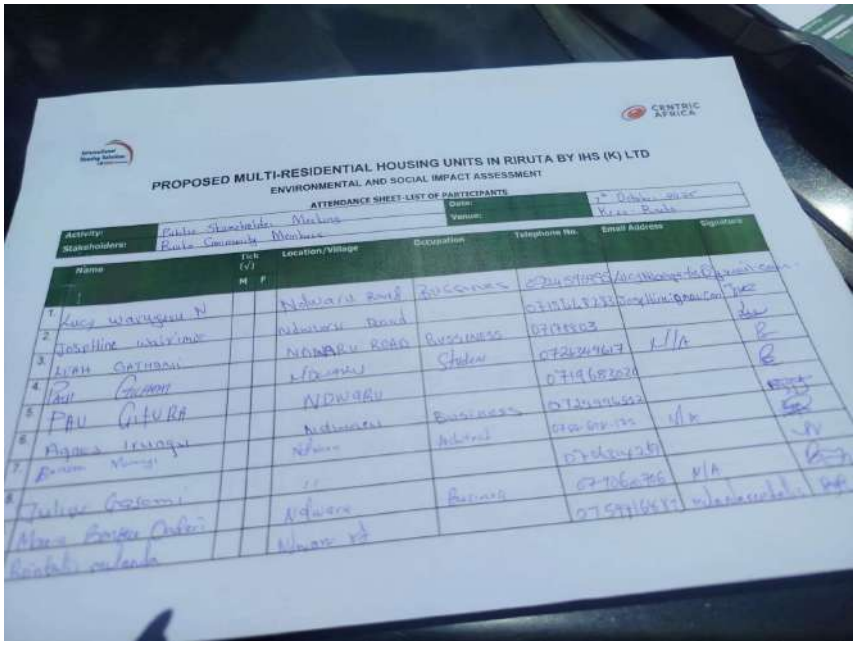
Action	Status	Who	Due by	Reporting Mechanism
Interested community members would register	Pending	The Community	Pre-construction	Names and contact details of interested community

themselves at the chief's office so that they are considered for job opportunities once construction begins.				members to be forwarded to Mi- Vida who are the project managers through the Area Chief

ATTENDANCE LISTS

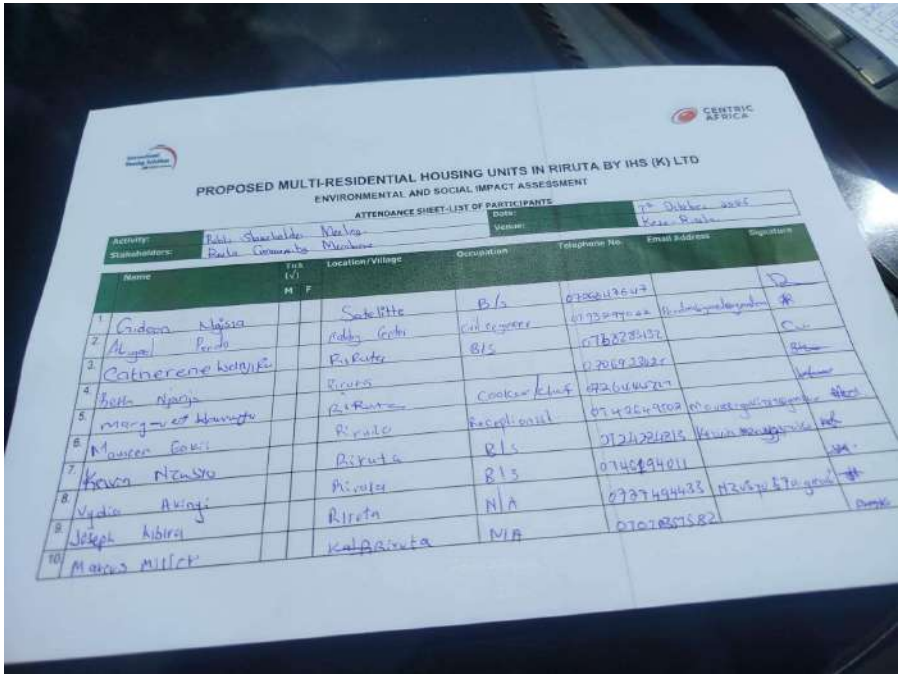





PROPOSED MULTI-RESIDENTIAL HOUSING UNITS IN RIRUTA BY IHS (K) LTD
ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT
ATTENDANCE SHEET-LIST OF PARTICIPANTS


PROPOSED MULTI-RESIDENTIAL HOUSING UNITS IN RIRUTA BY IHS (K) LTD
ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT
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ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT
ATTENDANCE SHEET-LIST OF PARTICIPANTS



PROPOSED MULTI-RESIDENTIAL HOUSING UNITS IN RIRUTA BY IHS (K) LTD

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT

ATTENDANCE SHEET-LIST OF PARTICIPANTS

	Name	Tick (√) M	F	Location/Village	Occupation	Telephone No.	Email Address	Signature
1	MARY Muthoni			Ndumu	Business	0706814536		MARY
2	KIMANY GITAU			NDWARU	NO	0706714536		KIMANY
3	Jane Min			Ndumu	Business	0730654969		
4	Tridah Kim			Nduaru	Business		Tridahwambui	
5	Wanjama Grace			Ndwaru	NO	0115765902		
6	Twalla Sitike			Ndwaru	Business	0703729481		
7	BRADLEY MICOP			Ndwaru	No	4116172	H/A	
8	MARY KIMANI			NDWARU	NO	0726975410		
9	Hindi Mwangi			NDWARU	Driver	0723537778	mwangimaggie	
10	Joyce Wanjiru			NDWARU	NO	0790120371		

PHOTOS OF THE MEETING



Ongoing community engagement on the Keza – Riruta project



Chief Bosibori addressing the stakeholders



EIA Expert addressing community concerns

MINUTES OF MEETING PREPARED BY:

Jane Wanjiru, Environmental & Social Expert, Centric Africa Limited

MINUTES OF MEETINGS REVIEWED BY:

REPRESENTATIVE OF	NAME AND TITLE	SIGNATURE	DATE
IHS INVESTMENTS	Beatrice Karanja – IHS Kenya		7/10/2025
CENTRIC AFRICA	HOTTENSIA W. KABUKI	Hkabuki	07/10/2025
LOCAL ADMINISTRATION	ORPHA BOSIBORI		07/10/2025

These minutes are considered to be an accurate recording of all items discussed. Written notices of discrepancies, errors or omissions must be given within seven (7) days, otherwise the minutes will be accepted as written.

Minutes of ESIA Stakeholder Consultation meeting

Project	Proposed Green Affordable Housing Units at Keza-Riruta by IHS (K) Ltd		
Project Number		**Date**	14th October, 2025
Time	11:59 am – 12:51 pm	**Venue**	Keza-Riruta
Chairperson	Ms. Orpha Bosibori- Asst. Chief- Riruta Sub-Location - (Assisted by Ms. Hottensia Kabuki)		
Participants	Please refer to the Appendix for the attendance list (* no. of participants)		
Agenda	1. Introduction 2. ESIA Process 3. Description of the Proposed Project 4. Potential E&S Impacts 5. Q&A		

SUBJECT RAISED

1 WELCOMING REMARKS & INTRODUCTIONS

The meeting was called to order at 11:59 am by the area chief, who requested a community member to open the meeting with a word of prayer. She then welcomed all attendees and expressed appreciation for their time and engagement in the Environmental and Social Impact Assessment process for the proposed multi-residential housing units at Keza - Riruta. She went on to invite Ms. Hottensia Kabuki to take over the meeting, who invited the ESIA team to introduce themselves.

Each of the ESIA team members introduced themselves, followed by a brief introduction from key project team representatives.

S/No	Name	Profession	Organization/County
1.	Beatrice Karanja	ESG Specialist	International Housing Solutions (K) Ltd
2.	Daniel Chumo	Environmental Specialist	Centric Africa Limited
3.	Hottensia Kabuki	Social Safeguard Specialist	Centric Africa Limited
4.	Jane Kimani	Social Safeguard Specialist	Centric Africa Limited
5.	Nimrod Mureithi	Mi Vida	Project Manager
6.	Abigail Kimosop	Mi Vida	Project Manager

Minutes of meeting

2	**PROJECT OVERVIEW**
	Mr.Daniel Chumo presented an overview of the design for the proposed Multi-Residential Housing Units at Keza - Riruta. He stated that Mi-Vida would be the project managers and that the development will consist of approximately 240 modern apartments. The blocks will offer 144 one-bedroom units and 96 two-bedroom units The apartments will be a mix of 1-bedroom and 2-bedroom units, designed as follows: • **1-bedroom units (40 sq.m.)** – 144 units. • **2-bedroom units (60 sq.m.)** – 96 units IHS aims to market these units to lower-middle-income renters seeking environmentally friendly homes in a prime location. The design would prioritize energy efficiency and environmental sustainability, aligning with green building principles. Mr. Nimrod highlighted that the project aims to achieve Level 3 EDGE (Excellence in Design for Greater Efficiencies) Certification—the highest level under the program—demonstrating a strong commitment to sustainability. This certification requires substantial reductions in energy consumption, water usage, and embodied energy in construction materials. To meet these standards, the development will incorporate sustainable features such as solar energy systems, rainwater harvesting, and natural ventilation. Beyond sustainability, the project also focuses on affordability, ensuring that high-quality, eco-friendly living spaces are available at competitive prices to meet the rising demand for affordable urban housing. The design promotes a sense of community through well-planned layouts that include shared green spaces, recreational areas, and pedestrian pathways, all while maximizing space efficiency and maintaining residents' privacy.
3	**ESIA PROCESS- (POTENTIAL ENVIRONMENTAL & SOCIAL IMPACTS)**
	Mr. Chumo, an Environmental Specialist, delivered a description of the environmental and social assessment and its significance to the proposed project, emphasizing the legal necessity to engage all important stakeholders affected by a proposed project prior to development. This is established in the Environmental Management and Coordination Act (EMCA) of 1999 He provided a detailed overview of the ongoing Environmental and Social Impact Assessment (ESIA) for the Karen End project. He highlighted the primary positive and negative impacts identified thus far, along with the recommended mitigation measures to minimize adverse effects. **Positive Impacts:** 1. **Optimal Land Utilization**: The project maximizes the use of the available land, addressing the growing need for housing while ensuring efficient land use. 2. **Promotion of Sustainable Urban Development**: The design incorporates energy efficiency and green building principles, with the project seeking green certification, including EDGE certification. 3. **Addressing Housing Shortages**: The development aligns with the government's agenda to provide affordable housing, supporting the fourth medium-term plan (2022-2027) and Kenya's Vision 2030. 4. **Employment and Income Generation**: The project will create jobs during both the construction and operational phases, stimulating the local economy. 5. **Creation of a Market for Goods and Services**: New residents will drive demand for local goods and services, benefiting the surrounding community. 6. **Improved Security**: Security measures such as CCTV, lighting, and security personnel will be implemented, enhancing safety in the area. **Negative Impacts and Mitigation Measures:** 1. **Shift in Species and Vegetation Clearance**: o Some vegetation clearance will be necessary. To mitigate this, trees removed will be replaced at a ratio of 1:2, focusing on drought-resistant and indigenous species. o Selected trees within the plot will remain and be integrated into the green spaces. 2. **Noise and Air Quality Impacts** (During Construction):

	○ **Noise**: Use of noise-dampening equipment, mufflers, and acoustic enclosures will be recommended. Construction work will be scheduled during daytime to minimize disturbances. ○ **Air Quality**: Dust screens will be installed, and equipment will be fitted with diesel particulate filters. Dust control measures will also be applied to access roads. 3. **Solid Waste and Wastewater Management**: ○ Waste will be managed in line with legal regulations, with waste reduction, reuse, and recycling emphasized. Licensed waste contractors will be engaged. ○ Wastewater will not be discharged into nearby rivers. Wastewater will be separated from stormwater, contained on-site, and handled by licensed waste handlers. 4. **Soil Erosion and Stormwater Management**: ○ Sediment and erosion control measures will be implemented. Cleared vegetation will be used as mulch to reduce soil erosion. ○ Drainage channels and stormwater management systems will be incorporated to prevent flooding and facilitate proper water infiltration. 5. **Water and Energy Conservation**: ○ Rainwater harvesting systems, greywater recycling, and solar energy for hot water systems will be integrated to minimize water and energy demand. ○ Energy-efficient lighting and water-conserving fixtures will be used to reduce consumption. 6. **Community Health and Safety**: ○ Proper site planning and demarcation will be implemented to protect the surrounding community during construction. Safety signage, traffic marshals, and emergency preparedness plans will be in place to manage risks such as fires and security incidents. 7. **Climate Change Adaptation**: ○ The project will incorporate climate resilience features, including open ground-floor structures to allow stormwater flow and prevent obstruction. Sustainable construction materials with proper thermal insulation and natural ventilation will be used to reduce energy demand for cooling and heating
	Ms. Hottensia, the project's social safeguard specialist, also emphasized that these impacts and mitigation measures are being carefully assessed to develop a comprehensive Environmental and Social Management Plan (ESMP) for the project.

4. COMMENTS, QUESTIONS, OBSERVATIONS

Following the consultants' presentation on the proposed project, members were given the opportunity to comment and share their views on the project.

NO.	ISSUES/COMMENTS/ RECOMMENDATIONS	RESPONSES
1.	**Orpha Bosibori- Asst. Chief- Riruta Sub-Location** • She stated that the community possessed the necessary qualifications for both skilled and unskilled labor and requested that they be given priority during job recruitment. She further noted that there were several young, qualified individuals from the area with training in fields such as civil engineering and electrical work and advocated for local community members to be prioritized for these jobs.	**Hottensia Kabuki- Social Safeguards Specialist – Centric Africa** • She stated that this would be taken into consideration.
2.	**Stephen Mbogo-Business Man** • He inquired about the number of boreholes the contractor intended to sink, noting that this could affect the production of existing boreholes established in the area. • He also inquired whether the developer, in collaboration with the County Government, is undertaking the rehabilitation of the feeder road that will be used during construction.	**Abigail Kimosop-Project Manager- Mi Vida Homes** • She emphasized that the decision on borehole siting is ultimately made by the Water Resources Authority (WRA), which follows specific criteria and approval procedures to guide the process. • Additionally, a community member pointed out that the presence of existing boreholes on neighboring properties does not guarantee approval for another borehole in the same area, as the final decision rests with the Water Resources Authority (WRA). • She clarified that all feeder roads fall under the jurisdiction of the Kenya Urban Roads Authority (KURA). She noted that the ongoing digging observed by community members was likely part of a separate KURA project to rehabilitate the roads. She further explained that, as stipulated in the contractor's agreement, any damage caused to the feeder roads during construction must be repaired by the contractor. Therefore, the recent roadworks witnessed in the area are likely independent of the housing project and may be part of KURA's own maintenance activities**.**
3.	**Paul Ndungu- Community Leader** • He inquired about the relationship between KEZA, IHS, and Centric Africa	**Hottensia Kabuki- Social Safeguards Specialist – Centric Africa** • She mentioned that the owners of the project, International Housing Solutions, had commissioned Centric Africa to conduct the Environmental Impact Assessment. Additionally, Mi Vida would serve as the project manager of the project.

		• She added that the law requires the developer to engage an independent firm to carry out the Environmental and Social Impact Assessment (ESIA) study. The contractor will then be responsible for implementing the recommendations outlined in the study.
4.	**Nicholas Mwita- Community Health Volunteer** • He inquired about the process for purchasing the houses, seeking clarification on the criteria and steps involved.	**Beatrice Karanja – ESG Specialist– IHS** • She explained that a site office would be established, including a sales and marketing desk, where interested buyers and renters could obtain detailed information about available financial facilities and partner banks offering financing options. She further noted that the construction was expected to take approximately two years.
5.	**Nancy (Director) – Spices Restaurant** • She mentioned that she owns a local business, Spice Restaurant, which offers excellent meals, and expressed interest in providing catering services. • Additionally, she noted her interest in purchasing a two- or three-bedroom unit within the project and conveyed her enthusiasm for the development.	**Hottensia Kabuki- Social Safeguards Specialist – Centric Africa** • She emphasized that the ESIA study would recommend that local businesses be given top priority once the project enters its implementation phase**.**

VOTE OF THANKS

The area chief thanked the community members for attending the public participation exercise stating that it was important for all stakeholders to be involved before the implementation of any project.

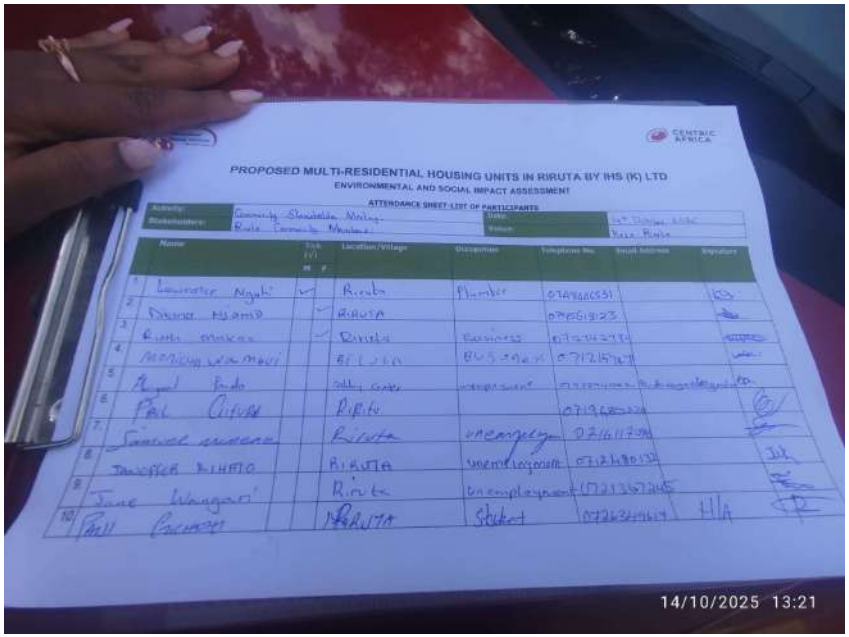
The project team thanked the participants for creating time to attend the meeting. The meeting ended with a word of prayer from one of the community members.

Follow-up actions

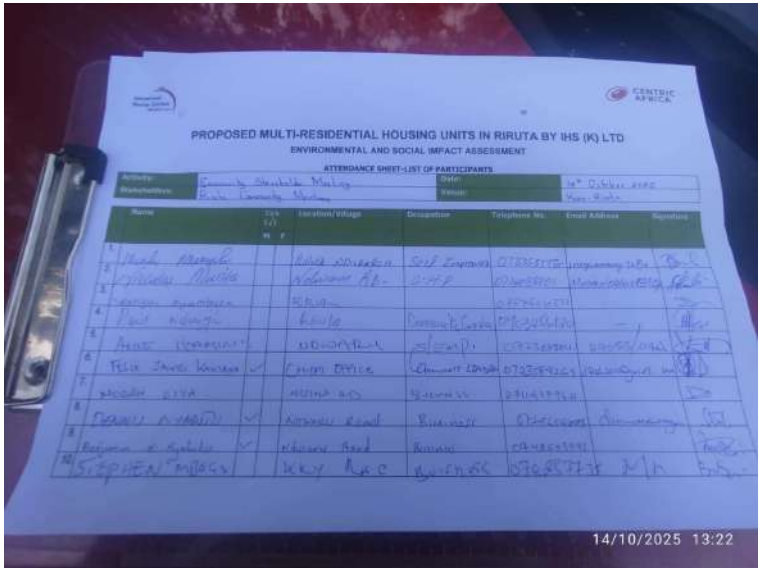
Action	Status	Who	Due by	Reporting Mechanism
Interested community members would register themselves at the chief's office so that they are considered for job	Pending	The Community	Pre-construction	Names and contact details of interested community members to be forwarded to Mi- Vida who are the project managers through the Area Chief

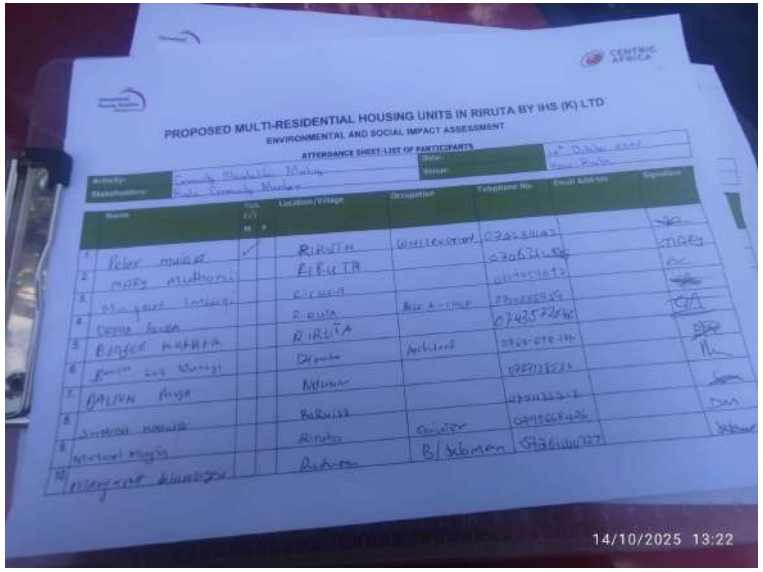
opportunities once construction begins.				

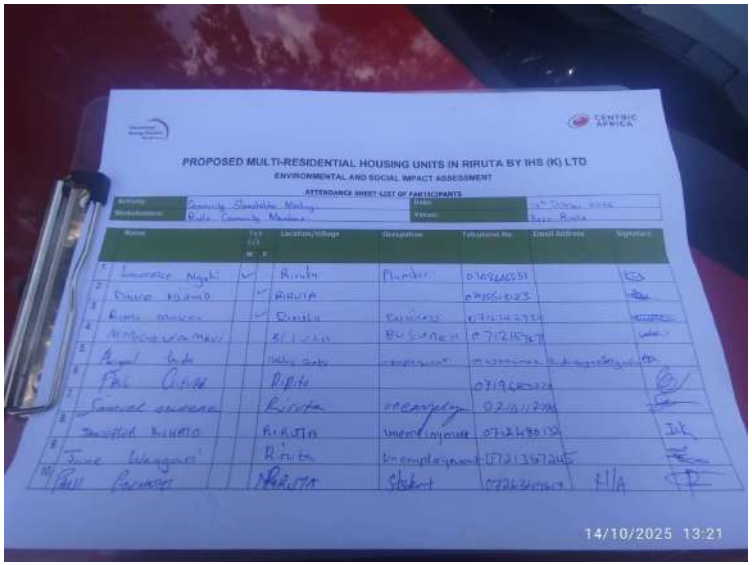
ATTENDANCE LISTS

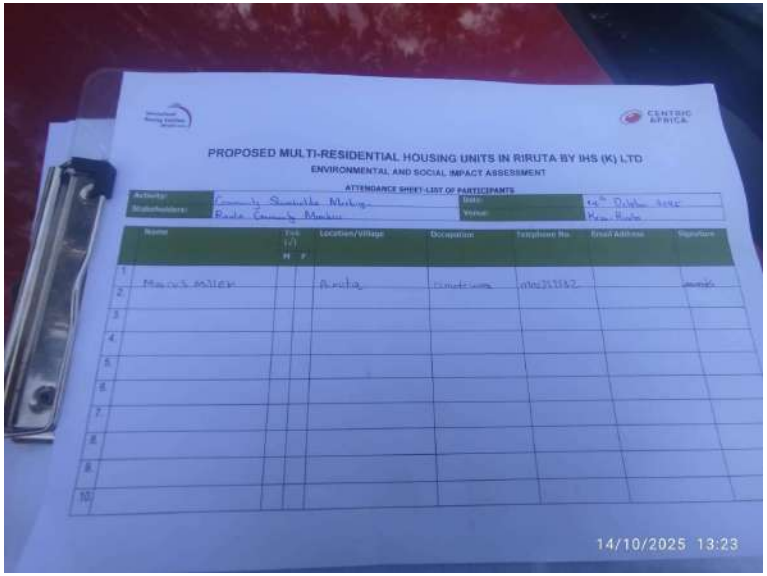












PHOTOS OF THE MEETING



Ongoing community engagement on the Keza – Riruta project



Hottensia Kabuki addressing community concerns

MINUTES OF MEETING PREPARED BY:

Jane Wanjiru, Environmental & Social Expert, Centric Africa Limited

MINUTES OF MEETINGS REVIEWED BY:

REPRESENTATIVE OF	NAME AND TITLE	SIGNATURE	DATE
IHS INVESTMENTS			
CENTRIC AFRICA	HOTTENSIA K- SOCIOLOGIST	Hkabuki	14/10/2025
LOCAL ADMINISTRATION	ORPHA ARCBA	A-CHIEF	14/10/2025

ASSISTANT CHIEF
KIRUTA SUB-LOCATION
RIRUTA LOCATION
Sign.....
Date.....

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Minutes of ESIA Stakeholder Consultation meeting

Project	Proposed Green Affordable Housing Units at Keza-Riruta by IHS (K) Ltd		
Project Number		**Date**	21st October, 2025
Time	11:00 am – 12:19 pm	**Venue**	Keza-Riruta
Chairperson	Ms. Orpha Bosibori- Asst. Chief- Riruta Sub-Location - (Assisted by Ms. Hottensia Kabuki)		
Participants	Please refer to the Appendix for the attendance list (* no. of participants)		
Agenda	1. Introduction 2. ESIA Process 3. Description of the Proposed Project 4. Potential E&S Impacts 5. Q&A		

SUBJECT RAISED

1 WELCOMING REMARKS & INTRODUCTIONS

The meeting was called to order at 11:00 am by the area chief, who requested a community member to open the meeting with a word of prayer. The chief then requested Phelix, an officer from his office to give a brief summary of the key discussion points that had emanated from previous stakeholder meetings held in regards to this project. The chief then invited Ms. Hottensia Kabuki to take over the meeting, who invited the ESIA team to introduce themselves.

Each of the ESIA team members introduced themselves, followed by a brief introduction from key project team representatives.

S/No	Name	Profession	Organization/County
1.	Daniel Chumo	Environmental Specialist	Centric Africa Limited
2.	Hottensia Kabuki	Social Safeguard Specialist	Centric Africa Limited
3.	Jane Kimani	Social Safeguard Specialist	Centric Africa Limited
4.	Nimrod Mureithi	Mi Vida	Project Manager
5.	Abigail Kimosop	Mi Vida	Project Manager

2	**PROJECT OVERVIEW**
	Hottensia Kabuki, a social safeguards specialist from Centric Africa gave an overview of the design for the proposed Multi-Residential Housing Units at Keza - Riruta. She stated that Mi-Vida would be the project managers and that the development will consist of approximately 240 modern apartments. The blocks will offer 144 one-bedroom units and 96 two-bedroom units The apartments will be a mix of 1-bedroom and 2-bedroom units, designed as follows: • **1-bedroom units (40 sq.m.)** – 144 units. • **2-bedroom units (60 sq.m.)** – 96 units IHS aims to market these units to lower-middle-income renters seeking environmentally friendly homes in a prime location. The design would prioritize energy efficiency and environmental sustainability, aligning with green building principles. Ms. Hottensia highlighted that the project aims to achieve Level 3 EDGE (Excellence in Design for Greater Efficiencies) Certification—the highest level under the program—demonstrating a strong commitment to sustainability. This certification requires substantial reductions in energy consumption, water usage, and embodied energy in construction materials. To meet these standards, the development will incorporate sustainable features such as solar energy systems, rainwater harvesting, and natural ventilation. Beyond sustainability, the project also focuses on affordability, ensuring that high-quality, eco-friendly living spaces are available at competitive prices to meet the rising demand for affordable urban housing. The design promotes a sense of community through well-planned layouts that include shared green spaces, recreational areas, and pedestrian pathways, all while maximizing space efficiency and maintaining residents' privacy.
3	**ESIA PROCESS- (POTENTIAL ENVIRONMENTAL & SOCIAL IMPACTS)**
	Mr. Chumo, an Environmental Specialist, delivered a description of the environmental and social assessment and its significance to the proposed project, emphasizing the legal necessity to engage all important stakeholders affected by a proposed project prior to development. This is established in the Environmental Management and Coordination Act (EMCA) of 1999 He provided a detailed overview of the ongoing Environmental and Social Impact Assessment (ESIA) for the Riruta project. He highlighted the primary positive and negative impacts identified thus far, along with the recommended mitigation measures to minimize adverse effects. **Positive Impacts:** 1. **Optimal Land Utilization**: The project maximizes the use of the available land, addressing the growing need for housing while ensuring efficient land use. 2. **Promotion of Sustainable Urban Development**: The design incorporates energy efficiency and green building principles, with the project seeking green certification, including EDGE certification. 3. **Addressing Housing Shortages**: The development aligns with the government's agenda to provide affordable housing, supporting the fourth medium-term plan (2022-2027) and Kenya's Vision 2030. 4. **Employment and Income Generation**: The project will create jobs during both the construction and operational phases, stimulating the local economy. 5. **Creation of a Market for Goods and Services**: New residents will drive demand for local goods and services, benefiting the surrounding community. 6. **Improved Security**: Security measures such as CCTV, lighting, and security personnel will be implemented, enhancing safety in the area. **Negative Impacts and Mitigation Measures:** 1. **Shift in Species and Vegetation Clearance**: o Some vegetation clearance will be necessary. To mitigate this, trees removed will be replaced at a ratio of 1:2, focusing on drought-resistant and indigenous species. o Selected trees within the plot will remain and be integrated into the green spaces.

	2. **Noise and Air Quality Impacts** (During Construction): ○ **Noise**: Use of noise-dampening equipment, mufflers, and acoustic enclosures will be recommended. Construction work will be scheduled during daytime to minimize disturbances. ○ **Air Quality**: Dust screens will be installed, and equipment will be fitted with diesel particulate filters. Dust control measures will also be applied to access roads. 3. **Solid Waste and Wastewater Management**: ○ Waste will be managed in line with legal regulations, with waste reduction, reuse, and recycling emphasized. Licensed waste contractors will be engaged. ○ Wastewater will not be discharged into nearby rivers. Wastewater will be separated from stormwater, contained on-site, and handled by licensed waste handlers. 4. **Soil Erosion and Stormwater Management**: ○ Sediment and erosion control measures will be implemented. Cleared vegetation will be used as mulch to reduce soil erosion. ○ Drainage channels and stormwater management systems will be incorporated to prevent flooding and facilitate proper water infiltration. 5. **Water and Energy Conservation**: ○ Rainwater harvesting systems, greywater recycling, and solar energy for hot water systems will be integrated to minimize water and energy demand. ○ Energy-efficient lighting and water-conserving fixtures will be used to reduce consumption. 6. **Community Health and Safety**: ○ Proper site planning and demarcation will be implemented to protect the surrounding community during construction. Safety signage, traffic marshals, and emergency preparedness plans will be in place to manage risks such as fires and security incidents. 7. **Climate Change Adaptation**: ○ The project will incorporate climate resilience features, including open ground-floor structures to allow stormwater flow and prevent obstruction. Sustainable construction materials with proper thermal insulation and natural ventilation will be used to reduce energy demand for cooling and heating
	Ms. Hottensia, the project's social safeguard specialist, also emphasized that these impacts and mitigation measures are being carefully assessed to develop a comprehensive Environmental and Social Management Plan (ESMP) for the project.

4. COMMENTS, QUESTIONS, OBSERVATIONS

Following the consultants' presentation on the proposed project, members were given the opportunity to comment and share their views on the project.

NO.	ISSUES/COMMENTS/ RECOMMENDATIONS	RESPONSES
1.	**Orpha Bosibori- Asst. Chief- Riruta Sub-Location** • She recommended that the contractor be involved in subsequent community meetings to enable familiarization with local community members. • She inquired whether community-based organizations, such as women's groups or self-help groups, could collaborate to purchase housing units.	**Abigail Kimosop – Project Manager – Mi Vida Homes** • She stated that once the tender process is complete and the preferred contractor selected, they will be introduced to the Chief and local community, including the available workforce, both skilled and unskilled. • She explained that a designated sales executive will oversee the sale of housing units, and such collective purchase arrangements may be discussed at that stage.
2.	**Abigael Pendo -Building & Construction** • She inquired about the project's start date.	**Abigail Kimosop-Project Manager- Mi Vida Homes** • She indicated that while the project was initially expected to commence before the festive season, anticipated delays in the licensing process may result in commencement early next year.
3.	**Michael Muyia – Painter** • He inquired about the fate of the Mugumo tree on-site, noting its cultural significance to the Kikuyu community. • He inquired about the deposit required to purchase an apartment and the sales commission for marketing the houses.	**Abigail Kimosop-Project Manager- Mi Vida Homes** • She clarified that the Mugumo tree at the center of the property will be preserved and integrated into a landscaped recreational area with seating and a children's play zone to honor its cultural importance. • She stated that sales have not yet commenced and, consequently, the deposit percentage has not been determined. • She added that in another ongoing project (Keza), the deposit required is 10% of the total property value.
4.	**Philip – Resident** • He inquired about the types of houses that will be built.	**Abigail Kimosop-Project Manager- Mi Vida Homes** • She stated that the development will include one-bedroom and two-bedroom apartments.
5.	**Sarah Mukina** • She inquired about the sizes of the houses.	

6.	**Wangui Nyambura** • She inquired if there would be a kiosk within the apartment complex for local vendors to sell vegetables and market goods to the house occupants.	**Abigail Kimosop-Project Manager- Mi Vida Homes** • She indicated that it was uncertain whether the contractor would include a kiosk within the complex. However, community members are encouraged to establish kiosks outside the premises to sell fresh produce**.** • Further clarified that a cabro-paved area at the front of the development will be designated as a boda boda (motorcycle) pick-up and drop-off zone for residents.
7.	**Maureen Achieng** • She inquired about the project timelines. • She expressed interest in supplying reflective jackets and dust coats during construction.	**Abigail Kimosop-Project Manager- Mi Vida Homes** • She explained that the project is expected to take approximately two years from groundbreaking (2026–2027). • She explained that provision of safety gear is the responsibility of the contractor; however, interested community members may submit proposals for consideration during procurement of such supplies..
8.	**Knight Nabalaya** • She enquired whether community members would be allowed to sell food at the construction site.	**Abigail Kimosop-Project Manager- Mi Vida Homes** • She explained that the contractor will establish a designated area for vetted food vendors with valid medical and food handler's certificates.
9.	**Jared Malingu – Business Man** • He hoped the community would benefit from the project**.** • He asked if community members could be engaged as sales agents for the housing units.	**Abigail Kimosop-Project Manager- Mi Vida Homes** • She stated that a dedicated sales executive will handle sales but community members can also refer clients, provided they are over 18 years old and the referred client qualifies to purchase. • She added that successful referrals will earn a 3% commission on the total property cost after signing a contract with Mi Vida Homes.
10.	**Peter Muikia** • He enquired if houses could be purchased through a rent-to-own or hire-purchase (Lipa Mdogo Mdogo) arrangement.	**Abigail Kimosop-Project Manager- Mi Vida Homes** • She explained that financing options will be discussed in detail with the designated sales executive during the sales phase.
11.	**Margaret Imbugi – Building and Construction** • She inquired about potential employment and business opportunities arising from the project..	**Hottensia Kabuki- Social Safeguards Specialist – Centric Africa**

		• She emphasized that local community members will be accorded first priority for any available employment or business opportunities related to the project.
12.	**Paul Ndungu – Business Man** • He recommended that landscaping be maintained to avoid excessive concretization of the area..	**Abigail Kimosop-Project Manager- Mi Vida Homes** • She assured the participants that for every tree removed during construction, two trees will be planted to enhance green cover and environmental sustainability..
13.	**Mary Muthoni** • She inquired about possible employment opportunities suitable for elderly members of the community.	**Hottensia Kabuki- Social Safeguards Specialist – Centric Africa** • She noted that the contractor will identify light-duty tasks appropriate for elderly individuals and prioritize them accordingly. • She added that during the design of Corporate Social Responsibility (CSR) initiatives, consideration may be given to establishing a program dedicated to supporting the elderly within the community.

VOTE OF THANKS

The area chief thanked the community members for attending the public participation exercise stating that it was important for all stakeholders to be involved before the implementation of any project.

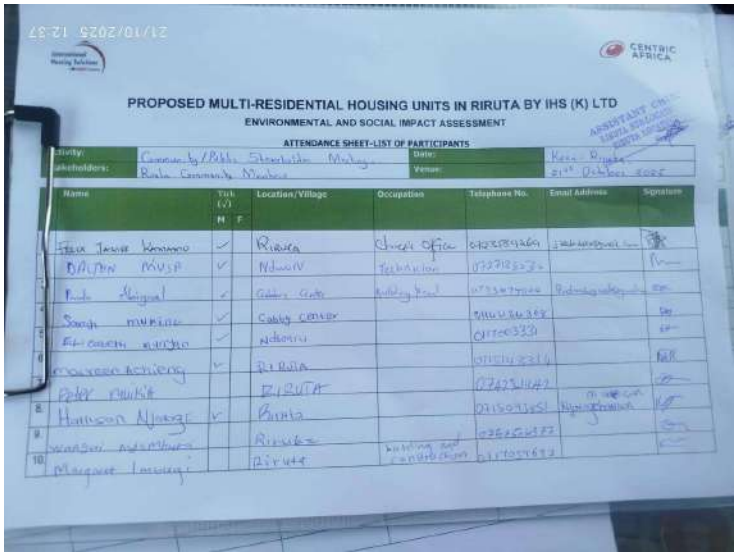
The project team thanked the participants for creating time to attend the meeting. The meeting ended with a word of prayer from one of the community members.

Follow-up actions

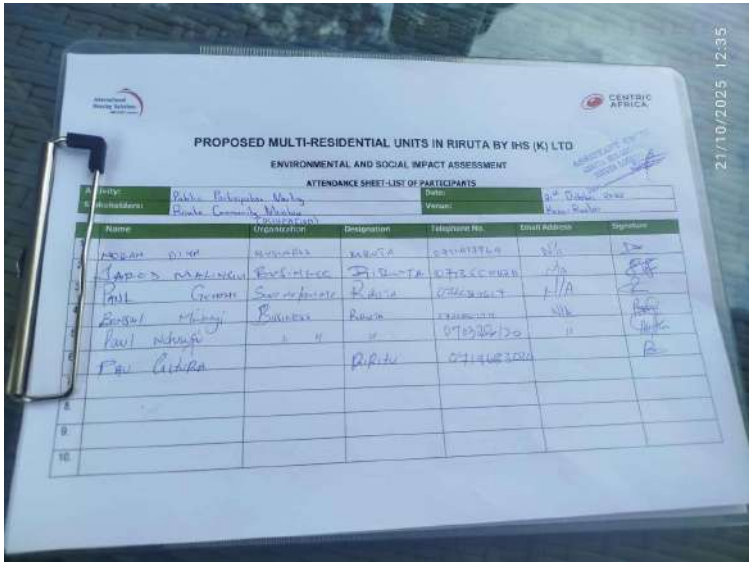
Action	Status	Who	Due by	Reporting Mechanism
Interested community members would register themselves at the chief's office so that they are considered for job opportunities once construction begins.	Pending	The Community	Pre-construction	Names and contact details of interested community members to be forwarded to Mi- Vida who are the project managers through the Area Chief

ATTENDANCE LISTS









PHOTOS OF THE MEETING



Chief Bosibori addressing community members



Community members raising their concerns during the meeting

MINUTES OF MEETING PREPARED BY:

Jane Wanjiru, Environmental & Social Expert, Centric Africa Limited

MINUTES OF MEETINGS REVIEWED BY:

REPRESENTATIVE OF	NAME AND TITLE	SIGNATURE	DATE
IHS INVESTMENTS			
CENTRIC AFRICA	HOTTENSIA K.- SOCIOLOGIST	Hkabuki	21/10/25
LOCAL ADMINISTRATION	ORPHA ARCBA	SNR-A-CHIEF	21/10/25

ASSISTANT CHIEF
KIRUTA SUB-LOCATION
KIRUTA LOCATION
21/10/25

These minutes are considered to be an accurate recording of all items discussed. Written notices of discrepancies, errors or omissions must be given within seven (7) days, otherwise the minutes will be accepted as written.

Annex 10-B: Questionnaires

STAKEHOLDER CONSULTATION QUESTIONNAIRE

ESIA for the Proposed Green Affordable Housing Units on L.R. No. Dagoretti/Riruta/6004 (Nairobi Block 66/6004) in Dagoretti South, Nairobi County

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Respondent Details		
Personal Information	Name KIMARU MARY	
	Gender F	☐ Male ☑ Female
	Occupation HIL	
	Organization	
	Contact Address/E-mail	0726975410
	Cell Phone	
	National ID Number	24190180
Stakeholder Information	Stakeholder Group represented (e.g., Resident, Neighbour, Potential customer, Developer, etc.)	
	How long have you lived/worked in this area?	15 YRS

Environmental and Social Concerns

1. What is your opinion regarding the proposed IHS Green Affordable Housing project ? They have considered us in a good way of development
2. What benefits do you think the proposed development will bring?
   a) Business opportunities
   b) Good security
   c) Uplift our living standard
   d) .....
   e) .....
3. What do you feel are potentially the impacts of the Proposed Green Affordable Housing project on the following:
   a) Security improvement
   b) Sewerage sewage line improvement
   c) Job opportunities available
   d) .....
   e) .....
4. What are some of the measures that the Proponent can put in place to mitigate against the potential negative impacts?
   a) Instal security light
   b) Care residence job opportunity
   c) Being a private sector you can come up with
   d) scholarship for our ~~kid~~ children
   e) Mentoring our students
5. Are you in any way opposed to the development of the **Proposed Green Affordable Housing Units by IHS?**

   Yes (state reason/s)..... No ✓

Signature ..... **Date of Interview** 7/10/2025

STAKEHOLDER CONSULTATION QUESTIONNAIRE

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Respondent Details		AGNES IRUNGU
Personal Information	Name	AGNES
	Gender	☐ Male ☑ Female
	Occupation	S/ BUSINESS
	Organization	
	Contact Address/E-mail	Nakuru.
	Cell Phone	0729696532
	National ID Number	25554052
Stakeholder Information	Stakeholder Group represented (e.g., Resident, Neighbour, Potential customer, Developer, etc.)	
	How long have you lived/worked in this area?	12 YRS

Environmental and Social Concerns

1. What is your opinion regarding the proposed IHS Green Affordable Housing project ?.....

   .....

2. What benefits do you think the proposed development will bring?

   a) .....

   b) .....

   c) .....

   d) .....

   e) .....

3. What do you feel are potentially the impacts of the Proposed Green Affordable Housing project on the following:

   a) SECURITY INSTALL

   b) .....

   c) .....

   d) .....

   e) .....

4. What are some of the measures that the Proponent can put in place to mitigate against the potential negative impacts?

   a) MENTORING STUDENT

   b) SCHOLARSHIP FOR OUR CHILDREN

   c) .....

   d) .....

   e) .....

5. Are you in any way opposed to the development of the **Proposed Green Affordable Housing Units by IHS**?

   Yes (state reason/s)..... No...✓.....

Signature ..... **Date of Interview**...7/10/2025

STAKEHOLDER CONSULTATION QUESTIONNAIRE

ESIA for the Proposed Green Affordable Housing Units on L.R. No. Dagoretti/Riruta/6004 (Nairobi Block 66/6004) in Dagoretti South, Nairobi County

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Respondent Details		
Personal Information	Name MARIA Bonface Onderi	
	Gender	☑ Male ☐ Female
	Occupation Business	
	Organization	
	Contact Address/E-mail 7464 Kisii	
	Cell Phone 0786600706	
	National ID Number 29505616	
Stakeholder Information	Stakeholder Group represented (e.g., Resident, Neighbour, Potential customer, Developer, etc.)	
	How long have you lived/worked in this area?	

Environmental and Social Concerns

1. What is your opinion regarding the proposed IHS Green Affordable Housing project ? To employ people on private Security team.
2. What benefits do you think the proposed development will bring?
   a) Employment
   b) Area development
   c) .....
   d) .....
   e) .....
3. What do you feel are potentially the impacts of the Proposed Green Affordable Housing project on the following:
   a) Noise pollution
   b) Dumping of waste products
   c) .....
   d) .....
   e) .....
4. What are some of the measures that the Proponent can put in place to mitigate against the potential negative impacts?
   a) Set appropriate working hours.
   b) Construction of dumping sites.
   c) .....
   d) .....
   e) .....
5. Are you in any way opposed to the development of the **Proposed Green Affordable Housing Units by IHS?**

   Yes (state reason/s)..... No. ✓

Signature ..... **Date of Interview** 7/10/2025

STAKEHOLDER CONSULTATION QUESTIONNAIRE

ESIA for the Proposed Green Affordable Housing Units on L.R. No. Dagoretti/Riruta/6004 (Nairobi Block 66/6004) in Dagoretti South, Nairobi County

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Respondent Details		
Personal Information	Name	
	Gender	☐ Male ☑ Female
	Occupation	N/A
	Organization	N/A
	Contact Address/E-mail	0712 22 6348
	Cell Phone	
	National ID Number	37544497
Stakeholder Information	Stakeholder Group represented (e.g., Resident, Neighbour, Potential customer, Developer, etc.)	Resident
	How long have you lived/worked in this area?	13 years

Environmental and Social Concerns

1. What is your opinion regarding the proposed IHS Green Affordable Housing project ?..... uplifting the Community.....
2. What benefits do you think the proposed development will bring?
   a) Developement
   b) Employment
   c) Socializing
   d) .....
   e) .....
3. What do you feel are potentially the impacts of the Proposed Green Affordable Housing project on the following:
   a) Security
   b) Peaceful navigation
   c) .....
   d) .....
   e) .....
4. What are some of the measures that the Proponent can put in place to mitigate against the potential negative impacts?
   a) Locals Employment
   b) Community Security
   c) Interminging
   d) .....
   e) .....
5. Are you in any way opposed to the development of the **Proposed Green Affordable Housing Units by IHS?**

   Yes (state reason/s)..... Uplifting the Community ..... No.....

Signature ..... **Date of Interview**..... 7/10/25

STAKEHOLDER CONSULTATION QUESTIONNAIRE

ESIA for the Proposed Green Affordable Housing Units on L.R. No. Dagoretti/Riruta/6004 (Nairobi Block 66/6004) in Dagoretti South, Nairobi County

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Respondent Details		
Personal Information	Name	Marcus Miller
	Gender	☑ Male ☐ Female
	Occupation	Climate work
	Organization	
	Contact Address/E-mail	
	Cell Phone	0123575 85
	National ID Number	6[illegible]583
Stakeholder Information	Stakeholder Group represented (e.g., Resident, Neighbour, Potential customer, Developer, etc.)	Resident neighbour
	How long have you lived/worked in this area?	4 years

Environmental and Social Concerns

1. What is your opinion regarding the proposed IHS Green Affordable Housing project ? It is a good project that will bring employment to the community
2. What benefits do you think the proposed development will bring?
   a) employment
   b) beautiful Surrounding
   c) .....
   d) .....
   e) .....
3. What do you feel are potentially the impacts of the Proposed Green Affordable Housing project on the following:
   a) A peaceful neighbourhood
   b) .....
   c) .....
   d) .....
   e) .....
4. What are some of the measures that the Proponent can put in place to mitigate against the potential negative impacts?
   a) Building fitness or social halls for the youths
   b) .....
   c) .....
   d) .....
   e) .....
5. Are you in any way opposed to the development of the **Proposed Green Affordable Housing Units by IHS**?

   Yes (state reason/s)..... No. ✓

Signature ...mmk..... **Date of Interview**...1.10.2025.....

STAKEHOLDER CONSULTATION QUESTIONNAIRE

ESIA for the Proposed Green Affordable Housing Units on L.R. No. Dagoretti/Riruta/6004 (Nairobi Block 66/6004) in Dagoretti South, Nairobi County

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Respondent Details		
Personal Information	Name Virginiah mumbi muthiora	
	Gender	☐ Male ☑ Female
	Occupation Business woman	
	Organization None	
	Contact Address/E-mail	
	Cell Phone 0724173 018	
	National ID Number 24774426	
Stakeholder Information	Stakeholder Group represented (e.g., Resident, Neighbour, Potential customer, Developer, etc.)	
	How long have you lived/worked in this area?	more than 10 years

Environmental and Social Concerns

1. What is your opinion regarding the proposed IHS Green Affordable Housing project ?.....
   It's good coz its removing people from slum areas
2. What benefits do you think the proposed development will bring?
   a) people will live in good houses
   b) .....
   c) .....
   d) .....
   e) .....
3. What do you feel are potentially the impacts of the Proposed Green Affordable Housing project on the following:
   a) .....
   b) .....
   c) .....
   d) .....
   e) .....
4. What are some of the measures that the Proponent can put in place to mitigate against the potential negative impacts?
   a) .....
   b) .....
   c) .....
   d) .....
   e) .....
5. Are you in any way opposed to the development of the **Proposed Green Affordable Housing Units by IHS**?

   Yes (state reason/s)..... No.....

Signature ..... **Date of Interview**.....

STAKEHOLDER CONSULTATION QUESTIONNAIRE

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Respondent Details		
Personal Information	Name	ABIGAEL PENDO
	Gender	☐ Male ☑ Female
	Occupation	unemployed
	Organization	Nil
	Contact Address/E-mail	Pendoabgael@gmail.com
	Cell Phone	0793294022
	National ID Number	39738918
Stakeholder Information	Stakeholder Group represented (e.g., Resident, Neighbour, Potential customer, Developer, etc.)	
	How long have you lived/worked in this area?	

Environmental and Social Concerns

1. What is your opinion regarding the proposed IHS Green Affordable Housing project ? The project will make the area to develop
2. What benefits do you think the proposed development will bring?
   a) Employment opportunities
   b) Beutification of the environment
   c) Improvement of roads in the area
   d) Security improvement in the area
   e) .....
3. What do you feel are potentially the impacts of the Proposed Green Affordable Housing project on the following:
   a) Employment opportunities
   b) Noise pollution
   c) Affordable houses
   d) Air pollution
   e) Because of security lights & guards, security will be good
4. What are some of the measures that the Proponent can put in place to mitigate against the potential negative impacts?
   a) Proper waste disposal
   b) No hooting near schools and hospital
   c) Bumbs/road signs
   d) Buliding of concrete wall, for security puipares and no interpance with outsider
   e) .....
5. Are you in any way opposed to the development of the **Proposed Green Affordable Housing Units by IHS**?

   Yes (state reason/s)..... No...✓...

Signature ..... **Date of Interview** 7/10/2022

STAKEHOLDER CONSULTATION QUESTIONNAIRE

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Respondent Details		
Personal Information	Name Lucy Wanguru N	
	Gender	☐ Male ☑ Female
	Occupation Bussines	
	Organization N/A	
	Contact Address/E-mail 0724596995	
	Cell Phone 0724596995	
	National ID Number 23061138	
Stakeholder Information	Stakeholder Group represented (e.g., Resident, Neighbour, Potential customer, Developer, etc.)	
	How long have you lived/worked in this area?	11 years

Environmental and Social Concerns

1. What is your opinion regarding the proposed IHS Green Affordable Housing project ? They consider people mostly from these area
2. What benefits do you think the proposed development will bring?
   a) developing the area
   b) Job opportunities
   c) .....
   d) .....
   e) .....
3. What do you feel are potentially the impacts of the Proposed Green Affordable Housing project on the following:
   a) favourable bussines conditions
   b) Roads to look good
   c) Street right
   d) .....
   e) .....
4. What are some of the measures that the Proponent can put in place to mitigate against the potential negative impacts?
   a) Privacy
   b) being positive to negative proponet
   c) .....
   d) .....
   e) .....
5. Are you in any way opposed to the development of the **Proposed Green Affordable Housing Units by IHS?**

   Yes (state reason/s)..... No. ✓

Signature ..... **Date of Interview** 7/10/2025

STAKEHOLDER CONSULTATION QUESTIONNAIRE

ESIA for the Proposed Green Affordable Housing Units on L.R. No. Dagoretti/Riruta/6004 (Nairobi Block 66/6004) in Dagoretti South, Nairobi County

International Housing Solution (K) Ltd intends to construct green affordable housing units providing residential accommodation along Ndwaru Road, off Naivasha Road in Riruta-Satellite area. The Environmental Impact Assessment and Audit Regulations 2003 (revised 2019) require that an Environmental Impact Assessment (EIA) be done on projects, and as a matter of law, stakeholders' comments are a significant component of the process. Centric Africa Limited (NEMA Firm of Experts No. 7112) has been contracted to undertake an EIA for submission to NEMA. Your views are crucial in this EIA process as they will enable NEMA to make an informed decision in approving and/or recommending remedial measures for the proposed project. As a stakeholder, you are kindly invited to give your views on the proposed project.

Respondent Details		
Personal Information	Name	
	Gender	☐ Male ☑ Female
	Occupation	
	Organization	
	Contact Address/E-mail	
	Cell Phone	
	National ID Number	
Stakeholder Information	Stakeholder Group represented (e.g., Resident, Neighbour, Potential customer, Developer, etc.)	
	How long have you lived/worked in this area?	

Environmental and Social Concerns

1. What is your opinion regarding the proposed IHS Green Affordable Housing project ? It is a good Ideal
2. What benefits do you think the proposed development will bring?
   a) The place will be developed
   b) It will be Ucured
   c) It will be a important place
   d) good Security
   e)
3. What do you feel are potentially the impacts of the Proposed Green Affordable Housing project on the following:
   a) - JOB will available
   b) - Security
   c)
   d)
   e)
4. What are some of the measures that the Proponent can put in place to mitigate against the potential negative impacts?
   a)
   b)
   c)
   d)
   e)
5. Are you in any way opposed to the development of the **Proposed Green Affordable Housing Units by IHS**?

   Yes (state reason/s) it will develop the place & Security No.....

Signature ..... **Date of Interview** 4/10

STAKEHOLDER CONSULTATION QUESTIONNAIRE

ESIA for the Proposed Green Affordable Housing Units on L.R. No. Dagoretti/Riruta/6004 (Nairobi Block 66/6004) in Dagoretti South, Nairobi County

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Respondent Details		
Personal Information	Name	John Kimani
	Gender	☑ Male ☐ Female
	Occupation	N/A
	Organization	Ndwaru
	Contact Address/E-mail	0705 813214
	Cell Phone	0705 813214
	National ID Number	11971079
Stakeholder Information	Stakeholder Group represented (e.g., Resident, Neighbour, Potential customer, Developer, etc.)	Resident
	How long have you lived/worked in this area?	Since childhood

Environmental and Social Concerns

1. What is your opinion regarding the proposed IHS Green Affordable Housing project ? Its good because of job opportunities business growth and community growth
2. What benefits do you think the proposed development will bring?
   a) Job opportunities
   b) Community developments
   c) Local bussiness increasing
   d) affortable housing
   e) Reducing less crime rate and improving security status
3. What do you feel are potentially the impacts of the Proposed Green Affordable Housing project on the following:
   a) locals people will have job opportunities
   b) the area growth will be of high standards
   c) Security in the area
   d) Less crime rate among the youth
   e) Business developments
4. What are some of the measures that the Proponent can put in place to mitigate against the potential negative impacts?
   a) Giving the local people jobs as first priority
   b) Hiring professional
   c) Maintaing environmental stetus
   d) Giving back to the people by atleast building hospital or police station
   e) Security should be maintained inside and outside the project.
5. Are you in any way opposed to the development of the **Proposed Green Affordable Housing Units by IHS**?

   Yes (state reason/s)..... No. it gives back to the community

Signature ..... **Date of Interview** 7/10/25

STAKEHOLDER CONSULTATION QUESTIONNAIRE

ESIA for the Proposed Green Affordable Housing Units on L.R. No. Dagoretti/Riruta/6004 (Nairobi Block 66/6004) in Dagoretti South, Nairobi County

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Respondent Details		
Personal Information	Name Benson Kimonye	
	Gender	☑ Male ☐ Female
	Occupation Community	
	Organization	
	Contact Address/E-mail 0706214535	
	Cell Phone	
	National ID Number	
Stakeholder Information	Stakeholder Group represented (e.g., Resident, Neighbour, Potential customer, Developer, etc.)	
	How long have you lived/worked in this area?	All of my life

Environmental and Social Concerns

1. What is your opinion regarding the proposed IHS Green Affordable Housing project ?.....
   .....
2. What benefits do you think the proposed development will bring?
   a) Work
   b) good Housing
   c) good Road and Lights
   d) .....
   e) .....
3. What do you feel are potentially the impacts of the Proposed Green Affordable Housing project on the following:
   a) .....
   b) .....
   c) .....
   d) .....
   e) .....
4. What are some of the measures that the Proponent can put in place to mitigate against the potential negative impacts?
   a) .....
   b) .....
   c) .....
   d) .....
   e) .....
5. Are you in any way opposed to the development of the **Proposed Green Affordable Housing Units by IHS**?

   Yes (state reason/s)..... No. ✓

Signature ..... **Date of Interview**... 2025/10/07

STAKEHOLDER CONSULTATION QUESTIONNAIRE

ESIA for the Proposed Green Affordable Housing Units on L.R. No. Dagoretti/Riruta/6004 (Nairobi Block 66/6004) in Dagoretti South, Nairobi County

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Respondent Details			
Personal Information	Name	Margaret Imbuga	
	Gender	☐ Male	☑ Female
	Occupation	N/A	
	Organization		
	Contact Address/E-mail	0117059692	
	Cell Phone		
	National ID Number	26753863	
Stakeholder Information	Stakeholder Group represented (e.g., Resident, Neighbour, Potential customer, Developer, etc.)		
	How long have you lived/worked in this area?		

Environmental and Social Concerns

1. What is your opinion regarding the proposed IHS Green Affordable Housing project ?
   I support the project coz it will develop the community
2. What benefits do you think the proposed development will bring?
   a) Roads will be well developed
   b) Business like mama Mboga will be well.
   c) Boda boda also will have jobs.
   d) We will have security for many
   e)
3. What do you feel are potentially the impacts of the Proposed Green Affordable Housing project on the following:
   a)
   b)
   c)
   d)
   e)
4. What are some of the measures that the Proponent can put in place to mitigate against the potential negative impacts?
   a)
   b)
   c)
   d)
   e)
5. Are you in any way opposed to the development of the **Proposed Green Affordable Housing Units by IHS**?
   Yes (state reason/s) ~~(...)~~ because it will create jobs for many No.

Signature ..... **Date of Interview** 7/10/25

STAKEHOLDER CONSULTATION QUESTIONNAIRE

ESIA for the Proposed Green Affordable Housing Units on L.R. No. Dagoretti/Riruta/6004 (Nairobi Block 66/6004) in Dagoretti South, Nairobi County

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Respondent Details		
Personal Information	Name MORAH DIVA	
	Gender	☐ Male ☑ Female
	Occupation BUSINESS	
	Organization	
	Contact Address/E-mail	
	Cell Phone 0711417964	
	National ID Number 24263630	
Stakeholder Information	Stakeholder Group represented (e.g., Resident, Neighbour, Potential customer, Developer, etc.)	
	How long have you lived/worked in this area?	

Environmental and Social Concerns

1. What is your opinion regarding the proposed IHS Green Affordable Housing project ? It will bring development in the community

2. What benefits do you think the proposed development will bring?
   a) Create Jobs Opportunity
   b) The community will develop
   c) Affordable housing
   d) .....
   e) .....

3. What do you feel are potentially the impacts of the Proposed Green Affordable Housing project on the following:
   a) .....
   b) .....
   c) .....
   d) .....
   e) .....

4. What are some of the measures that the Proponent can put in place to mitigate against the potential negative impacts?
   a) .....
   b) .....
   c) .....
   d) .....
   e) .....

5. Are you in any way opposed to the development of the **Proposed Green Affordable Housing Units by IHS**?

   Yes (state reason/s). It will create Jobs Opportunities ..... No.....

Signature ..... **Date of Interview** 7/10/25

STAKEHOLDER CONSULTATION QUESTIONNAIRE

ESIA for the Proposed Green Affordable Housing Units on L.R. No. Dagoretti/Riruta/6004 (Nairobi Block 66/6004) in Dagoretti South, Nairobi County

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Respondent Details		
Personal Information	Name	Ruth Mitchelle Sibagaya
	Gender	☐ Male ☑ Female
	Occupation	N/A
	Organization	N/A
	Contact Address/E-mail	mitchellesibagaya@gmail.com
	Cell Phone	0758366827
	National ID Number	41814946
Stakeholder Information	Stakeholder Group represented (e.g., Resident, Neighbour, Potential customer, Developer, etc.)	
	How long have you lived/worked in this area?	2years

Environmental and Social Concerns

1. What is your opinion regarding the proposed IHS Green Affordable Housing project ?
   The organisation is good beau because it help youth to get a job
2. What benefits do you think the proposed development will bring?
   a) Work ability
   b) It will improve the residence.
   c) Idling will decrease for the youth because they will be having a job.
   d)
   e) you become open mind
3. What do you feel are potentially the impacts of the Proposed Green Affordable Housing project on the following:
   a) Job opportunity
   b) It's a affordable house so living standard will be better
   c) their will be no idling for the youth.
   d)
   e)
4. What are some of the measures that the Proponent can put in place to mitigate against the potential negative impacts?
   a) giving them hopes and nothing changes.
   b)
   c)
   d)
   e)
5. Are you in any way opposed to the development of the **Proposed Green Affordable Housing Units by IHS**?

   Yes (state reason/s)..... No. ✓

Signature ..... **Date of Interview**.....

STAKEHOLDER CONSULTATION QUESTIONNAIRE

ESIA for the Proposed Green Affordable Housing Units on L.R. No. Dagoretti/Riruta/6004 (Nairobi Block 66/6004) in Dagoretti South, Nairobi County

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Respondent Details		
Personal Information	Name	ANNATH MBULA MAKAU
	Gender	☐ Male ☑ Female
	Occupation	
	Organization	
	Contact Address/E-mail	
	Cell Phone	0729 458 790
	National ID Number	25071105
Stakeholder Information	Stakeholder Group represented (e.g., Resident, Neighbour, Potential customer, Developer, etc.)	
	How long have you lived/worked in this area?	For Seven years

Environmental and Social Concerns

1. What is your opinion regarding the proposed IHS Green Affordable Housing project ?
   not bad, eoz we will be able to afford.
2. What benefits do you think the proposed development will bring?
   a) Job opportunities
   b) Employment
   c) good life
   d) security
   e)
3. What do you feel are potentially the impacts of the Proposed Green Affordable Housing project on the following:
   a)
   b)
   c)
   d)
   e)
4. What are some of the measures that the Proponent can put in place to mitigate against the potential negative impacts?
   a) working ours
   b) Air Pollution
   c)
   d)
   e)
5. Are you in any way opposed to the development of the **Proposed Green Affordable Housing Units by IHS**?

   Yes (state reason/s)..... No.....

Signature ..... **Date of Interview** 7/10/2025

STAKEHOLDER CONSULTATION QUESTIONNAIRE

ESIA for the Proposed Green Affordable Housing Units on L.R. No. Dagoretti/Riruta/6004 (Nairobi Block 66/6004) in Dagoretti South, Nairobi County

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Respondent Details		
Personal Information	Name	VIDIA ADHIAMBO
	Gender	☐ Male ☑ Female
	Occupation	Unemployed
	Organization	N/A
	Contact Address/E-mail	VidiaQgmail.com
	Cell Phone	0746194047
	National ID Number	41230036
Stakeholder Information	Stakeholder Group represented (e.g., Resident, Neighbour, Potential customer, Developer, etc.)	Neighbour
	How long have you lived/worked in this area?	6yrs

Environmental and Social Concerns

1. What is your opinion regarding the proposed IHS Green Affordable Housing project ? It will empower more youths by creating Job apportunities
2. What benefits do you think the proposed development will bring?
   a) Job opportunities
   b) Tender apportunities
   c) Development
   d) .....
   e) .....
3. What do you feel are potentially the impacts of the Proposed Green Affordable Housing project on the following:
   a) It will raise the standards of living
   b) It will create Job apportunities for educated and non educated
   c) .....
   d) .....
   e) .....
4. What are some of the measures that the Proponent can put in place to mitigate against the potential negative impacts?
   a) Controlling sewer line and floods (Air Pollution)
   b) Practice Reapforestation
   c) Noise pollution
   d) .....
   e) .....
5. Are you in any way opposed to the development of the **Proposed Green Affordable Housing Units by IHS**?

   Yes (state reason/s)..... No ✓

Signature ..... **Date of Interview** 07/8/2025

STAKEHOLDER CONSULTATION QUESTIONNAIRE

ESIA for the Proposed Green Affordable Housing Units on L.R. No. Dagoretti/Riruta/6004 (Nairobi Block 66/6004) in Dagoretti South, Nairobi County

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Respondent Details		
Personal Information	Name JANE WANGARI	
	Gender F	☐ Male ☑ Female
	Occupation UNEMPLOYED (CASUAL)	CASUAL LABOROUR
	Organization	N/A
	Contact Address/E-mail 0721367245	njerogenoge@gmail.com
	Cell Phone	0721367245
	National ID Number 36181462	36181462
Stakeholder Information	Stakeholder Group represented (e.g., Resident, Neighbour, Potential customer, Developer, etc.)	Neighbour
	How long have you lived/worked in this area?	

Environmental and Social Concerns

1. What is your opinion regarding the proposed IHS Green Affordable Housing project ? I am happy and I propose the project because it will bring development
2. What benefits do you think the proposed development will bring?
   a) Employment
   b) Development
   c) Affordable housing
   d) New face to our community
   e) Security Improvement
3. What do you feel are potentially the impacts of the Proposed Green Affordable Housing project on the following:
   a) It will improve the standard of the community
   b) It will make the vanurable persons to get money
   c) It will help the young people to focus when provided with jobs
   d) It will create sobriety because most young men will be busy
   e) It will help to increase good security to our community
4. What are some of the measures that the Proponent can put in place to mitigate against the potential negative impacts?
   a) Sewer and drinage Controlled
   b) Managing traffic
   c)
   d)
   e)
5. Are you in any way opposed to the development of the **Proposed Green Affordable Housing Units by IHS**?

   Yes (state reason/s)..... No. I don't oppose

Signature ..... **Date of Interview** 7/10/2025

STAKEHOLDER CONSULTATION QUESTIONNAIRE

ESIA for the Proposed Green Affordable Housing Units on L.R. No. Dagoretti/Riruta/6004 (Nairobi Block 66/6004) in Dagoretti South, Nairobi County

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Respondent Details		
Personal Information	Name	
	Gender	☐ Male ☑ Female
	Occupation	unemployed.
	Organization	N/A
	Contact Address/E-mail	Maureengakii787@gmail.com.
	Cell Phone	0742647502
	National ID Number	37435585
Stakeholder Information	Stakeholder Group represented (e.g., Resident, Neighbour, Potential customer, Developer, etc.)	Neighbour.
	How long have you lived/worked in this area?	7yrs.

Environmental and Social Concerns

1. What is your opinion regarding the proposed IHS Green Affordable Housing project ? It is a project that will empower the youth by Creating job opputunities - after this more projects should be created.
2. What benefits do you think the proposed development will bring?
   a) Job opportunities
   b) Tender opportunities.
   c) Huge development in the area
   d) .....
   e) .....
3. What do you feel are potentially the impacts of the Proposed Green Affordable Housing project on the following:
   a) It raise the living standards.
   b) It will Create job opportunities for both Skilled & non Skilled workers.
   c) .....
   d) It will bring a new face of the Community.
   e) Noise pollution
4. What are some of the measures that the Proponent can put in place to mitigate against the potential negative impacts?
   a) Controlling Sewer line floods.
   b) & Ensuring Reafforestation.
   c) .....
   d) .....
   e) .....
5. Are you in any way opposed to the development of the **Proposed Green Affordable Housing Units by IHS?**

   Yes (state reason/s)..... No. ✓

Signature ..... **Date of Interview** 7/10/2024.

STAKEHOLDER CONSULTATION QUESTIONNAIRE

ESIA for the Proposed Green Affordable Housing Units on L.R. No. Dagoretti/Riruta/6004 (Nairobi Block 66/6004) in Dagoretti South, Nairobi County

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Respondent Details		
Personal Information	Name Margaret Wanjiru	
	Gender F	☐ Male ☑ Female
	Occupation	un employed
	Organization	NA
	Contact Address/E-mail	
	Cell Phone	0726 444 227
	National ID Number	30223643
Stakeholder Information	Stakeholder Group represented (e.g., Resident, Neighbour, Potential customer, Developer, etc.)	Resident
	How long have you lived/worked in this area?	

Environmental and Social Concerns

1. What is your opinion regarding the proposed IHS Green Affordable Housing project ? Bring it on to the Community.
2. What benefits do you think the proposed development will bring?
   a) Job opportunities
   b) improving Living Standards to the Community
   c) empowering the skilled and unskilled
   d) affordable housing to the Community
   e) New face to our Community
3. What do you feel are potentially the impacts of the Proposed Green Affordable Housing project on the following:
   a) It will bring the flow of money in
   b) It will improve security
   c)
   d)
   e)
4. What are some of the measures that the Proponent can put in place to mitigate against the potential negative impacts?
   a) Working hours
   b) Putting the professionals and skilled people the site
   c) Traffic management.
   d) Waste to be disposed to the right Place.
   e) Practing the Kenyan Machakos Cutt one tree plant two.
5. Are you in any way opposed to the development of the **Proposed Green Affordable Housing Units by IHS**?

   Yes (state reason/s)..... No. ✓

Signature Wanjiru **Date of Interview** 7/10/2025

STAKEHOLDER CONSULTATION QUESTIONNAIRE

ESIA for the Proposed Green Affordable Housing Units on L.R. No. Dagoretti/Riruta/6004 (Nairobi Block 66/6004) in Dagoretti South, Nairobi County

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Respondent Details			
Personal Information	Name FELIX JAMES KAMAU		
	Gender MALE	☑ Male	☐ Female
	Occupation SOCIAL WORKER		
	Organization		
	Contact Address/E-mail 0723559269		
	Cell Phone		
	National ID Number 21055536		
Stakeholder Information	Stakeholder Group represented (e.g., Resident, Neighbour, Potential customer, Developer, etc.)		
	How long have you lived/worked in this area?	OVER 20YRS	

Environmental and Social Concerns

1. What is your opinion regarding the proposed IHS Green Affordable Housing project ? THIS IS A GREAT IDEA TO DEVELOP OUR AREA
2. What benefits do you think the proposed development will bring?
   a) - DEVELOPMENTAL BENEFITS
   b) IMPROVING THE ENVIRONMENT
   c) AFFORDABLE HOUSING
   d) - IMPROVEMENT OF SECURITY THROUGH SECURITY LIGHTS
   e) .....
3. What do you feel are potentially the impacts of the Proposed Green Affordable Housing project on the following:
   a) - THE RESIDENTS WILL HAVE EMPLOYMENT
   b) - THE YOUTHS WILL HAVE BETTER AFFORDABLE HOUSING
   c) .....
   d) .....
   e) .....
4. What are some of the measures that the Proponent can put in place to mitigate against the potential negative impacts?
   a) - REDUCTION OF NOISE POLLUTION
   b) - REDUCTION OF AIR POLLUTION
   c) - BETTER SEWARAGE SYSTEM
   d) .....
   e) .....
5. Are you in any way opposed to the development of the **Proposed Green Affordable Housing Units by IHS**?

   Yes (state reason/s)..... No. ✓

Signature ..... **Date of Interview**..7/10/2025.....

STAKEHOLDER CONSULTATION QUESTIONNAIRE

ESIA for the Proposed Green Affordable Housing Units on L.R. No. Dagoretti/Riruta/6004 (Nairobi Block 66/6004) in Dagoretti South, Nairobi County

International Housing Solution (K) Ltd intends to construct green affordable housing units providing residential accommodation along Ndwaru Road, off Naivasha Road in Riruta-Satellite area. The Environmental Impact Assessment and Audit Regulations 2003 (revised 2019) require that an Environmental Impact Assessment (EIA) be done on projects, and as a matter of law, stakeholders' comments are a significant component of the process. Centric Africa Limited (NEMA Firm of Experts No. 7112) has been contracted to undertake an EIA for submission to NEMA. Your views are crucial in this EIA process as they will enable NEMA to make an informed decision in approving and/or recommending remedial measures for the proposed project. As a stakeholder, you are kindly invited to give your views on the proposed project.

Respondent Details		
Personal Information	Name	
	Gender	☐ Male ☐ Female
	Occupation	
	Organization	
	Contact Address/E-mail	
	Cell Phone	
	National ID Number	
Stakeholder Information	Stakeholder Group represented (e.g., Resident, Neighbour, Potential customer, Developer, etc.)	
	How long have you lived/worked in this area?	

Environmental and Social Concerns

1. What is your opinion regarding the proposed IHS Green Affordable Housing project ?.....

   .....

2. What benefits do you think the proposed development will bring?

   a) .....

   b) .....

   c) .....

   d) .....

   e) .....

3. What do you feel are potentially the impacts of the Proposed Green Affordable Housing project on the following:

   a) .....

   b) .....

   c) .....

   d) .....

   e) .....

4. What are some of the measures that the Proponent can put in place to mitigate against the potential negative impacts?

   a) .....

   b) .....

   c) .....

   d) .....

   e) .....

5. Are you in any way opposed to the development of the **Proposed Green Affordable Housing Units by IHS**?

   Yes (state reason/s)..... No.....

Signature ..... **Date of Interview**.....

Annex 10-C: Community Profile Checklist

COMMUNITY PROFILE CHECKLIST

PROPOSED MULTI-FAMILY RESIDENTIAL UNITS IN RIRUTA BY IHS

Section A: General Information

1. Interviewer(s):	Name	HOTTENTIA KABUKI
2. Respondent:	Name	ORPHA B. AROBA
	Position in the area	SNR A-CHIEF
3. Area Chief (s):	Name	ORPHA B. AROBA
	Telephone number	0724888959
4. Date of Interview:		

Section B: Physical Information

1. County:	NAIROBI	5. Sub-Location:	RIRUTA.
2. Sub-County:	DAGORETTI	6. Name of the nearest town	NAIROBI
3. Ward:	RIRUTA	7. Distance to the nearest town in kilometers	3 KILOMETERS
4. Location:	RIRUTA		

Section C: Demographics/Population

1. Approx. population: (*Get population sub-location level if possible*)		2. Gender (%):	M	40%
3. Approx. the number of households:	20,000 Households		F	60%
4. Approx. number of people per household:	6 People	5. Approx. no. Vulnerable households: 3 People		Female-headed HH Child headed HH Elderly PLWDs Others specify
6. Has the population increased or decreased over the last 2 years?	Increased	7. What has the reason been for the increase or decrease?		High birth rate
8. If the population has INCREASED, where have the people come from? Why have they come to this area?	High birth rate Earier pregnacies	9. What % of the residents are indigenous and what % of the village are settlers?		% Indigenous: 50% % Settlers: 50%
10. Primary religion	Christians	11. Primary religion:		Christians
12. Primary ethnic groups:	Kikuyus	13. Other Ethnic groups:		Luos, Kambas, Kisiis Luhyas

Section D: Land Ownership and Rights

1. What % of the people in the village own land?	80%	2. How have people inherited land in the village? (do women have equal rights to inherit?)	- Inheritance - women to men have equal shares
3. What % of the population rents land?	50%	Land ownership type	- Inheritance

Section E: Livelihoods

1. What are the primary livelihood activities of community members (e.g., business, formal employment etc.)?	Business Formal employment	2. Approximately what % of the population is in formal employment with a salary?	% Formal: 50% % Informal: 50%

Section F: Land Use

ASSISTANT CHIEF
RIRUTA SUB-LOCATION
RIRUTA LOCATION
Sign:
Date: 21/10/25

1. What are the main land uses in the project area? (e.g., residential, commercial, unused, etc).	Residential commercial	2. If applicable, what are the main permanent and non-permanent vegetation/crop types produced? (e.g. trees and vegetables) What are the main animals kept?	Trees Vegetables - Goats, pigs cows sheep
3. Add a description of any other key land use.	Lease		

Section G: Community Cohesion/Cultural Sites

1. Are there any Community-Based Organisations/Associations? Provide names of and Objectives:	Yes, Dagoretti Greeners based organization.	2. Conflicts? E.g., any land disputes we need to be aware of?	- Boundaries
3. How is the community organized? Who are the main representatives? Prepare a diagram of how the community is organized	- DCC - ACC - Chief - Assist-chief - Nyumba kumi - Village elders - Youths - elderly - Community		
4. Where are the graves in the village? If not in the village, what cemetery do they use?	Langata.	5. Are there sacred shrines/bushes in the village or close by? What are they used for? (Include the name of the society if applicable)	- Mugumo tree - Used Herbals - Fruits - Leisure

Section H: Public Facilities/Infrastructure in the Village

1. Educational facilities in the village (insert specific names and number)		Name of facility	Distance in KM from the project area	2. Health facilities in the village (insert number)		Name of facility	Distance in KM from the village
	Pre-school Kindergarten	High Peak - Havard	1/2 KM		Clinic Dispensary	Riruta dispensary	1/2
	Primary	St. Johns	1 KM		Hospital	Kiruta hospital	2 km
	Secondary	Kduruma Mixed School	1 1/2 KM		Pharmacy	Johns & brothers	1/2 KM
	Higher education (University, College (specify)	P.C Kinyanjui	2KM	3. Is there a community centre in the village? What is the name?		Empowerment centre	
				4. Religious building (insert type and number)		ACK St Matthews	

Annex 10-D: FGD Records

FGD-Business Community

Facilitator Instructions: The purpose of the meeting is to gather information on the business community's trading activities, project's impact on business operations, and project perceptions. Introduce yourselves, the project, and explain the purpose of the meeting. Gather a representative sample of a maximum of 10 business operators that include a combination of females, youth, the elderly, and the disabled, where appropriate. Keep the discussion focused, and **probe** for explanations for responses (what, where, when, why, how). Take pictures. **Ensure everyone participates in the discussion.**

Project introductory statement: The International Housing Solutions (IHS)-Kenya proposes developing 240 green multi-residential housing units for sale. The proposed housing units will be built on a 1-acre piece of land along Ndwaru Road, off Naivasha Road in Riruta-Satellite area, Dagoretti South Sub- County in Nairobi City County.

Section A: General Information		**Responses**			
1	**Date and time of meeting**	7th October 2025	**Time of meeting**	**Start time:**	12:56 P.M.
				End time:	13:16 P.M.
2	**Name of Facilitators**	HOTTENSIA KABUKI			
3	**Number of Participants**	5			

Section B: The Project		
1	**Do you feel that you understand the project?**	Yes.
2	**What do you think could be the positive impacts of the project on traders and the community in general, so that people benefit?**	→ Boost local businesses.
3	**What negative impacts could the project have on traders/livelihood groups and the community in general?**	→ None
4	**How do you think that the project could minimize or avoid negative impacts?**	→ N/A.
5	**Do you have any questions/comments regarding the project?**	→ The 'affordable' labeling is misleading.

Section C: Trading		
1	**What kinds of businesses do you operate?** **(the composition of the group-types of goods/wares/traders)**	→ Butcheries, food vendors, selling raw foods, selling Plastics & gas.
2	**Do you have a trading association? If so who is involved?** **What is the purpose of the association?** **Where is it based?**	→ No.

3	What are the modes of transportation for your goods?	→ Motorbikes (fastest mode)
4	What are your working hours/days?	→ Between 7:00am - 11:00p.m
5	Would you say that you make a good income from trading? Explain the response if good or poor.	→ The income is not good & has to be supplemented
6	What are the challenges of trading in this area? How do you overcome these challenges?	→ Low numbers of clientelle. → Customer taking goods on credit → Customers refusing to pay up their credit.
7	Do you think the construction of the housing units will positively or negatively impact the local economy?	→ positively
Section D: Impact on Business Operations		
1	How will the construction phase affect your business operations (e.g., traffic, noise, access)?	→ Traffic will affect their business. noise & dust. → Create an alternative access route.
2	Do you expect any disruptions in customer foot traffic or deliveries during construction?	→ No
Section E: Customer Base and Market Demand		
1	Do you think the new housing units will bring in more customers? Why or why not?	→ Yes. Will bring in more customers
2	What kind of changes do you expect in the profile of your customer base once the housing units are built?	→ More 'middle class' customer base.
3	How do you think the housing development will affect the demand for your products/services?	→ More demand for products & services
Section F: Competition and Business Growth		

1	Do you anticipate more competition with new businesses entering the area after the housing development is completed?	→ More competition with the increase/emergence of new businesses from the increase in housing/ accommodation in the area.
2	Do you see any opportunities for business expansion or diversification as a result of this new housing development?	→ Likelihood of business expansion with the anticipated boosts of local businesses.
Section G: Community Impact		
1	How do you think the new housing units will impact the community as a whole?	→ CSR projects i.e construction of business premises (i.e grocery shop
2	Do you think the development will contribute to a better business environment or increase property values?	→ Yes. Better business environment & increase in property values.
3	Are there any community benefits (e.g., improved infrastructure, better public spaces) that you hope to see from this development?	→ Improved infrastructure i.e security lighting
Section H: Please insert any observations/comments regarding the meeting here		
1	Comments/observations (what went well/not so well, was everyone participating, what are your observations of the community and the standards of living, vulnerabilities)?	→ None.
Section K: Insert photos here		
Please take some pictures of the meeting with a description below each photo:		

FGD Female

Facilitator Instructions: The purpose of the meeting is to gather information on women's role in the household, livelihoods/jobs, health issues, challenge perceptions on quality of life, education options for children, health care, and project perceptions. Introduce yourselves, and the project and explain th purpose of the meeting. Gather a representative sample of a maximum of 10 women that include a combination of females, youth, elderly, and disable where appropriate. Keep the discussion focused and please **probe** for explanations for responses (what, where, when, why, how). Take lots of picture **Ensure everyone participates in the discussion.**

Project introductory statement: The International Housing Solutions (IHS)-Kenya proposes developing 240 green multi-residential housing units for sale The proposed housing units will be built on a 1-acre piece of land within the KEZA Riruta Housing Estate, in Dagoretti South Sub-County in Nairobi Cit County.

Section A: General Information		Responses			
1	Date	7th October 2025	Time of meeting	Start time:	12:47pm
				End time:	1:16pm
2	Name of Facilitator	Jane Wanjiru Kimani			
3	Number of Participants	Five			
4	Number of female-headed households in the group? What is the main reason for this?	Four out of five households are female headed households. The main reason for this is death and men who don't want to take responsibility.			

Section B: The Project		
1	What is your overall view/perception of the proposed project? (positive, negative, please explain why)	The women generally endorsed the project as they saw it as a golden opportunity that would help them provide for their homes through the employment opportunities the project will create.
2	What concerns or negative impacts do you foresee for the women? - How do you think that the project could minimize or avoid negative impacts on women?	- Noise pollution - Dust - Use of water bowsers
3	What specific benefits do you anticipate? - How can the project enhance its positive impacts on the community and environment?	- Employment opportunities - Improved security. - Offering locals opportunities for both skilled and unskilled labours.
4	What are your expectations from this project?	- To benefit from employment opportunities.

Section C: Role of Women		
1	What roles do women typically undertake in the community? - Please consider roles in home and livelihoods.	- Women are viewed as role models, care givers and nurtesers of their homes.
2	Do men and women have equal opportunities in the community, workplace, and education? (Provide specific examples of inequality/equality and contributing factors)	- They have unequal opportunities. - There are unequal opportunities as women are viewed as the weaker vessel and unable to perform tasks that are viewed as tasks for men.

3	Do women feel safe in the community? (explain any specific safety concerns) - Are there any particular crimes affecting women that are common in the community? - Have you experienced any conflicts related to land, water, or any other resource in the community? Please explain your responses	They dont feel safe due to concerns such as domestic violence and rape, cases. There are sewer problems in the area. Most of them are blocked.
4	Do you think these new housing units will influence your sense of security in the neighborhood?	Yes.
5	What challenges do women and girls face in the community?	- Rape. - Neglect from their patness. - Domestic violence.
6	Are there female-headed households in the community? - What is the main reason for this? - Are there any specific challenges that female-headed households face?	Yes Patness who have died or dont want to take responsibility. - They are unable to provide for their families.
Section D: Institutions / Community Development /Access to services and infrastructure		
1	Do you have any women's groups? What are they called? What is the purpose of these groups??	Yes. Most groups are for table banking and merry-go-round.
2	Are women involved in decision-making both at the household and community level? If YES, how are they involved? - Do they feel that their voices are heard?	Women are not involved. No.
3	How do you receive information about local issues and developments in the community?	Through the chief's office.
4	Are any other governmental, NGOs/CBOs operating in the community? - If yes, which ones and what do they do? How successful have their projects been?	Yes (C.B.O's) YEEP - focuses on promoting sports. Ka-sobei - helping young people fight drugs.
5	Do you feel that the area has sufficient infrastructure and services (e.g., schools, healthcare, transportation, markets, water & sanitation, power) to support the new housing units?	No There's no dispensary / hospital in the area.

6	What are your top three development needs in the community?	1. Dispensary 2. Market. 3. Upgrading of the road.
7	What improvements, if any, would you like to see in the area's infrastructure as part of the development project?	- They would like to be built for a market or dispensary.
Section E: Economy/Income Generation		
1	What are the common employment opportunities available for women in this community?	- Housekeeping jobs. - Cleaning jobs. - Cooking jobs.
2	From which economic activity do women get the majority of income? - What is the second most important source?	- Mostly business (Most of them own make-shift kiosks. - Casual labour.
3	What economic changes do you expect from this project? (probes: employment opportunities, local business impacts, land value changes etc)	- Most of them are looking to benefit from employment opportunities.
4	Do you foresee any negative economic impacts? (E.g., displacement, loss of agricultural land, cost of living changes)	- The cost of living will go up as well as rent prices in the area.
Section G: Gender and GBV (sexual, physical, verbal, psychological (emotional), and it can take many forms, from verbal violence and hate speech, to rape or murder) and Conflict Resolution		
1.	Do you experience gender-based violence (GBV) in the community?? - If YES, what are the most common types of GBV in the community?	Yes. - Domestic violence. - Rape.
2.	How are GBV issues handled in the community? To whom do you report? Are you satisfied with how GBV matters are handled in the community?	- Through the chief's office. - police stations - Hospitals. Yes.
3.	Do you have support centers for GBV cases (Government/ Non-government). Name them	Yes - Dreams - Shofco.
4.	What else can be done to address GBV in the locality?	- Create a centre for Gender based violence.
5.	What are the existing grievance redress systems/mechanisms in the community?	- There are currently no existing grievance redress mechanisms in the community.

Section H: Education, Literacy, and Training		
1	How would you describe accessibility and quality of education for girls/women? - Average distance in km and the levels of schools accessed	Education is accessible and it's good quality. 3Km. Both Primary & secondary.
2	Can girls/women in the community generally read and write? YES/NO - What barriers to education exist in your community	Yes. 70% of them can read and write. - Most of them face financial barriers.

Section H: Health		
1	How and where do you access healthcare? - Do the services available meet your needs?	Through the healthcare centre at Rinta. Yes, however the facility has no medicines.
2	What are the top 3 health problems that girls/women face in the community? (Please explain the reason for each of the health issues) - Are there any particular times of the year when these issues are more challenging? If so, please explain	- HIV/AIDS. - Sexually transmitted diseases. - Vaginal infections. - When schools are closed and children are on holiday.
3	Are there any environmental issues that affect health in the community (e.g., water quality, sanitary conditions, etc) Please explain	Poor water quality affects the community.
4	How do you think the new housing units might impact your family's health or quality of life?	People will have better quality of life due to clean environment.

Section I: Access to Water						
1	Where do you get your water for domestic, irrigation, and livestock uses? Do you pay for water? Yes. If yes, what is the rate, and do you consider this affordable? 5 shillings / 10 shillings.		Description of water source	Walking distance from dwelling (km)	Collection method (if applicable)	Description of quality/colour/ taste/smell
		Domestic use: (drinking, cooking, washing clothes and dishes, bathing	Borehole Piped Water	1 Km.	Pipped	- The water is treated.
2	Are there times of the year when water runs out, runs low, or the quality changes? (Please explain the water source and reason for the change in water levels and how it affects women)	Yes. When the temperatures are high, there is less water.				
3	What are the existing water resource management practices in the community?	Most people harvest rain water.				

Section J: Sanitation and Hygiene & Waste Management

1	What type of toilet facilities do households have? (E.g., flush toilets, ventilated pit latrine, un-ventilated pit latrine, hole in the ground, no latrine/use the bush etc). - Are these facilities shared or does each household own them? - Are the toilets connected to a sewer system?	- Pit latrines. - Use of bush. Most facilities are shared. No
2	How/where do people dispose of household waste? (E.g>, Burn, open dumping, put in the river, other methods- specify)	Open dumping.
Section K: Vulnerable Groups		
1	Generally, who is the most vulnerable in the community? (Widows, the youth, the poor, the sick, the disabled, etc). What makes them vulnerable? (list reasons for each category) How does the rest of the community treat the vulnerable groups?	- Widows - Children - Disabled - Most children are orphaned. - Widowed women have no one to protect them. - Disabled people are unable to even take care of themselves. The community takes care of all vulnerable members.
2	How can the project ensure the safety and well-being of community members, especially vulnerable groups?	By empowering them financially through creation of job opportunities.
Section N: Participation and Appropriate Consultation Approaches		
1	How was your experience in the consultation/involvement in the planning process for this housing project?	The involvement was good.
2	Are there specific pieces of information you would like to know about, such as construction schedules, anticipated noise levels, or measures being taken to protect health and safety?	They wanted to know about the construction schedules.
3	What would be your preferred method of receiving updates about the project (e.g. flyers, meetings)?	Through the chief's office.

Riruta

FGD Youth /Association

Facilitator Instructions: The purpose of the meeting is to gather information on the socio-economic situation of the youth in terms of participation in decision-making, employment, recreation, and aspirations. There should be no more than 10 participants. Keep the discussion focused, and please **probe** for explanations for responses (what, where, when, why, how).

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Section A: General Information		Responses			
1	Date of meeting 7th October 2025		Time of the meeting	Start time:	
				End time:	
2	Name of Facilitator (inc note taker)	Daniel Chumo			
3	Number of Participants 6 Participants	Males:	5		
		Females:	1		

Section B: The Project		
1	Do you feel that you have a clear understanding of what the project entails? If not, ask what they need clarification on and provide the information	Yes,
2	How do you think the construction of new housing units will affect the community, particularly for young people?	It will have a positive impact by empowing economically the community members (jobs) and improve the visual appearance of the area
3	What do you think could be the positive impacts/benefits of the project on youth? - How can the project enhance its positive impacts on the community and environment?	- Provision of employment / job opportunities - Improve standards of living within the area - Informing ~~the~~ providing capacity building to the community representatives - Involving the members of community in project implementa.
4	What concerns or negative impacts do you foresee from the project? (e.g. pollution, loss of green spaces, strain on local infrastructure, etc)	- Air pollution from construction works - Noise emission from construction - labor influx
5	How do you think that the project could minimize or avoid negative impacts? - Construction restricted to daytime hours - Sprinkle water	- Contractor may not consider locals for employment opportunities (labor influx). * Ensure that the local liason is picked from the immediate community and ~~consider~~ the locals ~~are~~ considered for employment
6	What are your expectations from this project?	Expect to uplift the infrastructure / ~~land~~ value of the ~~area~~ (improved standards of living)

Section C: Overview		
1	What are the main issues faced by youth? Why?	- Unemployment : lack of opportunities - Mental health : societal pressure incl. unemployment
2	What are the key priorities among the youth?	- Job seeking - Provision of water storage tanks (for business) laundry etc

3	What programs are in place to help the youth? How successful have they been?	Kazi mtaani (Climate Works) - Ongoing and fairly good. However, very limited numbers benefit
4	What role do you see youth playing in environmental conservation efforts?	→ Tree planting, Participate in Government climate works programs
Section D: Housing Needs and Preferences		
1	What do you think about the current housing conditions in this area? Do they meet your needs and those of your family?	The standards are low. ~~Can improve through~~ The
2	With the new housing units, what would you like to see in terms of design or facilities (e.g, recreational spaces, safety features)	- Improve access roads adjacent to the proposed site. - Boda Boda Shed provision.
Section E: Community Development and Involvement		
1.	How do you receive information about local issues and developments in the community?	Social media forums: - Twitter - Whatsapp
2.	To what extent do the youth play a role in decision-making in community development? Do you feel that youth voices are heard?	- Minimal. Not usually involved - Feel left out
3.	What kind of social support would you like to see included as part of the development project?	- Provide and avail the job opportunities to the youth.
4.	How do you see your future in this area? Do you think the new housing units will play a role in shaping that future?	- Yes, will provide additional opportunities i.e jobs, injection of money to the local economy.
Section F: Access to Services and Infrastructure		
1.	Do you feel there are enough services and facilities (e.g., schools, sports facilities, youth centers, transportation) for young people in this area?	No, available facilities are limited and need improvement. Main utilized is Ndaragwa sports centre is available but old and need upgrade.
2.	How do you think the new housing units might impact access to these services and facilities?	May be positive if they improve the facilities as BSR However, impact will be -ve if not improved as will lead to increased pressure to the facilities
3.	What kinds of infrastructure improvements would make this area more youth-friendly as the housing units are built?	- Improving the infrastructure facilities in the area

4.	What do the youth do in their spare time? - Where do they go?	Play football
Section G: Education		
1.	What percentage of young people in our community do you estimate have completed secondary education, Vocational/college school? - What challenges are faced by youths in the attainment of education?	Secondary school — 90-100% TVET — 20-30% Challenges mainly due to drug/alcohol abuse
2.	How involved are community members in supporting education initiatives of youth?	- Through ~~Gem~~ School Committees for Government owned-schools.
3.	What opportunities exist for youth to develop vocational skills or receive training in our community?	Opportunities are limited. - Available ones are within construction facilities / infrastructure within the area
Section H: Safety and Security		
1.	Do you feel safe in your current neighborhood? Are there any particular crimes that are common in the community?	Yes theft occurance, mainly night hours
2.	What security measures should be put in place in the new housing development to make the area more secure? (e.g., well-lit areas, security personnel, controlled access)?	Provision of street lighting & CCTVs with the surrounding roads
3.	How do you think the new housing units will impact the overall safety of the community?	Will impact positively by bringing new job opportunities
Section I: Employment and Economic Considerations		
1.	How do you perceive the current job opportunities for youth in our area?	Opportunities are scarce & unavailable
2.	What are the main sources of income, goods, and services in your community?	① From ~~Markets business~~ (Kawangware and Dagoretti Market) ② From casual jobs (Like Kazi Mtaani, Kibera, Car wash areas
3.	Approximately what percentage of young adults in our community do you think are employed in full-time salaried positions? What are the contributing factors for this?	About 15-20%. Many youth resort to SME's at ~~age~~ young/school going ages
4.	What percentage of young people in our community do you believe are self-employed?	About 50%

5.	What are the primary occupations or jobs that young people in our community are engaged in?	Trade - Kazi mtaani jobs & Construction (manual) works
6.	What kind of job opportunities would you like to see from the new housing development?	Technical (electrical, masons, etc) jobs and the manual jobs Professional ~~eng~~ jobs (civil/structural Eng')
7.	How do you think the new housing might affect the economic situation of your family or community (e.g. cost of living, job prospects)	- May impact positively through job opportunities and ↑ money circulation in the local economy (increased)
Section J: Health		
1.	What are the main health concerns for youth in our community?	- Pneumonia - Common cold
2.	Are there any health concerns you have regarding the construction of new housing units (e.g., air quality, noise etc)?	Yes: - Dust emission may lead to allergies due to dust
Section K: Drug and Alcohol Abuse		
1	How prevalent do you perceive drug/alcohol abuse to be among youth in your community, and what economic consequences do you think it has?	Drug abuse is high and has lead to ~~reduced~~ lost of job opportunities → low standard of living → low money circulation → local businesses not doing well (straining)
2	Have you noticed any patterns or trends regarding how drug abuse affects youth employment and economic opportunities?	The drug abuse has been on an increase while economic opportunities on a decline
Section L: Participation and Appropriate Consultation Approaches		
1.	How was your experience in the consultation/involvement in the planning process for this housing project?	Good & satisfactorily
2.	Are there specific pieces of information you would like to know about, such as construction schedules, anticipated noise levels, or measures being taken to protect health and safety?	None.
3.	Do you feel that the needs and voices of the youth are being considered in the planning of this new housing project?	~~No~~ Yes,
4.	What more can be done to ensure your voice is heard? What kind of feedback mechanisms would help you feel that your input is being taken	+ Include a youth as part of contact persons/ liason to the project separate from the local administration. + Inclusion of a Youth liason between project & the community

	seriously?	
5.	What would be your preferred method of receiving updates about the project (e.g. flyers, meetings)?	- SMS / whatsapp

Facilitator Instructions: The purpose of the meeting is to gather information on women's role in the household, livelihoods/jobs, health issues, challenges, perceptions on quality of life, education options for children, health care, and project perceptions. Introduce yourselves, and the project and explain the purpose of the meeting. Gather a representative sample of a maximum of 10 women that include a combination of females, youth, elderly, and disabled where appropriate. Keep the discussion focused and please **probe** for explanations for responses (what, where, when, why, how). Take lots of pictures. **Ensure everyone participates in the discussion.**

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Section A: General Information		**Responses**			
1	**Date `**	7th October 2025	**Time of meeting**	**Start time:**	**12:47pm**
				End time:	**1:16pm**
2	**Name of Facilitator**	Jane Wanjiru Kimani			
3	**Number of Participants**	5			
4	**Number of female-headed households in the group?** **What is the main reason for this?**	4/5 Most men have shunned their responsibility as the head of the household and provider of their homes, forcing women to step up and lead.			
Section B: The Project					
1	**What is your overall view/perception of the proposed project? (positive, negative, please explain why)**	The women generally endorsed the project as they saw it as a golden opportunity that would help them provide for their homes through the employment opportunities that the project would create. They also stated that security in the area would generally improve as a result of the project.			
2	**What concerns or negative impacts do you foresee for the women?** **- How do you think that the project could minimize or avoid negative impacts on women?**	The women cited noise pollution as one of the negative effects of the project and suggested that the contractor use noise mufflers to ensure that the noise levels are not high. They also advocated for the use of water bousers to mitigate dust during construction.			
3	**What specific benefits do you anticipate?** **- How can the project enhance its positive impacts on the community and environment?**	The women emphasized the need to consider the locals first during recruitment of the needed taskforce. They mentioned that they were well able to perform both skilled and unskilled labour and would appreciate if they were given first priority as most of them were the providers of their homes.			
4	**What are your expectations from this project?**	Most of them were really looking forward to securing job placements during the implementation phase of the project.			
Section C: Role of Women					
1	**What roles do women typically undertake in the community?** **- Please consider roles in home and livelihoods.**	Women typically are the caregivers and nurtures of their families as they are the mothers of their homes. Society also views them as role models, firstly to their families and secondly to the community they live in.			
2	**Do men and women have equal opportunities in the community, workplace, and education?** **(Provide specific examples of inequality/equality and contributing factors)**	Men and women do not have equal opportunities in this community especially when it comes to employment. Men are considered first as women have to leave their places of work to tend for emergencies arising in their homes such as sickness of their children.			

3	**Do women feel safe in the community? (explain any specific safety concerns)** **- Are there any particular crimes affecting women that are common in the community?** **- Have you experienced any conflicts related to land, water, or any other resource in the community? Please explain your responses**	Women in this community have safety concerns such as domestic violence and rape cases which are rampant in the area due to insecurity challenges. The community currently has major challenges with access to clean water as well as burst and blocked sewer systems. During rainy seasons, they mentioned that most landlords direct their sewers to the roads.
4	**Do you think these new housing units will influence your sense of security in the neighborhood?**	The housing units will improve security in the area as the units are fitted with CCTV cameras.
5	**What challenges do women and girls face in the community?**	Women and girls in this community face challenges such as neglect, early death and rape.
6	**Are there female-headed households in the community?** **- What is the main reason for this?** **- Are there any specific challenges that female-headed households face?**	Four out of five households in this discussion were female headed. The main reason for this occurrence was men generally not wanting to take responsibility of their homes, while some women were widowed by gang violence and insecurity in the area.
Section D: Institutions / Community Development /Access to services and infrastructure		
1	**Do you have any women's groups? What are they called? What is the purpose of these groups??**	Women groups in this area are mainly for merry- go – round purposes and table banking purposes.
2	**Are women involved in decision-making both at the household and community level?** **If YES, how are they involved?** **- Do they feel that their voices are heard?**	Women are not involved in decision making at the community level as that is seen as a role for men. They generally do not feel that they are heard as women.
3	**How do you receive information about local issues and developments in the community?**	Information on local developments were mostly passed on through the chief's office.
4	**Are any other governmental, NGOs/CBOs operating in the community?** **- If yes, which ones and what do they do? How successful have their projects been?**	CBOs in the area include YEEP and Ka- Sober. Ka-sober helps community members fight against drugs while YEEP encourages and grows sport related talent and interest.
5	**Do you feel that the area has sufficient infrastructure and services (e.g., schools, healthcare, transportation, markets, water & sanitation, power) to support the new housing units?**	The area lacked a hospital or dispensary facility and they had to use the one in Kawangware.

6	**What are your top three development needs in the community?**	The top three developmental needs in this community were the need for a dispensary, market and upgrading of their feeder roads.
7	**What improvements, if any, would you like to see in the area's infrastructure as part of the development project?**	They would love to have a market constructed for them.
Section E: Economy/Income Generation		
1	**What are the common employment opportunities available for women in this community?**	The common employment opportunities available for women were mostly fruit and vegetable vending businesses.
2	**From which economic activity do women get the majority of income?** **- What is the second most important source?**	Majority of their income came from fruit and vegetable vending businesses and casual labour.
3	**What economic changes do you expect from this project? (**probes: employment opportunities, local business impacts, land value changes etc**)**	The women were really looking forward to benefiting from casual jobs either as cleaners or food vendors.
4	**Do you foresee any negative economic impacts? (E.g., displacement, loss of agricultural land, cost of living changes)**	They cited that rent rates in the area will generally increase as well as the cost of living.
Section G: Gender and GBV (sexual, physical, verbal, psychological (emotional), and it can take many forms, from verbal violence and hate speech, to rape or murder) and Conflict Resolution		
1.	**Do you experience gender-based violence (GBV) in the community??** **- If YES, what are the most common types of GBV in the community?**	Yes The most common types of Gbv in the area are domestic violence and rape.
2.	**How are GBV issues handled in the community?** **To whom do you report?** **Are you satisfied with how GBV matters are handled in the community?**	GBV issues are handled through the chief's office, the police station and local hospitals. Such cases are mostly reported to police stations as well as the chief's office. The women were satisfied with how these issues were handled especially through the chief's office.
3.	**Do you have support centers for GBV cases (Government/ Non-government). Name them**	GBV support centres in this community include Shofco and Dreams.
4.	**What else can be done to address GBV in the locality?**	They would love to be built for a GBV centre in the community.
5.	**What are the existing grievance redress systems/mechanisms in the community?**	Most grievances are addressed through the chief's office.
Section H: Education, Literacy, and Training		

1	**How would you describe accessibility and quality of education for girls/women?** **- Average distance in km and the levels of schools accessed**	Education for girls in the area is accessible. Schools are located approximately 3km from the community.
2	**Can girls/women in the community generally read and write? YES/NO** **- What barriers to education exist in your community**	Women/Girls in this community can generally read. Most barriers to education in the area are influenced by financial factors. Most homes are not able to raise the subsidised fee for their children to go to school.
Section H: Health		
1	**How and where do you access healthcare?** **- Do the services available meet your needs?**	Healthcare is accessed through Riruta – Health facility. The services offered generally meet the needs of the community.
2	**What are the top 3 health problems that girls/women face in the community? (**Please explain the reason for each of the health issues**)** **- Are there any particular times of the year when these issues are more challenging? If so, please explain**	Top three health problems in the community are HIV/AIDS, presence of sexually transmitted diseases and vaginal infections. These issues are most rampant when schools are closed.
3	**Are there any environmental issues that affect health in the community (**e.g., water quality, sanitary conditions, etc**) Please explain**	The water quality was cited as one of the issues that affect health in the community.
4	**How do you think the new housing units might impact your family's health or quality of life?**	The new housing units will improve the family's health as a result of clean and accessible water.

Section I: Access to Water						
1	**Where do you get your water for domestic, irrigation, and livestock uses?** **Do you pay for water?** **If yes, what is the rate, and do you consider this affordable?**		**Description of water source**	**Walking distance from dwelling (km)**	**Collection method (if applicable)**	**Description of quality/colour/ taste/smell**
		Domestic use: (drinking, cooking, washing clothes and dishes, bathing	Boreholes Piped water	1km	Most water is pipped	The water is treated
2	**Are there times of the year when water runs out, runs low, or the quality changes? (**Please explain the water source and reason for the change in water levels and how it affects women**)**	Water quality is affected during rainy season as the available water is easily contaminated by sewer water.				
3	**What are the existing water resource management practices in the community?**	Most homes harvest rain water using drums and buckets.				
Section J: Sanitation and Hygiene & Waste Management						
1	**What type of toilet facilities do households have? (**E.g., flush toilets, ventilated pit latrine, un-ventilated pit latrine, hole in the ground, no latrine/use the bush etc**).**	Households generally have pit latrines, while others practice open defecation.				

	- Are these facilities shared or does each household own them? **- Are the toilets connected to a sewer system?**	Most of these facilities are shared. Most of these toilets are not connected to any sewer system.
2	**How/where do people dispose of household waste? (**E.g>, Burn, open dumping, put in the river, other methods- specify**)**	Most household waste is openly dumped in the community.
Section K: Vulnerable Groups		
1	**Generally, who is the most vulnerable in the community? (Widows, the youth, the poor, the sick, the disabled, etc).**	The most vulnerable community members are widows, children and people living with disability.
	What makes them vulnerable? (list reasons for each category)	Children are vulnerable as most of them are orphaned as a result of HIV/AIDS and other causes, widows are vulnerable as they don't have men in their households who are known to be the protectors of the home, while people living with disability are generally unable to fend for themselves.
	How does the rest of the community treat the vulnerable groups?	Most vulnerable people in the community are treated well as community well wishers take care of them.
2	**How can the project ensure the safety and well-being of community members, especially vulnerable groups?**	The project can ensure the safety and wellbeing of community members by providing them with job opportunities so that they can be able to take care of themselves, their dependants as well as help other vulnerable members of the community.
Section N: Participation and Appropriate Consultation Approaches		
1	**How was your experience in the consultation/involvement in the planning process for this housing project?**	The participants stated that they had a good experience.
2	**Are there specific pieces of information you would like to know about, such as construction schedules, anticipated noise levels, or measures being taken to protect health and safety?**	The women were interested in knowing the construction schedules.
3	**What would be your preferred method of receiving updates about the project (e.g. flyers, meetings)?**	Their preferred method of receiving updates about the project was through the chief's office.

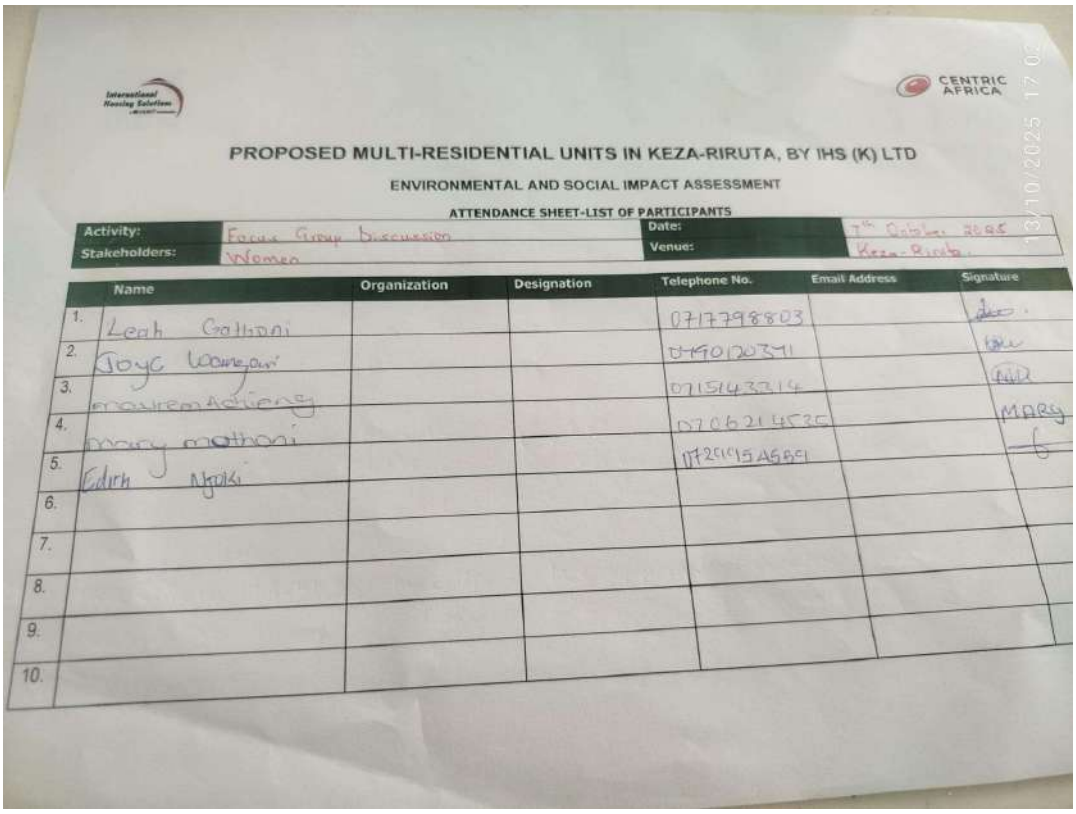
FOCUS GROUP PHOTOS





Women participating in the Focus Group Discussion

FOCUS GROUP ATTENDANCE LIST



PROPOSED MULTI-RESIDENTIAL UNITS IN KEZA-RIRUTA, BY IHS (K) LTD

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT

ATTENDANCE SHEET-LIST OF PARTICIPANTS

Activity: Focus Group Discussion
Stakeholders: Women
Date: 7th October 2025
Venue: Keza-Riruta

	Name	Organization	Designation	Telephone No.	Email Address	Signature
1.	Leah Gathoni			0717798803		
2.	Joyce Waweru			0790120341		
3.	maureen Adhiambo			0715143214		
4.	mary mathai			0706214535		MARY
5.	Edith Njoki			17201915A589		
6.						
7.						
8.						
9.						
10.						

Annex 10-E: Invitation Letters

CENTRIC AFRICA LTD

Centric Africa Limited
Engineering and Environmental Management Consultants, Westpark Towers,
5th floor, Office No 508.
Postal address: 102081-00101, Tel: +254 (0) 791 602686
E: enquiries@centricafrica.com
W: www.centricafrica.com

October 9, 2025

The Management
Jacaranda Homes
Riruta, Nairobi
Kenya

Dear Sir/Madam,

RE: Environmental Impact Assessment for the Proposed Housing Units in KEZA-Riruta-Nairobi City County by IHS (K) Ltd

International Housing Solutions-Kenya (IHS) proposes to develop 240 multi-family residential units in Riruta location, Dagoretti South, Nairobi County. The proposed development aims at addressing the housing shortage in Nairobi Metropolitan, creating employment opportunities, among other benefits.

Centric Africa Ltd was appointed as the National Environment Management Authority (NEMA) licensed Firm of Experts to undertake an Environmental and Social Impact Assessment (ESIA) Study of the proposed project.

As part of the stakeholder engagement process, we identified the **neighbors** as key stakeholders and therefore seek your views, comments, and suggestions on the proposed project. Subsequently, we wish to invite you to attend either of our consultation meetings scheduled for **October 14th** and **October 21st, 2025**, at **10:00 a.m.**, to be held at the project site **within the KEZA Estate.**

Should you prefer a one-on-one consultation, please let us know your preferred date and time within the consultation period.

The valuable input will ensure that the proposed development is constructed and operated in an environmentally and socially sustainable manner and that your views/concerns are evaluated and taken into consideration.

We would be grateful if you could confirm your availability with our Social Safeguards Specialist- Ms. Hottensia Kabuki at hottensia@centricafrica.com or +254 720 826705 at your earliest convenience. Please advise us if you have any queries.

Yours faithfully,

CENTRIC AFRICA LIMITED
P. O. Box 102081 - 00101
NAIROBI, KENYA

Daniel Chumo
Environmental and Social Expert

9/10/25 Evelorn

CENTRIC AFRICA LTD

Centric Africa Limited
Engineering and Environmental Management Consultants, Westpark Towers, 5th floor, Office No 508.
Postal address: 102081-00101, Tel: +254 (0) 791 602686
E: enquiries@centricafrica.com
W: www.centricafrica.com

October 9, 2025

The Management
Riruta Gardens
Riruta, Nairobi
Kenya

Dear Sir/Madam,

RE: Environmental Impact Assessment for the Proposed Housing Units in KEZA-Riruta-Nairobi City County by IHS (K) Ltd

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P. O. Box 102081 - 00101
NAIROBI, KENYA

Daniel Chumo
Environmental and Social Expert

MARK SAIGILU
9/10/2025

CENTRIC AFRICA LTD

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Postal address: 102081-00101, Tel: +254 (0) 791 602686
E: enquiries@centricafrica.com
W: www.centricafrica.com

October 9, 2025

The Principal
Havard School-Riruta
P.O.Box 5670-00100
Riruta, Nairobi
Kenya

Dear Sir/Madam,

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Yours faithfully,

CENTRIC AFRICA LIMITED
P. O. Box 102081 - 00101
NAIROBI, KENYA

Daniel Chumo
Environmental and Social Expert

HAVARD SCHOOL
ADMIN
09 OCT 2025
P.O. Box 5670 - 00100, NAIROBI

CENTRIC AFRICA LTD

Centric Africa Limited
Engineering and Environmental Management Consultants, Westpark Towers,
5th floor, Office No 508.
Postal address: 102081-00101, Tel: +254 (0) 791 602686
E: enquiries@centricafrica.com
W: www.centricafrica.com

October 9, 2025

The Management

Havard Apartments

Ndwaru Road- Off Naivasha Road

Riruta, Nairobi

Kenya

Dear Sir/Madam,

RE: Environmental Impact Assessment for the Proposed Housing Units in KEZA-Riruta-Nairobi City County by IHS (K) Ltd

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Yours faithfully,

CENTRIC AFRICA LIMITED
P. O. Box 102081 - 00101
NAIROBI, KENYA

HAVARD SCHOOL
ADMIN
09 OCT 2025
Tel: 0722 535441
0745 644712
P.O Box 5679 - 00100, NAIROBI

Daniel Chumo
Environmental and Social Expert

CENTRIC AFRICA LTD

Centric Africa Limited
Engineering and Environmental Management Consultants, Westpark Towers,
5th floor, Office No 508
Postal address: 102081-00101, Tel: +254 (0) 791 602686
E: enquiries@centricafrica.com
W: www.centricafrica.com

October 9, 2025

The Principal

Ndwaru Road Royal Academy

P.O. BOX 72823-00200,

Riruta, Nairobi

Dear Sir/Madam,

RE: Environmental Impact Assessment for the Proposed Housing Units in KEZA-Riruta-Nairobi City County by IHS (K) Ltd

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Yours faithfully,

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P. O. Box 102081 - 00101
NAIROBI, KENYA

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Engineering and Environmental Management Consultants, Westpark Towers,
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Postal address: 102081-00101, Tel: +254 (0) 791 602686
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October 9, 2025

The Management

GrayWoods Residency

Riruta, Nairobi

Kenya

Dear Sir/Madam,

RE: Environmental Impact Assessment for the Proposed Housing Units in KEZA-Riruta-Nairobi City County by IHS (K) Ltd

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Yours faithfully,

CENTRIC AFRICA LIMITED
P.O. Box 102081 - 00101
NAIROBI, KENYA

Daniel Chumo

Environmental and Social Expert

9th oct

Annex 11: MEP Survey Report



IHS Keza Project
Site Survey MEP Report

28th March 2025

1. Introduction

The following is a detailed report of the MEP services and facilities that were located around the Keza Site. The site survey and inspection were done on 21st March 2025 at 1100 hrs. Photos were taken of the identifiable aspects of this survey and appended to this report

2. Mechanical Services

The services explored to aid in the mechanical detailing of the IHS Keza include Water, sewer and storm water. All indicative, inactive and active services have also been included in this report. Calculations used to provide approximate loads and demands are based on the data provided in the design and development brief provided to us. In it the proposed allocation of units is in the mix of **112No.** 1 Bedroom units and **98No.** 2 Bedroom units.
Associated codes of design for the purposes of estimation of demand of water and sewer flow design have also been factored in the survey report.

- ### Water Supply

  There is a council water main line across Ndwaru road. The services are not mapped hence the pipe sizes cannot be confirmed now and the indications below are approximate locations as advised by Landlord. The council water is mostly available for **2 days a week**, **hence an alternative source of water is necessary for self-sufficiency.**



Fig 1: Site survey map (Water Mains)

Using **120 lts/person/day** as per **BS 8542:2011** and an industry occupancy rate of **1.5 persons per room** the following is the water requirement for the development.

Table 1: Water Demand Calculation

Description	No. of Units	Occupancy	Capacity (Lts/Day)	2 Days Storage
1 Bedrooms	112	168	20,160.00	**40,320.00**
2 Bedrooms	98	294	35,280.00	**70,560.00**
Total	**210**	**462**	**55,440.00**	**110,880.00**

From the above calculation, we project the water demand for the proposed mix of housing and occupancy will be **55.44m³** for a **single day usage** to be accommodated in roof tanks and we have allowed for a **two-day** underground tank with a capacity of **110.88m³.**
For backup and self-sufficiency in water supply for the development it would be advisable to conduct a hydrological survey of the area to determine the ground water yields for proper borehole detailing.

Sewer

We located a sewer manhole **SMH1, SMH2, SMH3 & SMH4** about **30, 20, 70** and **150 meters** from the from the front side of the site along Ndwaru Road. Council sewer manholes **SMH2**, **SMH3** and **SMH4** are currently connected but not active. **SMH4** is meant to continue through the access road along the barbershop shown in red, but it is not currently connected to the other side of Ndwaru road. SMH1 is the proposed manhole by the Landlord to connect to the line via **SMH2**. The landlord is also actively planning on extending the line, shown in green from **SMH4** to **SMH5** which is the first and closest active council manhole.

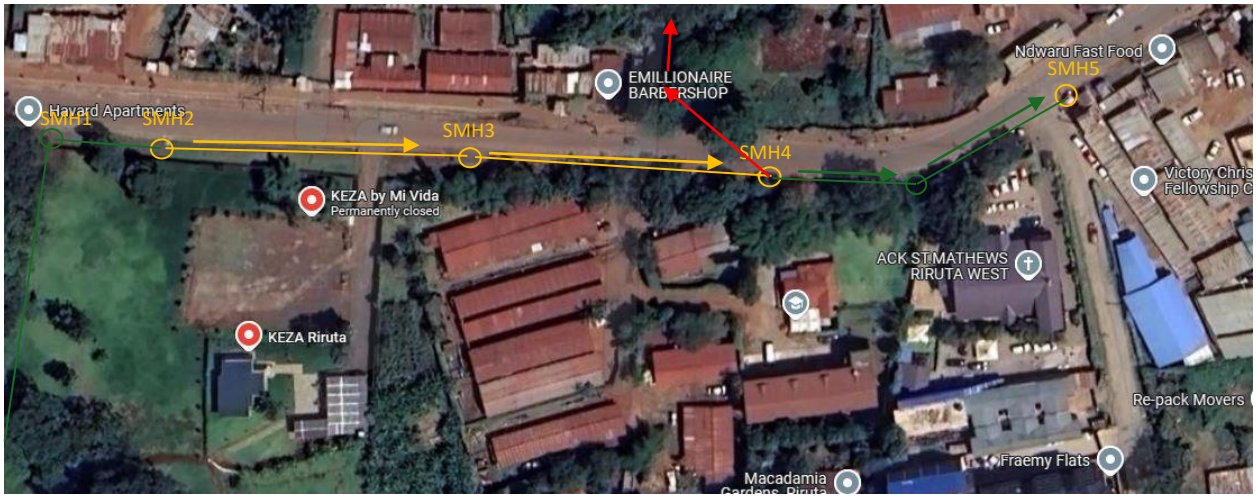


Fig 2: Site survey map (Sewer line)

Foul drainage discharge calculations:

Using **150 lts/person/day** as per **BS 8542:2011** and an industry occupancy rate of **1.5 persons per room** the following is the estimated foul drainage discharge for the development.

Table 2: Foul Drainage Discharge Calculation

Description	No. of Units	Occupancy	Capacity (Lts/Day)
1 Bedrooms	112	168	25,200.00
2 Bedrooms	98	294	44,100.00
Total	**210**	**462**	**69,300.00**

With the projected capacity of **210 Apts** and a design occupancy of **462 occupants** the projected foul discharge for the development is approximately **69,300.00lts/day.**

- **Storm**

There is a small storm drain constructed at the front of the property along Ndwaru Road. The general slope of the land is towards the front side of the property opposite the storm drain. The site is on the lowest part of the land. The landlord has began the construction of a storm drain along the main access road into the property as shown in green below.



Fig 3: General slope of the property



Fig 4: Open channel drain along Ndwaru Road

Electrical Services

The services explored to aid in the electrical detailing of the IHS Keza include Power Supply, ISP presence and Solar PV Feasibility. Calculations used to provide approximate loads and demands are based on the data provided in the design and development brief. The proposed allocation of units is in the mix of **112No.** 1 Bedroom units and **98No.** 2 Bedroom units.

- ### Power Supply

  There is a **high tension (HT), 11KV** line along Ndwaru Road with a pole mounted transformer about **200m** from the front side of the property.

  Power Demand Calculations:

  Using a maximum demand of **1.7KVA** for one-bedroom units and **2.2KVA** for two-bedroom units, the following is the power requirement for the development.

  Table 3: Power Demand Calculation

Description	No. of Units	Avg Demand/Unit (KVA)	Total Max Demand (KVA)
1 Bedrooms	112	1.7	190.4
2 Bedrooms	98	2.2	215.6
Total Load			**406.0**
80% Diversity			**324.8**
Loading the TX at 80%			**406.0**

  From the above calculation, we estimate the power demand for the proposed mix of housing and occupancy will be **406.0 KVA.** As a result, we recommend that a **630 KVA** ground mounted transformer to be availed to supply power to the development.

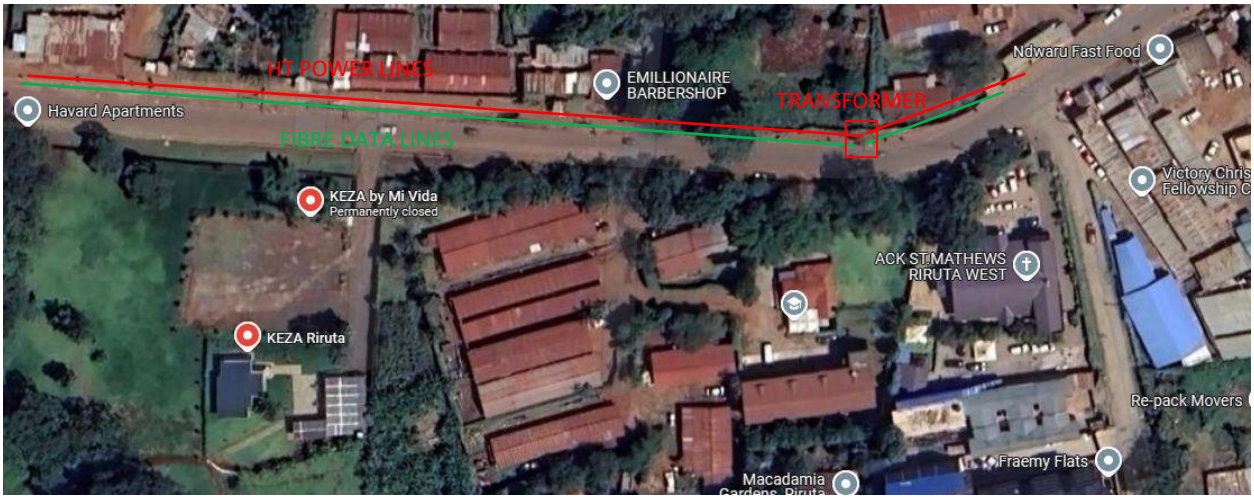


Fig 5: HT Power lines and ISP fibre lines



Fig 6: 11KV line along Ndwaru road



Fig 7: Pole mounted transformer

- **Internet Service Provisions**

The area is serviced with pole mounted internet lines along the Ndwaru road. There is



Fig 8: Pole service internet lines

- **Solar PV Feasibility**

The site has tall trees around but at the current construction height we do not foresee any shade from either trees or neighboring properties.

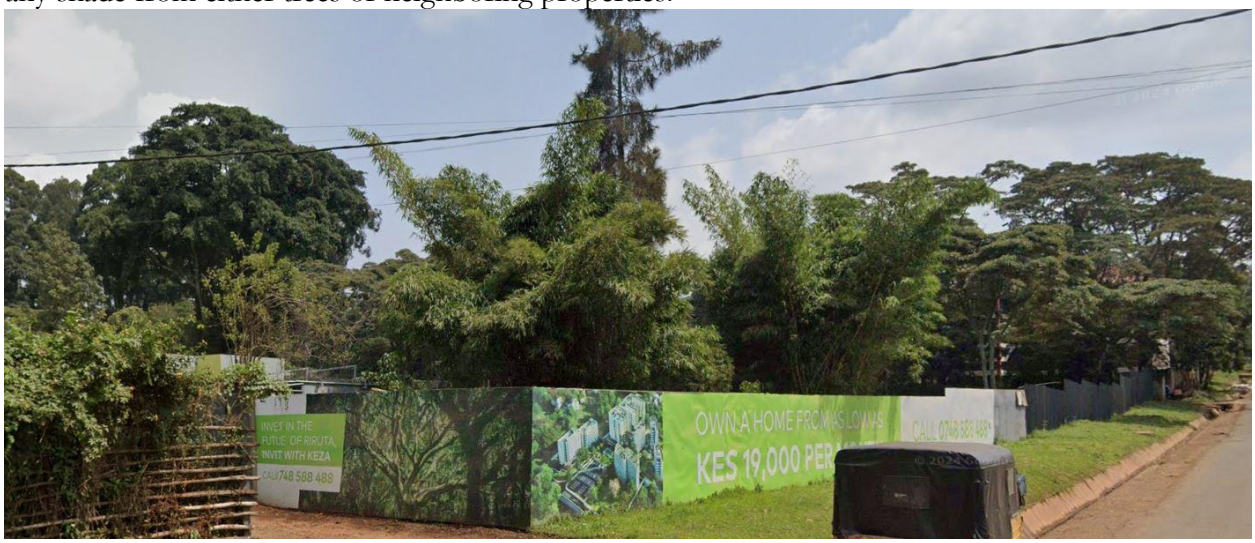


Fig 9: Relatively open site with no shade

Annex 12: GHG emissions – Climate resilience and carbon footprint assessment

FOOTPRINT ASSESSMENT

Riruta IHS Housing Development – Nairobi City County

Key Information	Detail
Project Name	Riruta IHS Housing Development
Proponent	International Housing Solutions Kenya Ltd
Location	Ndwaru Road, Riruta Ward, Dagoretti South Sub-County, Nairobi City County
Date of Assessment	November 2025
Units Assessed	240 Residential Units

1. Executive Summary

This report provides an executive summary of the Greenhouse Gas (GHG) Emission Inventory and Climate Change Risk Assessment (CCRA) conducted for the Riruta IHS Housing Development. The assessment confirms that the project incorporates robust mitigation and adaptation measures, resulting in a **low to moderate life-cycle carbon footprint** and a high degree of climate resilience.

Key Findings:

- **Mitigation:** Through resource-efficient design, the project achieves a projected annual operational GHG emission reduction of approximately **30%** compared to a conventional baseline.
- **Adaptation:** Comprehensive Sustainable Urban Drainage Systems (SuDS) and dual water systems effectively address primary vulnerabilities related to **pluvial flooding** and **water scarcity**.
- **Compliance:** The project is in full alignment with the **Climate Change Act (2016)**, IFC Performance Standard 3, and the Nairobi City County Green Building Guidelines (2023).

The overall risk profile is deemed acceptable, with adaptation and mitigation measures integrated at the design stage, ensuring long-term operational sustainability and resilience.

2. Greenhouse Gas (GHG) Emission Inventory

The GHG inventory followed a Tier 1 analytical approach, utilizing the IPCC (2006) Guidelines and incorporating the Kenya Grid Emission Factor (0.46 kg CO_2e/kWh). Emissions are categorized across the construction and operational life cycle.

2.1 Construction Phase Footprint

The construction phase represents a one-off capital emission expense, primarily driven by embodied materials (cement and steel).

Category	Estimated Footprint (t CO_2e)	Notes
Embodied Materials (Concrete & Steel)	≈ 1,850	Manufacturing and delivery of primary materials.
Fuel Combustion (Diesel)	≈ 161	Heavy equipment and transport.
Total One-Off Footprint	**~2,010**	Amortized over 50 years: **40 t CO_2e/yr**

2.2 Operational Phase Emissions & Mitigation Success

The operational phase emissions are primarily driven by energy consumption. Significant emissions avoidance has been achieved through efficient design features like LED lighting, solar water heating, and passive ventilation.

Emission Source	Gross Annual Emissions (t CO_2e/yr)	Efficiency Impact	Net Annual Emissions (t CO_2e/yr)
Grid Electricity	≈ 238	-95 t CO_2e/yr avoided	≈ 143
Standby Generator (Diesel)	≈ 8	Minimal impact	≈ 8
Domestic LPG (Cooking)	≈ 61	N/A	≈ 61
Waste & Wastewater	≈ 12	N/A	≈ 12
Total Net Operational Footprint	**~319 (Gross)**	**-95 t CO_2e/yr**	**~224**

Operational GHG Reduction Visualization

This chart illustrates the projected 30% reduction in annual operational GHG emissions due to embedded efficiency measures:

Baseline (Gross)	Net (Projected)	Reduction Achieved
319 tCO_2e	**224 tCO_2e**	**95 tCO_2e**
▓▓▓▓▓▓▓▓▓▓ (100%)	▓▓▓▓▓▓▓ (70%)	▓▓▓ **(30%)**

Net Operational Intensity: The project's per-unit carbon intensity is **~0.93 t CO_2e/unit/yr**, which demonstrates high performance against urban housing benchmarks.

3. Climate Change Risk and Adaptation Strategy

The CCRA identified site-specific vulnerabilities based on projected regional climate data (gradual warming of +1–1.5 °C by 2050 and intensified rainfall).

3.1 Identified Vulnerabilities

Vulnerability	Context / Impact
Pluvial Flooding	Increased rainfall intensity may overwhelm existing roadside drains, given the site's location in the Ndwaru–Ngong sub-catchment.
Water Scarcity	Extended dry spells leading to intermittent supply from the Nairobi City Water and Sewerage Company (NCWSC).
Heat Stress	Urban heat-island effects potentially elevating indoor temperatures and requiring cooling interventions.
Power Reliability	Extreme weather events occasionally disrupt grid power supply.

3.2 Adaptive Capacity and Measures

The project design integrates several resilience measures to manage the identified risks:

Risk Area	Adaptation / Mitigation Measure	Expected Outcome
Flooding	**Sustainable Urban Drainage System (SuDS):** Permeable pavements, infiltration trenches, and underground attenuation chambers. Reinforced drains and a 6m green vegetated buffer.	Reduced runoff volume and rate; improved groundwater infiltration.
Water Scarcity	**Dual Water System:** Rooftop rainwater harvesting feeding a dedicated storage system, complemented by low-flow sanitary fittings.	Reliable domestic and irrigation water supply, reducing reliance on NCWSC.
Heat Stress	**Passive Design:** Cross-ventilated unit design and strategically shaded façades. Landscaping with indigenous, drought-tolerant species.	Moderated micro-climate and lower indoor temperatures, minimizing the need for mechanical cooling.
Energy	**Energy Security:** Solar water-heating installed; provision made for future photovoltaic (PV) solar panel installation and essential backup generation.	Continuous essential services and further reduction of the grid carbon footprint.

4. Conclusion and Strategic Recommendations

The Riruta IHS Housing Development demonstrates leadership in sustainable urban development by preemptively addressing both carbon mitigation and climate change adaptation. The comprehensive technical approach aligns the project with national and international environmental standards, positioning the asset for long-term viability in a changing climate.

Strategic Recommendation:

Continue to monitor the performance of the efficiency (GHG reduction) and resilience (SuDS/water harvesting) systems post-commissioning to ensure the projected outcomes are realized throughout the operational life of the asset. Furthermore, prioritize the commissioning and integration of the future photovoltaic (PV) solar panels to achieve zero-net or net-positive operational status.

Annex 13: Traffic Impact Assessment Report

TRAFFIC IMPACT ASSESSMENT STUDY

FOR

THE PROPOSED KEZA RIRUTA PHASE 2 DEVELOPMENT

FINAL REPORT

30 September 2025

Client	Consultant
Keza Development LLP Naivasha Ndwaru Road Junction P.O. Box 43233 – 00100, Nairobi	ITEC Engineering Ltd. Infrastructure, Transportation & Environment Consulting Engineers 9A Sifa Towers, Lenana Road, Kilimani P.O. Box 3103-00100 GPO, Nairobi Tel: +254 20 4406905; 0792 745459, info@itecengineering.co.ke www.itec-eng.org

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of	Keza Development LLP
ITEC Contact:	Jeff Odago

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Author	Jeff Odago		30/09/25	Asst. Engineer
Approver	Eng. Tom Opiyo		30/09/25	Traffic Engineer

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EXECUTIVE SUMMARY

ITEC Engineering Ltd. was commissioned to undertake a Traffic Impact Assessment (TIA) for the proposed Keza Riruta Phase 2 residential development located along Ndwaru Road in Nairobi County. The study assessed current traffic conditions, projected future demand arising from the development, evaluated both motorized and non-motorized transport operations, determined trip generation and parking requirements, and proposed mitigation measures to ensure safe and sustainable access.

Traffic and pedestrian surveys were carried out in September 2025, covering both weekday and weekend peak periods. The analysis was based on the Highway Capacity Manual (HCM 2016) and the Institute of Transportation Engineers (ITE) Trip and Parking Generation Manuals, with adjustments made to reflect local car ownership levels and mobility patterns.

The baseline assessment indicated that most road sections and intersections currently operate at acceptable service levels (LOS C or better), though localized congestion was recorded at the Naivasha/Ndwaru junction during the morning peak. Pedestrian activity was found to be high, yet facilities are inadequate, with many walking along the road due to insufficient crossings, narrow walkways, and limited signage.

By 2027, the development is expected to generate approximately 2,016 daily trips, with a modal split showing that about 56% of demand will be absorbed by walking, boda bodas, and public transport. While the main site access is forecast to remain within acceptable operating conditions, the Naivasha/Ndwaru junction is projected to experience severe congestion (LOS F) without intervention.

Parking demand analysis highlighted a major discrepancy between international ITE benchmarks and locally observed behaviour. ITE-based projections suggested a requirement of 580 spaces, while locally adjusted estimates indicated demand closer to 274 spaces. Oversupplying parking would raise construction costs, waste valuable land, and encourage car use, whereas right-sizing to local demand ensures efficiency and supports sustainable mobility.

Key recommendations include the provision of raised zebra crossings with rumble strips on Ndwaru Road, widening of pedestrian walkways to 2m to accommodate bi-directional flows, provision of boda boda and taxi drop-off zones, installation of acceleration and deceleration lanes at the main access to ease ingress and egress, and engagement with KURA for junction improvements. These measures are intended to mitigate risks, improve safety for vulnerable road users, and maintain efficient traffic operations.

Overall, the study demonstrates that the Keza Riruta Phase 2 development can be integrated into the surrounding road network with minimal negative impact, provided that the recommended measures are incorporated into the final design..

1 INTRODUCTION

1.1 Project Information

The proposed residential project is within the Riruta area located on Ndwaru road off Naivasha road in Nairobi. The development has existing access along Ndwaru road which is currently a 2-way 2-lane arterial road. It is part of the urban feeder roads network under the Kenya Urban Roads Authority (KURA).



Figure 1-1: Project Location

1.2 Scope of Works

The scope of the Traffic Impact Assessment includes:

1. Undertaking traffic surveys and analysis (motorized and non-motorized);
2. Undertaking a trip generation study of the property.
3. A parking demand study within the complex;
4. Determining suitable mitigation measures and interventions; and,
5. Preparation of Traffic Impact Assessment report.

2 DATA COLLECTION AND ANALYSIS

2.1 Data Collection

Motorised and Non-Motorised Traffic volume data were collected during the peak periods on two (2) weekdays i.e. 5th and 8th of September, 2025 (Friday and Monday) and one weekend i.e. 6th of September, 2025 (Saturday). The peak periods include: Morning peak period (6:00 am – 9:00 am); Mid-day peak period (12:00am – 3:00pm); and, Evening peak period (4:00 pm – 7:00 pm). The critical traffic census locations as shown in Figure 2-1 below.



Figure 2-1: Traffic Survey Locations

The vehicles were classified under four (4) categories, namely:

1. Cars, pick-ups, 4WDs (personal use);
2. Minibuses & Vans (Public Service Vehicles);
3. Buses; and,
4. Light Goods, Medium Goods & Heavy Goods Vehicles.

For non-motorized traffic, the three (3) categories considered were:

1. Pedestrians;
2. Bicycles; and,
3. Human / Animal-drawn carts.

2.2 Analysis Criteria

The traffic data collected was analysed based on the Highway Capacity Manual (HCM) 2016 guidelines to determine the current levels of service (LOS) and hence the traffic operating conditions.

Six (6) Levels of Service (LOS) are normally defined for each type of facility. Letters designate each level, from A to F, with LOS A representing the best operating conditions and LOS F the worst. Each level of service represents a range of traffic operating conditions and the driver's perception of those conditions. Detailed descriptions of LOS are given in the box below.

LOS A describes primarily free-flow operations at average travel speeds, usually about 90 percent of the Free Flow Speed (FFS) for the given road class. Vehicles are completely unimpeded in their ability to manoeuvre within the traffic stream. Control delay at signalized intersections is minimal.

LOS B describes reasonably unimpeded operations at average travel speeds, usually about 70 percent of the FFS for the Road class. The ability to manoeuvre within the traffic stream is only slightly restricted, and control delays at signalized intersections are not significant.

LOS C describes stable operations; however, ability to manoeuvre and change lanes in midblock locations may be more restricted than at LOS B, and longer queues, adverse signal coordination, or both may contribute to lower average travel speeds of about 50 percent of the FFS for the Road class.

LOS D borders on a range in which increases in flow may cause substantial increases in delay and decreases in travel speed. LOS D may be due to adverse signal progression, inappropriate signal timing, high volumes, or a combination of these factors. Average travel speeds are about 40 percent of FFS.

LOS E is characterized by significant delays and average travel speeds of 33 percent or less of the FFS. Such operations are caused by a combination of adverse progression, high signal density, high volumes, extensive delays at critical intersections, and inappropriate signal timing.

LOS F is characterized by urban road flow at extremely low speeds, typically one- third to one-fourth of the FFS. Intersection congestion is likely at critical signalized locations, with high delays, high volumes, and extensive queuing.

2.2.1 Analysis Criteria for Road Sections

The *HCM 2016* Level of Service analysis criteria are shown in Tables 2-1 and 2-2 below.

Table 2-1:Level of Service Analysis Criteria for Unsignalized Intersections

Level of Service	Description	Delay (sec/veh)
A	Free flow conditions with drivers unaffected by other movements in the traffic streams	<10
B	Stable flow with drivers having reasonable freedom to manoeuvre	>10 – 20
C	Stable flow, but drivers somewhat restricted.	>20 - 35
D	Approaching stable flow limits with drivers significantly restricted	>35 – 55
E	Unstable flow, traffic volume at or close to capacity with drivers severely restricted	>55 – 80
F	Forced flow, traffic volume above capacity limits	>80

Table 2-2: Urban Road Lane Capacity Criteria

Link Type	2 Way 7m wide Lane Capacity (passenger cars/hour/lane)	1 Way 7.0m wide Lane Capacity (passenger cars/hour/lane)
Arterial Road	1000	2200
Collector Road	800	1450
Local Road	300	900

2.2.2 Analysis Criteria for Non-Motorized Transport

Pedestrian Volume Counts were carried out at the designated links for three (3) days over the peak periods on each day. Manual tallying was used and the classifications in Table 2-3 adopted.

Table 2-3: Classification of Non-Motorized Traffic

NMT Category	Description
Pedestrian	Includes people who walk on foot on the road side
Bicycle	Includes human powered/pedal driven two-wheeled vehicles
Human / Animal-drawn cart	Two-wheeled carts drawn by animals or human beings.

An analysis was done of the pedestrian crossing volumes relative to the motorised vehicles. The PV^2 criteria was used as the crossing assessment, which calculates the level of conflict between pedestrian (P) and vehicles (V) at a given location. The difficulty experienced crossing a road is influenced by its width, speed of traffic and number of lanes being crossed.

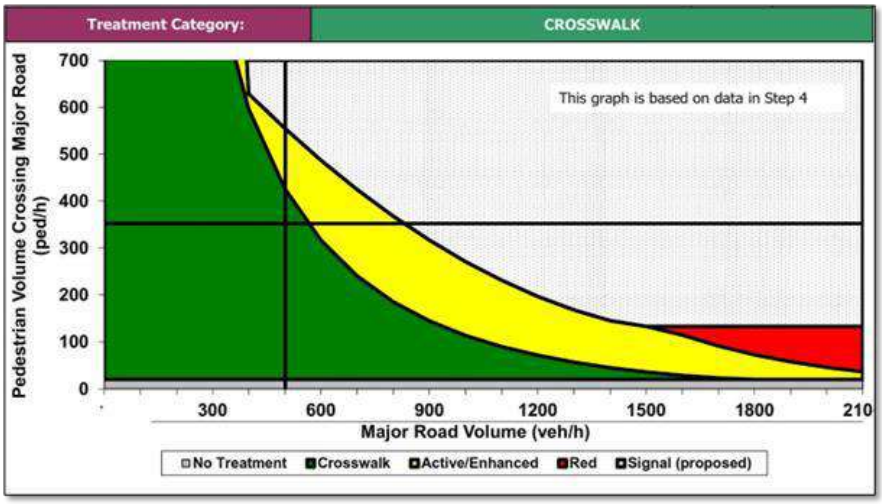


Figure 2-2: Example of Pedestrian Crossing Warrants (PV2) Categorization

3 BASELINE TRAFFIC CONDITIONS

3.1 Motorized Traffic

Given that the proposed residential development has a large number of units, it is expected that traffic operating conditions will deteriorate slightly due to the expected additional generated trips to and from the development, particularly during the peak hours.

The following observations were made:

1. Traffic operating conditions were visually observed to be acceptable during all peak periods with no excessive delays or waiting times;
2. The preliminary analysis shows all intersections have good Levels of Service; and,
3. The geometric design layouts of the accesses and the immediate external road network are generally acceptable as per current KURA methodology.

Table 3-1 below shows the worst current (2025) morning traffic operating conditions on the various road sections and intersections.

Table 3-1: Current (2025) Worst Approach Conditions (AM)

	Intersection Name	Control Type	Worst Mvmt	V/C	LOS
1	Ndwaru road	Link	-	0.47	A
2	Naivasha road junction	Two-way stop	Northbound	0.88	D

Table 3-2 below shows the worst current (2025) midday traffic operating conditions on the various road sections and intersections.

Table 3-2: Current (2025) Worst Approach Conditions (Midday)

	Intersection Name	Control Type	Worst Mvmt	V/C	LOS
1	Ndwaru road	Link	-	0.31	A
2	Naivasha road junction	Two-way stop	Northbound	0.55	A

Table 3-3 below shows the worst current (2025) evening traffic operating conditions on the various road sections and intersections.

Table 3-3: Current (2025) Worst Approach Conditions (PM)

	Intersection Name	Control Type	Worst Mvmt	V/C	LOS
1	Ndwaru road	Link	-	0.37	A
2	Naivasha road junction	Two-way stop	Northbound	0.70	B

From the results above, the following conclusions can be made for the sections studied:

1. The traffic operating conditions in the study locations are generally better than the acceptable LOS C during all peak periods; and,
2. The traffic capacity and delay operating conditions at the Naivasha road intersection are worse than LOS C, during the morning peak.

3.2 Non-Motorized Traffic

For Non-Motorised Traffic, KURA through the Street Design Manual for Urban Areas in Kenya aims at improving the quality of urban environments through the provision of efficient mobility and liveable streets. Improperly designed crossing facilities cause discomfort to pedestrians and may jeopardize pedestrian safety as well as create hindrance to smooth vehicular traffic flow.

Pedestrian volume counts were carried out at mid-block crossings during the peak periods i.e., Morning peak period (6:00 am – 9:00 am), Midday peak period (12:00 am – 2:00 pm) and Evening peak period (4:00 pm – 7:00 pm).

Table 3-4: Current Pedestrian Volumes

	Intersection Name	Control Type	Peak Period	Volume To	Volume From
1	Ndwaru road	-	AM	43	23
			Midday	18	21
			PM	13	16

The following observations were made:

1. Most pedestrian were observed to walk along the road rather than crossing, due to the undeveloped nature of the surrounding are;
2. Crosswalks were not provided along the entire alignment of Ndwaru road;
3. There is no signage to regulate speeds or warn drivers of pedestrian crossing;
4. Vehicle speeds along Ndwaru road were occasionally high; and,
5. During peak periods, the potential for pedestrians walking on the carriageway is high due to the narrow walkways immediately adjacent to the boundary wall.

3.2.1.1 Pedestrian Crossing Warrants

Increased pedestrian-vehicle interactions, especially at peri-urban midblock crossings, have resulted to higher risks and pedestrian fatalities. This situation further worsens under heterogeneous traffic conditions, where indiscriminate mix of vehicles with diverse characteristics in conjunction with poor discipline complicate pedestrian-vehicle interactions. The purpose behind creating concentrated crossing points for movements to selected locations where:

1. Pedestrian and cyclist networks exist or are being developed to improve the safety, amenity of the environment, and accessibility for pedestrians and cyclists;
2. Pedestrians and cyclists are provided with a safe place to cross the road using treatments and devices that effectively manage conflicts between pedestrians/cyclists and vehicles;
3. Motorists would expect the presence of pedestrians and cyclists;
4. The crossing can be readily identified by all road users as a point of crossing (this may include delineation, coloured pavement or other devices);
5. Pedestrians with limited vision or mobility can be provided with non-visual cues and/or physical aids; and,
6. Regulatory traffic control devices can be installed.

In the analysis of the pedestrian crossing volumes relative to the motorised vehicles, the PV^2 criteria has been used to assess the crossing demand. The PV^2 criteria assesses the level of conflict between pedestrian (P) and vehicles (V) at a given location. The difficulty experienced crossing a road is influenced by its width, speed of traffic and number of lanes being crossed.

3.3 Parking Demand

A parking study was undertaken to determine the current supply and demand of parking spaces, and, the extent of their usage.

An assessment of the parking demand for the proposed residential apartment development comprising 120 Studio units, 120 one-bedroom units, 168 two-bedroom units and 72 three-bedroom units. The analysis applies the Institute of Transportation Engineers (ITE) *Parking Generation Manual* (5th Edition) to establish a baseline requirement and then introduces a sensitivity adjustment to reflect the actual car ownership patterns of Kenyan middle-income households.

The ITE manual identifies Land Use Code (LUC) 221 – Multifamily Housing (Mid-Rise) as the appropriate category for the subject development. ITE rates are based on North American household trends, which typically assume higher levels of private vehicle ownership. For the baseline case, ITE parking demand rates per unit type were applied.

For the sensitivity case, adjustments were made using Nairobi-specific observations:

1. One-bedroom and Studio units: 30–40% of households typically own a car;
2. Two-bedroom units: majority of households own one car, but rarely two;
3. Three-bedroom units: ownership is higher, but still largely one vehicle per family; and,
4. Shared mobility, public transport, and boda boda use substitute private vehicle ownership for a notable share of households.

These adjustments bring the projected demand closer to the reality of Kenyan middle-income developments.

Table 3-5: Baseline Parking Demand (ITE Rates)

Unit Type	Number of Units	ITE Rate (Spaces/Unit)	Total Parking Demand (Spaces)
Studio	120	0.9	108
1-bed	120	1.1	132
2-bed	168	1.3	218
3-bed	72	1.7	122
Total	**480**	—	**580**

The baseline scenario projects 580 spaces.

3.3.1 Sensitivity Adjustment – Kenyan Context

Using observed local ownership patterns, the following adjusted factors were applied:

1. Studio Units: 0.3 spaces per unit;
2. 1-Bedroom Units: 0.4 spaces per unit;
3. 2-Bedroom Units: 0.7 spaces per unit; and,
4. 3-Bedroom Units: 1.0 spaces per unit.

This reflects a context where most households own at most one car, with many small unit tenants relying on public transport or shared mobility.

Unit Type	**Number of Units**	**Adjusted Rate (Spaces/Unit)**	**Adjusted Parking Demand (Spaces)**
Studio	120	0.3	36
1-Bedroom	120	0.4	48
2-Bedroom	168	0.7	118
3-Bedroom	72	1.0	72
Total	**480**	—	**274**

The adjusted projection yields a demand of approximately 274 parking spaces.

The gap between the baseline (580) and adjusted (274) highlights the importance of context-sensitive planning. Providing too much parking risks locking up valuable land, raising construction costs, and encouraging higher vehicle ownership. The sensitivity-adjusted demand aligns better with the behaviour of Kenyan middle-income families, where public transport and shared mobility absorb a significant share of travel demand. Given the development's unit mix, three-bedroom units account for the largest share of demand, while mini and one-bedroom units generate minimal requirements.

4 FUTURE TRAFFIC CONDITIONS

4.1 Trip Generation

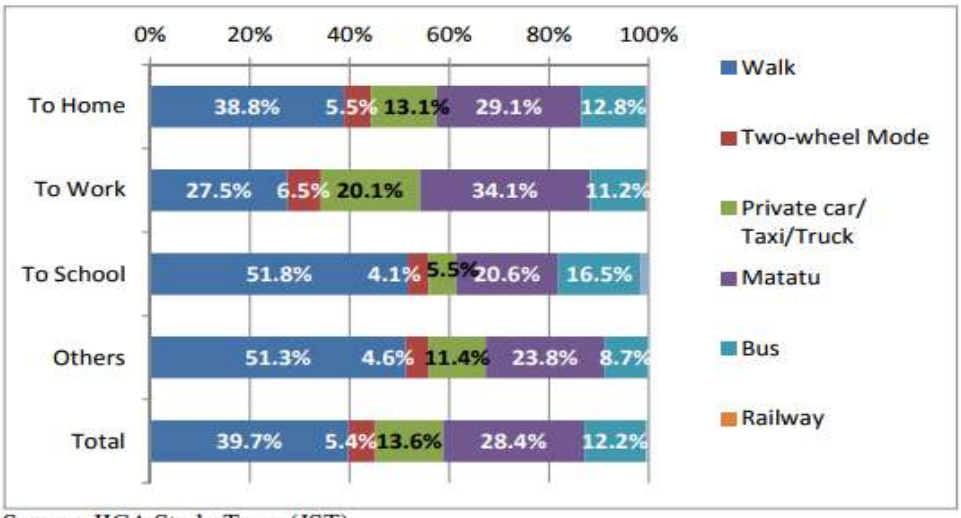
The expected generated/attracted traffic due to the proposed expansion works at The Keza Riruta is computed following the *ITE Trip Generation Manual 9th Edition* recommendations. The ITE traffic generation rates are considered conservative as car ownership and usage rates in the sample country (USA) are much higher than in Kenya. These are used given that Kenya does not have a comprehensive dataset for traffic generation from various land use and developments.

The table below gives a summary of the trips that are likely to be generated by the proposed residential structures and retail convenience store. These traffic generation rates are considered conservative as car ownership and usage rates in the sample country (USA) are much higher than in Kenya.

Table 4-1: Trips Generated / Attracted to the Development

Description / ITE Code	Units	Expected Units	Gen. Trips (Daily)	AM In	AM Out	PM In	PM Out
Mid-Rise Apartment (221)	DU	480	2016	45	99	109	79

It was assumed that for this development, the primary trip purposes are varied. The modal split between pedestrian and vehicular traffic could not be ascertained. Figure 4-1 below shows the adopted modal split for generated traffic for the various modes and trip purposes for Nairobi.



Source: JICA Study Team (JST)

Figure 4-1: Modal Split of Generated Traffic[1]

It was assumed that for this development, the primary trip purposes are varied. 55.9% of generated traffic will be non-motorized traffic (NMT) with the remaining comprising of motorized traffic

[1] The Project on Integrated Urban Development Master Plan for the City of Nairobi in the Republic of Kenya

(MT), given the development is adequately served by Public Service Vehicles (matatus and buses). The property is also approximately 200m from the Naivasha road bus stops for onward journeys beyond the locality. It can then be assumed that the passengers will disembark at these bus stops and walk to the development.

The total traffic was then split between the two modes of traffic as shown in Table 4-2 below.

Table 4-2: Motorized and Non-Motorized Traffic generated

	AM in	AM out	PM in	PM out
Total traffic (Vph)	45	99	109	79
NMT	55.9%			
	25	56	61	44
MT	44.1%			
	20	44	48	35

Given that the property will also attract non-motorized either from public transport or the local environs, provisions must be made or current ones improved to allow for efficient access into the property as well as to allow free flow of other passers-by pedestrians. These provisions should include:

1. Pedestrian walkways;
2. Raised "zebra" crossings;
3. Taxi and *boda-boda* drop-off zones; and,
4. Street lighting and signage.

4.2 Future Motorized Traffic Scenarios

The total traffic will be computed as the sum of generated/attracted traffic from the proposed expansion works and forecasted normal traffic at a growth rate of 5.0% per annum. The following future traffic scenario was considered: Future (September 2027) traffic conditions **WITH** the development and **WITHOUT** road capacity improvements.

The analysis results indicate congestion at the Naivasha road / Ndwaru road intersection is the major cause of poor Levels of Service (LOS). Table 4-3 below shows the worst future (September 2027) morning traffic operating conditions on the various road sections and intersections.

Table 4-3: Future (2025) Worst Approach Conditions (AM)

	Intersection Name	Control Type	Worst Mvmt	V/C	LOS
1	Ndwaru road	Link	-	0.54	A
2	Naivasha road junction	Two-way stop	Northbound	1.03	F

Table 4-4 below shows the worst future (2025) midday traffic operating conditions on the various road sections and intersections.

Table 4-4: Future (2025) Worst Approach Conditions (Midday)

	Intersection Name	Control Type	Worst Mvmt	V/C	LOS
1	Ndwaru road	Link	-	0.36	A
2	Naivasha road junction	Two-way stop	Northbound	0.64	A

Table 4-5 below shows the worst future (2025) evening traffic operating conditions on the various road sections and intersections.

Table 4-5: Future (2025) Worst Approach Conditions (PM)

	Intersection Name	Control Type	Worst Mvmt	V/C	LOS
1	Ndwaru road	Link	-	0.43	A
2	Naivasha road junction	Two-way stop	Northbound	0.81	C

From the results above, the following conclusions can be made for the sections studied:

1. The traffic operating conditions are generally better than the acceptable LOS C during all peak periods; and,
2. The traffic capacity and delay operating conditions at the Naivasha road / Ndwaru road intersection are unacceptable, and intersection improvements will still be required in future.

It can be concluded that with the natural growth of normal traffic there will be a slight deterioration in the traffic operating conditions adjacent to the property. The Naivasha road interventions are however beyond the scope of this study.

4.2.1 Main Access and Frontage

Based on the projected maximum hourly flow rate following completion of the expansion works, the main access into the Keza Riruta will be operating at good LOS of C and above. Therefore, no interventions are required to improve the capacity.

To allow for easier ingress and egress, acceleration and deceleration lanes are recommended at the access to mitigate disruptive tailbacks onto the road. To reduce vehicle speeds further on all the approaches to the main access and the pedestrian crossing, rumble strips are recommended.

4.3 Future Non-Motorized Traffic

The pedestrian peak hourly variations were projected to the year 2027 with the adopted growth rates as well as the generated NMT traffic due to the proposed expansion of the development.

Table 4-6 Future Pedestrian Volumes

	Intersection Name	Control Type	Peak Period	Volume To	Volume From
1	Keza Riruta Main Access	Zebra Crossing	AM	68	79
			Midday	43	77
			PM	74	60

It is recommended the pedestrian walkways be widened along the Ndwaru road frontage to an effective width of two (2) metres. This is in line with best practice to accommodate bi-directional pedestrian movements as well as catering for people living with disabilities (PLWD) or vulnerable road users.

Low compliance and high compliance scenarios were analysed to show which crossing treatments should be implemented. Low compliance areas have little or no signage indicating pedestrian crossings, limited traffic calming and no existing pedestrian crossing facilities. High compliance areas have lower speeds, proper signage and zebra crossings already in place.

In future (2027), with projected vehicle and pedestrian volumes, the crossing treatments required are raised "zebra" crossings for the Ndwaru road frontage of the Keza Riruta site. This is due to projected vehicle and pedestrian traffic on the carriageway that make separation of pedestrians and vehicles necessary. This will involve engaging KURA to facilitate the improvement.

5 CONCLUSIONS

The Traffic Impact Assessment for the Keza Riruta Phase 2 development shows that the project can be absorbed into the local road network if targeted interventions are adopted. Current traffic conditions are generally acceptable, though the Naivasha/Ndwaru junction already exhibits congestion which will intensify by 2027 without capacity improvements.

The development will generate substantial additional trips; however, most will be accommodated through non-motorized and public transport modes, thereby reducing pressure on the road system. This reinforces the need to enhance pedestrian infrastructure, improve crossings, and provide safe facilities for boda bodas and taxis.

Parking requirements should be guided by local demand rather than international norms. While ITE projections suggest 580 bays, the more realistic figure of 274 spaces better reflects Kenyan travel patterns. Adopting this standard prevents over-supply, reduces costs, and encourages more sustainable land use.

The mitigation measures identified, including junction upgrades, pedestrian walkway improvements, raised zebra crossings, access lane adjustments, and traffic calming, are essential to ensuring safe and efficient access. These interventions, combined with collaboration with KURA for junction enhancements, will safeguard both mobility and safety outcomes.

In summary, Keza Riruta Phase 2 can proceed without adverse transport impacts if the proposed measures are fully implemented. By addressing pedestrian safety, managing parking provision, and alleviating junction congestion, the project will contribute positively to mobility and support the wider objectives of sustainable urban development.

Link Type	2 Way 7m Lane Capacity (passenger cars/hour/lane)	2 Way 7.3m Lane Capacity (passenger cars/hour/lane)
Arterial Road	1350	1500
Collector Road	1000	1200
Local Road	600	750

Level of Service	Description	Volume to Capacity Ratio (V/C)
A	Free flow conditions with drivers un affected by other movements in the traffic streams	<0.65
B	Stable flow with drivers having reasonable freedom to maneuver	0.65-0.75
C	Stable flow, but drivers somewhat restricted.	0.75-0.85
D	Approaching stable flow limits with drivers significantly restricted	0.85-0.95
E	Unstable flow, traffic t or close to capacity with drivers severely restricted	0.95-1.0
F	Forced flow, over capacity limits	>1.0

Generated Trips (Vph)			
Morning Time Peak		Evening Time Peak Hour	
In	Out	In	Out
20	44	48	35

Current Conditions

Riruta 1

Period	NAIVASHA RD SOUTH-NAIVASHA RD NORTH	NAIVASHA RD NORTH-NAIVASHA RD SOUTH	NDWARU ROAD-NAIVASHA ROAD SOUTH	NAIVASHA ROAD SOUTH-NDWARU ROAD	NDWARU RD - NAIVASHA RD NORTH	NAIVASHA RD NORTH-NDWARU RD
Morning Peak	496	388	96	32	72	56
Mid Day peak	296	256	64	24	72	64
Evening Peak	376	320	80	60	156	92

Period	NAIVASHA RD SOUTH-NAIVASHA RD	NAIVASHA RD NORTH-NAIVASHA RD	NDWARU ROAD-NAIVASHA	NAIVASHA ROAD SOUTH-NDWARU	NDWARU RD - NAIVASHA RD NORTH	NAIVASHA RD NORTH-NDWARU RD
Morning peak	0.88	0.10	0.11	0.37	0.11	0.49
Mid Day peak	0.55	0.10	0.07	0.27	0.11	0.30
Evening peak	0.70	0.22	0.12	0.34	0.21	0.38

Period	NAIVASHA RD SOUTH-NAIVASHA RD NORTH	NAIVASHA RD NORTH-NAIVASHA	NDWARU ROAD-NAIVASHA	NAIVASHA ROAD SOUTH-	NDWARU RD - NAIVASHA	NAIVASHA RD NORTH-NDWARU
Morning peak	D	A	A	A	A	A
Mid Day peak	A	A	A	A	A	A
Evening peak	B	A	A	A	A	A

Riruta 2

Period	WAITHAKA-NAIVASHA ROAD	NAIVASHA ROAD-WAITHAKA				
Morning Peak	284	184				
Mid Day peak	168	140				
Evening Peak	160	208				

Period	WAITHAKA-NAIVASHA ROAD					
Morning peak	0.47					
Mid Day peak	0.31					
Evening peak	0.37					

Period	WAITHAKA-NAIVASHA ROAD	0				
Morning peak	A	A				
Mid Day peak	A	A				
Evening peak	A	A				

575

Future Conditions (2028) WITHOUT development WITHOUT improvement

Riruta 1

Period	NAIVASHA RD SOUTH-NAIVASHA RD NORTH	NAIVASHA RD NORTH-NAIVASHA RD SOUTH	NDWARU ROAD-NAIVASHA ROAD SOUTH	NAIVASHA ROAD SOUTH-NDWARU ROAD	NDWARU RD - NAIVASHA RD NORTH	NAIVASHA RD NORTH-NDWARU RD
Morning Peak	575	450	112	38	84	65
Mid Day peak	343	297	75	28	84	75
Evening Peak	436	371	93	70	181	107

Period	NAIVASHA RD SOUTH-NAIVASHA RD NORTH	NAIVASHA RD NORTH-NAIVASHA RD SOUTH	NDWARU ROAD-NAIVASHA ROAD SOUTH	NAIVASHA ROAD SOUTH-NDWARU ROAD	NDWARU RD - NAIVASHA RD NORTH	NAIVASHA RD NORTH-NDWARU RD
Morning peak	1.03	0.12	0.13	0.43	0.12	0.57
Mid Day peak	0.64	0.11	0.09	0.31	0.13	0.35
Evening peak	0.81	0.25	0.14	0.40	0.24	0.44

Period	NAIVASHA RD SOUTH-NAIVASHA RD NORTH	NAIVASHA RD NORTH-NAIVASHA RD SOUTH	NDWARU ROAD-NAIVASHA ROAD SOUTH	NAIVASHA ROAD SOUTH-NDWARU ROAD	NDWARU RD - NAIVASHA RD NORTH	NAIVASHA RD NORTH-NDWARU RD
Morning peak	F	A	A	A	A	A
Mid Day peak	A	A	A	A	A	A
Evening peak	C	A	A	A	A	A

Riruta 2

Period	WAITHAKA-NAIVASHA ROAD	NAIVASHA ROAD-WAITHAKA	0	0	0	0
Morning Peak	329	214	0	0	0	0
Mid Day peak	195	163	0	0	0	0
Evening Peak	186	241	0	0	0	0

Period	WAITHAKA-NAIVASHA ROAD					
Morning peak	0.54					
Mid Day peak	0.36					
Evening peak	0.43					

Period	WAITHAKA-NAIVASHA ROAD	0				
Morning peak	A	A				
Mid Day peak	A	A				
Evening peak	A	A				

Keza Riruta – PV² Analysis

Year	Peak	Pedestrians (P)	Vehicles (V)	PV² Value	Recommendation
2025	AM	66	468	1.45 × 10^7	Zebra crossing / calming
2025	Mid	39	308	3.70 × 10^6	Zebra crossing / calming
2025	PM	29	368	3.93 × 10^6	Zebra crossing / calming
2027	AM	146	543	4.31 × 10^7	Zebra crossing / calming
2027	Mid	119	358	1.53 × 10^7	Zebra crossing / calming
2027	PM	134	427	2.44 × 10^7	Zebra crossing / calming

All values are below the 10^8 threshold, so formal signal warrants are not triggered. However, the 2027 AM peak (4.31×10^7) is approaching higher levels, highlighting a potential upcoming need for raised zebra crossings, rumble strips, and dedicated walkways for safety.

Annex 14: IHS GRM

GRIEVANCE REDRESS MECHANISM (GRM)

FOR

INTERNATIONAL HOUSING SOLUTIONS (IHS) KENYA

IHS KENYA GREEN HOUSING AFFORDABLE FUND

PREPARED	REVIEWED BY	APPROVED BY
Beatrice Njoki Karanja	Amber Frugte	Paola Mendez
ESG Specialist	EIB senior social expert	EIB EE Specialist
22.07.2021	27.07.2021	28.07.2021

ABBREVIATIONS

AoI	Project Area of Interest
EPC	Engineering Procurement and Construction
ESG	Environmental Social Governance
GBVH	Gender Based Violence and Harassment
GRM	Grievance Redress Mechanism
IHS	Internal Housing Solutions
HR	Human Resources

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INTRODUCTION

The purpose of this grievance procedure is to stipulate ways in which complaints will be handled and concerns addressed promptly, using an understandable and transparent process that provides timely feedback to those concerned, without any retribution.

This grievance mechanism covers workers directly engaged by IHS (direct workers), workers engaged through third parties to perform work related to core business processes of the project for a substantial duration (third-party workers), as well as workers engaged by company primary suppliers (supply chain workers). It also covers external stakeholders of our operations including communities where we operate, relevant authorities and a separate grievance mechanism (annexed herein) for tenants who shall be residing in IHS projects once completed.

The GRM shall be regularly reviewed and kept up to date, by referencing any new statutory guidelines, changes in contracts or representation.

PRINCIPLES OF GRIEVANCE HANDLING

- **Transparency and fairness**: The process for grievance resolution shall be transparent, in harmony with the local culture and in the appropriate language. It shall explicitly assure potential users that the mechanism will not impede their access to other judicial or administrative remedies.
- **Accessibility and cultural appropriateness**: All stakeholders including every member of a community or group shall have access to the grievance procedure. Any individual or group that is directly or indirectly affected by the Company's and its contractors' activities, can raise a grievance.
- **Openness and communication regularity**: There shall be multiple channels available for individuals and groups to choose their preferred method for lodging grievances.
- **Channels of communication** shall be kept open throughout the process of addressing each grievance and up to three (3) months after the situation has been resolved.
- **Written records**: All grievances shall be registered on a Grievance Form and tracked through to resolution. This shall include documentation of how the grievance has been resolved.
- **Dialogue and site visits**: All grievances shall warrant discussions with the complainant and a site visit to gain a first-hand understanding of the nature of the concern. The purpose of the visit is to verify the validity and severity of the grievance
- **Timely resolution**: The Company aims to resolve grievances within **30 working days**. Grievances that have not been resolved in this time frame shall at a minimum have been acknowledge and investigated.
- **Confidentiality:** The process shall ensure that the complaints are dealt with utmost confidentially. This is an effort to provide a safe environment without for aggrieved persons to come forth and protect them from undue pressure or reprisals. Exceptions to confidentiality are: threats of physical harm to self/others, and threats to cause significant damage to real or personal property. If an agreement is reached, the agreement becomes a public record under the State law.
- **No cost:** Access to the Grievance Mechanism is done free of any charges or costs.

- **Non-retaliation**: employees, workers representatives and external stakeholders, who submit a grievance or participate in this process, shall not suffer any discrimination, victimisation, retaliation or loss of earnings. IHS has zero tolerance policy on victimization. Any employee alleged to have been in victimization shall be subjected to a disciplinary process leading up to summary dismissal.
- **Human Rights**- All stakeholders shall be treated treated equally and in a dignified manner, regardless of race, ethnicity, nationality, class, caste, religion, belief, sex, gender, language, sexual orientation, gender identity, sex characteristics, age, health or other status. IHS work is rooted in the principle of non-discrimination. Working with communities across different countries, we challenge discriminatory laws and practices to ensure all people can enjoy their rights on an equal basis

Levels of Grievance

The correct procedural approach to processing a grievance depends on its type, and whether it is raised by an individual or a group.

Not all complaints shall be handled through a GRM. For example, grievances that allege corruption, coercion, or major and systematic violations of rights and/or policies, are normally referred to organizational accountability mechanisms or administrative or judicial bodies for formal investigation, rather than to GRMs, which are designed for collaborative problem solving.

Individual grievances

These are raised by individual workers relating to an aspect of their personal employment for example, issues such as dissatisfaction regarding their personal pay or benefits, excessive and/or mandatory overtime, unfair dismissal, or feel that their role presents unreasonable challenges, i.e. they may have a disability for which reasonable adjustments have not been made.

For such individual grievances, the Labor Manager on site should be involved and employees (internal) workers' grievance procedures provided herein will be followed

Collective grievances

These are grievances raised by more than one member of staff. If two or more employees raise the same issue with management, the collective grievance must be submitted in written form through their representatives. Kenyan law recognizes workers right to join unions without interference and to bargain collectively. Where collective grievances are submitted by union representatives, procedure for following up a collective grievance is generally similar to that which is recommended in the event of an individual grievance, and usually involves conducting an investigation to assess the situation(s) leading to its submission, followed by meetings focused on reaching a resolution. In the event of any dispute, dispute resolution mechanism provided herein shall be followed

Interpersonal Issues

They can arise from a wide variety of different circumstances, and can result in individual and collective complaints. Depending on the circumstances, a grievance related to interpersonal dynamics is likely to relate to bullying, sexual harassment, discrimination or a combination of the three.

- **Direct discrimination** occurs when someone is treated unfairly and is disadvantaged because of personal characteristics such as race, gender, sex, pregnancy, marital status, ethnic or social origin, color, sexual orientation, age, physical appearance, religion/ belief, culture, language, national extraction, social origin and political opinion that is protected under Employment law.
- **Indirect Discrimination** occurs when a rule seems neutral, but has a discriminatory impact on certain people. For example, a physical attribute necessary for a particular job might be applied equally to men and women, but would indirectly discriminate on the basis of sex, as women tend to be e.g. shorter than men.

In order to protect the inherent dignity of IHS direct employees, third parties as well as workers engaged by primary suppliers, IHS shall require all its guiding policies such as sexual harassment and bullying policy, non-discrimination policy to be annexed and signed off in employee contracts and all IHS contractual agreements.

Should the aggrieved employees find difficulty in communicating freely with his / her immediate Supervisor, or where the line manager is responsible for discrimination, bullying or sexual harassment, then the employee is encouraged to present the matter using IHS whistleblower toll free direct line. The grievances shall be investigated and forwarded to the legal team and IHS ESG Manager who's the governance director who shall provide a meeting to discuss the grievance. The affected employees shall have the right to be accompanied and/or represented by a colleague or official of a trade union at that meeting if they so choose.

Behaviour that constitutes discrimination, sexual harassment or bullying will not be tolerated and will lead to action being taken against any person who subjects any employee to discrimination, sexual harassment or bullying which may include summary dismissal. Legal aid and psychosocial support shall be provided to victims of abuse and Gender Based Violence and Harassment.

Whistleblowing/ Reports on violation

Whistleblowing is a term describing grievances that consist of reporting wrongdoing at work or transgressing laws that could be detrimental to the company and are considered to be "of public interest". The whistleblowing line shall enable individuals both internally and externally to raise concerns with utmost confidentiality as anonymity shall be guaranteed. Employees who report on wrongdoing of public interest within their company are protected by law from losing their job with the company by Witness Protection Act of 2012

Concerns reported under whistleblowing policy shall be:

- Theft/ fraud
- Bribery/ corruption
- Sexual harassment
- Conflict of interest
- Collusion
- Breach of law

- someone's health and safety is in danger
- if workplace activities risk damage to — or actually damage — the environment.

IHS Whistleblowing policy and guidelines shall be shared with all direct and indirect employees and third parties. This shall also be conspicuously displayed in all IHS workstation and construction sites

Bi- annual assessments shall be carried out on the whistleblowing and grievance mechanism on all stakeholders to continuously sensitize them on the mechanisms place

PROCESS

Based on the principles described above, the grievance mechanism process shall involve four main stages:

1. Receiving and recording the grievance;
2. Investigation and site inspection;
3. Response; and
4. Monitoring and evaluation.

EXTERNAL GRIEVANCES

This shall be used by external stakeholders including relevant agencies and community where we shall be working

I. Receiving and Recording the Grievances

Multiple avenues shall be provided for grievance submission. Aggrieved stakeholder (s) shall be able to report grievances to either or IHS directly or to the Development Manager who shall be in charge of all IHS construction projects.

Both verbal and non-verbal grievance shall be received through a variety of channels i.e.

- Email address provided in the IHS website and displayed on all IHS construction sites;
- Grievance book that shall be provided in all of our Developers' sites
- IHS Phone hotline;
- Community Liaison Officer who shall be nominated by the community through the local administration office and
- Various commonly used social media platforms like twitter, Facebook and Instagram which shall be escalated to respective ESG managers to respond

All external grievances shall be registered by the Development manager and passed over to ESG Specialist. The grievance shall be recorded on *Grievance Form* (*See Annex A*) that

shall form the grievance book and a formal confirmation along with a copy of the form shall be shared with the complainant.

The name of the complainant, organization/community, date recorded and name of the person that receives the grievance shall be noted together with details of the grievance. The complainant shall have the choice to remain anonymous or reveal their identity. Each grievance shall be assigned a reference number which shall be used and shared with the complainant. This will allow the complainant to anonymously check on updates and be briefed on the status of their grievance report using the contacts provided.

A centralized database supported by IHS shall be provided. All grievances received shall be logged into that database using a common protocol and means of recording grievances received. Centralized logging and tracking is important both for accountability, taking stock of grievance trends, tracking the social thermometer, and for enabling continuous learning. All grievances shall be registered by the Development Manager regardless of even if they are likely to be ultimately deemed not legitimate.

II. Assessing Eligibility

This is a procedural step to ensure that the issue being raised is relevant to a project. Eligibility criteria helps determine whether issues raised require the use of GRM or other channels for recourse, and what issues or contexts may require further clarification in order to determine eligibility.

Eligibility shall be determined on the basis of the four criteria:

1. If the project is active i.e. appraisal has begun and project ongoing
2. If the grievance alleges that the project has caused a negative economic (including livelihood), social (including labor rights and working conditions), or environmental (pollution of land/ water/ air, loss of biodiversity or ecosystem services) impact on the complainant, or has the potential to cause such an impact
3. If the grievance indicates that those filing the complaint are the ones who have been impacted, or are at risk of being impacted; or that those filing the complaint are representing the impacted or potentially impacted stakeholders at their request
4. Violation of the law or contract signed with the stakeholder that’s submitting grievance

The grievance must provide enough information for the Development Manager and ESG Specialist to make a determination on eligibility.

A simple categorization of complaints shall be done – i.e. type of issue raised and the effect on the environment/claimant if the impacts noted were to occur. This shall help assign responsibility.

The following issues are excluded:

- Issues related to obtaining employment with the IHS Projects.

- Complaints that are frivolous or absurd are not admissible. These include grievances soliciting for bribes, politically driven demands and domestic complaints etc that do not relate to IHS projects. However, all matters shall be noted for review

NB: the admissibility criteria shall be determined by both the ESG manager and respective project Development manager

III. Roles and Responsibilities

Implementing the external grievance mechanism is the responsibility of the Development Manager & ESG Specialist. At the construction site, the Construction project manager shall be responsible for receiving all external grievances which shall be escalated to Development Manager for action. The Construction manager shall be the Development manager representative at project level

It is likely that at times they will need support from the technical committee in investigating or resolving a grievance. Other key players are likely to include:

- Asset Manager
- heads of sections where the grievances fall;
- Technical experts and professionals to determine if the complaint is feasible; and
- legal teams in cases where the grievance involves a breach in regulations, laws or agreement on resolution can't be reached

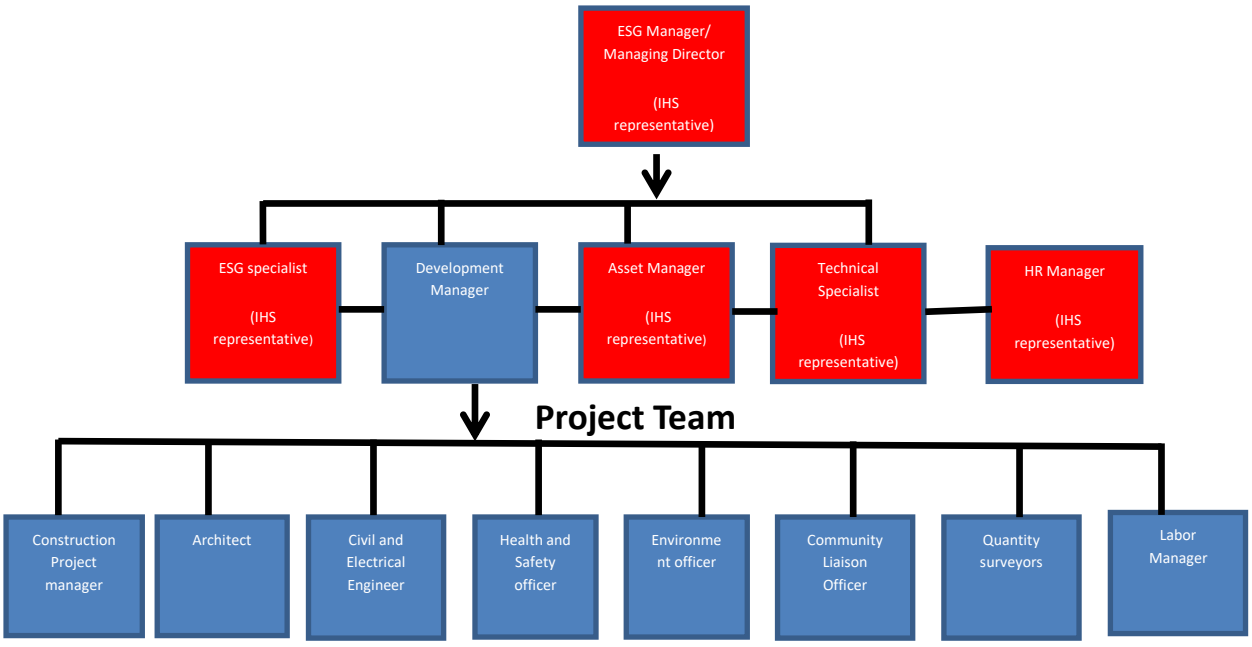


Figure 1: IHS Organo chart

Engineering Procurement and Construction (EPC) and Subcontractors Responsibilities

The EPC contracts for projects financed by IHS Kenya are actively concluded, implemented, and managed by Development Managers. He/ she shall be responsible for overseeing both the workers and community grievances

The labour manager shall be part of the project team and shall have a direct reporting line to the Development manager. He/she shall be responsible for handling workers' grievances using the GRM provided herein and supervised by the Development manager

As for external grievances, the construction project manager shall be responsible for receiving all external grievances on site which shall be escalated to Development Manager within 24hours for action.

The Development manager/partner shall be entirely responsible for implementing the organizations ESG requirements at subcontractor level. All contracts and appointment letters of EPC contractors, sub-contractors and professionals will require that they must comply with requirements of the IHS Kenya ESMS

Site Inspection, Investigation and Resolution

Submitted grievances shall be discussed by the Development Manager and the ESG Specialist who shall organize a site inspection undertaken by herself, Development Manager and/ or by an assigned member to check the validity and severity of the grievance. The inspection shall be undertaken within seven days (7) of receiving the grievance, and the ESG Specialist shall work with the Development Manager and other relevant heads of sections/activities from which the grievances arise, to investigate the problem and identify measures to resolve the grievance as appropriate. This could involve provision of information to clarify the situation, undertaking measures to remedy problems or compensation for any damage that has been caused either by financial compensation or compensation in-kind, and introduction of mitigation measures to prevent recurrence of the problem in the future.

Where a grievance is found to be inadmissible as per the exclusion list provided herein, i.e. Issues related to obtaining employment with the IHS Projects, grievances soliciting for bribes, politically driven demands and domestic complaints that do not relate to IHS projects, a clear documented explanation shall be provided to the complainant after investigation as to why this is the case.

Usually, many complaints can be resolved through direct and relatively straightforward action e.g. investigating alleged damage caused by a vehicle; making public information more accessible in a community.

In other cases, further assessment involving multiple stakeholders and issues, and potentially an extended process of joint fact-finding, dialogue and/or negotiation, will be necessary to resolve the complaint. In these cases, the GRM shall propose a *stakeholder assessment and engagement process* to respond to the complaints

IV. Response

A formal response detailing how the grievance will be resolved shall be provided to each complainant within 30 days where possible. Where resolution is delayed, the complainant shall be provided with regular updates on progress. The complainant has the right to reject the resolution proposed in which case the ESG Specialist shall discuss the complainant expectations and review and update the proposed resolution on the basis of these discussions.

Where need be, another round of inspection and issue-investigation shall be conducted by the ESG Specialist, Development Manager and technical committee comprising of the IHS asset manager, community liaison officer and legal aid. A formal response will be made to the complainant on the outcome.

If the dispute has not been resolved to the satisfaction of the parties after the meetings, they may by mutual agreement to select an independent mediator to facilitate the resolution of the dispute. The mediator shall not have the capacity to impose a decision on the parties, but shall play the role of facilitating communication and mutual understanding, to enable the parties to reach a mutually acceptable agreement.

For the option of independent mediation, mediators on the roster/panel should have at least the following qualifications:

- The panel shall represent the demographics of the community i.e. shall include both women and men. This shall be taken into consideration when assigning a mediator who shall have to be acceptable to both parties;
- Community representatives such as reputable village elders shall also be considered as possible mediators for external grievances;
- professional experience and expertise in impartial mediation;
- knowledge of [project type and activities in Kenya] and the region, including an understanding of indigenous and tribal culture and practices;
- [national and local language, as appropriate] proficiency;
- availability in principle for assignments of up to 20 days; and
- willingness to declare all relationships and interests that may affect their ability to act as impartial mediators in particular cases.

Where mediation fails, the grievance can be submitted for arbitration whereby both parties agree to be bound by the decision of an independent arbiter

The aggrieved party has the right to seek other remedies including judicial process while the GRM process is ongoing. However, IHS shall endeavor to handle disputes internally until the full internal dispute settlement procedure has been exhausted.

If resolution can’t be agreed, then the complainant has the right to seek other judicial or administrative remedies.

V. Monitoring and Evaluation

Two to three weeks after implementing the resolution, the ESG Specialist shall contact the complainant to ensure that the complainant is satisfied and to gather feedback on the grievance resolution process. The meeting shall be registered in the grievance log. If required, further follow up visits shall be scheduled.

Each Grievance file will contain, at a minimum:

i. the date of the request as received;

ii. the date the written acknowledgment was provided (and oral acknowledgment if also done);

iii. the dates and nature of all other communications or meetings with the Claimant and other relevant Stakeholders;

iv. any requests, offers of, or engagements of a Mediator or Facilitator;

v. the date and records related to the proposed solution/way forward;

vi. the acceptance or objections of the Claimant (or other Stakeholders);

vii. the proposed next steps if objections arose;

viii. the alternative solution if renewed dialogues were pursued;

ix. notes regarding implementation; and

x. any conclusions and recommendations arising from monitoring and follow up.

Review of the Grievance Log

It is essential that the grievances are logged and reviewed on a **quarterly** basis to determine if the same or similar grievances are being recorded in one or more locations. Multiple grievances related to the same or similar issues indicate a more systemic problem within the project/company which needs to be mitigated through the development of Company controls or measures.

Recurring grievances would require the technical/steering committee comprising of all professionals i.e. architects, engineers, Community Liaison Officer, ESG Specialist and Fund Manager to deliberate on the root cause and develop an action plan for implementation by the Development Manager which shall be discussed on a quarterly basis

IHS shall work closely with government agencies and local security agencies in the event of threats by complainants

WORKERS GRIEVANCES

This applies to both IHS Direct workers and workers engaged by third parties and shall form part of the Human Resources (HR) manual

Procedure

I. Any employee who has an individual problem or grievance shall approach the Labour manager/HR to present the matter. He / she may be accompanied by a representative or confidante who shall provide assistance. The Labour manager/HR shall discuss representations made to him together with his immediate supervisor and shall take action within **one working day.**

II. In order for a grievance to be considered formally, it should be preferably in writing by the aggrieved person. However, IHS will not only consider formally written grievances, but also listen to verbal grievances. However, both verbal and non-verbal grievances shall be acknowledged in writing and copy shared with employee

III. All grievances shall be documented for follow up on any corrective action and future reference**.**

IV. In the event of more serious grievance or if the grievance is not resolved adequately to the satisfaction of the aggrieved person, then the grievance shall be lodged to the Labor Manager in the form of a memo. The grievance and the remedy sought from the Company must be clearly stated.

V. Investigations shall be done by the Labor Manager and he/she must convene a grievance hearing within **three (3) working days** of receipt of the completed grievance Memo. The ESG Specialist shall be informed and involved with investigation relating to discrimination, violence and sexual harassment

Level one: Grievance Hearing

Parties present include the following; Aggrieved employee, employee representative (where necessary), Immediate supervisor and Labor Manager/ HR Manager.

The employee clearly states the nature of his/her complaint and the settlement desired, using the Grievance Form.

The parties present are entitled to question the employee to clarify the issue, and to obtain necessary details.

In the event that it is not possible to resolve the matter at the first meeting, the Labor Manager/ HR manager shall adjourn the meeting and seek to resolve the matter within four (4) working days of the meeting.

Note: Written records should be kept at all stages. The initial complaint should be in writing if possible, along with the response, notes of any meetings and the findings and the reasons for the findings. An employee who is subject to discipline in terms of the Disciplinary Procedures may not refer the issue to the Grievance Procedure.

Level Two: Appeal Hearing

If the grievance is not resolved within the four working (4) days contemplated above, the employee may appeal.

Notice of appeal shall be in writing and shall be accompanied by a copy of the original grievance Memo plus any response he may have received at level one. The basis of appeal must be indicated. The appeal is submitted to the Labor Offiicer/ HR Manager who will take charge to present to Top Management.

For IHS direct workers. there will be an Appeals Committee to deal with grievances consisting of ESG Specialist, ESG Specialist, Workers' Representative and Human Resources Manager.

For contractors and subcontractor workers, the Development Manager shall form part of the appeals committee. The committee shall be responsible for timely resolution of complaints and shall provide a meeting to discuss the grievance should the worker wish to attend.

An employee shall have the right to be accompanied and/or represented by a colleague or official of a trade union at that meeting if they so choose. The appeals committee shall investigate and respond to the matter within seven (7) working days of receipt of the appeal notice. Such investigation may include conducting a hearing with the relevant parties present.

The employee will be entitled to seek redress through other legitimate channels, but it is agreed that such channels may not be used simultaneously with the procedures in this Agreement. Should the HR Manager or Development Manager be the subject of the appeal, he / she will be excluded from being a member of the Appeals Committee.

Dispute Resolution (Workers Grievances)
The principles and process outlined in the Dispute Resolution Procedure included below, will guide the resolution of any such dispute.

It is accepted that the divergent interests of employer and employee will at times lead to conflict. (Applies to Union/Management interactions only)

A dispute is any serious disagreement between the parties which has not been resolved in terms of the relevant procedures set out in this Agreement.

Dispute Settlement Procedures

I. Either party may declare a dispute by notifying the other party in writing. The notice of dispute shall contain the following information, the issues or issues in dispute, the procedure the party deems to have been exhausted, the last position adopted by either side, as seen by the party declaring the dispute, any other relevant information concerning the dispute which the other party may reasonably require.

II. Whenever a dispute is declared, the parties shall meet as soon as practically possible, but in any event within ten (10) working days of the dispute having been declared. The parties may meet as often as appears necessary and constructive thereafter, pro-vided that not more than twenty (20) working days have elapsed since the date on which the dispute was declared.

III. If the dispute has not been resolved to the satisfaction of the parties after the meeting(s), they may, by mutual agreement, select a mediator to facilitate the resolution of the dispute. The mediator shall not have the capacity to impose a decision on the parties, but shall play the role of facilitating communication and mutual understanding, to enable the parties to reach a mutually acceptable agreement.

IV. No disputes shall be referred to an external third party until the full internal dispute settlement procedure has been exhausted. The parties commit themselves to every

reasonable effort to resolve disputes internally, on the basis that negotiated settlements of disputes are more constructive than the possible imposition of settlements by an external party.

V. It is agreed that each party is responsible for maintaining a written record of the dispute and the mutual attempts at resolving it, at each stage of the procedure.

VI. In the event of a trade dispute between the Company and the Union, either party may report the dispute to the Labor Commissioner by notice in writing. It is agreed that this will only be done after the internal disputes resolution procedures contained in this Agreement have been exhausted.

VII. The company and the union recognize that the economic wellbeing of both parties depends upon the maintenance of harmonious relations and industrial peace. It is therefore agreed that, in the event of any difference of opinion arising in respect of the interpretation or application of this Agreement, or in respect of any other matter which may arise, they will enter into conciliatory discussions with the object of seeking a settlement satisfactory to both. It is further agreed that, until these discussions or any channels as may be available have been exhausted neither party will resort to actions designed to bring about a stoppage of work.

VIII. If, in spite of their best endeavors, the Company and the Union fail to reach a mutually satisfactory settlement and, as a consequence, a stoppage of work is contemplated, it is agreed that, there shall be no strike or lock-outs on any matter whatsoever until this procedure has been exhausted.

IX. The following steps shall have been completed before a strike or lockout is embarked upon.

- Either party serves fourteen (14) days' notice in writing of its intention to take such action where upon both parties agree to meet within this period in an attempt to resolve the matter.
- In the event that the matter is not resolved within the above mentioned period either party at expiration of this period shall exercise its right to strike or lock-out by serving a further fourteen (14) days' notice in writing of its intention.
- The Union will restrain its members from committing act or acts likely to cause damage to any Company's property.
- No intimidation or victimization will be employed by either party.

NB: the above process is governed by Kenyan Employment Law. However, the document will be reviewed and updated whenever there are legislation changes

Time Limits

It is agreed that the time limits that apply to the grievance procedure are there in order to ensure a speedy response to complaints, and not to obstruct legitimate attempts at resolving such complaints. To that end, the parties agree that time limits may be extended

or reduced in certain circumstances by mutual agreement between the employee and the responsible manager

Support of victims of Human Rights' violations
All grievances shall be addressed in a dignified manner irrespective of an individual's gender, race, colour, religion/beliefs, political affiliations or sexual orientation.

Behaviour that constitutes discrimination, sexual harassment or bullying will not be tolerated and will lead to action being taken against any person who subjects any employee to discrimination, sexual harassment or bullying which may include summary dismissal.

IHS shall will assess and/or seek advice as to whether a specific grievance mechanism needs to be established for vulnerable groups. This may be the case if certain aspects of the general community grievance process (such as language issues or the need to file a grievance in writing) are deemed unsuitable for the community in question. Regardless of the arrangement, IHS will have to be satisfied that the grievance management system accommodates any specific requirements of the Peoples, while at the same time meeting the Fund requirements.

Medical care shall also be provided at no cost to survivors of abuse. Legal aid and psychosocial support shall be provided to victims of abuse and Gender Based Violence and Harassment

The company shall also partner with reputable human rights advocacy groups to support the survivors where such incident occur

Implementation

The current company Grievance Mechanism will be implemented following the current steps:

1. The Grievance Mechanism will be officially adopted by the Board;
2. The ESG Specialist will be tasked with supervising the implementation of the Grievance Mechanism;
3. The ESG Specialist and Human Resources Manager will be responsible for informing the management, developers and employees regarding the Grievance Mechanism.
4. The Development Manager will report monthly the status of any grievances to the Asset Manager and ESG Specialist

Fund Reporting

Quarterly ESG reports shall be provided to the investors covering grievances, project incidents and labor issues experienced within the reporting period.

Dissemination strategy

The GRM shall be advertised in IHS website

IHS Direct workers

The grievance mechanism shall form part of employee handbook and HR manual. This shall be communicated to all employees during orientation and signed off as part of employee documentation.

Workers engaged by contractors and third parties on site

The GRM shall be annexed in all contractors' agreements where the nominated representative shall be required to acknowledge by signing.

The GRM shall also be displayed in a prominent position at all construction sites and shall be communicated to all workers on site during orientation. The development manager shall require the contractor to create an awareness program covering the GRM as part of the training matrix.

Primary suppliers

The GRM shall be annexed into all suppliers' contracts where they shall be required to sign off separately.

Community & External stakeholders

The grievance mechanism will be communicated from the very beginning during the project stakeholders and public participation meetings with the affected and interested persons

The influence and importance of local leadership in the communities and communities based organizations of the project AoI is significant. They are therefore an important voice-piece for disseminating key messages. Both formal and informal channels of communication will be used to disseminate grievance mechanisms.

To facilitate communications with and between the GRM and potential Claimants, the GRM will receive support from the local government and civil society organizations

In addition, all sites shall be furnished with grievance log book where all grievance shall be recorded and escalated to the right party for action

APPENDIX

- Tenants grievance mechanism
- Whistleblower Policy
- Grievance record form

TENANT GRIEVANCE MECHANISM

WHO CAN LODGE A COMPLAINT?

Any tenant or landlord or group of tenants who resides in any properties managed by IHS.

UNFAIR PRACTICES

A practice prescribed as a practice unreasonably prejudicing the rights or interests of a tenant or a landlord.

Unfair practices may relate to:

The changing of locks	tenants committee
deposits	municipal services
damage to property	nuisances
demolitions and conversions	overcrowding and health matters
Eviction	tenant activities
forced entry and obstruction of entry	maintenance
House Rules, subject to the provisions of the Sectional Titles Act, where applicable	reconstruction or refurbishment work
intimidation	issuing spoliation and attachment orders
issuing of receipts	grant interdicts

HOW TO LODGE A COMPLAINT AND PROCESSES

- Personally, at the Property Management offices
- By mail to the Building/ Property manager responsible for that specific property,
  Contact detail of the manager are shared with tenants as when they move in.

- By phone to the Building/ Property manager responsible for that specific property

As from the date of any complaint having been lodged-with the property manager, until the property management has made a ruling on the matter, or a period of three months has elapsed:

- The landlord **MAY NOT** evict any tenant,

- The tenant **MUST CONTINUE** to pay the rental payable in respect of that dwelling as applicable prior to the complaint or if there has been a rent increase prior to such complaint.
- The landlord must affect necessary maintenance

Process

Complaints must be lodged on the complaint form prescribed by the property management office, obtainable from the property manager provisions will also be made for online access of the form.

Below are 6 steps involved in lodging a complaint

STEPS	**PROCESS**
Step 1	A complaint is registered
Step 2	Letters are issued to both parties
Step 3	Property management will conduct a preliminary investigation to

	determine whether the complaint relates to a dispute inrespect of a matter which may constitute an unfair practice
Step 4	Meeting is scheduled to try and resolve the matter, ifthere is no agreement between the parties during the meeting proceeding then the aggrieved party has the right to pursue judicial process or seek mediation
Step 5	During the arbitration, a ruling is given which is binding to both parties
Step 6	A ruling by property manager is deemed to be a legally binding and must be signed and approved by both parties

GENERAL PROVISION

A landlord may not discriminate against a tenant during the lease period or when negotiating for a lease on grounds of:

Race	Culture
Gender	Pregnancy
Sexual Orientation	Ethnic or social origin
Marital Status	Colour
Religion	Conscience
Age	Belief
Disability	Language and birth

RESPONSIBILITIES

Tenants must	**Landlords must**
1. Pay rent on time. 2. Use reasonable care and not damage property. 3. Properly dispose of garbage. 4. Refrain from taking on additional occupants or subleasing without the landlord's written permission.	1. Make property habitable beforetenants move in. 2. Effect repairs for which a landlord isresponsible for, under the lease 3. Provide all services agreed to in thelease 4. Provide written notice to tenants when ownership of the property istransferred to a new landlord. 5. Not unlawfully discriminate
A tenant shall not be evicted from thedwelling without a court order	A landlord must give a tenant at least2(two) months written notice of intention to increase rental.

Whistleblower Policy

It is the policy of IHS is to ensure maintaining compliance with applicable laws, regulations, and the established policies of the Country and Firm. In that light individuals are encouraged to bring forth issues, without fear of reprisal. There are times when maintaining such compliance involves questioning, in good faith, whether a policy, practice, or other activity might be a violation of law or policy. There also may be occasions in which a concerned person might feel it necessary, in good faith, to go beyond mere questioning and file a protest or complaint about an activity.

Individuals are encouraged to bring problems to the attention of the Firm's ESG Manager for prompt investigation and resolution. Supervised Persons may also log complaints anonymously at www.MySafeWorkplace.com or any other mode that shall be created by the company and it shall be the company's responsibility to notify all staff of the different methods of lodging a complaint or grievance. If any Supervised Person (or other person) involved in the Firm's activities (each, a "Whistleblower") believes, in good faith, that some practice or activity is being conducted in violation of law or an adviser policy or otherwise constitutes an improper financial or employment practice, that person must report the matter (a "Concern") to adviser's ESG Manager. Any Concern should describe in detail the specific facts demonstrating the basis for the complaint, report or inquiry. Concerns may be made under this policy on a confidential or anonymous basis; however, Whistleblowers must recognize that adviser may be unable to fully evaluate a vague or general Concern that is made anonymously.

All Concerns brought to the attention of adviser's ESG Manager will be investigated to determine if the allegations are true, whether the issue is material and what action(s), if any, are necessary to correct the Concern. If the identity of the Whistleblower is known, ESG Manager will acknowledge receipt of the Concern within ten business days to the Whistleblower. All Concerns will be acted upon quickly and thoroughly in order to ideally provide any reportable information to the applicable regulatory bodies within 120 days of receipt of the Concern.

If you are unsure whether a violation has occurred, you should discuss the matter with the Firm's Compliance Officer who reports to the Manager Director. Failure to report a violation could result in disciplinary action against any non-reporting Supervised Person, which may include termination of employment. IHS Management has a non-retaliation policy that applies to Supervised Persons who report such matters in good faith. More specifically, the Firm will not discharge, demote, suspend, threaten, harass or in any manner discriminate against any Supervised Person based upon the lawful and good faith actions of such Supervised Person submitting a Concern. It is, however, noted that the act of making allegations that prove to be unsubstantiated or made maliciously, recklessly, with gross negligence or foreknowledge that such allegations are false will be viewed as a serious offense and may result in discipline (including without limitation termination of employment and civil or criminal liability).

Reports of Concerns, and investigations pertaining thereto, shall be kept confidential to the extent possible. However, consistent with the need to conduct an adequate investigation, the Firm cannot guarantee complete confidentiality.

At least annually, the Compliance Officer or a delegate will review the Firm's employment and severance agreements currently in effect to ensure that the agreements do not contain any language that limits a IHS Investment Management employee's: (1) right to file a charge or complaint with a federal, state or local governmental agency or commission ("Government Agency"); (2) ability to communicate with any Government Agency or otherwise participate in any investigation or proceeding that may be conducted by any Government Agency, including providing documents or other information; or (3) limit an employee's right to receive an award for information provided to any Government Agency.

The Compliance Officer, or designee, will include training regarding this Policy in the adviser's Annual Training presentation.

Form- Grievance Record **Project Name:**

Document version: 1.0

Document date: 25th May 2021

Grievance Record		
Grievance Number	**Date submitted**	**Target Date for Resolution**
Name of Complainant (*if they wish to provide*):		
Address and contact details of Complainant:		
Grievance Received By:		
Team Member Responsible for handling the grievance:		
Description of Grievance:		

Actions to Resolve the Grievance		
Delegation to		
Action	**Who**	**When**
Response/ Resolution		
Strategy to communicate Response		
Sign Off		
Date		

Conclusion			
Is complainant satisfied?	**Yes/No**		**Comments from Community liaison Officer**
Complainant comments regarding resolution			
Grievance closed:	**Yes/No**	**Grievance resubmitted**	**Yes/No**
Signature and Role:		**Date:**	

Complainant Signature:		**Date:**	
Date		**New Grievance Number:**	

Annex 15: NEMA-Approved ESIA ToR

NATIONAL ENVIRONMENT MANAGEMENT AUTHORITY

Terms of Reference (TOR) Approval

License No.: NEMA/ENVIS/EIA/TOR/Approval_0069

Application Reference No: NEMA/ENVIS/EIA/TOR/00183

Reference No: NEMA/ENVIS/EIA/TOR/00183

The Director

Ihs (kenya) Limited

P.O. BOX 2161, 00606,Sarit Centre

Email: **BKaranja@ihsinvestments.co.ke**

RE: TERMS OF REFERENCE FOR ENVIRONMENTAL & SOCIAL IMPACT ASSESSMENT FOR ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT FOR THE PROPOSED RIRUTA KEZA IHS HOUSING DEVELOPMENT LOCATED ON DAGORETTI/RIRUTA/6004 (NAIROBI BLOCK 66/6004) ALONG NDWARU ROAD, OFF NAIVASHA ROAD IN RIRUTA, RIRUTA WARD, DAGORETTI SOUTH SUB-COUNTY, NAIROBI COUNTY

The National Environment Management Authority (NEMA) acknowledges receipt of your Terms of Reference (ToR) for the above subject.

Pursuant to the Environmental Management and Coordination Act, 1999, the Environmental (Impact Assessment and Audit) Regulations 2003 and Legal notice 31 & 32 of 2019, your terms of reference for the Environmental Impact Assessment (EIA) for the **{{Title Of Proposed Project}**}, has been **approved** with the attached conditions.

You shall submit a duly signed ESIA study report prepared by a team of experts to the Authority, accompanied by the above specialized assessment reports upon payment of the applicable EIA processing and monitoring fees, being 0.1% of the total project cost and a soft copy of the summarized ESMP in **WORD** format for preparation of public notice.

Joseph Makau

For DIRECTOR GENERAL

National Environment Management Authority

TERMS AND CONDITIONS

1. You shall undertake an inclusive and detailed stakeholders' engagement and Public Participation with the Project Affected Persons (PAPs) in full compliance with Regulation 17 of the EIA/EA Regulations 2003, with evidence of analysis and incorporation of public comments, concerns and issues in the final ESIA study Report. To ensure an inclusive public participation and engagement process, the Proponent shall submit evidence of the same in the form of:
2. A notice giving the PAPs 7 days' notice of meetings to be held, the notice(s) should include:
3. Posters posted in strategic public places in the vicinity of the site of the proposed project, informing the affected parties and communities of the proposed project.
4. A notice published on the proposed project for two successive weeks in a newspaper that has a nationwide circulation.
5. Announcement made over the radio of the notice in both official and local languages in a radio with nationwide coverage at least once a week for two consecutive weeks.
6. At least 3 meetings held with the PAPs with evidence of the 3 public consultation meetings, each with duly endorsed minutes, attendance list signed and stamped by the area local administrator, as well as photographs, written comments from the participants and duly filled and signed questionnaires, signed memoranda to be annexed to minutes as supporting documents.
7. Provide evidence of engaging a suitably qualified coordinator appointed in consultation with the Authority to receive and record both oral and written comments during public participation meetings.
8. You shall undertake a detailed baselines environmental assessment including Water quality, Soil site geotechnical analysis, Ambient air quality, Noise Level measurements and biodiversity assessment of the proposed project site area.
9. You shall identify potential Green House Gas (GHG) emission sources and the projected emission estimates and undertake a Climate Change Risk and Vulnerability Assessment to inform appropriate adaptation and mitigation measures to climate-proof the project in line with provisions of the Climate Change Act, 2016.
10. You shall ensure that the Final ESIA report is signed by all members of the multi-disciplinary team of experts.