

**ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT STUDY REPORT FOR THE  
PROPOSED MOKE GARDENS COMPREHENSIVE AFFORDABLE HOUSING DEVELOPMENT  
IN LUKENYA, MAVOKO SUB COUNTY, MACHAKOS COUNTY**



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**PREPARED BY**

**REAL PLAN CONSULTANTS LIMITED**



**June, 2021**

# DOCUMENT CONTROL

## MOKE GARDENS COMPREHENSIVE HOUSING DEVELOPMENT PROJECT

### EMPLOYER:

MOKE GARDENS LIMITED

### CONSULTANT

REAL PLAN CONSULTANTS LIMITED

### DOCUMENT TITLE:

**ENVIRONMENTAL & SOCIAL IMPACT ASSESSMENT STUDY REPORT**

## Final Report

### RECORDS FOR REVISION

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## Certificate of Declaration and Document Authentication

This document has been prepared in accordance with the Environmental Management and Coordination Act 2015 and Environmental (Impact Assessment and Audit) (amendment) Regulations, 2019.

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### DISCLAIMER:

This Environmental Impact Assessment Study Report is based on literature review and findings from field assessment. It is however, subject to conditions in the Environmental Management and Coordination Act 2015 and Environmental (Impact Assessment and Audit) Regulations 2019



**FACT SHEET**

<b>Assignment Name</b>	Environmental and Social Impact Assessment Study Report For Proposed Moke Gardens Comprehensive Housing Development into Affordable Housing Units in Lukenya, Mavoko Sub-County, Machakos County
<b>Proponent</b>	Moke Gardens Limited
<b>Land Parcels Nos.</b>	Mavoko Town Block 3/9798-10020, 10070-10075, 10077-10079
<b>Project Components</b>	<ul style="list-style-type: none"> <li>• Construction of 4000 housing units including social amenities/infrastructure to be done in phases:</li> <li>• <b>Phase II (48 No. blocks)</b> <ul style="list-style-type: none"> <li>✓ 4-bedroom Maisonnette – 20 No.</li> <li>✓ 3-bedroom units – 440 No.</li> <li>✓ 2-bedroom units – 680 No.</li> <li>✓ 1-bedroom units – 153 No.</li> <li><b>Total = 1,292 units</b></li> </ul> </li> <li>• <b>Phase III (31 No. blocks)</b> <ul style="list-style-type: none"> <li>✓ 3-bedroom units – 480 No.</li> <li>✓ 2-bedroom units – 760 No.</li> <li>✓ 1-bedroom units – 279 No.</li> <li><b>Total = 1,519 units</b></li> </ul> </li> <li>• <b>Phase IV (23 No. blocks)</b> <ul style="list-style-type: none"> <li>✓ 3-bedroom units – 400 No.</li> <li>✓ 2-bedroom units – 520 No.</li> <li>✓ 1-bedroom units – 207 No.</li> <li><b>Total = 1,127 units</b></li> </ul> </li> </ul>
<b>Project Location</b>	<ul style="list-style-type: none"> <li>• Lukenya, Mavoko Sub-County, Machakos County</li> </ul>
<b>Target Beneficiaries</b>	<ul style="list-style-type: none"> <li>• Residents within Nairobi metropolitan area particular to Nairobi City County and Machakos Town satellite towns/centres like Athi River, Mlolongo and Machakos Junction</li> </ul>
<b>Lead Expert</b>	Henry Mwau



## ABBREVIATIONS

CBD	Convention on Biological Diversity
CPP	Consultations and Public Participation
EA	Environmental Audit
EHS	Environmental Health and Safety
ESIA	Environmental and Social Impact Assessment
EMCA	Environmental Management and Coordination Act,
ESMMP	Environmental & Social Management and Monitoring Plan
GRM	Grievance Redress Mechanism
GBV	Gender Based Violence
KPLC	Kenya Power and Lighting Company
MASL	Metres Above Sea Level
NCCG	Nairobi City County Government
NEMA	National Environment Management Authority
NBSAP	National Bio-diversity Strategy and Action Plan
NEAP	National Environmental Action Plan
NWSC	Nairobi Water & Sewerage Company
PPE	Personal Protective Equipment
OHS	Occupational Health and Safety
OSHA	Occupational Safety and Health Act
TOR	Terms of Reference
WIBA	Work Injury Benefits Act



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## EXECUTIVE SUMMARY

### E.1 Project Information

Globalization, urbanization, migration and technological advancements have continued to drive cities forward right from their infant stages, the cyclic processes, growth, through to their renewal and regeneration. More and more people are moving and positioning themselves in cities for business, work, venturing forth and recreation. The demand for residential space development situation in Kenyan urban areas has remained under tremendous pressure, leading to the development of informal settlements that suffer challenges of congestion, poor sanitation and indecent housing, especially in big cities and towns like Nairobi Metropolitan area constituting of Machakos, Nairobi, Kajiado, Kiambu and Kajiado Counties .

To address the concern affordable housing shortages, MOKE Gardens Limited as a private investor has identified the opportunity and viability of constructing about Nos. 4000 (four thousand) affordable housing units in Lukenya area, Mavoko Sub-County, Machakos County.

The project is aimed to provide comprehensive, reliable, and secure residential zone with all relevant support infrastructure and social amenities. The project will definitely help in meeting the increasing demand for housing in the Nairobi metropolis area.

This project is intended to provide decent housing and associated physical and social infrastructure for the resident's within Nairobi Metropolitan Area especially in Machakos, Kajiado and Nairobi area particularly during the Covid-19 pandemic which is feared to spread rapidly as a result of poor sanitation and lack of basic social and physical infrastructure.

### E.2 Project location, Land Ownership and Size

The proposed project is located on L.R. Nos. Mavoko Town Block 3/9798-10020, 10070-10075, 10077-10079 Lukenya ward, Mavoko Sub-County, Machakos county (**Figure 2-1**). The property is registered under Harun Osoro Nyamboki of P.O Box 54867-00200 Nairobi under absolute tenure. Subdivision of the original land LR No. Mavoko Town Block 3/2410 was done on 11<sup>th</sup> November 2008. The original title was surrendered but processing of the individual titles for the new land parcels is yet to be done. The original parcel, Mavoko Town 3/2410 measured about 16.12 Ha (39.5 acres). The area under consideration measures 14 Ha (34.6 acres )which



inclusive of all the land parcels and roads. Each parcel measures 0.0405 Ha (1 acres) except for land parcels Nos 10073-10075 which are relatively bigger.

Amendment of approved amalgamation, subdivision of land parcel & change of use from maisonettes to include multi-dwelling units (apartments), shopping centre, day care centre, nursery and primary school, health centre, recreational areas and public amenities, located in Lukenya area, Mavoko SubCounty, Machakos County.is annexed (Annex 3).

The location currently has numerous existing land uses that include maisonettes, temporary road construction site, temporary workers structures, demonstration houses, boreholes, access roads and a mini-wastewater treatment plant.

### **E.3 Environmental and Social Screening and Scoping**

According to Kenya Gazete No 62 the legal notice 31 and 32 of 30<sup>th</sup> April 2019, EMCA (No 8 of 1999) (second schedule) was amended and Projects categorized as low risk, medium risk and High risk according to their potential impacts to the environment.

Screening of the proposed project was done and according to the classification described in the above legislation the proposed project is categorized under high risk projects (3) *Urban development including (g) establishment of new housing estate developments exceeding one hundred housing units”,.*

A scoping exercise was carried out to determine the range of issues to be addressed in the ESIA, the significant issues that would need detailed study and those that were not significant. Determination of the boundaries of the ESIA in terms of the geographical extent and timing was also done. The outcome of the scoping exercise was a Terms of Reference (ToR) which was prepared and submitted to NEMA in January,2021 and was approved on February 11 2021 (annex 2) thus subjecting the project to a Full Study

### **E.4 Policy, Legal and Administrative Framework**

The ESIA study preparation was guided by legal instruments to ensure that the investments conform to the sustainability requirements for projects. Policy provisions included Policy provisions will include; Environmental Management and Coordination Act, 2015, Environmental (Impact Assessment and Audit) Regulations 2003 with 2019 amendments,Water Act



2016, County Government Act no 17 of 2012, Land Laws (amendment) Act 2016, The Physical and Land Use Planning Act, 2019, Occupational Health and Safety Act 2007 (OSHA 2007), The Public Health Act (Cap. 242), Traffic Act 2012, Urban and Cities Act No 13 of 2011, The Land Registration Act, 2012, The Energy Act of 2019, The Work Injury Benefits Act 2007, The Standards Act Cap. 496, Public Roads and Roads of Access Act (Cap. 399), Civil Aviation Act No. 21 of 2013, the Employment Act No. 11, 2007

Plans that were reviewed include: No. 6 of 1999, Physical Planning Policy, Public Health Policy, National Housing Policy of Kenya (Sessional Paper No. 3 of 2004), The Kenya Vision 2030, Nairobi Metro 2030, Housing Finance Policy in Emerging Markets – The World Bank, Big 4 Agenda and Machakos County Integrated Development Plan (2018-2022) among others:

### **E.5 Overview of the Project**

The primary objective of the proposed project involves construction of approximately No. 4000 (four thousand) housing units as detailed below:

#### **Phase II will comprise the following housing typologies;**

- 20 No. 4- bedrooms Maisonnette (partially constructed).
- 11 No. 10 storey, 3 bed/ 1 bed block apartments (440 No. 3 bedroom and 99 1-bedroom units)
- 17 No. 10 storey, 2 bed/ 1 bed block apartments (680 No. 2 bedroom units and 153 1-bedroom units) (Note: The ratio of 3 bed/ 1 bed blocks to 2 bed/ 1 bed blocks is 39.29% to 60.71%.

#### **Phase III (31 No. blocks)**

Phase III will comprise the following housing typologies;

- 12 No. 19 storey 3 bed/ 1 bed block apartments (480 No. 3 bedroom units, and 108 No. 1 bedroom units)
- 19 No. 10 storey, 2 bed/ 1 bed block apartments (760 No. 2 bedroom units, and 171 No. 1 bedroom units) (Note: The ratio of the 3 bed/ 1 bed blocks to 2 bed/ 1 bed blocks is 38.71% to 61.29%).

#### **Phase IV (23 No. blocks)**





Phase four will comprise the following housing typologies;

- 10 No. 10 storey blocks of 3 bed/ 1 bed units (400 No. 3 bedroom units and 90 No. 1 bedroom units)
- 13 No. 10 storey, 2 bed/ 1 bed block apartments (520 No. 2 bedroom units, and 117 No. 1 bedroom units)

## **E.6 Anticipated Impacts**

### **E.6.1 Anticipated Positive Impacts**

- **Employment opportunities:** The project shall directly result to creation of job opportunities both during construction and operation phases of the project also through tendering for consultancy services and construction works.
- **Addressing Housing Challenge:** The Project shall lead to improved accessibility to housing requirements of Nairobi metropolitan area residents particular to Nairobi City County and Machakos Town satellite towns/centres like Athi River, Mlolongo and Machakos Junction. This is a positive contribution to the government agenda of provision of affordable housing to its population
- **Realization Nairobi Metro vision 2030:** The project is directly linked to the vision 2030 and the President's Big 4 agenda of providing for affordable housing to Kenyans. Infrastructure services within Nairobi metropolitan area particular to Nairobi City County and Machakos Town satellite towns/centres like Athi River, Mlolongo and Machakos Junction will also be enhanced.
- **Market for Construction Materials:** The Project will require materials, some of which will be sourced locally. These include, quarry masonry stones, steel, plastic pipes, valves, cement, sand and hardcore. This will provide a ready market for suppliers in and outside the Project area.
- **Economic Growth:** The project shall directly lead to improved local micro economy of the society of the residents and businessmen within the project area.
- **Individual Investment:** Economically, the project will be an investment to the proponent. The proposed project once complete can also be used as a collateral asset.



- **Increased Business Opportunities:** The large number of project staff required will provide ready market for various goods and services, leading to several business opportunities for small-scale traders such as food vendors around the construction site.
- **Optimal Use of Land:** The housing development leads to optimal use of land. Considering the scarcity of serviced land in Nairobi metropolitan area, the project enhances the returns on the limited land space in the Machakos County
- **Revenue to Government:** Value Added Tax (VAT) on construction materials/ tools to be purchased and NEMA fees among others will be sources of revenue for the government and its institutions.
- **Enhanced Security:** During the operation of the project, security will be enhanced in the premise and the units through distribution of suitable security lights and presence of a security guard. This will lead to improvement in the general security in the surrounding area.
- **Improved Infrastructure:** Project activities will lead to improvement of transport, sewerage, water supply and telecommunication networks. Such services are a prerequisite to development in any region

### E.6.2 Environmental and Social Impacts and Proposed Mitigation Measures

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

**Table E.1: Summary of Potential Negative Impacts and Mitigation**

Potential Impacts	Management Actions
Vegetation Clearing, Soil Erosion and Sedimentation	<ul style="list-style-type: none"> <li>• Adopt selective de-vegetation that aims at clearing only the project site where necessary.</li> <li>• The proponent proposes to carry out landscaping of the area.</li> <li>• Unnecessary felling of the existing trees should be avoided.</li> <li>• Once the project lifespan ends, the proponent shall replant the field with appropriate vegetative cover including indigenous trees.</li> </ul>



Potential Impacts	Management Actions
	<ul style="list-style-type: none"> <li>Planting trees, flowers and other green measures</li> </ul>
Air Quality	<ul style="list-style-type: none"> <li>Maintain construction equipment at high operational conditions maintained and serviced in accordance with the specifications such as to control emissions into the air.</li> <li>Earth moving be done under damp conditions as much as possible to prevent emission of dust into the air,</li> <li>Similarly, piled materials (sand and aggregate) should be maintained dump to prevent dust emissions,</li> <li>Use of sprinklers to regularly water construction site, this suppresses the dust menace at construction sites</li> <li>Screening of the construction site to contain and arrest construction-related dust.</li> <li>Vehicles delivering soil or dusty materials shall be covered to reduce spills and windblown dust.</li> <li>The removal of vegetation/topsoil shall be avoided until such time as clearance is required.</li> </ul>
Excessive Vibration and Noise Pollution	<ul style="list-style-type: none"> <li>Limit the times of construction to daylight hours (8am-5pm).</li> <li>Erect signage to prohibit unnecessary hooting at the project site.</li> <li>Ensure that noise &amp; excessive vibration from construction activities are within permissible levels as per the provision of Environmental Management and Coordination (Noise and Excessive Vibration Pollution) (Control) Regulations, 2009. This includes among others adhering to permissible noise and vibration levels.</li> <li>Construction work should strictly be undertaken between permissible time periods as stipulated in the second Schedule– Maximum Permissible Noise Levels for Construction Sites of</li> </ul>



Potential Impacts	Management Actions
	<p>EMCA(Noise and Excessive Vibration Pollution) (Control) Regulations, 2009.</p> <ul style="list-style-type: none"> <li>• Provide PPEs such as ear muffs to the contractors.</li> <li>• Carry out baseline noise monitoring within the area before, during and after the construction works.</li> <li>• Acquire noise and excessive vibrations emission permit from NEMA when undertaking excessive noise and vibration emitting activities</li> </ul>



Potential Impacts	Management Actions
<p>Wastes removals and disposal</p>	<ul style="list-style-type: none"> <li>• A site waste management plan should be prepared by the contractor prior to commencement of construction works. This should include designation of appropriate waste storage areas, collection and removal schedule and identification of approved disposal site;</li> <li>• The project proponent and contractor must ensure that collection bins/ receptacles are placed at strategic locations within project site as collection centres to facilitate separation and sorting of various types of wastes.</li> <li>• The waste shall be properly segregated and separated to encourage recycling of some useful waste materials i.e. some stone and concrete materials can be used as backfills.</li> <li>• Contract a licensed waste handler to collect solid wastes which cannot be reused at the site.</li> <li>• Adopt the 3R waste management approach, that is (reduce, reuse and recycle) whereby waste shall be segregated – plastics, glass, tins, papers, wood, metals etc. (later to be re-used or recycled).</li> <li>• Avail colour coded waste bins for source waste sorting at the project site.</li> <li>• Recycling non-woven fabrics and PE films into plastic particles to make some daily plastic products like plastic slippers, plastic desks and chairs</li> </ul>
<p><b>Public and Occupational Health and Safety Risks</b></p>	<ul style="list-style-type: none"> <li>• Ensure that all construction machines and equipment are in good working conditions to prevent occupational hazards during excavation activities;</li> <li>• Establish a Health and Safety Plan (HASp) for civil works areas</li> </ul>



Potential Impacts	Management Actions
	<p>ensuring the working hours are controlled and that employees are not allowed to extend the working hours beyond an acceptable limit for purposes of gaining extra pay;</p> <ul style="list-style-type: none"> <li>• Provide adequate manual labour to meet the requirements of the tasks;</li> <li>• Appoint a trained health and safety team for the duration of the construction work, monitor and advise appropriately on health and safety matters during the rehabilitation activities</li> <li>• Provide workers with gloves, ear gears, sturdy rubber boots and overalls to protect their skin from the effects of cement;</li> <li>• Provide workers training on safety procedures and emergency response such as fire and first aid measures;</li> </ul>
<p>HIV/AIDS prevalence and drug abuse</p>	<ul style="list-style-type: none"> <li>• Conduct sensitization to the staff and community on drug abuse, irresponsible sexual behaviors, HIV and AIDS, stress management, and voluntary counseling and testing.</li> <li>• Avail condom dispensers at the site to the construction staff and the latter occupants.</li> <li>• Strengthen advocacy through awareness training in HIV/AIDS and other Sexually Transmitted</li> <li>• Infections to the community members.</li> <li>• Identify other players (local CBOs, NGOs, and government organizations) on HIV/AIDS for enhanced collaboration;</li> <li>• Provide counseling and testing for HIV/AIDS.</li> <li>• Prohibit smoking within the project site</li> </ul>
<p>Spread of COVID 19</p>	<ul style="list-style-type: none"> <li>• Strict compliance to WHO and GoK guidelines curbing/prevent spread of Covid -19 that include Maintaining the social distancing</li> </ul>



Potential Impacts	Management Actions
	<p>and Personnel hygiene which include frequent washing of hands and strict wearing of masks</p> <ul style="list-style-type: none"> <li>• Provisioning of washing hand points that will have running water and detergents</li> <li>• Ensuring constant use of thermo-guns for all persons entering site to confirm no persons with temperatures above 37.5 degrees centigrade enter site</li> <li>• Provide labelled area of isolation for any affected persons</li> <li>• Allowing for immediate evacuation of any infected persons to designated hospitals</li> </ul>
<p>Surface Drainage Wastewater, and Water Pollution/ Contamination</p>	<ul style="list-style-type: none"> <li>• Ensure that hazardous materials are handled and stored in a good manner, to limit their movement into the environment.</li> <li>• Trenching during plumping works should not interfere with the existing drainage channels.</li> <li>• Ensure that open stockpiles of construction materials are covered with tarpaulin or similar fabric during rainy season.</li> <li>• Removal of soil vegetative cover should be kept at minimum and should only be carried out with absolute necessity</li> <li>• Stockpile of construction materials i.e. sand, ballast, stones etc. be placed away from drainage system.</li> <li>• Monitor the natural flow system during heavy rains and make improvements where necessary.</li> <li>• Clear any blocked drainage channels.</li> <li>• Clear all soil residues/debris after trenching works.</li> <li>• The proposed site for construction must be free from floods and</li> </ul>



Potential Impacts	Management Actions
	<p>should have adequate drainage to prevent effects of soil erosion and surface run-offs.</p> <ul style="list-style-type: none"> <li>• Provide containments to used oils and also construct a bund wall to the generator set room (if any).</li> <li>• Install grease trap or oil water separator.</li> <li>• During construction stage sanitary waste shall be managed through mobile toilets and if need be, temporary pit latrines shall be constructed connected to sewer line.</li> <li>• Establish drainage channels to ensure that surface runoff do not mix with effluent from the sanitary facilities.</li> <li>• Wastewater shall be managed through proper disposal into MAVWASCO Sewerage system</li> </ul>
<p>Water use and Increasing Demand</p>	<ul style="list-style-type: none"> <li>• During construction phase, use water economically to avoid wastage.</li> <li>• Conducting regular water system audits to identify and rectify any possible water leakages.</li> <li>• Used water can be sprinkled on the haulage road and dusty surfaces to reduce dust emissions.</li> <li>• Provide additional source of water to reduce pressure on the existing water source. E.g. through rainfall harvest.</li> <li>• Routine check-ups and monitoring of the drainage system to avoid leakages and blockages.</li> <li>• Construction of separate storm water and waste water drain.</li> <li>• Implement water saving devices in the ablution block use e.g. dual flush toilets, automatic shut-off taps, etc</li> <li>• The designs have water reservoirs for storage.</li> </ul>





Potential Impacts	Management Actions
	<ul style="list-style-type: none"> <li>• Re-use or use recycled water for dust suppression</li> <li>• Provide roof &amp; storm water harvesting facilities connected to underground water storage tanks</li> </ul>
Security and crime	<ul style="list-style-type: none"> <li>• Sensitize construction workers, locals and security to be on the lookout on suspicious activities near the site.</li> <li>• Proper design incorporating lighting to enhance security.</li> <li>• Liaise with the administration units such as the police, chiefs and District Officers to provide regular surveillance and patrols to protect workers and the neighborhood.</li> <li>• Conduct sensitization campaigns for the public on risks related to construction sites.</li> <li>• Body search workers on entry, to avoid getting weapons on site and upon leaving site, ensure nothing is stolen.</li> <li>• Ensure only authorized personnel get to the premise.</li> <li>• Ensure security alarms are installed.</li> </ul>
Traffic snarl-ups	<ul style="list-style-type: none"> <li>• Provide reflective road signs on both sides of the working area at a distance not less than</li> <li>• 50m from the works.</li> <li>• Hire traffic marshal to control movement of trucks, heavy equipment, and machineries.</li> <li>• Planned deliveries of materials.</li> <li>• Proper display of warning signs such as ‘Road works ahead’, ‘slow down’ among others.</li> <li>• Provide road diversions.</li> <li>• Acquisition of traffic disruption permits from Traffic Police Authority whenever necessary.</li> </ul>



Potential Impacts	Management Actions
	<ul style="list-style-type: none"> <li>• Expand the access road to accommodate both vehicular and non-vehicular traffic expected in the area</li> <li>• Contractor will develop and implement a traffic management plan to mitigate against possible accidents</li> <li>• Ensure road safety measures for the construction vehicles to the extent possible by observing all traffic regulations in the Traffic Act 2012</li> </ul>

### E.7 Main Findings

The Main Findings from the assessment described in the Report are as follows:

- i. The project is to be implemented on 40 located on L.R. Nos. Mavoko Town Block 3/9798-10020, 10070-10075, 10077-10079 Lukenya ward, Mavoko Sub-County, Machakos county (**Figure 2-1**).
- ii. The property is registered under Harun Osoro Nyamboki of P.O Box 54867-00200 Nairobi under absolute tenure. Subdivision of the original land LR No. Mavoko Town Block 3/2410 was done on 11<sup>th</sup> November 2008. The original title was surrendered but processing of the individual titles for the new land parcels is yet to be done.
- iii. The original parcel, Mavoko Town 3/2410 measured about 16.12 Ha (39.5 acres). The area under consideration measures 14 Ha (34.6 acres )which inclusive of all the land parcels and roads. Each parcel measures 0.0405 Ha (1 acres) except for land parcels Nos 10073-10075 which are relatively bigger
- iv. Application for amendment of approved amalgamation, subdivision of land parcel NO. MAVOKO TOWN BLOCK 3/9798-10020, 10070-10075, 10077-10079 & change of use from maisonettes to include multi-dwelling units (apartments), shopping centre, day care centre, nursery and primary school, health centre, recreational areas and public



amenities, located in Lukenya area, Mavoko SubCounty, Machakos County was done, the proposed comprehensive land use layout plan is part of the annexure (Annex 3).

- v. The location currently has numerous existing land uses that include maisonettes, temporary road construction site, temporary workers structures, demonstration houses, boreholes, access roads and a mini-wastewater treatment plant.
- vi. The site has 51 maisonettes units where twenty-five (25) are complete and the remaining (26) are incomplete. Out of the complete units fifteen (15) are occupied while four (4) are sold out but yet to be occupied. This section constitutes the project phase one. Phase 1.
- vii. There also exists a road construction site, which is temporarily rented out to a road construction contractor. The temporary structures are set for demolition once the construction is concluded.
- viii. The site also has permanent demonstration units and temporary staff structures in the section earmarked for phase 4, adjacent to the maisonettes. These structures will be demolition once phase four commences.
- ix. Two boreholes also exist on site.
- x. The largest proportion of the site under consideration is undeveloped and covered with vegetation especially sections earmarked for phase two and three.

## **E.8 Conclusions and Recommendations**

This project is feasible with a perspective of social economic evaluation, financial evaluation and environmental assessment, which has stable economic benefit and strong anti-risk capacity. The analysis of the project alternative options showed that the project is indispensable. Therefore, the project is necessary, and should be implemented as soon as possible. A comprehensive Environmental Management Plan (EMP) and Environmental Monitoring Strategy has been developed of which the proponent will implement to ensure minimal damage to the environment. There are also guidelines for addressing environmental, occupational health and safety especially during project implementation.

We therefore, recommend the project for NEMA approval because it:- a) is well within the spirit



of the National Constitution, b) will support in realization Nairobi Metro vision 2030: and the President's Big 4 agenda of providing for affordable housing to Kenyans. Infrastructure services within Nairobi metropolitan area will also be enhanced., c) will contribute towards the realization of goals for Kenya' Vision 2030 goals, and d) will not violate the strategies for the National Spatial Plan 2015-2045.

In view of the findings of the ESIA, the proposed project is considered as environmentally sound. Further, the project proponent is willing to guarantee that the potential adverse impacts whose means of mitigation have been disclosed in this report and most of them have already been incorporated in the project design will be effectively implemented. On the basis of these findings, it is recommended that the proposed Moke Gardens Comprehensive Housing Development into Affordable Housing Units in Lukenya, Mavoko Sub-County, Machakos County be approved based on the willingness by the proponent to implement the proposed project in strict adherence to the Environmental and Social Management Plan (ESMP) and Environmental Monitoring Plan. Further, NEMA should issue the proponent with an EIA license as required by Kenya's environmental laws



## CHAPTER 1 : INTRODUCTION

### 1.1. Background and Rationale for the ESIA

Globalization, urbanization, migration and technological advancements have continued to drive cities forward right from their infant stages, the cyclic processes, growth, through to their renewal and regeneration. More and more people are moving and positioning themselves in cities for business, work, venturing forth and recreation.

The need for affordable has continued to soar considering the current economic downturn which has seen increased unemployment and the subsequent drop in disposable incomes. Additionally, the government's Affordable Housing initiative continues to lag behind expectations despite the growing housing deficit in Kenya which is estimated at 2.0 mn units

The demand for residential space development situation in Kenyan urban areas has remained under tremendous pressure, leading to the development of informal settlements that suffer challenges of congestion, poor sanitation and indecent housing, especially in the Nairobi Metropolitan area.

According to the 2019 census data, Kenya currently has a population of 47.6 mn persons, growing at 2.2% p.a. which is 1.0% higher than the global average. Additionally, Kenya's urban population continues to grow rapidly accounting for 31.1% of the total population and estimated to grow by 4.3% p.a. according to the World Bank. This demographic trend is expected to continue supporting housing demand in urban areas, exacerbating the current housing deficit estimated at 2.0 mn units

To address the concern affordable housing shortages, MOKE Gardens Limited as a private investor has identified the opportunity and viability of constructing about Nos. 4000 (four thousand) affordable housing units in Lukenya area, Mavoko Sub-County, Machakos County.

Moke Gardens is a Strategic Partner on the Affordable Housing Program, an initiative of the Government of Kenya to develop 500,000 affordable housing units

The project is aimed to provide comprehensive, reliable, and secure residential zone with all relevant support infrastructure and social amenities. The project will definitely help in meeting the increasing demand for housing in Nairobi metropolitan area particular to Nairobi City



County and Machakos Town satellite towns/centres like Athi River, Mlolongo and Machakos Junction.

This project is intended to provide decent housing and associated physical and social infrastructure for the residents in the Nairobi metropolis area particular to Nairobi City County and Machakos Town satellite towns/centres like Athi River, Mlolongo and Machakos Junction especially during the Covid-19 pandemic which was feared may spread rapidly as a result of poor sanitation and lack of basic social and physical infrastructure.

## **1.2. Scope of the Project**

The scope of the works for the project is as follows:

### **Phase II will comprise the following housing typologies;**

- 20 No. 4- bedrooms Maisonnette (partially constructed).
- 11 No. 10 storey, 3 bed/ 1 bed block apartments (440 No. 3 bedroom and 99 1-bedroom units)
- 17 No. 10 storey, 2 bed/ 1 bed block apartments (680 No. 2 bedroom units and 153 1-bedroom units) (Note: The ratio of 3 bed/ 1 bed blocks to 2 bed/ 1 bed blocks is 39.29% to 60.71%.

### **Phase III (31 No. blocks)**

Phase III will comprise the following housing typologies;

- 12 No. 19 storey 3 bed/ 1 bed block apartments (480 No. 3 bedroom units, and 108 No. 1 bedroom units)
- 19 No. 10 storey, 2 bed/ 1 bed block apartments (760 No. 2 bedroom units, and 171 No. 1 bedroom units) (Note: The ratio of the 3 bed/ 1 bed blocks to 2 bed/ 1 bed blocks is 38.71% to 61.29%).

### **Phase IV (23 No. blocks)**

Phase four will comprise the following housing typologies;

- 10 No. 10 storey blocks of 3 bed/ 1 bed units (400 No. 3 bedroom units and 90 No. 1 bedroom units)



- 13 No. 10 storey, 2 bed/ 1 bed block apartments (520 No. 2 bedroom units, and 117 No. 1 bedroom units)

### 1.3. Project justification and Benefits

The specific Project objective is providing a comprehensive, reliable, and secure residential zone with all relevant support infrastructure and social amenities. The project will definitely help in meeting the increasing demand for housing in the Nairobi metropolis area particular to Nairobi City County and Machakos Town satellite towns/centres like Athi River, Mlolongo and Machakos Junction as envisaged in the Government’s Housing Pillar under the “Big 4” agenda .Below is a summary of anticipated project benefits.

- **Addressing Housing Challenge:** The Project shall lead to improved accessibility to housing requirements of residents of highly populated area of Nairobi and Machakos counties. This would go a long way in helping to reduce congestion in light of the outbreak of covid-19 disease. This is also a positive contribution to the government agenda of provision of affordable housing to the population.
- **Realization Nairobi Metro vision 2030:** The project is directly linked to the vision 2030 of providing for affordable housing to residents of Nairobi City County and Machakos Town satellite towns/centres like Athi River, Mlolongo and Machakos Junction
- **Employment opportunities:** The project shall directly result to creation of job opportunities both during construction and operation phases of the project also through tendering for professional consultancy services and construction works.
- **Economic Growth:** The project shall directly lead to improved local micro economy of the society of the area within Nairobi City County and Machakos Town satellite towns/centres like Athi River, Mlolongo and Machakos Junction

### 1.4. Objectives of the project

The motivation for establishment of the project is the need to ensure affordable units in the Nairobi metropolis area particular to residents of Nairobi City County and Machakos Town satellite towns/centres like Athi River, Mlolongo and Machakos Junction. This would go a long



way in helping to reduce congestion in light of the outbreak of covid-19 disease. The conceived project is designed to be within character of the current housing trend of the project area, where a survey revealed that flats and affordable units are common within the industrial commercial premises.

### **1.5. Need for the project**

This project is intended to provide decent housing and associated physical and social infrastructure for the Nairobi City County and Machakos Town satellite towns/centres like Athi River, Mlolongo and Machakos Junction residents especially during the Covid-19 pandemic period which is feared may spread rapidly as a result of poor sanitation and lack of basic social and physical infrastructure.

### **1.6. Terms of Reference (TOR)**

The TORs for this study are the production of an ESIA study report to address the effects and impacts (Positive and Negative) of the proposed Moke Gardens Comprehensive Housing Development into Affordable Housing Units in Lukenya, Mavoko Sub-County, Machakos County. The ESIA Lead Expert (practicing license Annex 1) is under instructions from the project proponent to do a thorough environmental and social assessment with the aim of getting the approval from the National Environment Management Authority before commencement of the project. ToRs in this project sought to:

- i. To review existing legal and institutional framework related to the proposed affordable units project development and propose ways of ensuring compliance
- ii. To collect and collate baseline information relevant to the proposed development
- iii. To collect primary data through the community participatory process and site visits
- iv. To identify and assess positive and negative impacts of the proposed project
- v. To identify and analyze alternative options for the proposed project
- vi. To develop mitigation measures and cost estimates for the negative impacts of the project





- vii. To design an Environmental and Social Management and Monitoring Plan (including cost estimates) and a monitoring framework for the environmental and social impacts of the project.

### **1.7. ESIA Approach and Methodology**

The systematic investigative and reporting methodology specified for conducting Project Report Studies (Legal Notice 31 and 32 of EMCA) 1999 and was adopted in this Study.

This report also seeks to ensure that all the potential environmental and social impacts are identified and that workable mitigation measures are adopted. The report also seeks to ensure compliance with the provision of Environmental (Impact Assessment and Audit) Regulations 2003 with 2019 amendments as well as other regulations. The report emphasizes the duties of the proponent and the Contractor during the construction phase as well as that of the proponent during the operation phase of this project.

Specific tasks undertaken during the assessment include:

#### **1.7.1. Environmental Screening**

Environmental screening was carried out to determine whether an ESIA study is necessary for this project and at what level of evaluation. This took into consideration the requirements of the Environmental Management and Coordination Act (EMCA), 2015, and specifically the second schedule of the same Act. According to the site visits undertaken and classification described in the above legislation the proposed project is categorized under high risk projects (3) *urban development including (g) establishment of new housing estate developments exceeding one hundred housing units*

#### **1.7.2. Environmental Scoping**

A scoping exercise was carried out to determine the range of issues to be addressed in the ESIA, the significant issues that would need detailed study and those that were not significant. Determination of the boundaries of the ESIA in terms of the geographical extent and timing was also done. The outcome of the scoping exercise was a Terms of Reference (ToR) which was prepared and submitted to NEMA on January, 2021 and was approved on February 11 2021



(annex 2) thus subjecting the project to a Full Study

### **1.7.3. Desktop study**

This involved review of project documents, architectural drawings, site layouts, and relevant policy, legal and institutional frameworks. Documents containing climatic, demographic and hydrological data for Athi River and County were also relied upon.

### **1.7.4. Site Visits and Public Participation.**

Field visits were meant for physical inspections of the project site in order to gather information on the state of environment. Several photos of the project site were taken for inclusion in this report (Sample Photos - Annex 4). The study also sought public opinion/views through Consultation and Public Participation (CPP) exercises.

CPP involved holding a comprehensive meeting with the members of the public in May 2021 in collaboration with the area chiefs (Minute and attendance sheet –Annex 5). In addition structured questionnaires were administered to the key stakeholders and members of the public especially those neighbouring the proposed site in April 2021 (Annex 7). Details of the outcome of consultation are discussed in chapter 6 of this report. Representations from all the neighbourhoods attended the meeting.

### **1.7.5. Collection of baseline and data analysis**

The task involved identification, collection and analysis of environmental baseline data, identification of impacts; analyses and evaluation of impacts; formulation of mitigation measures for significant negative impacts; development and analysis of project alternatives, and development of environmental/social management and monitoring plans.

### **1.7.6. Identification, Prediction and Determination of Environmental Impacts**

A systematic approach was used to rank identified impacts according to their significance determined by consideration of project activity **event magnitude** and **receptor sensitivity**. The expected significance of environmental impacts was assessed considering:



- **Extent:** An area of influence covered by the impact. In this sense, if the action produces a much-localized effect within the space, it is considered that the impact is low (1). If, however, the effect does not support a precise location within the project environment, having a pervasive influence beyond the project footprint, the impact will be at location level (3) or could be County (5)
- **Timing:** Refers to the moment of occurrence, the time lag between the onset of action and effect on the appearance of the corresponding factor. We consider five categories according to this time period is zero, up to 1 year (short term), or more than two years, which are called respectively medium term (3), long-term (4), and permanent (5).
- **Intensity:** refers to the degree of impact on the factor, in the specific area in which it operates, ranked from low (1) to high (5).
- **Probability:** Refers to the likelihood of the impact occurring during the project implementation, this is also ranked as Probable (1) to highly probable.

**Receptor Sensitivity** determined by:

- **Presence** – whether biological species present are unique, threatened, protected or not vulnerable and are present during a period of high sensitivity (e.g. breeding, spawning or nesting). For human receptors, whether they are permanently present to uncommon in the area of impact and for physical features whether those present are highly valued or of limited or no value. For physical receptors/features, whether they are national or international value (e.g. state protected monument), local or regional value and is sensitive to disturbance or none of the above; and
- **Resilience** – how vulnerable people and/or species and/or features are to the change or disturbance associated with the environmental interaction with reference to existing baseline conditions and trends (such as trends in ecological abundance/diversity/status, ambient air quality etc.) and their capacity to absorb or adapt to the change. For physical receptors/features, highly vulnerable, undergoes moderate but sustainable change which stabilizes under constant presence of impact source or unaffected or marginally affected.



### **1.7.7. Reporting**

In the entire exercise, the proponent and ESIA expert contacted each other on the progress of the study and signing of various documents. The proponent will have to submit 10 copies of this report, a summary of environmental and social management plan alongside a CD to the National Environment Management Authority for review and issuance of an ESIA license. All the materials and workmanship used in the execution of the work shall be of the best quality and description. Any material condemned by the architect shall be removed from the site at the Contractor's cost. Environmental and social concerns will be part of the planning and development process and not an afterthought. It is expected that the works will continue without any conflicts and there will be implementation of the Environmental and Social Management and Monitoring Plan (ESMMP).



## CHAPTER 2 : PROJECT DESCRIPTION

### 2.1 Project location

The proposed project is located on L.R. Nos. Mavoko Town Block 3/9798-10020, 10070-10075, 10077-10079 Lukenya ward, Mavoko Sub-County, Machakos county (**Figure 2-1**). The property is registered under Harun Osoro Nyamboki of P.O Box 54867-00200 Nairobi under absolute tenure. Subdivision of the original land LR No. Mavoko Town Block 3/2410 was done on 11<sup>th</sup> November 2008. The original title was surrendered but processing of the individual titles for the new land parcels is yet to be done. The original parcel, Mavoko Town 3/2410 measured about 16.12 Ha (39.5 acres). The area under consideration measures 14 Ha (34.6 acres )which inclusive of all the land parcels and roads. Each parcel measures 0.0405 Ha (1 acres) except for land parcels Nos 10073-10075 which are relatively bigger

Amendment of approved amalgamation, subdivision of land parcel & change of use from maisonettes to include multi-dwelling units (apartments), shopping centre, day care centre, nursery and primary school, health centre, recreational areas and public amenities, located in Lukenya area, Mavoko SubCounty, Machakos County.is part of annexures in this report (Annex 3).

The location currently has numerous existing land uses that include maisonettes, temporary road construction site, temporary workers structures, demonstration houses, boreholes, access roads and a mini-wastewater treatment plant.

The site has 51 maisonettes units where twenty-five (25) are complete and the remaining (26) are incomplete. Out of the complete units fifteen (15) are occupied while four (4) are sold out but yet to be occupied. This section constitutes the project phase one. Phase 1.

There also exists a road construction site, which is temporarily rented out to a road construction contractor. The temporary structures are set for demolition once the construction is concluded.

The site also has permanent demonstration units and temporary staff structures in the section earmarked for phase 4, adjacent to the maisonettes. These structures will be demolition once phase four commences. Two boreholes also exist on site. The largest proportion of the site under consideration is undeveloped and covered with vegetation especially sections earmarked

for phase two and three.

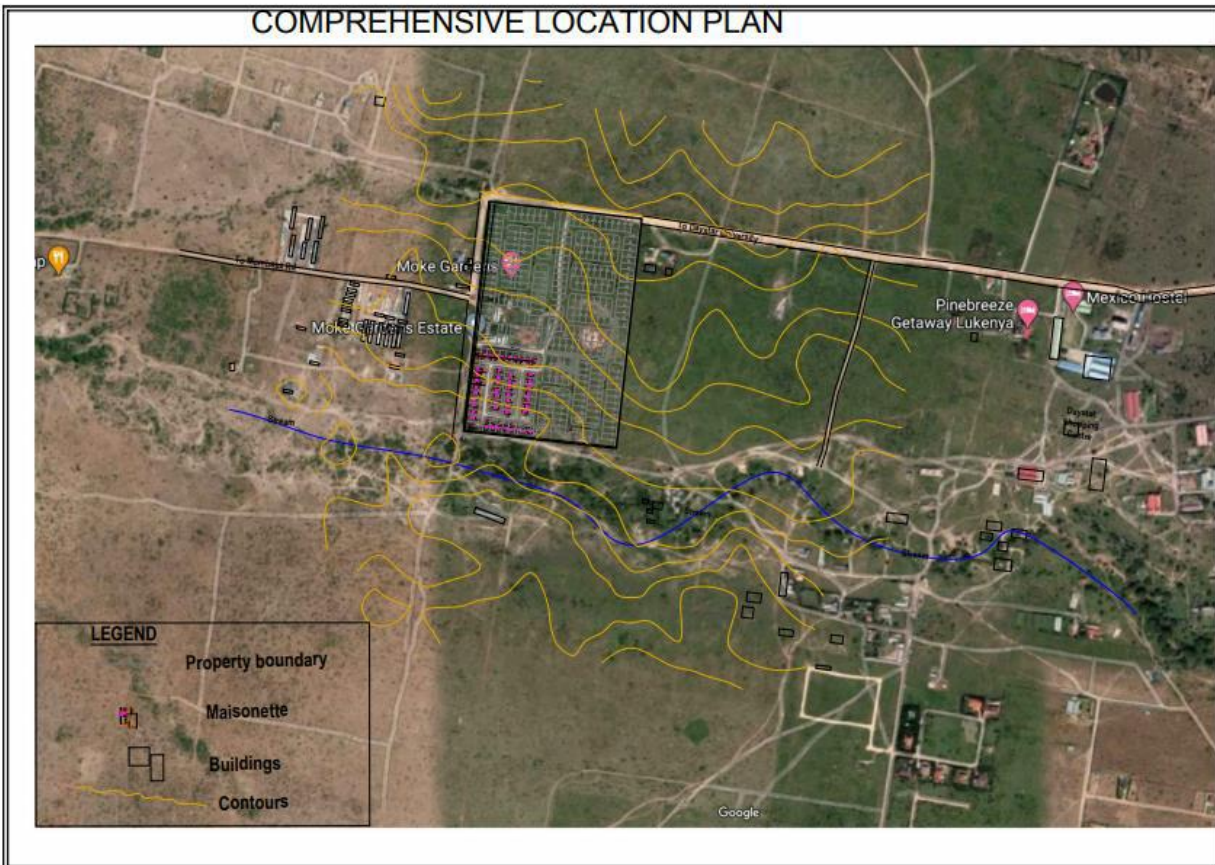


Figure 2-1: Location plan of the proposed land for development

## 2.2 The Project Description and Layout Plan

The project will essentially involve the construction of approximately No. 4000 (four thousand) housing units. The affordable /commercial typologies and percentage distribution for phase I, II and III are as shown in **Table 2-1** and

**Table 2-2** below respectively. The development drawings were submitted to and approved by the county Government of Machakos and are attached to this report (Annex 8). A notification of approved of development permission by the Machakos county Physical and Land Planning Department is also annexed to this report (annex 9).

Table 2-1: Affordable/ Commercial House Typologies forPhase II, III & IV

	Phase II	Phase III	Phase IV
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Typologie	Affordable		Commercial		Affordable		Commercial		Affordable		Commercial	
	Blocks	Units	Blocks	Units	Blocks	Units	Blocks	Units	Blocks	Units	Blocks	Units
<b>3-bed</b>	3	120	8	320	4	160	8	320	4	160	6	240
<b>2-bed</b>	15	600	2	80	17	680	2	80	11	440	2	80
<b>1-bed</b>	--	162	--	90	--	189	--	90	--	135	--	72
<b>Total</b>	18	882	10	490	21	1,029	10	490	15	735	8	392
		64%		36%		68%		32%		65%		35%

**Table 2-2 Percentage distribution of Affordable to Commercial – Phase II, III & IV**

Phase		Affordable		Commercial
	No. of Units	Percentage (%)	No. of Units	Percentage (%)
<b>Phase II</b>	882	64%	490	36%
<b>Phase III</b>	1,029	68%	490	32%
<b>Phase IV</b>	735	65%	392	35%
<b>Total</b>	<b>2,646</b>	<b>65.7%</b>	<b>1,372</b>	<b>34.3%</b>

#### Distribution Formula

The formula applied to achieve the above distribution for 3 bed/ 1 bed blocks and 2 bed/ 1 bed blocks is as follows;

- 3 bed/ 1 bed blocks (33 No. blocks) – 40% [broken down as follows; 25% commercial and 15% affordable].
- 2 bed/ 1 bed blocks (49 No. blocks) – 60% [broken down as follows; 5% commercial and 55% affordable].

The following conditions shall apply to the development;

- That the proponent provides adequate measures against environmental degradation.
- That the proponent is bound by any other conditions that may be imposed by the county government in its by-laws.
- The proponent shall adhere to the drawing specification as approved
- The proponent shall adhere to the all condition included in the approval letter

The scope of the works for the project is as follows:

#### **2.2.1 Phase 1(Bedroom Maisonette;)**

- 9 No. Maisonettes from phase I are complete and ready for sale on commercial basis.

- 20 No. Maisonettes, constructed partially, to be complete and offered for sale on commercial

### **2.2.2 Phase II (48 No. blocks)**

**Phase II will comprise the following housing typologies;**

- 20 No. 4- bedrooms Maisonette (partially constructed).
- 11 No. 10 storey, 3 bed/ 1 bed block apartments (440 No. 3 bedroom and 99 1-bedroom units)
- 17 No. 10 storey, 2 bed/ 1 bed block apartments (680 No. 2 bedroom units and 153 1-bedroom units) (Note: The ratio of 3 bed/ 1 bed blocks to 2 bed/ 1 bed blocks is 39.29% to 60.71%.

The breakdown of the units is as follows;

- 4-bedroom Maisonette – 20 No.
- 3–bedroom units – 440 No.
- 2–bedroom units – 680 No.
- 1–bedroom units – 153 No.

**Total = 1,292 units**

Distribution of units/ blocks between commercial and affordable

- ✓ 4-bedroom Maisonette – 20 No. all on commercial basis
- ✓ 3–bedroom units – 8 blocks (320 units); commercial 3 blocks (120 units); affordable
- ✓ 2–bedroom units – 2 blocks (80 units); commercial-15 blocks (600 units); affordable
- ✓ 1–bedroom units – all 1-bedroom units in the blocks for commercial will be delivered on commercial basis. The same will apply for affordable housing. Hence, 90 1-bedroom units will be delivered on commercial basis and 162 units delivered on affordable basis.

### **2.2.3 Phase III (31 No. blocks)**

Phase III will comprise the following housing typologies;

- 12 No. 19 storey 3 bed/ 1 bed block apartments (480 No. 3 bedroom units, and 108 No.



1 bedroom units)

- 19 No. 10 storey, 2 bed/ 1 bed block apartments (760 No. 2 bedroom units, and 171 No. 1 bedroom units) (Note: The ratio of the 3 bed/ 1 bed blocks to 2 bed/ 1 bed blocks is 38.71% to 61.29%).

The breakdown of the units is as follows;

- 3–bedroom units – 480 No.
- 2–bedroom units – 760 No.
- 1–bedroom units – 279 No.

**Total = 1,519 units**

Distribution of units/ blocks between commercial and affordable is as follows;

- ✓ 3–bedroom units – 5 blocks (200 units); commercial 3 blocks (120 units); affordable
- ✓ 2–bedroom units – 3 blocks (120 units); commercial 20 blocks (800 units); affordable
- ✓ 1–bedroom units – all 1-bedroom units in the blocks for commercial will be delivered on commercial basis and those in affordable blocks on affordable basis. Hence, 72 1-bedroom units will be delivered on commercial basis and 207 units delivered on affordable basis.

#### **2.2.4 Phase IV (23 No. blocks)**

Phase four will comprise the following housing typologies;

- 10 No. 10 storey blocks of 3 bed/ 1 bed units (400 No. 3 bedroom units and 90 No. 1 bedroom units)
- 13 No. 10 storey, 2 bed/ 1 bed block apartments (520 No. 2 bedroom units, and 117 No. 1 bedroom units)

The breakdown of the units is as follows;

- 3–bedroom units – 400 No.
- 2–bedroom units – 520 No.
- 1–bedroom units – 207 No.

**Total = 1,127 units**

Distribution of units/ blocks between commercial and affordable is as follows;

- ✓ 3-bedroom units – 6 blocks (240 units); commercial – 4 blocks (160 units); affordable
- ✓ 2-bedroom units – 2 blocks (80 units); commercial – 11 blocks (440 units); affordable
- ✓ 1-bedroom units – all 1-bedroom units in the blocks for commercial will be delivered on commercial basis and those in affordable blocks on affordable basis. Hence, 72 1-bedroom units will be delivered on commercial basis and 135 units delivered on affordable basis.

## **2.3 Infrastructure**

The development will have a comprehensive and robust infrastructure including :complete boundary wall with electric fence plus 24hr guarding services, ample parking,two lifts per block, fresh water from two boreholes and mains, grid and Solar Power, shopping Centre, playing area, primary school, day care centre, medical centre, landscaped gardens, security CCTV,provision for Internet and waste disposal mechanisms. There will also be sewerage disposal system that will be connected to the adjacent public sewer system.

### **2.3.1 Electrical system**

There will be connection to the existing electricity main line of the Kenya Power company, which will be used in all phases of the project.In additional solar panels will be installed The necessary guidelines and precautionary measures relating to the use of electricity shall be adhered to.

### **2.3.2 Water Reticulation system**

Water from existing 2No Moke borehole will be used during construction and operation phases. The government is in the process of linking water mains to Moke Gardens More over there will be water storage tanks to increase water supply to various components of the affordable units.

### **2.3.3 Sewerage**

The government is in the process of connectin Moke Garden to the existing sewer network .The

land under consideration also lies along a conventional sewer system that is 90% complete. The sewer-line run along the 12m and 18m roads. Although the system is not in use yet, the developer intends to connect the proposed development once the sewer is operational. The proponent will also apply for the expansion of the sewer line if need be.

#### **2.3.4 Solid Waste**

Solid waste management facilities will consist of dustbins stored in the affordable units protected from rain, rodents and any animals. The solid wastes from each block will be assembled in the garbage collection point ready for disposal by a NEMA licensed waste disposal company. The waste will then be collected by a NEMA licensed private waste management company contracted by the County Government and be composited, palletized or re-cycled depending on the waste management strategy to be adopted in line with the Environmental Management and Co-ordination (Waste Management) Regulations, 2006. Short of this, the wastes will be taken to a registered disposal site.

#### **2.3.5 Surface water disposal**

The developer intends to provide adequate waste management system where artificial infrastructure will be integrated with the natural system.

#### **2.3.6 Security**

There will be the main manned entrance for ease of security operations. Around the affordable units' compound will be a boundary wall that will be erected. The project will also be connected with security alarms, CCTV cameras, entry control, and quick response systems to enhance security.

#### **2.3.7 Fire safety**

The development will provide for firefighting facilities such as fire extinguishers in the form of hydrants.

#### **2.3.8 Parking area**

The drive way and parking area, which will be paved, will be spacious and will be provided.

### **2.3.9 Landscaping**

The site will be landscaped after construction, using plant species available locally. This will include establishment of theme gardens and lush grass lawns to improve the visual quality of the site where pavements will not have taken space.

### **2.3.10 Buildings Construction**

The technology used in the design and construction of the affordable units will be based on international standards, which have been customized by various housing units in Kenya. The project will consist of affordable units with associated facilities, parking and infrastructure .

The buildings will be constructed as per the approved respective Structural Engineer's detail. Basically, the building structures will consist of concrete appropriately reinforced with metal (steel and iron). The roof will consist of structural timber and steel members and roofing tiles. The buildings will be provided with a well-designed concrete staircase for every unit.

The buildings will be provided with facilities for drainage of storm water from the roof through peripheral drainage systems into the drainage channels provided and out into the natural drainage channel/system. Drainage pipes will be of the PVC type and will be laid under the buildings and the driveway encased in concrete. This is industrial area and is busy with commercial buildings and has various public drainage channels. However, it is recommended that the roof water is harvested and stored in tanks for use.

The floors will be finished in ceramics tiles. Good quality wardrobes and kitchen cabinets will be provided.

The buildings will have adequate natural ventilation through provision of permanent vents in all habitable rooms, adequate natural and artificial light, piped water stored in above ground water tanks and firefighting facilities.

## **2.4 Description of the Project's Construction Activities**

The construction activities shall involve four phases namely pre construction, construction, operational and decommissioning

## **2.5 Pre-construction Investigations**

The implementation of the project's design and construction phase will start with thorough investigation of the site's biological and physical resources in order to minimize any unforeseen adverse impacts during the project cycle.

### **2.5.1 Sourcing and Transportation of Building Materials**

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

### **2.5.2 Clearance of Vegetation**

The site has some grass vegetation cover growing in it and a few mature trees that include acacia trees. The proponent shall ensure as many trees as possible are conserved and tree planting is done after project completion.

### **2.5.3 Storage of Materials**

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

## **2.6 - Description of the Project's Construction Activities**

### **2.6.1 Excavation and Foundation Works**

The site visits to the site have revealed that the area has a layer of black cotton soil in most of the sections. However, this shall be excavated and disposed off in approved sites (preferably exhausted quarries).

### **2.6.2 Masonry, Concrete Work and Related Activities**

The construction of the building walls, foundations, floors, pavements, drainage systems, perimeter fence and parking area among other components of the project will involve a lot of masonry work and related activities. General masonry and related activities will include stone shaping, concrete mixing, plastering, slab construction, construction of foundations, and erection of building walls and curing of fresh concrete elements. These activities are known to be labour intensive and will be supplemented by machinery such as concrete mixers. It is also proposed that local labour is engaged mainly targeting the youth and taking cognizance of gender parity where appropriate.

### **2.6.3 Structural Steel Works**

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

### **2.6.4 Roofing and Sheet Metal Works**

Roofing activities will include sheet metal cutting, raising the roofing materials such as clay roofing tiles and structural timber to the roof and fastening the roofing materials to the roof.

### **2.6.5 Electrical Work**

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

### **2.6.6 Plumbing**

Installation of pipe-work for water supply and distribution will be carried out within the entire blocks. In addition, pipe-work will be done to connect sewage from the premises to the main sewers which are in the process of being connected by Government of Kenya (GoK)

### **2.6.7 Landscaping**

To improve the aesthetic value or visual quality of the site once construction ceases, the proponent will carry out landscaping. This will include establishment of a theme garden and

lush grass lawns where applicable and will involve replenishment of the topsoil. It is noteworthy that the proponent will use plant species that are available locally preferably indigenous ones for landscaping.

## **2.7 Description of the Project's Operational Activities**

### **2.7.1 Residence**

A total of 4,000 affordable units are planned in the long term meaning about such number of families will be accommodated in the long-term. Several domestic activities such as cooking, washing, use of vehicles, and leisure and recreational activities will thus accompany residence. In addition, there will be production of domestic and sanitary wastes, both solid and liquid.

### **2.7.2 Solid Waste**

The proponent will provide facilities for handling solid waste generated within the facility. These will include dust bins/skips for temporarily holding waste within the premises before final disposal at the designated dumping site. The solid wastes from each block will be assembled in the garbage collection point ready for disposal by a NEMA licensed waste disposal company. Private waste disposal companies that are approved by NEMA and County Government will be responsible for solid waste disposal.

### **2.7.3 Waste Water and Storm Water Management**

The Government is in the process of connecting Moke gardens to main sewer where sewage generated from each unit will be discharged to. Storm water will be properly channeled to the existing drainage in the area.

As much as possible, it is recommended that roof water harvesting is facilitated.

### **2.7.4 Cleaning**

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

### **2.7.5 General Repairs and Maintenance**

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

### **2.8 Description of the Project's Decommissioning Activities**

Decommissioning is an important phase in the project cycle and comes last to wind up the operational activities of a particular project. It refers to the final disposal of the project and associated materials at the expiry of the project lifespan.

This phase will entail winding up the project at the end of life within the project life cycle. This will pave way for a different development as guided by the needs in the future. The proponent at that time will prepare a decommissioning plan that comprises of social and environmental safeguards.

#### **2.8.1 Dismantling of Equipment and Fixtures**

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

#### **2.8.2 Site Restoration**

Once all the waste resulting from demolition and dismantling works is removed from the site, the site will be restored through replenishment of the topsoil and re-vegetation using trees and grass plants species.

#### **2.8.3 Building Materials and Energy Used**

Several building materials will be required for construction of the units and associated facilities. These will include sand, ballast, hard core, timber, cement, clay tiles, metal sheets, electrical



gadgets, and steel, plumbing materials, glass and paints among others. Most of these materials will be obtained locally within Nairobi Metropolitan area. The main sources of energy that will be required for construction of the project will include mains electricity and fossil fuels (especially diesel). Electricity will be used for welding, metal cutting/grinding and provision of light. Diesel will run material transport vehicles and building equipment/machinery such as bulldozers and concrete mixers. The proponent intends to promote efficient use of building materials and energy through proper planning to reduce economic and environmental costs of construction activities.

#### **2.8.4 Solid Waste Generated**

Large amounts of solid waste will be generated during construction of the project. These will include metal cuttings, rejected materials, surplus materials, surplus oil, excavated materials, paper bags, empty cartons, empty paint and solvent containers, broken glass among others. The proponent will take steps to minimize the generation of such waste and to ensure proper disposal procedures.

A lot of domestic waste such as waste from foodstuffs, empty plastic containers, cartons, etc. will be generated during the operational phase of the project. The proponent will be responsible for waste management within the Housing Project and will put in place measures such as provision of waste handling facilities and ensuring prompt and regular waste disposal. On decommissioning, large quantities of solid waste will be generated from demolition works and equipment dismantling. The proponent will provide measures for recycling, reuse or disposal of such wastes.

## **CHAPTER 3 : POLICY, LEGAL AND LEGISLATIVE FRAMEWORK**

### **3.1 Introduction**

Environmental and Social Impact Assessment is an instrument for environmental management and development control. It is now accepted that development projects must be economically viable, socially acceptable and environmentally sound. It is a condition of the Kenya Government for developers to conduct Environmental and Social Impact Assessment (ESIA) on the development Projects.

According to Sections 58 and 138 of the Environmental Management and Coordination Act (EMCA) No. 8 of 2015 and Section 3 of the Environmental (Impact Assessment and Audit) Regulations 2019 (Legal Notice No.31), Urban developments including establishment of new housing estate developments exceeding one hundred housing units are categorized a high risk project and require an Environmental and Social Impact Assessment study report prepared and submitted to the National Environment Management Authority (NEMA) for review and eventual licensing before the development commences. This was necessary as many forms of developmental activities cause damage to the environment and hence the greatest challenge today is to maintain sustainable development without interfering with the environment.

### **3.2 Environmental policy**

This ESIA study has been prepared to fully comply with environmental and social safeguard policies and procedures as per various Regulations by National Environment Management Authority, in Kenya.

### **3.3 Relevant Kenya Policies**

The policies that are relevant to the proposed project include the following:

#### **3.3.1 Policy Paper on Environmental and Development (Sessional Paper No. 6 of 1999)**

This policy was formulated on the basis of the National Environment Action Plan (NEAP) process of 1994. The policy's major objective is to harmonize environmental and developmental concerns to ensure sustainability. Furthermore, this policy ensures that environmental issues are taken into consideration before the commencement of development

policies, programmes, plans and projects. The proposed project is therefore consistent with the Sessional Paper No. 6 of 1999.

### **3.3.2 Physical Planning Policy**

The current policy governs the development and approval of all building plans as provided for in the Physical Planning Act (Cap 286). The proposed project will be subjected to the provisions of this policy and legislation

### **3.3.3 Public Health Policy**

The prevailing public health policy calls upon the project proponent to ensure that buildings are adequately provided with utilities so that they are fit for human habitation. The proposed development has been designed by professional engineers and architects and as such will have all amenities/utilities that are essential for safeguarding public health for all people using the facilities.

### **3.3.4 National Housing Policy of Kenya (Sessional Paper No. 3 of 2004)**

The housing policy was mainly intended to facilitate increased investment by the formal and informal private sector, in the production of housing for low and middle-income urban dwellers. The overall goal of this Housing Policy is to facilitate the provision of adequate shelter and a healthy living environment at an affordable cost to all socio-economic groups in Kenya in order to foster sustainable human settlements. This is meant to minimize the number of citizens living in shelters that are below the habitable living conditions. The proposed project will ensure to comply with the provisions of the above policy.

### **3.3.5 The Kenya Vision 2030**

Kenya Vision 2030 is based on three "pillars": Economic, Social, and Political. The 2030 goal for urban areas, to reach "a well-housed population living in an environmentally- secure urban environment in particular, will be achieved by bringing basic infrastructure and services namely roads, street lights, water and sanitation facilities, storm water drains, footpaths, and others. It is also important the promotion of: environmental conservation and pollution and waste management, through the application of the right economic incentives in

development initiatives.

Moreover, Environment's cleanliness and security is ensured via protection and conservation of sensitive areas such wetlands and wildlife corridors and migratory routes which can be done by conducting project's Environmental and Social Impact Assessments and developing of comprehensive mapping of land use patterns in Kenya.

### **3.3.6 Nairobi Metro 2030**

Nairobi Metro 2030 was developed in the year 2008 to provide a guide for the NMR play its role in the National growth strategies under the Kenya Vision 2030. It is a transitional document that brings into focus challenges faced under urban growth and development. The document provides forum to achieve sustained rates of economic growth necessary for successful economic and social development. The Metro 2030 provides links with the Central Government through Kenya Vision 2030 and other development plans as well as seeking to strengthen the Local Authorities as part of the devolvement of power and recognizing need for ensuring efficient and effective management of resources at the grassroots.

Nairobi Metro 2030 carries the vision for Nairobi Metropolitan Region to be a World Class African Metropolis supportive to the overall national agenda under the Kenya Vision 2030. The agenda to achieve this vision is the need to enhance mechanisms for economic growth, employment creation, improved lifestyles and improved infrastructure. Therefore, the proposed project contributes to the Nairobi Metro 2030 by providing development that will contribute to the collective growth within the metropolitan.

### **3.3.7 Housing Finance Policy in Emerging Markets – The World Bank**

In 1993, the World Bank published an influential report on housing policy, "Housing: Enabling Markets to Work." This report documented the importance of housing in the economy while at the same time providing governments with guidelines on how best to design policy to create efficient housing markets. A section of that report already focused on housing finance and its importance in the effective operation of housing markets.

Although the importance of the housing sector in social and economic development is widely accepted, the role of housing finance has gained prominence in the last decade. This shift has

mirrored the rise in importance accorded to the development of the financial sector. The 2002 World Bank Development report emphasized the importance of growing the financial sector as part of a development strategy. Housing finance is often seen as critical both to the housing sector and to the development of the financial sector (banks, nonbanking financial institutions, and bond markets).

### **3.3.8 Big 4 Agenda**

The Big 4 agenda forms part of the current government's development manifesto, which is, aimed at refocusing development and resources on key priority areas across the country for the period between 2018 and 2022. The agenda anchored on four major areas focuses on affordable housing, creation of employment through manufacturing, enhancing food security and universal healthcare.

On housing, the government seeks to achieve at least 500,000 affordable homes in all major cities by 2022. As evident on the letter reference, no MTIHUD/HUD/8/11/2VOL.1/52 dated 26<sup>th</sup> November 2019 the developer is a **Strategic Partner on Affordable Housing Program**. This project is intended to provide opportunities for increased affordable housing, thereby contributing to the achievement of government housing agenda within the in the Big 4 Plan. This is by constructing about **4,131 housing units**.

Besides the project aims at providing a medical centre, educational and shopping facilities and other employment areas thus further contributing to the big four agenda.

As a Strategic Partner on Affordable Housing Program the National Government has committed to facilitating the following

- Completion of bridge across Stoni Athi River in Mavoko Sub-County along Athi River – Kinanie Road through the enables of Affordable Housing Program;
- Completion of trunk sewer line in Lukenya;
- Tax rebates/incentives;
- Upload of the project onto Boma Yangu Portal; and
- Strategic Partners Certificate on Affordable Housing Program

### **3.3.9 Machakos County Integrated Development Plan (2018-2022)**

An integrated development plan offers guidance in all aspects of growth of the County. The CIDP has earmarked Kinanie area to receive several infrastructural projects. These projects are all aimed towards improving the quality of life in the area. These projects include development of roads, provision of social services and improvement of services through repair of patrol vehicles in the location. Hence, the project is located in a suitable location.

### **3.4 Institutional arrangements**

Environmental Impact Assessment (EIA) is a methodology used to identify the actual and probable impacts of the projects and programmes on the environment and to recommend alternatives and mitigating measures. The assessment is required at all stages of project development with a view to ensuring environmentally sustainable development for both existing and proposed public and private sector development ventures. The National EIA regulations were issued in accordance with the provisions of Environmental Management and Coordination Act (EMCA) of 1999. The EIA Regulations must be administered, taking into cognizance provisions of EMCA 1999 and other relevant national laws. The intention is to approve and license only those projects that take into consideration all aspects of concern to the public as they impact on health and the quality of the environment.

### **3.5 Institutional Framework**

At present there are over twenty (20) institutions and departments which deal with environmental issues in Kenya. Some of the key institutions include the National Environmental Council (NEC), National Environmental Management Authority (NEMA), the Forestry Department, Kenya Wildlife Services (KWS), Water Resources Management Authority (WRMA) and others. There are also local and international NGOs involved in environmental issues in the country.

#### **3.5.1 National Environmental Management Authority (NEMA)**

The objective and purpose for which NEMA is established is to exercise general supervision and co-ordinate over all matters relating to the environment and to be the principal instrument of

the government in the implementation of all policies relating to the environment. A Director-General appointed by the president heads NEMA. The Authority shall:

- Co-ordinate the various environmental management activities being undertaken by the lead agencies and promote the integration of environmental considerations into development policies, plan, programmes and projects with a view to ensuring the proper management and rational utilization of the environmental resources on a sustainable yield basis for the improvement of the quality of human life in Kenya.
- Take stock of the natural resources in Kenya and their utilization's and consultation, with the relevant lead agencies, land use guidelines.
- Examine land use patterns to determine their impact on the quality and quantity of the natural resources.
- Carry out surveys, which will assist in the proper management and conservation of the environment.
- Advise the government on legislative and other measures for the management of the environment or the implementation of relevant international conservation treaties and agreements in the field of environment as the case may be.
- Advise the government on regional and international environmental convention treaties and agreements to which Kenya should be a party and follow up the implementation of such agreements where Kenya is a party.
- Undertake and co-ordinate research, investigation and surveys in the field of environment and collect and disseminate information about the findings of such research, investigation or survey.
- Mobilize and monitor the use of financial and human resources for environmental management.
- Identify projects and programmes or types of projects and programmes, plans and policies for which environmental audit or environmental monitoring must be conducted under EMCA.
- Initiate and evolve procedures and safeguards for the prevention of accidents, which may cause environmental degradation and evolve remedial measures where

accidents occur.

- Monitor and assess activities, including activities being carried out by relevant lead agencies in order to ensure that the environment is not degraded by such activities, environmental management objectives are adhered to and adequate early warning on impending environmental emergencies is given.
- Undertake, in co-operation with relevant lead agencies programmes intended to enhance environmental education and public awareness about the need for sound environmental management as well as for enlisting public support and encouraging the effort made by other entities in that regard.
- Publish and disseminate manuals, codes or guidelines relating to environmental management and prevention or abatement of environmental degradation.
- Render advice and technical support, where possible to entities engaged in natural resources management and environmental protection so as to enable them to carry out their responsibilities satisfactorily.
- Prepare and issue an annual report on the state of the environment in Kenya and in this regard may direct any lead agency to prepare and submit to it a report on the state of the sector of the environment under the administration of that lead agency and,
- Perform such other functions as government may assign to the Authority or as are incidental or conducive to the exercise by the authority of any or all of the functions provided under EMCA.

However, NEMA mandate is designated to the following committees:

### **3.5.2 Public Complaints Committee**

The Committee performs the following functions:

- Investigate any allegations or complaints against any person or against the authority in relation to the condition of the environment in Kenya and on its own motion, any suspected case of environmental degradation and to make a report of its findings together with its recommendations thereon to the Council.



- Prepare and submit to the Council periodic reports of its activities which shall form part of the annual report on the state of the environment under section 9 (3) and
- To perform such other functions and exercise such powers as may be assigned to it by the council.

### **3.5.3 National Environment Action Plan Committee**

This Committee is responsible for the development of a 5-year Environment Action plan among other things. The National Environment Action Plan shall:

- Contain analysis of the Natural Resources of Kenya with an indication as to any pattern of change in their distribution and quantity over time.
- Contain analytical profile of the various uses and value of the natural resources incorporating considerations of intergenerational and intra-generational equity.
- Recommend appropriate legal and fiscal incentives that may be used to encourage the business community to incorporate environmental requirements into their planning and operational processes.
- Recommend methods for building national awareness through environmental education on the importance of sustainable use of the environment and natural resources for national development.
- Set out operational guidelines for the planning and management of the environment and natural resources.
- Identify actual or likely problems as may affect the natural resources and the broader environment context in which they exist.
- Identify and appraise trends in the development of urban and rural settlements, their impact on the environment, and strategies for the amelioration of their negative impacts.
- Propose guidelines for the integration of standards of environmental protection into development planning and management.
- Identify and recommend policy and legislative approaches for preventing, controlling or mitigating specific as well as general diverse impacts on the environment.

- Prioritize areas of environmental research and outline methods of using such research findings.
- Without prejudice to the foregoing, be reviewed and modified from time to time to incorporate emerging knowledge and realities and;
- Be binding on all persons and all government departments, agencies, States
- Corporation or other organ of government upon adoption by the national assembly

#### **3.5.4 Standards and Enforcement Review Committee**

This is a technical Committee responsible for environmental standards formulation methods of analysis, inspection, monitoring and technical advice on necessary mitigation measures.

Standards and Enforcement Review Committee consists of the members set out in the third schedule to the Environmental Management and Co-ordination Act. The Permanent Secretary under the Minister is the Chairman of the Standard and Enforcement Review Committee. The Director General appoints a Director of the Authority to be a member of the Standards and Enforcement Review Committee who is the Secretary to the committee and who provides secretarial services to the Committee. The Committee also regulates its own procedure. The Standard and Enforcement Review Committee may co-opt any person to attend its meetings and a person so co-opted shall participate at the deliberations of the committee but shall have no vote. Finally, the Committee shall meet at least once every three months for the transactions of its business.

#### **3.5.5 National Environmental Tribunal (NET)**

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

#### **3.5.6 National Environmental Council (NEC)**

EMCA 1999 No. 8 Part III section 4 outlines the establishment of the National Environment Council (NEC). NEC is responsible for policy formulation and directions for purposes of EMCA; set national goals and objectives and determines policies and priorities for the protection of the

environment and promote co-operation among public departments, local authorities, private sector, non-governmental organizations and such other organizations engaged in environmental protection programmes. It also performs such other functions as assigned under EMCA.

### **3.5.7 National Environmental Action Plan (NEAP)**

The NEAP for Kenya was prepared in mid 1990s. It was a deliberate policy effort to integrate environmental considerations into the country's economic and social development. The integration process was to be achieved through a multi-sectoral approach to develop a comprehensive framework to ensure that environmental management and the conservation of natural resources are an integral part of societal decision-making.

### **3.5.8 The National Poverty Eradication Plan (NPEP).**

The objective NPEP is to alleviate poverty in rural and urban areas by 50 percent by the year 2015; as well as the capabilities of the poor and vulnerable groups to earn income. It also aims to narrow gender and geographical disparities and a healthy, better educated and more productive population. This plan has been prepared in line with the goals and commitments of the World Summit for the Sustainable Development (WSSD) of 1995. Since poor housing is among the indicators of poor societies, pursuits to address it build individuals capacity to relieve poverty.

## **3.6 Legal Framework**

There are several legal provisions on environmental protection, which touch on and regulate the development of infrastructure like the one under this proposal. A summary of the various legislations relevant to the development is given hereunder. The following pieces of legislation and regulations are applicable to the proposed development.

### **3.6.1 The Environmental Management and Coordination Act, 2015**

The Act (amended 2015) defines the legal and administrative co-ordination of the diverse sectoral initiatives in the field of environment. The Act harmonizes the sector specific legislations touching on the environment in a manner designed to ensure greater protection

of the environment. Its functions include:-

- The coordination of various environmental management activities;
- Initiation of legislative proposals;
- Research, investigations, and surveys on the field of environment.
- Creation of environmental education and awareness programmes;
- Advise the government on regional and international agreements to which Kenya is party;
- Executing the Environmental Impact Assessment (EIA) under the Environmental (Impact Assessment and Audit) Regulations 2019 among other duties

### **3.6.2 The Environmental Assessment and Audit) Regulations 2019**

Environmental Impact Assessment under the Act is guided by Environmental (Impact Assessment and Audit) Regulations 2019, which is given under legal notice no. 101. The regulations stipulate the ways in which environment impact assessment and audits should be conducted. The project falls under the second schedule of EMCA, 2015 section 58 (1), (4) that require an Environmental Impact Assessment project report. As stipulated by the legal notice No. 101, 2003, PART V, Section 31 (3) (a) (i) and (ii) it is required that an environmental assessment be undertaken to provide baseline upon which subsequent environmental control audit shall be based. The EIA expert has compiled the report as per the format and contents in the regulations.

### **3.6.3 Environmental Management and Coordination (Water Quality regulations), 2006**

These regulations provide for the protection of lakes, rivers, streams, springs, wells and other water sources used for domestic, industrial, agricultural, recreational and any other purpose. Different standards apply to different mode of usage. The objective of the regulations is to protect human health and the environment. The effective enforcement of the water quality regulations will lead to a marked reduction of water-borne diseases and hence a reduction in the health budget.

The regulations also provide guidelines and standards for the discharge of poisons, toxins,

noxious, radioactive waste or other pollutants into the aquatic environment in line with the Third Schedule of the regulations. The regulations have standards for discharge of effluent into the sewer and aquatic environment. While it is the responsibility of the sewerage service providers to regulate discharges into sewer lines based on the given specifications, NEMA regulates discharge of all effluent into the aquatic environment. The regulations provide for the creation of a buffer zone for irrigation schemes of at least fifty (50) metres in width between the irrigation scheme and the natural water body. Standards for irrigation water are given in schedule nine of the regulations.

Everyone is required to refrain from any actions, which directly or indirectly cause water pollution, whether or not the water resource was polluted before the enactment of the Environmental Management and Coordination Act (EMCA) Gazetted in 1999. The proposed project will ensure, through the EMP, that appropriate measures are taken to prevent pollution of underground and surface water sources are implemented throughout the project cycle.

#### **3.6.4 Environmental Management and Coordination (Waste Management Regulations), 2006**

The Minister for Environment and Natural Resources gazetted these regulations in 2006. These Regulations may be cited as the Environmental Management and Co-ordination (Waste Management) Regulations, 2006. Waste Management Regulations are meant to streamline the handling, transportation and disposal of various types of waste. The aim of the Waste Management Regulations is to protect human health and the environment. Currently, different types of waste are dumped haphazardly posing serious environmental and health concerns. The regulations place emphasis on waste minimization, cleaner production segregation of waste at source and proper disposal measures are undertaken throughout the project cycle. The provisions in PART IV (24) and PART II (9), the wastes are to be handled, stored and transported by a licensed individual authorized by NEMA and delivered into a designated storage plant or site. The proponent for the project will segregate waste at source and ensure only licensed handlers are allowed to collect and dump in a designated landfill.

### **3.6.5 Environmental Management and Coordination Controlled Substances Regulations, 2007 (Legal Notice No. 73 of 2007)**

The Controlled Substances Regulations defines controlled substances and provides guidance on how to handle them. This regulation mandates NEMA to monitor the activities of persons handling controlled substances, in consultation with relevant line ministries and departments, to ensure compliance with the set requirements. Under these regulations, NEMA will be publishing a list of controlled substances and the quantities of all controlled substances imported or exported within a particular. The list will also indicate all persons holding licenses to import or export controlled substances, with their annual permitted allocations.

The regulations stipulate that controlled substances must be clearly labelled with among other words, “Controlled Substance-Not ozone friendly”) to indicate that the substance or product is harmful to the ozone layer. Advertisement of such substances must carry the words, “Warning: Contains chemical materials or substances that deplete or have the potential to deplete the ozone layer.”

Producers and/or importers of controlled substances are required to include a material safety data sheet. Persons are prohibited from storing, distributing, transporting or otherwise handling a controlled substance unless the controlled substance is accompanied by a material safety data sheet. Manufacturers, exporters or importers of controlled substances must be licensed by NEMA. Further, any person wishing to dispose of a controlled substance must be authorized by NEMA. The licensee should ensure that the controlled substance is disposed of in an environmentally sound manner. These regulations also apply to any person transporting such controlled substances through Kenya. Such a person is required to obtain a Prior Informed Consent (PIC) permit from NEMA. The project will ensure that it minimizes or reduces the use of controlled substances. Where needed, the proponent will ensure that required safe working procedures and permits are in place.

### **3.6.6 Environmental Management and Coordination (Conservation of Biodiversity regulations), 2006**

Kenya has a large diversity of ecological zones and habitats including lowland and mountain

forests, wooded and open grasslands, semi-arid scrubland, dry woodlands, and inland aquatic, and coastal and marine ecosystems. In addition, a total of 467 lake and wetland habitats are estimated to cover 2.5% of the territory. In order to preserve the country's wildlife, about 8% of Kenya's land area is currently under protection.

The country has established numerous goals, as well as general and specific objectives that relate to these issues, among others: environmental policies and legislations; involvement of communities; documentation of national biological resources; sustainable management and conservation of biodiversity; fair and equitable sharing of benefits; technical and scientific cooperation; biodiversity assessment; dissemination of information; institutional and community capacity building; and integration of biodiversity concerns into development planning. The proposed project will ensure compliance with the above regulation throughout the project cycle.

### **3.6.7 Environmental Management and Coordination (Noise and Excessive Vibration Pollution Control) Regulations, 2009**

These Regulations determine that no person or activity shall make or cause to be made any loud, unreasonable, unnecessary or unusual noise that annoys, disturbs, injures or endangers the comfort, repose, health or safety of others and the environment. In determining whether noise is loud, unreasonable, unnecessary or unusual, the following factors may be considered:

- Time of the day;
- Proximity to residential area;
- Whether the noise is recurrent, intermittent or constant;
- The level and intensity of the noise;
- Whether the noise has been enhanced in level or range by any type of electronic or mechanical means; and,
- Whether the noise is subject to be controlled without unreasonable effort or expense to the person making the noise.

These regulations also relate noise to its vibration effects and seek to ensure no harmful vibrations are caused by controlling the level of noise. Any person(s) intending to undertake activities in which noise is suspected to be injurious or endangers the comfort, repose, health or

safety of others and the environment, must make an application to NEMA and acquire a license subject to payment of requisite fees and meeting the license conditions.

The regulation clearly states that no persons shall carry out activities such as fireworks and demolitions without a valid permit issued by the authority (Part IV- 19).

The provision of this Act will be applied in the management of the project with a strict adherence to the provisions of the above regulations.

### **3.6.8 Air Quality Regulations, 2014**

The objective of this regulation is to provide for prevention, control and abatement of air pollution to ensure clean and healthy ambient air. It provides for the establishment of emission standards for various sources, including as mobile sources (e.g. motor vehicles) and stationary sources (e.g. industries) as outlined in the Environmental Management and Coordination Act, 1999 (2015 amendment). It also covers any other air pollution source as may be determined by the Minister in consultation with the Authority. Emission limits for various areas and facilities have been set. The regulations provide the procedure for designating controlled areas, and the objectives of air quality management plans for these areas. The following operations (provided they are not used for disposal of refuse), are exempt from these regulations:

- Back-burning to control or suppress wildfires;
- Firefighting rehearsals or drills conducted by the Fire Service Agencies
- Traditional and cultural burning of savannah grasslands;
- Burning for purposes of public health protection;

The proponent shall observe these requirements and implement mitigation measures proposed in the ESMMP in an effort to comply with the provisions of these regulations.

### **3.6.9 The Traffic Act, 2012**

The Traffic Act gives provisions and guidelines that govern the Kenya roads transport sector. These guidelines are essential to private, public and commercial service vehicles in ensuring safety and sanity on the roads hence ensuring the environment; the human being a component is safeguarded. In section 41 The Act demands for installation and certification of speed



governors for the commercial vehicles ferrying goods adjusted to the loading condition of such vehicles to a limit of 80 KPH, registration and competence of drivers.

Moreover, the owner of commercial vehicles or trailer shall ensure clear markings on their vehicles in English language on the right side of the vehicle showing ownership details, tare weight of vehicle and maximum authorized weight.

Section 26 and 27 of the same discourages engines that emit exhaust gases to the atmosphere without passing via a silencer or expansion chamber

In ensuring safety of all the persons in transit section 56 encourages that every public and commercial vehicle be fitted with inspected and first class first aid box and fire extinguisher. The proponent has already conducted a traffic impact assessment to inform the project on the best measures to avoid congestion on the roads.

### **3.6.10 Public Health Act (Cap. 242)**

Part IX, section 115, of the Act states that no person/institution shall cause nuisance or condition liable to be injurious or dangerous to human health. Section 116 requires that Local Authorities take all lawful, necessary and reasonably practicable measures to maintain their jurisdiction clean and sanitary to prevent occurrence of nuisance or condition liable to be injurious or dangerous to human health. Such nuisance or conditions are defined under section 118 as waste pipes, sewers, drainers or refuse pits in such state, situated or constructed as in the opinion of the medical officer of health to be offensive or injurious to health. The proposed project will adhere to the provisions provided in this Act.

The Act provides guideline to the contractor on how he shall manage all wastes (Liquid and Solid Wastes) emanating from the project in a way not to cause nuisance to the neighbours, this Act during construction shall be read alongside the waste management regulations of EMCA 1999 for utmost compliance.

### **3.6.11 Urban and Cities Act No 13 of 2011**

The Act came into function with regard to Article 184 of the Constitution providing regulations on the classification, governance and management of urban areas and cities and further providing the criteria of establishing urban areas.

Part III of the Act gives the regulations and functions of every city or municipality with regard to integrated development plans, which shall include but not limited to environmental plans and disaster preparedness, within the area of jurisdiction in achieving objects of devolved governments under section 174 of the constitution while maintaining the socio-economic rights of the people.

Moreover, in the first schedule, the Act enlists the services the services that the any municipality shall provide to its residents which include but not limited to traffic control and parking, water and sanitation, refuse collection, solid waste management, pollution abatement services among others.

The proposed project is within the Machakos County CIDP.

### **3.6.12 The Land Laws (Amendment) Act, 2016**

This is an ACT of Parliament to give effect to Article 68 of the Constitution, to revise, consolidate and rationalize land laws; to provide for the sustainable administration and management of land and land based resources, and for connected purposes. This amendment provides for procedures on evictions from land, and for connected purposes.

The Land Act of 2012 subsection (1) states that ‘any land may be converted from one category to another in accordance with the provisions of this Act or any other written law.’ it continues to state in subsection (2) that Without prejudice to the generality of subsection (1)

- a) Public land may be converted to private land by alienation
- b) Subject to public needs or in the interest of defense, public safety, public order, public morality, public health, or land use planning, public land may be converted to community land
- c) private land may be converted to public land by
  - i Compulsory acquisition;
  - ii Reversion of leasehold interest to Government after the expiry of a lease; and
  - iii Transfers; or
  - iv Surrender.
- d) Community land may be converted to either private or public land in accordance

with the law relating to community land enacted pursuant to Article 63(5) of the Constitution. It is important to note that any substantial transaction involving the conversion of public land to private land shall require approval by the National Assembly or county assembly as the case may be. Part I of the same Act states that title to land may be acquired through—

- a) allocation;
- b) land adjudication process;
- c) compulsory acquisition;
- d) prescription;
- e) settlement programs;
- f) transmissions;
- g) transfers;
- h) long term leases exceeding twenty-one years created out of private land;

Section 152 C of 2012 on eviction from a public land will require affected persons to be notified in writing, by notice in the gazette and in at least 2 newspapers nationwide and circulation by radio announcement in local language at least 3 months before eviction. In the amended Land Law Act of 2016, evictions or demolitions must be carried out in a manner that respects dignity, right to life and security for those evicted. The proposed project will ensure compliance with the provisions of this Act.

### **3.6.13 The Land Registration Act, 2012**

The Land Registration Act is in place to revise, consolidate and rationalize the registration of titles to land, to give effect to the principles and objects of devolved government in land registration, and for connected purposes. This Act applies to Subject to section 4, this Act shall apply to:

- Registration of interests in all public land as declared by Article 62 of the Constitution;
- Registration of interests in all private land as declared by Article 64 of the Constitution; and
- Registration and recording of community interests in land.

Section 24 states that: (a) the registration of a person as the proprietor of land shall vest in that person the absolute ownership of that land together with all rights and privileges belonging or appurtenant thereto; and (b) the registration of a person as the proprietor of a lease shall vest in that person the leasehold interest described in the lease, together with all implied and expressed rights and privileges belonging or appurtenant thereto and subject to all implied or expressed agreements, liabilities or incidents of the lease.

The proponent will ensure his/her compliance with the provisions of this Act.

#### **3.6.14 The National Land Commission Act, 2012 (No. 5 of 2012)**

Section 5 of the Act outlines the Functions of the Commission, pursuant to Article 67(2) of the Constitution as follows 5(1):-

- To manage public land on behalf of the national and county governments;
- To recommend a national land policy to the national government;
- To advise the national government on a comprehensive programme for the registration of title in land throughout Kenya;
- To monitor and have oversight responsibilities over land use planning throughout the country.

The proponent will ensure his/her compliance with the provisions of this Act.

#### **3.6.15 Water Act, 2016**

The Water Act, 2016 provides the legal framework for the management, conservation, use and control of water resources and for the acquisition and regulation of right to use water in Kenya. It also provides for the regulation and management of water supply and sewerage services. In general, the Act gives provisions regarding ownership of water, institutional framework, national water resources, management strategy, and requirement for permits, state schemes and community projects Part II. Part IV of the Act entitles every persons to a right to clean and safe water.

This Act shall be relevant during construction of the project whereby the proponent will be required to comply with the effluent discharge requirements during construction of the project which will require that the contractor obtain relevant permits from County

Government

### **3.6.16 The Energy Act of 2019**

The Act establishes that any persons planning, building, operating or maintains a transmission or distribution system must seek authorization to carry out electrical works, certificate of electrical works issued/prescribed and licenses granted by the Authority.

The proponent shall ensure that the electricians are qualified including other requirements during construction. The finished units will have each a solar water heating system so as to ensure harnessing of clean green energy

### **3.6.17 The Occupational Safety and Health Act (OSHA), 2007**

Before any premises are occupied, or used a certificate of registration must be obtained from the chief inspector. The occupier must keep a general register. The Act covers provisions for health, safety and welfare. This Act applies to all workplaces where any person is at work, whether temporarily or permanently. The purpose of this Act is to secure the safety, health and welfare of persons at work, and protect persons other than persons at work against risks to safety and health arising out of, or in connection with, the Activities of persons at work. Some of the areas addressed here are machinery safety, chemical safety and health, safety and welfare special provisions are also provided in the ILO conventions on safety and health in construction recommendation, 1988 R175. All premises must acquire/obtain a certificate of registration before occupying or putting it into use.

The Act provides OHS guidelines which shall be followed by both the contractor and the proponent during implementation of the project in order to avoid injuries and even loss of life to workers and neighboring residents.

### **3.6.18 The Standards Act Cap. 496**

The Act is meant to promote the standardization of the specification of commodities, and to provide for the standardization of commodities and codes of practice; to establish a Kenya Bureau of Standards, to define its functions and provide for its management and control. Code of practice is interpreted in the Act as a set of rules relating to the methods to be applied or the

procedure to be adopted in connection with the construction, installation, testing, sampling, operation or use of any article, apparatus, instrument, device or process.

The proponent shall ensure to source materials that are regulated and bear the KEBS standardization mark to ensure safety and quality of products.

### **3.6.19 Public Roads and Roads of Access Act (Cap. 399)**

Sections 8 and 9 of the Act provides for the dedication, conservation or alignment of public travel lines including construction of access roads adjacent to lands from the nearest part of a public road.

Sections 10 and 11 allows for notices to be served on the adjacent land owners seeking permission to construct the respective roads.

The proponent shall issue notices to land owners adjacent to the project area before construction works begin and shall inform the relevant bodies on the intended modifications of the roads near the proposed project.

### **3.6.20 Physical and Land Use Planning Act (2019)**

An Act of Parliament to provide for the preparation and implementation of physical development plans and for connected purposes enacted by the Parliament of Kenya Under this Act, no person shall carry out development within the area of a local authority without a development permission granted by the local authority under section 33. The local authority concerned shall require the developer to restore the land on which such development has taken place to its original condition within a period of not more than ninety days. If on the expiry of the ninety days' notice given to the developer such restoration has not been effected the concerned local authority shall restore the site to its original condition and recover the cost incurred thereto from the developer.

Thus the Act directs, regulates and harmonizes development and use of land over the Country, the design of the houses has allowed space to be used as playground for children as a communal club house for social amenities

### **3.6.21 Employment Act Cap 226 of 2007**

The Act (Revised Edition 2012) is enacted to consolidate the law relating to trade unions and

trade disputes, to provide for the registration, regulation, management and democratization of trade unions and employers organizations and federations. Its purpose is to promote sound labour relations through freedom of association, the encouragement of effective collective bargaining and promotion of orderly and expeditious dispute the protection and promotion of settlement conducive to social justice and economic development for connected purposes. This Act is important since it provides for employer – employee relationship that is important for the activities that would promote management of the environment within the energy sector. The proponent will ensure that the contractor prepares a Labour management plan to guide on his engagement with workers and among workers during the construction period.

### **3.6.22 The County Government Act 2012**

The County Government act was formed after promulgation of the new constitution of Kenya (2010). The constitution calls for devolution of duties in the counties for effective results. These county governments may manage and let land besides regulating and licensing trade activities including construction in their areas of jurisdiction besides provision and maintenance of roads, footways, street lighting and sewerage in their areas.

Section 160 of the act empowers counties to establish and maintain sanitary services for the removal and destruction of, or otherwise deal with all kinds of refuse and effluent and where such service is established, compel its use by persons to whom the service is available.

Similarly, section 163 (e) empowers the local Authorities to prohibit businesses which by reason of smoke, fumes, chemicals, gases, dust, smell, noise, vibration or other cause, may be or become a source of danger, discomfort or annoyance to the neighborhood, and to prescribe conditions subject to which such business shall be carried on. It is in this vein that section 165 mandates the County to grant or to renew business licenses or to refuse the same.

In order to discharge its duties effectively, section 170 of the act allows the right of access to private property at all times by local authorities, its officers and servants for purposes of inspection, maintenance and alteration or repairs of sewers. According to section 173, any person who, without prior consent in writing from the County, erects a building on; excavate or opens-up; or injures or destroys a sewer, drains or pipes shall be guilty of an offence. Any demolitions and repairs thereof shall be carried out at the expense of the offender. The Act, by

virtue of section 176 also empowers the local authority to regulate sewerage and drainage, fix charges for use of sewers and drains and ensure that connecting premises meets the related costs.

### **3.6.23 Work Injury Benefits Act, 2007**

This is an Act of Parliament to provide for compensation to employees for work related injuries and diseases contracted in the course of their employment and for connected purposes. An employee is a person who has been employed for wages or a salary under a contract and includes apprentice or indentured learner. The proponent will ensure that all workers during construction period are insured. All reportable accidents and all fatalities will be reported to DOSHS and those affected will be extended medical aid and assisted during recovery to normal health.

### **3.6.24 HIV/AIDS Prevention and control Act (Act No. 14 of 2006)**

Part 11, Section 7 of the Act requires that HIV and AIDs education be carried out at the workplace. The government is expected to ensure the provision of basic information and instruction on HIV and Aids prevention and control to: -

- Employees of all government ministries, departments, authorities, and other agencies as well as employees of private and informal sectors.
- The information on HIV/AIDS is expected to be treated with confidentiality at the work place and positive attitude towards infected employees.

The proponent will ensure that trainings and sensitization programs are offered to all workers during construction phase as provided by the law



## **CHAPTER 4 : BASELINE INFORMATION OF THE PROJECT AREA**

### **4.1 Introduction**

Baseline conditions entail the sum-total of all biophysical and geo-physical condition of the project area. The conditions presented are for the full spatial extent of the project area.

Gathering of baseline data is necessary to meet the following objectives:

- To understand key social, cultural, economic, and political conditions in areas potentially affected by the proposed project;
- To provide data to predict, explain and substantiate possible impacts;
- To understand the expectations and concerns of a range of stakeholders on the proposed development;
- To inform the development of mitigation measures; and
- To benchmark future socio-economic changes/impacts and assess the effectiveness of mitigation measures. information

### **4.2 Geographical Characteristic of the Projhect Area**

#### **4.2.1 Climatic Conditions**

The proposed project site is semi-arid and receives bimodal rains i.e. long rains and short rains. Long rains fall between March and May and short rains fall between October and December.

#### **4.2.2 Topography and Drainage**

The site is generally flat and slopes from North West to South West. This terrain adequately supports most developments in the area. The terrain also facilitates natural drainage and surface run-off from the site. .

#### **4.2.3 Soils**

The site is characterized by black cotton soils. These soils are permeable and absorb water easily, which facilitates drainage. The soil and geological formation on the site is stable and suitable to support the proposed development.

### 4.3 Biological Environment

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

#### 4.3.1 Flora

The land under consideration has several patches and types of vegetation. The undeveloped section has extensive grassland on the West and North West of the property occasioned by acacia trees and shrubs as shown in the figures below. The developed section of the land has well-manicured lawns with some tenants having planted crops such as maize and bananas.



**Figure 4-1: Current state of project site with Acacia shrubs and natural grass**

#### 4.3.2 Fauna

The project site currently has numerous existing land uses that include maisonettes, temporary road construction site, temporary workers structures, demonstration houses, boreholes, access roads and a mini-wastewater treatment plant.

Human activities have altered the natural habitat for animals over the years. The project's effect may seem insignificant to such lives but it is of great concern to the environment at large. It is expected that the area may be populated by small mammals such as mice, rats, moles and other members of the rodent family. Bird species were also observed at the site during the site meetings. None of the faunal species observed are rare or endangered.

## 4.4 Socio-economic Environment

### 4.4.1 Existing Development

The site currently has numerous existing land uses that include maisonettes, temporary road construction site, temporary workers structures, demonstration houses, boreholes, access roads and a mini-wastewater treatment plant.

The site has 51 maisonettes units where twenty-five (25) are complete and the remaining (26) are incomplete. Out of the complete units fifteen (15) are occupied while four (4) are sold out but yet to be occupied. This section constitutes the project phase one. The semi-detached four-bedroom maisonettes are built on 1/4acre that is shared between two units. The figures below show images of complete maisonettes under phase 1 and existing maisonettes adjacent to the project site.



Complete maisonettes under phase 1



Existing maisonettes adjacent to the project site

#### Figure 4-2: Existing maisonettes

There also exists a road construction site, which is temporarily rented out to a road construction contractor. The temporary structures are set for demolition once the construction is concluded. The image below shows the workers makeshift onsite .



**Figure 4-3: Workers makeshift onsite**

The site also has permanent demonstration units and temporary staff structures in the section earmarked for phase 4, adjacent to the maisonettes. These structures will be demolished once phase four commences. Two boreholes also exist on site. The largest proportion of the site under consideration is undeveloped and covered with vegetation especially sections earmarked for phase two and three.



Existing Borehole site and undeveloped project area  
elevated tank

**Figure 4-4: Existing Borehole site , elevated tank and undeveloped project site**

#### **4.4.2 Infrastructure And services**

##### **4.4.2.1 Roads and accessibility**

An 18m road connecting to Daystar University, Mombasa and Mutungoni Road serves Moke Gardens. In both directions, the roads ultimately connect the site to the 60m Mombasa Road. The road borders the site to the West and part of the South. The earth road is in a fair condition and is currently being upgraded to tarmac. There also exists a 12m access road to the East, which is not in good condition. The earth road links the site and the larger area to Daystar University. The road to Moke Gardens Gated community is tarmked main entrance



Marram road within the project site.



Main entrance to Moke Gardens Gated community

**Figure 4-5: Murram and Tarmacked Road within the Project Site**

##### **4.4.2.2 Water supply**

The area is supplied water by two boreholes located within the site. One of the boreholes is located in the section earmarked for phase four (gate one entrance) while the other is situated in phase two. The water is pumped into elevated tanks that supply the existing developments and works. To efficiently serve the development, a centralized water tank space has been set aside.

##### **4.4.2.3 Power Supply**

The site and its neighborhood are connected to the National Grid through service lines that run

along the access roads and the boundary of the property. The power supplier is Kenya Power. There is also a stand-by generator that serves the existing structures in case of black outs.

#### **4.4.2.4 Liquid Waste Disposal**

The site is served by a septic tank with a mini-wastewater treatment plant and an onsite sewer system (see the **Figure 4-6**below).



**Figure 4-6: Existing on-Site Wastewater Mini-Treatment**

The land under consideration also lies along a conventional sewer system that is 90% complete. The sewer-line run along the 12m and 18m roads. Although the system is not in use yet, the developer intends to connect the proposed development once the sewer is operational. Notably, the National Government as a Strategic Partner to this project as committed to completing this trunk sewer to Lukenya



**Figure 4-7: Conventional Sewer Manhole along the 18m Road**

#### **4.4.2.5 Solid Waste Disposal**

A private company collects wastes generated on site. The developer will provide a more comprehensive solid waste management system.

#### **4.4.2.6 Storm Water Management**

The developer intends to provide adequate waste management system where artificial infrastructure will be integrated with the natural system. In the completed sections of phase one, functional drainage infrastructure is provided (see the image below)



**Figure 4-8: Existing Storm Water Infrastructure**

#### **4.4.3 Adjacent Land Use Analysis**

Most of the adjacent parcels are still undeveloped. They include Land Parcel Nos. Mavoko Town Block 3/2408 & 2409, which lie West of the site. To the North-West is a school, The Stone Athi School that is among the adjacent parcels with physical development. To the Northeast is a

single-dwelling residential (maisonettes). The site is bordered by 18m and 12m roads to the North, West and South.



Stone Athi School



Single dwelling residentials in the neighbourhood

**Figure 4-9: Stone Athi School and Single dwelling residentials in the neighbourhood**

#### **4.4.4 Neighbourhood Analysis**

##### **4.4.4.1 Residential**

Lukenya area and specifically Daystar University Shopping Centre has several residential developments. They are however clustered around the shopping center just adjacent to the school. This would bring the conclusion that the establishment of the University influences demand for residential and other complementary services.

Key residential development in the larger neighbourhood include Green Park Estate, Karibu Homes, River Park and Sidai Estate among others.

##### **4.4.4.2 Commercial Development**

The area has several commercial activities that are mainly concentrated at Daystar University Shopping Centre. The center has diverse business activities including hospitality developments such as Lukenya Gateway, Lukenya Resort, Lukenya Motocross and Paradise Tents Lukenya. These also serve as recreational facilities to the surrounding community. The centre provides basic commercial services for students and other residents.

Athi River town is also a key commercial development located in the larger neighbourhood. The



industrial town's rapid growth has drastically increased demand for trunk, housing and other basic infrastructure.

#### **4.4.5 Educational**

The area is known for its learning institutions, which include Daystar University, The Stone Athi School, Lukenya Boys, Lukenya Girl and Lukenya Primary School. The Daystar University located about 2.9km from the site has influenced the emergence of the Daystar Shopping Centre with basic commercial services and residential development. Arguably, establishment of the university is a key factor that has attracted investors and residents in the area.

#### **4.4.6 Emerging Development Trends**

Some of the key emerging development trend in the neighbourhood include:

- Establishment of gated community residential and mixed use schemes
- Establishment of various institutions like schools and churches
- Growth of high end residential and commercial developments along Mombasa Road
- Demand for low density industrial development
- Increased demand and subsequent development of housing units
- Need for more environmentally friendly and planned urban neighbourhoods

## **CHAPTER 5 : PROJECT ALTERNATIVES**

### **5.1 Project alternatives**

The purpose of this section of the ESIA is to examine feasible alternatives to the project and, highlight the benefits of and general rationale for the project that need to be considered against any potential environmental cost. The general principle involved in identifying option(s) to the proposed development is to ensure that the option chosen, which indeed may be the 'non development' option, would result in optimal returns in social and environmental capital: In effect, the option chosen should bode well not only for the developer, but also for the environment and stakeholders in the area.

This section is a requirement in line with Regulation 18(1) of Legal Notice 101 specifies the basic content of an Environmental Impact Assessment report subsequent to which, subsection (i) requires an analysis of alternatives including project site, design and technologies and reasons for preferring the proposed site, design and technologies.

Feasible land-use options are compared in terms of lowest costs and most benefits criteria: environmental impacts, social acceptability, economics (including productivity of land-use) and design feasibility. However, under this study the alternative that was considered for the project was basically focused on:

1. "No-action" Alternative
2. Relocation Alternative
3. Alternative Land-uses
4. Alternative materials and technology
5. Solid Waste Management Alternatives
6. The Proposed Development as described in the EIA Report

Each of the project alternatives was analyzed for environmental and social impacts to the extent possible and a rationalization made as to why the chosen alternatives constitute the best practicable environmental option.

### **5.2 The No Action Alternative**

The No Action Alternative in respect to the proposed project implies that the status quo is

maintained, that is no construction activity takes place. This option is most suitable alternative from an extreme environmental perspective as it ensures non-interference with the existing conditions. However, the need for such development is high and the anticipated environmental and social impacts resulting from construction have already been experienced. This option will however involve an acceptance of the vulnerability most residents in Nairobi Metropolitan region particularly in satellite towns/centres like Athi River, Mlolongo and Machakos Junction. The land will remain under-utilized or neglected. The No Project Option is the least preferred from the socio-economic and partly environmental perspective since if the project is not done: -

- The economic benefits especially during construction i.e. provision of jobs for skilled and non-skilled workers will not be realized.
- There will be no generation of income by the developer and the Government.
- The social-economic status of dwellers and local people would remain unchanged.
- The local skills would remain under utilized
- No employment opportunities will be created for Kenyans who will work in the project area.
- Discouragement for investors to produce this level of standard and affordable developments in future.

### **5.3 The Relocation Alternative**

Relocation option to a different site is an option available for the project implementation. At the moment, there are no alternative sites for the proposed development (i.e. the project proponent does not have an alternative site). This means that the proponent has to look for the land if relocation is proposed. Looking for the land to accommodate the scale and size of the project and completing official transaction on it may take a long period. In addition, it is not a guarantee that such land would be available. It is also worth noting that the said project is already underway in terms of seeking development approvals in various government departments and conducting of various other essential activities like socio-economic surveys, neighborhood analysis and geotechnical surveys. Therefore, the project proponent would spend another long period of time on design and approvals of the plans by the relevant

government departments. The project design and planning before the stage of implementation would call for costs; already incurred in the proposed development i.e. whatever has been done and paid to date would be counted as a loss to the proponent. In consideration of the above concerns and assessment of the current proposed site, relocation is not a viable option.

#### **5.4 Alternative Land Use Activities**

The area is in a residential zone i.e. used for establishments of residential houses like immediate massionates. Alternative land use activities may conflict with surrounding land use activities. For uniformity purposes, the proponent is interested in development of affordable units similar both in form and character to what is existing in the nearby neighborhood.

#### **5.5 Alternative to Construction Materials and Technology**

There is a wide range of construction and furnishing materials which can be sourced locally and internationally. In this construction, certified raw materials/equipment and modern technology will be used. Also, electrical appliances that save energy will be given first priority. The concrete pillars and walls will be made using locally sourced stones, cement, sand (washed and clean), metal bars and fittings that meet the Kenya Bureau of Standards requirements.

#### **5.6 Solid Waste Management Alternatives**

Throughout the construction, the project will produce wastes such as soil, wood chips, metal scraps and paper wrappings among other. Wastes to be generated during operation phase are mainly domestic in nature. The proponent is expected to observe EMCA (Waste Management Regulations, 2006). Priority will be given to reduction of wastes, recycling, and reuse. This will minimize environmental pollution.

#### **5.7 The Proposed Development as described in the EIA Report**

This Environmental and Social Impact Assessment Study Report is based on information and consultations with the project proponent, the Architect and details contained in the architectural plans and drawings of the project. These are included in the Annexure. The project entails construction of affordable housing units to benefit residents within Nairobi metropolitan area particular to Nairobi City County and Machakos Town satellite towns/centres

like Athi River, Mlolongo and Machakos Junction

The impacts and mitigation measures for this alternative are discussed in detail throughout this report. The positive impacts have been identified. This alternative will have significant impacts on the environment and therefore has considered the necessary measures to mitigate the identified issues of concern.

The alternative is likely to have the greatest implications on socio-economic environment of the area and surrounding communities. Due to the proposed quality of the development, it is anticipated that it would provide a major housing opportunity for area development.

The Merits of this alternative are as follows:

- i. There will be stable and reliable housing available to residents within the Project area and the county at large.
- ii. The property (land) value in the area will appreciate.
- iii. The project design and proposed housing units for the whole land parcel has ensured optimal economic and spatial land-use;
- iv. Visual and aesthetic amenities of the area shall improve.
- v. The county and national economies will improve from the revenue collected.
- vi. The National Government will be able to deliver on its agenda of affordable housing

## **CHAPTER 6 : CONSULTATIONS AND PUBLIC PARTICIPATION**

### **6.1 Stakeholder Mapping**

The project area is surrounded by the following primary key stakeholders;

- Pine breeze hotel and restaurant
- Daystar university
- Daystar Mulandi Primary School.
- Primary School
- Commercial Centre at the Daystar university main entrance section
- Lukenya Girls High School along the Daystar-Mombasa road connection.
- Single dwelling residentials in Lukenya
- Green park Residentials

### **6.2 Public Participation**

Public participation basically involves engaging members of the public to express their views about a certain project. Public participation tries to ensure that due consideration will be given to public values, concerns and preferences when decisions are made. Public involvement is a fundamental principle of the ESIA process. Timely, well planned and appropriately implemented public involvement programs will contribute to ESIA studies and to the successful design, implementation, operation and management of proposals. Specifically, public involvement is a valuable source of information on key impacts, potential mitigation measures and the identification and selection of alternatives. It also ensures the ESIA process is open, transparent and robust, characterized by defensible analysis. Nearly all ESIA systems make provision for some type of public involvement. This term includes public consultation (or dialogue) and public participation, which is a more interactive and intensive process of stakeholder engagement. Most ESIA processes are undertaken through consultation rather than participation. At a minimum, public involvement must provide an opportunity for those directly affected by a proposal to express their views regarding the proposal and its environmental and social impacts.

The purpose of public involvement is to:

- Informing stakeholders and members of public
- Gaining their views, concerns and values
- Taking account of public inputs in decision making
- Influencing project design
- Obtaining local knowledge
- Increasing public confidence
- Improving transparency and accountability in decision making
- Reducing conflict

### **6.3 Public Consultation objectives**

The aim of public participation is to ensure that all the stakeholders likely to be affected or to influence the Project are identified and targeted as part of the EIA Study process. Public participation for this project was carried out with the following aims:

- To inform the project affected persons (PAPs) of the intended project that affects their livelihoods in a significant way.
- To inform the local people and other stakeholders about the proposed project and its objectives
- To seek views, concerns and opinions of the PAPs and people in the area concerning the project and incorporate the information in the ESIA study report.
- Take account of the information and views of the public in the ESIA and decision making.
- To establish if the local people foresee any positive or negative environmental effects from the project and if so, how they wish the perceived impacts to be addressed to
- Provide an opportunity for the public to influence project design in a positive manner (thereby creating a sense of ownership of the proposal);
- Improve transparency and accountability of decision-making; and
- Increase public confidence in the ESIA process.
- Reduce conflict through the early identification of contentious issues;
- Facilitate consideration of alternatives, mitigation measures and tradeoffs;

- Obtain local and traditional knowledge that may be useful for decision-making;
- Ensure that important impacts are not overlooked and benefits are maximized;

#### **6.4 Public Consultation Methodology**

Consultations and public participation (CPP) exercise for the assessment was carried out in the months of May 2021. In adherence to Covid 19 guidelines on measures to curb spread of Covid 19 by WHO and MoH the ESIA team only held 1. No Public meetings at at kinanie location with the members of the public in collaboration with the area chiefs (Minute and attendance sheet – Annex 5). A notice (Annex 6) inviting members of the public to the meeting was put up 7 days before the date of the meeting

In addition structured questionnaires were administered to the key stakeholders and members of the public especially those neighbouring the proposed site in May 2021 (Annex 7). Neighboring the site are several residential establishments, Mansionettes, schools and commercial buildings.

Most of those interviewed had no objection to the proposed project. They also reiterated that more emphasis should be put towards ensuring that the proposed project and its infrastructure would not negatively interfere with the environmental integrity of the surrounding areas.

#### **6.5 Outcome of Consultations and public participation**

##### **6.5.1 Public meetings**

All attendees were issued with a pamphlet (Annex 8) that consisted of the project impacts and proposed measures during the meeting. The main issues discussed during the meeting are summarized below;

**Type of investment:** The type of development is proposed construction of 4,000 housing units including social amenities/infrastructure (See attached drawings). It was noted that the proposed Project is not unique in the area; similar apartments have been established in the area and are currently being viewed by targeted clients with an aim of being occupied.

**Designs and drawing:** The proponent has provided the designs and drawings for the proposed development that incorporates the stakeholder's views.



**Project Positive Impacts:** Implementation of the project will result to positive impacts such as provision of affordable housing to residents within Nairobi metropolitan area particular to Nairobi City County and Machakos Town satellite towns/centres like Athi River, Mlolongo and Machakos Junction, creation of job opportunities, realization of Nairobi Metro Vision 2030, provision of market for construction materials provision of business opportunities through direct and indirect trade, improved infrastructural facilities such as provision of portable water within the area and improved security.

**Project Negative Impacts:** Anticipated negative impacts that were discussed alongside the proposed mitigation measures included: labour influx, traffic congestion around the area due to heavy vehicles turning, insecurity, dust emission, noise and vibrations and increased demand for social and infrastructural services.

**Table 6-1: Summary of Comments and Responses during the Meetings**

No	Comment	Response
1.	Participants wanted to know the project cost and developer	The project, on completion, would be valued at about KShs. 11Bn and assured the participants that the developer was committed to doing meaningful CSR throughout the construction and operationalization of the proposed development.
2.	Participants requested developer to consider increasing the current the daily wages to be above Kshs 450	The developer noted that manual labourers on the construction site were paid a daily wage of KShs. 500 which was above market price. Additionally, artisans were paid KShs. 1,500, higher than the KShs. 1,000 offered locally.
3.	Participants wanted to know the accessibility and affordability of the proposed social amenities to the local community.	the experts explained that the government affordable housing guidelines would be followed to determine the price of goods produced and services offered.
4.	Participants wanted assurance of consideration of locals for employment	Lead Expert also urged the locals to sign up on <i>Boma Yangu</i> and familiarise themselves with the

No	Comment	Response
	opportunities	application process, and payment and financing options so that they can be among the direct beneficiaries of the proposed project.
5.	Participants requested the contractor to be advised to source material locally	The developer reiterated his commitment to sourcing materials locally because it was convenient, affordable and also part of the Affordable Housing Strategic Partner Certification conditions as well as the development approval conditions.
6.	Participants wanted to know the mechanism to be put in place to ensure safety of workers on site	EIA expert stated the contractors were bound by the Occupational Safety and Health Act-2007, which dictates that the contractors must put in place sufficient measures to protect workers on site.

**Figure 6-1 below** presents sample photographs that were taken during meeting proceedings



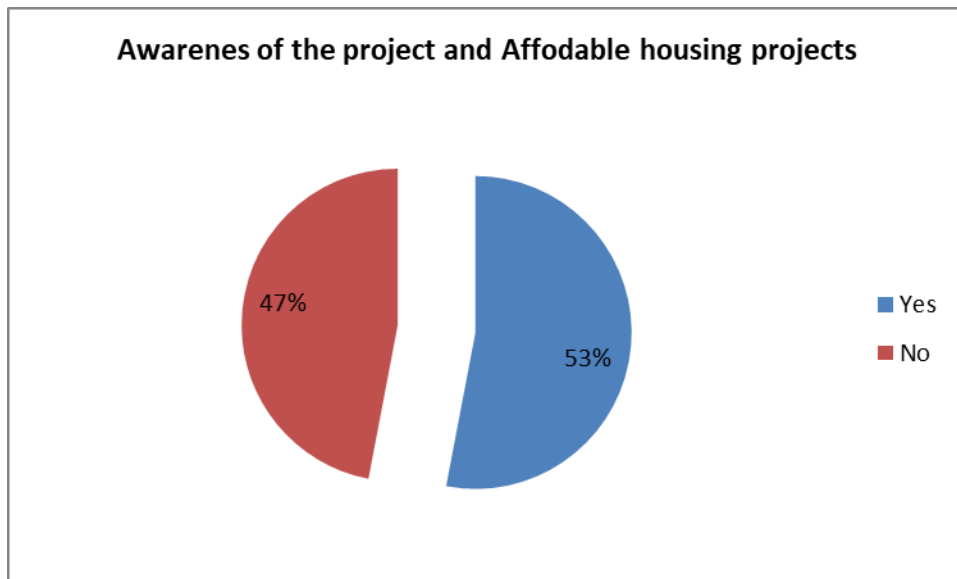


**Figure 6-1: Photographs Taken during the Meetings**

### 6.5.2 Outcomes of interviews

#### 6.5.2.1 Project awareness and acceptance

Only 53% of the respondents were aware of the proposed project, its location and activities during consultation activities. The ESIA team made awareness of the project to the rest ensuring they understood the project interventions and associated impacts. All the respondents supported the project activities to proceed and requested the ESIA team to ensure mitigation of the negative impacts.



**Figure 6-2: Project awareness and support**

### 6.5.2.2 Project impact on health and safety

Most of the respondent (73%) indicated thea the project will result in improved health and safety in the project area while a few (27%) felt that there will be no impacts related to health and safety to the area residents.

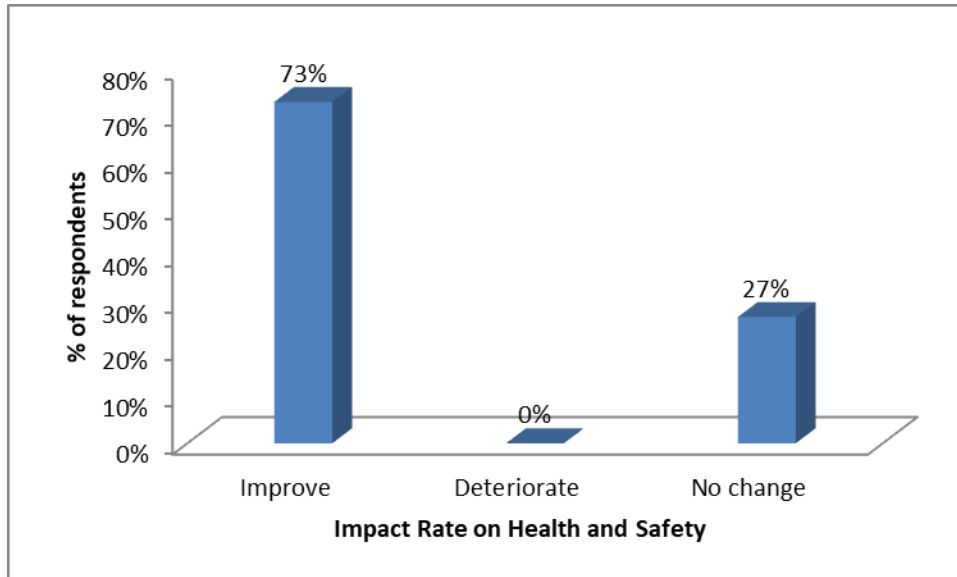


Figure 6-3: Impact on Health and Safety

### 6.5.2.3 Project impact on traffic

73% of the respondents felt that during and after project implementation traffic in the area will slightly increase but will be manageable, the rest (27%) felt that the project the effect of the project will be insignificant.

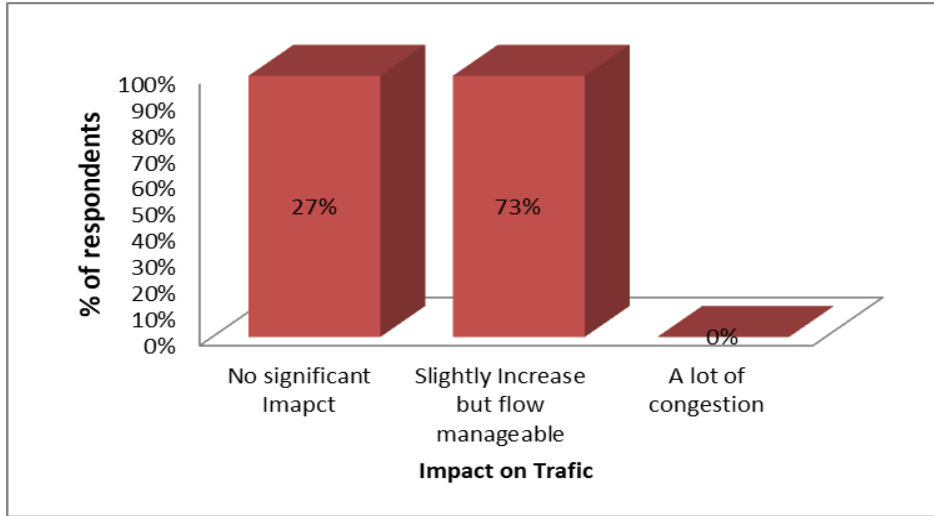


Figure 6-4: Impact on traffic

#### 6.5.2.4 Project Impact on water

The area is yet to be connected to the MAVWASCO water services and is relying on boreholes. Most respondents (87%) feels that when the project is implemented water services will be improved probably through consideration of connecting the area with MAVWASCO water services .

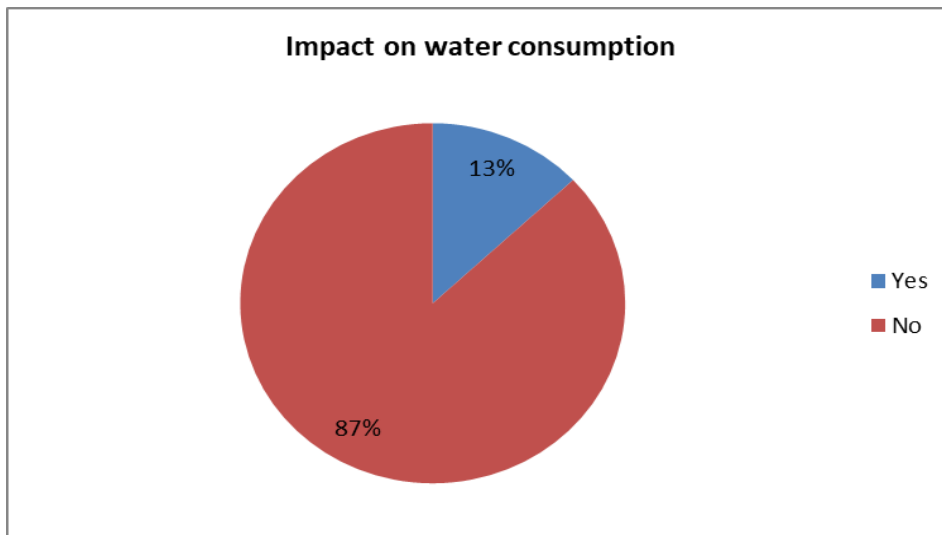


Figure 6-5: Impact on water

#### 6.5.2.5 Impact on Noise

At least 40% of the respondents felt that the moving vehicles especially tractor will cause

noise during project implementation. Most (60%) of the respondents indicated that the project will not be associated with noisy activities.

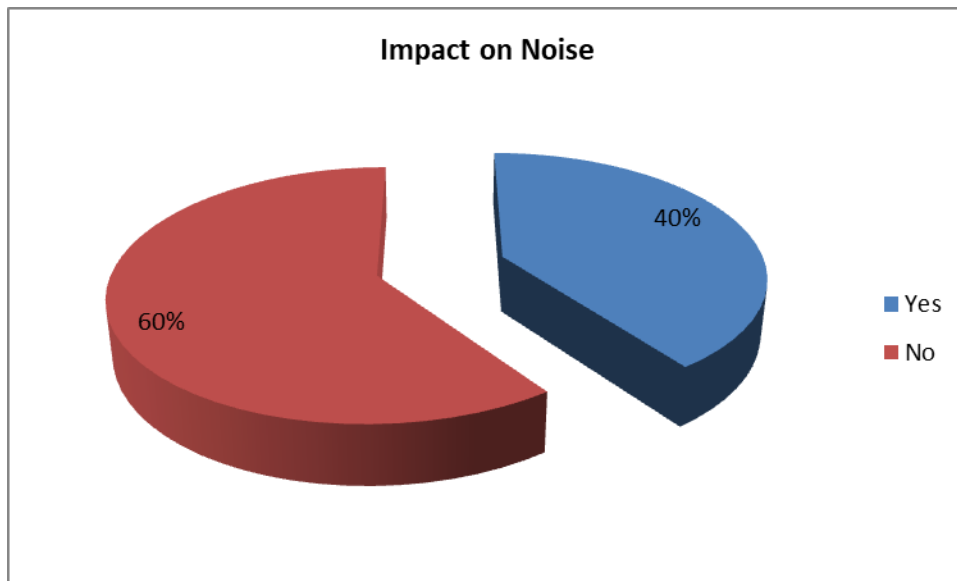


Figure 6-6: Impact on noise pollution

#### 6.5.2.6 Impact on waste

The respondents were asked whether the proposed mode of disposal of waste that included segregation to a central point and contracting designated NEMA licensed handler would affect them. 73% of the respondents felt that they will be affected. This is due to the norm of waste collection whereby they wait for waste to be accumulated in an area before collection.

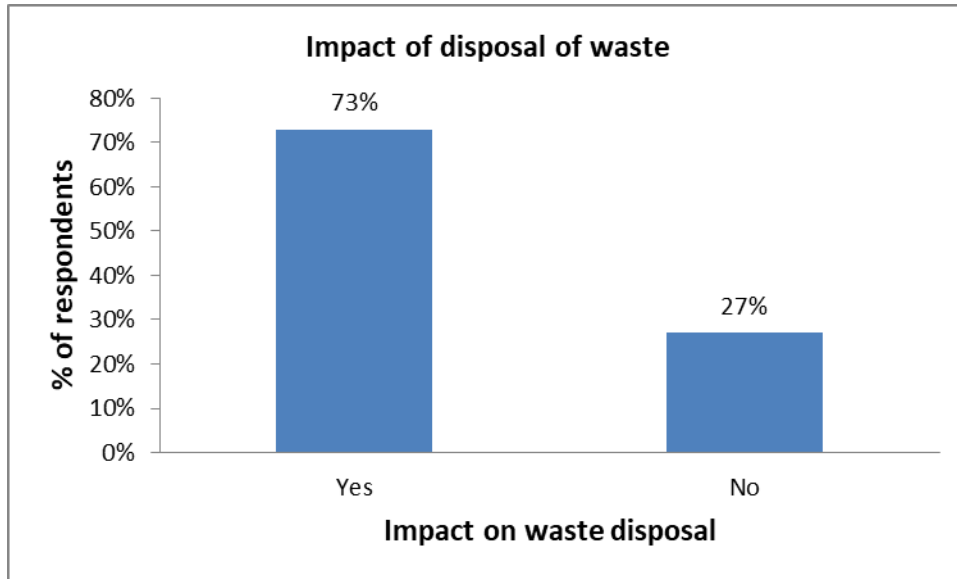


Figure 6-7: impact on Disposal of waste

#### 6.5.2.7 Expected Positive Impacts to the community

Below are the positive impacts that were highlighted by the respondents

- Creation of employment
- Improved lighting through installation of street lights
- Improved water supply through drilling of boreholes
- Increased social amenities improves infrastructure –roads
- Enhanced water supply
- More housing
- Improved security
- Improved living standards
- Business growth
- Improved development in the area

## **CHAPTER 7 : POTENTIAL ENVIRONMENTAL SOCIAL IMPACTS & MITIGATION MEASURES**

### **1.1 Introduction**

This chapter outlines the potential negative and positive impacts that will be associated with the housing project and mitigation measures . The impacts will be related to activities to be carried out during construction of the project. The operational phase impacts of the project will be associated with the activities carried out by the residents/tenants, which will mainly be domestic. In addition, closure and decommissioning phase impacts of the project are also highlighted.

The impacts arising during each of the phases of the proposed development namely construction, operation and decommissioning, can be categorized into:

- Impacts on biophysical environment;
- Health and safety impacts; and
- Social-economic impacts

### **1.2 Definition and Classification of Environment Impact**

An environmental impact is any change to the existing condition of the environment caused by human activity or an external influence. Impacts may be:

- Positive (beneficial) or negative (adverse);
- Direct or indirect, long-term or short-term in duration, and wide-spread or local in the extent of their effect.

Impacts are termed cumulative when they add incrementally to existing impacts. In the case of the project, potential environmental impacts would arise during the pre-construction, construction and the operations phases of the Project and at those stages positive and negative impacts would occur.

### **1.3 Impact Significance**

The purpose of this ESIA study report is to identify the significant impacts related to the project or activity under consideration and then to determine the appropriate means to avoid or mitigate those which are negative. Significant impacts are defined, not necessarily in order of



importance, as being those which:

- Are subject to legislative control;
- Relate to protected areas or to historically and culturally important areas;
- Are of public concern and importance;
- Are determined as such by technically competent specialists;
- Trigger subsequent secondary impacts;
- Elevate the risk to life threatening circumstances; and
- Affect sensitive environmental factors and parameters

### 1.4 Impact Assessment and Scoring

The potential impacts associated with the proposed development have been assessed as presented in the **Table 7-1** below. Precautionary principle was used to establish the significance of impacts and their management and mitigation i.e. where there is uncertainty or insufficient information, the Environmentalist erred on the side of caution.

**Table 7-1: Environment Impact Scoring and Rating Criteria**

<b>Severity of Impact</b>	<b>Rating</b>	<b>Scoring</b>
Insignificant / non harmful/less beneficial	-1/+1	Very Low
Small/ Potentially harmful / Potentially beneficial	-2/+2	Low
Significant / slightly harmful / significantly beneficial	-3/+3	Medium
Great/ harmful / beneficial	-4/+4	High
Disastrous/ extremely harmful / extremely	-5/+5	Very high
<b>Spatial Scope of the Impact</b>	<b>Rating</b>	<b>Scoring</b>
Activity specific	-1/+1	Very Low
Right of way specific	-2/+2	Low
Within Project area 5km radius	-3/+3	Medium
Regional	-4/+4	High
National	-5/+5	Very high
<b>Duration of Impact</b>	<b>Rating</b>	<b>Scoring</b>
one day to one month	-1/+1	Very Low
one month to one years	-2/+2	Low
Within Project construction period	-3/+3	Medium
within the Project life	-4/+4	High

at decommissioning	-5/+5	Very high
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### Example of Cumulative Impact Scoring

1. +3,+2,+5,+4, +4,+1=+4 (the weight that occurs more is adopted )
2. +2,+2,+5,+4, +4,+1=+3 (if two scores or more tie, then an average of the scores shall be adopted)

## 1.5 Anticipated Positive Impacts during construction

### 1.5.1 Employment opportunities:

The project shall directly result to creation of job opportunities both during construction and operation phases of the project also through tendering for consultancy services and construction works.

#### Impact Scoring

Severity of Impact	+5
Spatial Scope of the Impact	+3
Duration of Impact	+4
<b>Overall score</b>	<b>+4</b>
<b>Interpretation</b>	<b>High</b>

### 1.5.2 Market for Construction Materials

The Project will require materials, some of which will be sourced locally. These include, quarry masonry stones, steel, plastic pipes, valves, cement, sand and hardcore. This will provide a ready market for suppliers in and outside the Project area.

#### Impact Scoring

Severity of Impact	+4
Spatial Scope of the Impact	+4
Duration of Impact	+4
Overall score	+4
Interpretation	High

### 1.5.3 Economic Growth

The project shall directly lead to improved local micro economy of the society of the residents and businessmen within the project area.

#### Impact Scoring

Severity of Impact	+4
Spatial Scope of the Impact	+3
Duration of Impact	+4
Overall score	+4
Interpretation	High

#### 1.5.4 Increased Business Opportunities

The large number of project staff required will provide ready market for various goods and services, leading to several business opportunities for small-scale traders such as food vendors around the construction site.

##### Impact Scoring

Severity of Impact	+4
Spatial Scope of the Impact	+3
Duration of Impact	+4
Overall score	+4
Interpretation	High

#### 1.5.5 Optimal Use of Land

The housing development leads to optimal use of land. Considering the scarcity of serviced land in Nairobi metropolitan area, the project enhances the returns on the limited land space in Machakos County.

##### Impact Scoring

Severity of Impact	+4
Spatial Scope of the Impact	+3
Duration of Impact	+4
Overall score	+4
Interpretation	High

#### 1.5.6 Revenue to Government

Value Added Tax (VAT) on construction materials/ tools to be purchased among others will be sources of revenue for the government.

##### Impact Scoring

Severity of Impact	+4
Spatial Scope of the Impact	+3
Duration of Impact	+4
Overall score	+4

Interpretation	High
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### 1.5.7 Improved Infrastructure

Project activities will lead to improvement of transport, sewerage, water supply and telecommunication networks. Such services are a prerequisite to development in any region.

#### Impact Scoring

Severity of Impact	+4
Spatial Scope of the Impact	+3
Duration of Impact	+4
Overall score	+4
Interpretation	High

### 1.6 Anticipated Negative Impacts during construction Period

#### 1.6.1 Vegetation Clearing, Soil Erosion and Sedimentation

Construction activities have the potential to clear vegetation and, loosen soils particularly on where excavations will be done, these soils can then be washed down into the lower areas (streams and valleys) leading to soil quality degradation. This impact is mildly significant because the site is already a built up area, with scattered savanna grass dotted with scanty shrubs and a few trees.

The rest of the land is bare land already cleared of vegetation by human activities. There is no stream, river or river source within the project site. However, there will be substantial amount of unwanted soil generation during excavation that the proponent will ensure that it is transported and disposed of at authorized sites as per relevant regulations mentioned in chapter three of this report.

#### Impact Scoring

Severity of Impact	-2
Spatial Scope of the Impact	-2
Duration of Impact	-3
Overall score	-2
Interpretation	low

#### Mitigation measures

The following is proposed to mitigate against soil erosion and, its effects and enhance

vegetation cover.

- Adopt selective de-vegetation that aims at clearing only the project site where necessary.
- The proponent proposes to carry out landscaping of the area.
- Unnecessary felling of the existing trees should be avoided.
- Once the project lifespan ends, during decommissioning, the proponent shall replant the field with appropriate vegetative cover including indigenous trees.
- Planting trees, flowers and other green measures.

### 1.6.2 Air Quality

Potential air pollution caused by emissions from construction equipment (carbon, hydrocarbons, particulate matter,) earth movers and excavators, vehicles, concrete and cement batching plants and trucks, Emission of dust from trucks and vehicles accessing the construction areas and camp site/garage as well as material piling (sand and aggregate). Odor from temporary disruption of accumulated and buried solid waste materials at locations of construction, such impacts may affect the immediate residential houses and commercial premises. This impact will be temporal during both pre construction and project construction phase.

#### Impact Scoring

Severity of Impact	-3
Spatial Scope of the Impact	-3
Duration of Impact	-3
<b>Overall score</b>	-
<b>Interpretation</b>	<b>Medium</b>

#### Mitigation Measures

- Maintain construction equipment at high operational conditions maintained and serviced in accordance with the specifications such as to control emissions into the air.
- Earth moving be done under dump conditions as much as possible to prevent emission of dust into the air,
- Similarly, piled materials (sand and aggregate) should be maintained dump to prevent dust emissions,

- Use of sprinklers to regularly water construction site, this suppresses the dust menace at construction sites
- Screening of the construction site to contain and arrest construction-related dust.
- Vehicles delivering soil or dusty materials shall be covered to reduce spills and windblown dust.
- The removal of vegetation/topsoil shall be avoided until such time as clearance is required.

### 1.6.3 Excessive Vibration and Noise Pollution

Construction Phase for the proposed Project will most likely result in noise emissions as a result of the machines that will be used (excavation equipment among others) and construction vehicles delivering materials to site. Noise and excessive vibration can be a nuisance to the local community if construction works begin too early in the day and continues into the night.

#### Impact Scoring

Severity of Impact	-3
Spatial Scope of the Impact	-2
Duration of Impact	-3
<b>Overall score</b>	<b>-3</b>
<b>Interpretation</b>	<b>Medium</b>

#### Mitigation measures

- Limit the times of construction to daylight hours (8am-5pm).
- Erect signage to prohibit unnecessary hooting at the project site.
- Ensure that noise & excessive vibration from construction activities are within permissible levels as per the provision of Environmental Management and Coordination (Noise and Excessive Vibration Pollution) (Control) Regulations, 2009. This includes among others adhering to permissible noise and vibration levels.
- Construction work should strictly be undertaken between permissible time periods as stipulated in the second Schedule– Maximum Permissible Noise Levels for Construction Sites of EMCA(Noise and Excessive Vibration Pollution) (Control) Regulations, 2009.
- Provide PPEs such as ear muffs to the contractors.

- Carry out baseline noise monitoring within the area before, during and after the construction works.
- Acquire noise and excessive vibrations emission permit from NEMA when undertaking excessive noise and vibration emitting activities

#### 1.6.4 Wastes removals and disposal

Solid wastes generated during pre-construction and construction includes: waste infrastructure materials, packaging material, plastics, cuttings and trimmings off materials among others. Dumping around the site will interfere with the aesthetic status on the surrounding environment. Plastic bags may act as pest breeding grounds which may be disease causing vectors to the local residents. Occupation phase will be marked by increased waste generation as compared to the existing conditions.

#### Impact Scoring

Severity of Impact	-3
Spatial Scope of the Impact	-2
Duration of Impact	-3
<b>Overall score</b>	<b>-3</b>
<b>Interpretation</b>	<b>Medium</b>

#### Mitigation measures

- A site waste management plan should be prepared by the contractor prior to commencement of construction works. This should include designation of appropriate waste storage areas, collection and removal schedule and identification of approved disposal site;
- The project proponent and contractor must ensure that collection bins/ receptacles are placed at strategic locations within project site as collection centres to facilitate separation and sorting of various types of wastes.
- The waste shall be properly segregated and separated to encourage recycling of some useful waste materials i.e. some stone and concrete materials can be used as backfills.
- Contract a licensed waste handler to collect solid wastes which cannot be reused at the site.
- Adopt the 3R waste management approach, that is (reduce, reuse and recycle) whereby

waste shall be segregated – plastics, glass, tins, papers, wood, metals etc. (later to be re-used or recycled).

- Avail colour coded waste bins for source waste sorting at the project site.
- Recycling non-woven fabrics and PE films into plastic particles to make some daily plastic products like plastic slippers, plastic desks and chairs.

### 1.6.5 Public and Occupational Health and Safety Risks

Potential impacts during construction include: exposure to physical hazards from the construction activities, use of equipment; trips and fall hazards; rock falls/slides during construction of the upper floors and exposure to dust and noise. Construction workers are likely to have injuries and hazards as the construction works such as trenching and excavations as well as work at height unavoidably expose workers to occupational health and safety risks. The workers are also likely to be exposed to risk of construction noise and air pollution.

#### Impact Scoring

Severity of Impact	- 3
Spatial Scope of the Impact	-2
Duration of Impact	-3
<b>Overall score</b>	<b>-3</b>
<b>Interpretation</b>	<b>medium</b>

#### Mitigation measures

- Ensure that all construction machines and equipment are in good working conditions to prevent occupational hazards during excavation activities;
- Establish a Health and Safety Plan (HASP) for civil works areas ensuring the working hours are controlled and that employees are not allowed to extend the working hours beyond an acceptable limit for purposes of gaining extra pay;
- Provide adequate manual labour to meet the requirements of the tasks;
- Appoint a trained health and safety team for the duration of the construction work, monitor and advise appropriately on health and safety matters during the rehabilitation activities
- Provide workers with gloves, ear gears, sturdy rubber boots and overalls to protect their



skin from the effects of cement;

- Provide workers training on safety procedures and emergency response such as fire and first aid measures;

**1.6.6 Irresponsible social behavior HIV/AIDS prevalence and drug abuse within the project area**

The Project will attract new people to the Project area and this can lead to several repercussions leading to the spread of HIV/AIDS and/ or other sexually transmitted diseases (STDs). Influx of new people to the Project area especially construction workers can affect the number of new cases of HIV, because they often interfere with an otherwise stable situation but the contrary can also happen where the newcomers find themselves at higher risk

**Impact Scoring**

Severity of Impact	-2
Spatial Scope of the Impact	-3
Duration of Impact	-3
<b>Overall score</b>	<b>-3</b>
<b>Interpretation</b>	<b>Medium</b>

**Mitigation Measures**

Develop HIV/AIDS awareness programmes or initiatives to target the construction workers from the Project site including the youth; with the objective of reducing the risks of exposure and the spread of HIV virus in the Project area. Measures recommended for implementation to enable reduce the spread of the virus include the following;

- Conduct sensitization to the staff and community on drug abuse, irresponsible sexual behaviors, HIV and AIDS, stress management, and voluntary counseling and testing.
- Avail condom dispensers at the site to the construction staff and the latter occupants.
- Strengthen advocacy through awareness training in HIV/AIDS and other Sexually Transmitted
- Infections to the community members.
- Identify other players (local CBOs, NGOs, and government organizations) on HIV/AIDS for enhanced collaboration;
- Provide counseling and testing for HIV/AIDS.

- Prohibit smoking within the project site.

### 1.6.7 Increased Spread of Covid -19

The Project will attract new people to the project area seeking employment during the construction period and this can lead to increased spread of Covid 19. This may result from increased interaction of people from various areas and lack of observing guideless as outlined by the Ministry of health (MoH) and World Health Organization (WHO)

#### Impact Scoring

Severity of Impact	-2
Spatial Scope of the Impact	-2
Duration of Impact	-3
<b>Overall score</b>	<b>-2</b>
<b>Impact Rating</b>	<b>Medium - Negative</b>

#### Mitigation Measures for increased spread of COVID 19

- Strict compliance to WHO and GoK guidelines curbing/prevent spread of Covid -19 that include Maintaining the social distancing and Personnel hygiene which include frequent washing of hands and strict wearing of masks
- Provisioning of washing hand points that will have running water and detergents
- Ensuring constant use of thermo-guns for all persons entering site to confirm no persons with temperatures above 37.5 degrees centigrade enter site
- Provide labelled area of isolation for any affected persons
- Allowing for immediate evacuation of any infected persons to designated hospitals

### 1.6.8 Surface Drainage Wastewater, and Water Pollution/ Contamination

These impacts will be rampant during the pre-construction, construction and operations phase of the project. They will result mainly from storm water and accidental waste contamination of portable water with waste water during all the three project phases.

#### Impact Scoring

Severity of Impact	-4
Spatial Scope of the Impact	-3

Duration of Impact	-4
<b>Overall score</b>	<b>-3</b>
<b>Interpretation</b>	<b>high</b>

### Mitigation Measures

- Ensure that hazardous materials are handled and stored in a good manner, to limit their movement into the environment.
- Trenching during plumbing works should not interfere with the existing drainage channels.
- Ensure that open stockpiles of construction materials are covered with tarpaulin or similar fabric during rainy season.
- Removal of soil vegetative cover should be kept at minimum and should only be carried out with absolute necessity
- Stockpile of construction materials i.e. sand, ballast, stones etc. be placed away from drainage system.
- Monitor the natural flow system during heavy rains and make improvements where necessary.
- Clear any blocked drainage channels.
- Clear all soil residues/debris after trenching works.
- The proposed site for construction must be free from floods and should have adequate drainage to prevent effects of soil erosion and surface run-offs.
- Provide containments to used oils and also construct a bund wall to the generator set room (if any).
- Install grease trap or oil water separator.
- During construction stage sanitary waste shall be managed through mobile toilets and if need be, temporary pit latrines shall be constructed connected to sewer line.
- Establish drainage channels to ensure that surface runoff do not mix with effluent from the sanitary facilities.
- Wastewater shall be managed through proper disposal into MAVWASCO Sewerage

system

### 1.6.9 Water use and Increasing Demand

These impacts will be rampant during the construction and operations phase of the project. Water use is connected to the construction and occupation activities. Water during construction phase will be sourced from the existing 2.No boreholes that were drilled under Phase 1. Connection to the existing water services to be done during project operation phase to supplement the water from the boreholes..

#### Impact Scoring

Severity of Impact	-4
Spatial Scope of the Impact	-4
Duration of Impact	-4
<b>Overall score</b>	<b>-4</b>
<b>Interpretation</b>	<b>high</b>

#### Mitigation Measures

- During construction phase, use water economically to avoid wastage.
- Conducting regular water system audits to identify and rectify any possible water leakages.
- Used water can be sprinkled on the haulage road and dusty surfaces to reduce dust emissions.
- Provide additional source of water to reduce pressure on the existing water source. E.g. through rainfall harvest.
- Routine check-ups and monitoring of the drainage system to avoid leakages and blockages.
- Construction of separate storm water and waste water drain.
- Implement water saving devices in the ablution block use e.g. dual flush toilets, automatic shut-off taps, etc
- The designs have water reservoirs for storage.
- Re-use or use recycled water for dust suppression
- Provide roof & storm water harvesting facilities connected to underground water

storage tanks

### 1.6.10 Security and crime

These impacts are expected during all the project phases. Security will be critical to safeguard against externalities and petty theft by workers during construction phase.

#### Impact Scoring

Severity of Impact	-4
Spatial Scope of the Impact	-3
Duration of Impact	-4
<b>Overall score</b>	<b>-4</b>
<b>Interpretation</b>	<b>high</b>

#### Mitigation Measures

- Sensitize construction workers, locals and security to be on the lookout on suspicious activities near the site.
- Proper design incorporating lighting to enhance security.
- Liaise with the administration units such as the police, chiefs and District Officers to provide regular surveillance and patrols to protect workers and the neighborhood.
- Conduct sensitization campaigns for the public on risks related to construction sites.
- Body search workers on entry, to avoid getting weapons on site and upon leaving site, ensure nothing is stolen.
- Ensure only authorized personnel get to the premise.
- Ensure security alarms are installed.

### 1.6.11 Traffic snarl-ups

These impacts are expected during all the project phases. From the onset, there will be increased vehicular movement in and out of the site. This project has conducted a Traffic Impact Assessment and it has ascertained that there will be pressure on the existing roads around the site only getting worse towards the occupation period. Construction period will be characterized by heavy motor vehicles leading and turning from and in to the site.

#### Impact Scoring

Severity of Impact	-4
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Spatial Scope of the Impact	-3
Duration of Impact	-4
<b>Overall score</b>	<b>-4</b>
<b>Interpretation</b>	<b>high</b>

### Mitigation Measures

- Provide reflective road signs on both sides of the working area at a distance not less than
- 50m from the works.
- Hire traffic marshal to control movement of trucks, heavy equipment, and machineries.
- Planned deliveries of materials.
- Proper display of warning signs such as ‘Road works ahead’, ‘slow down’ among others.
- Provide road diversions.
- Acquisition of traffic disruption permits from Traffic Police Authority whenever necessary.
- Expand the access road to accommodate both vehicular and non-vehicular traffic expected in the area
- Contractor will develop and implement a traffic management plan to mitigate against possible accidents
- Ensure road safety measures for the construction vehicles to the extent possible by observing all traffic regulations in the Traffic Act 2012

## 1.7 Anticipated Positive Impacts during Operation Period

### 1.7.1 Addressing Housing Challenge

The Project shall lead to improved accessibility to housing requirements to residents of Machakos County and within Nairobi Metropolitan Area in General. This is a positive contribution to the Government agenda of provision of affordable housing to its population

### Impact Scoring

Severity of Impact	+4
Spatial Scope of the Impact	+4
Duration of Impact	+4

<b>Overall score</b>	<b>+4</b>
<b>Interpretation</b>	<b>High</b>

### 1.7.2 Realization Nairobi Metro vision 2030

The project is directly linked to the vision 2030 and the President’s Big 4 agenda of providing for affordable housing to Kenyans. Infrastructure services within Nairobi Metropolis will also be enhanced.

#### Impact Scoring

Severity of Impact	+4
Spatial Scope of the Impact	+4
Duration of Impact	+4
Overall score	+4
Interpretation	High

### 1.7.3 Individual Investment

Economically, the project will be an investment to the proponent. The proposed project once complete can also be used as a collateral asset.

#### Impact Scoring

Severity of Impact	+4
Spatial Scope of the Impact	+3
Duration of Impact	+4
Overall score	+4
Interpretation	High

### 1.7.4 Optimal Use of Land

The proposed comprehensive development ensures optimal use of land. Considering that the proposed project site is currently vacant, and the scarcity of developed land in the area, the project enhances the returns on the limited developed land in this area. The project will promote sustainable development by providing a live-work and play environment.

#### Impact Scoring

Severity of Impact	+4
Spatial Scope of the Impact	+3
Duration of Impact	+4
Overall score	+4
Interpretation	High

### 1.7.5 Overall Development

The proposed project will attract various support services, as well as create linkages to other necessary services. This in turn will promote the overall development of the project area.

#### Impact Scoring

Severity of Impact	+4
Spatial Scope of the Impact	+3
Duration of Impact	+4
Overall score	+4
Interpretation	High

### 1.7.6 Strengthening of Local Economy

On completion, the development will lead to an influx of people in the area, hence bolstering local trade. This will have a positive impact on the economy and livelihoods of local communities.

#### Impact Scoring

Severity of Impact	+4
Spatial Scope of the Impact	+3
Duration of Impact	+4
Overall score	+4
Interpretation	High

### 1.7.7 Enhanced Security

During the operation of the project, security will be enhanced in the premise and the units through distribution of suitable security lights and presence of a security guard. This will lead to improvement in the general security in the surrounding area.

#### Impact Scoring

Severity of Impact	+4
Spatial Scope of the Impact	+3
Duration of Impact	+4
Overall score	+4
Interpretation	High

## 1.8 Anticipated Negative Impacts during Operation Period

### 1.8.1 Pressure on Existing Facilities

The proposed development is also likely to increase pressure on existing infrastructure such as



roads, sewer, electricity and water supply. This would be due to increased human and vehicular densities in the project area.

### Impact Scoring

Severity of Impact	-2
Spatial Scope of the Impact	-3
Duration of Impact	-3
<b>Overall score</b>	<b>-3</b>
<b>Interpretation</b>	<b>Medium</b>

### Mitigation measures

#### 1.8.1.1 Ensuring Efficient Solid Waste Management

The proponent will be responsible for efficient management of solid waste generated by the project during its operation. In this regard,

- The proponent will provide waste handling facilities such as waste bins and skips for temporarily holding domestic waste generated at the site.
- The proponent will ensure that such disposed of regularly and appropriately.
- It is recommended that the proponent put in place measures to ensure that the occupants of the Houses manage their waste efficiently through recycling, reuse and proper disposal procedures.

#### 1.8.1.2 Minimization of Sewage Release

- The proponent will ensure that there are adequate means for handling the large quantities of sewage generated by the units being directed to the Machakos County with a connection from the development.

#### 1.8.1.3 Ensure Efficient Energy Consumption

- The proponent plans to install an energy-efficient lighting system for the project. This will contribute immensely to energy saving during the operational phase of the project.
- In addition, occupants of the apartments will be sensitized to ensure energy efficiency in their domestic operations. To complement these measures, it will be important to monitor energy use during the occupation of the houses and set targets for efficient

energy use

#### **1.8.1.4 Ensure Efficient Water Use**

- The proponent will install water-conserving automatic taps and toilets.
- Moreover, any water leaks through damaged pipes and faulty taps will be fixed promptly by qualified staff.
- In addition, the occupants of the apartments will be sensitized to use water efficiently.

#### **1.9 Impacts during Decommissioning Phase**

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

- Paint
- Cement and soil
- Sand, gravel and cement
- Glass
- Crashed stones and ballast –
- Concrete tiles and slabs

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

##### **1.9.1 Efficient Solid Waste Management**

- Solid waste resulting from demolition or dismantling works will be managed as previously described.

##### **1.9.2 Reduction of Dust**

- Concentration High levels of dust concentration resulting from demolition or dismantling works will be minimized as described above .

##### **1.9.3 Minimization of Noise and Vibration**

- Significant impacts on the acoustic environment will be mitigated as described above.

## **CHAPTER 8 : ENVIRONMENTAL AND SOCIAL MANAGEMENT AND MONITORING PLAN (ESMMP)**

### **8.1 Introduction**

Integrating environmental issues in business management, such as those related to real estate development increases efficiency while enhancing the project proponent financial and environmental management. These issues, which are normally of financial concern, are: costs, product quality, investments, level of productivity and planning.

Environmental planning and management as a concept seek to improve and protect environmental quality for both the project site and the neighborhood through segregation of activities that are environmentally incompatible. Environmental planning and management integrate land use structure, social systems, regulatory law, environmental awareness and ethics.

Environmental and Social management plan (ESMP) for development projects such as the proposed residential apartment complex development is aimed at providing a logical framework within which identified negative environmental and social impacts can be mitigated and monitored. In addition, ESMP assigns responsibilities for action to various actors, and provides time frame within which mitigation measures can be done.

ESMP is a vital output for an Environmental and Social Impact Assessment as it provides a checklist for project monitoring and evaluation. A number of mitigation measures are already incorporated into the project design.

The ESMMP outlined in **Table 8-1**, **Table 8-2** and **Table 8-3** has addressed the identified potential negative impacts and mitigation measures for the proposed residential development during pre construction, construction and operation project phases .

### **8.2 Environmental Monitoring and Evaluation**

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

(amendment) Regulations, 2019.

In the context of the proposed project, design has made provisions for an elaborate operational monitoring framework for the following among others:

- Disruption of natural environment
- Air and noise pollution
- Workers accidents and health infections during construction process
- Solid and liquid wastes management

### **8.3 Management Plan Principles**

This project is geared towards enhancing social and economic benefits to residents of Nairobi City County and Machakos Town satellite towns/centres like Athi River, Mlolongo and Machakos Junction. The project should also observe environmental protection requirements in accordance to the established laws and regulations to ensure sustainability. To realize this goal, acceptability by a majority of the beneficiaries and minimal effects to the physical environment will require to be integrated in the project through constant consultations, evaluations and review of the design aspects throughout the project coverage.

Among the factors that need to be considered in this particular project implementation will include:

- Ensure occupational safety and health standards are upheld to reduce accident occurrence and human suffering.
- Enhance integration of environmental, social and economic functions in the project implementation,
- Consider preventive measures towards possible social and economic disruptions that may arise from the project implementation in accordance with the laid down guidelines,
- The proponent and other players in the project activities be prevailed upon to implement the ESMP through a sustained supervision and continuous consultations

### **8.4 Specific Management Issues**

#### **8.4.1 Management Responsibilities**

In order to implement the management plan, it is recommended that a supervisor is identified

to oversee environment and safety management aspects during construction of the project. The supervisor would also be expected to co-ordinate and monitor environmental management during construction and provide monitoring schedules during operations.

#### **8.4.2 Environmental Management Guidelines**

Upon completion and commissioning the project, it will be necessary to establish appropriate operational guidelines on environmental conservation and social linkages to enable the operations' management identify critical environmental and social issues and institute appropriate actions towards minimizing associated conflicts.

Basically, the guidelines should cover among other areas environmental management programmes, standard operation procedures, compliance monitoring schedule and environmental audit schedules as required by law. Social harmony of the facilities and associated components will be achieved through collaborations with the stakeholders within the area.

#### **8.4.3 Environmental Monitoring and audits**

Environmental monitoring and audits are essential in a project's life span as they are conducted to establish if project implementation has complied with set environmental management standards for Kenya as spelt out in EMCA, 2015, and the Environmental (Impact Assessment and Audit) (amendment) Regulations, 2019.. In this project, environmental monitoring and audit will be conducted to ensure that identified potential negative impacts are mitigated during the project's life span.

#### **8.4.4 Decommissioning Process**

The main purpose of decommissioning is to restore/rehabilitate the site to acceptable standards. The lifespan of the proposed project is expected to be approximately 100 years depending on the quality of workmanship and maintenance during occupation phase. This period of time is long and there may be many changes which may not be foreseeable including the technological and legal aspects. On the other hand, the decommissioning may also come earlier than the expected length of time due to various reasons like change in physical planning policy or the discovery/realization of a more optimal use of the land. It is

therefore recommended that a decommissioning plan be prepared prior to decommissioning so that all aspects will be assessed against the prevailing conditions and requirements.

The decommissioning will involve demolitions of the structures, removal of debris and landscaping. Particularly, the proponent will:

- Remove all underground facilities from the site
- Landscape the site to improve site appearance
- Remove All the equipment from the site
- Fence and signpost unsafe areas
- Backfill surface openings if practical

**Table 8-1: Pre-Construction Phase Environmental and social Management Monitoring Plan**

Potential Impacts	Management Actions	Target Areas& Responsibilities	Monitoring Indicator	Budget
Seeking EHS approvals and permits from relevant bodies such as NEMA, DOSHS	<ul style="list-style-type: none"> <li>The Proponent shall ensure that all pertinent permits, certificates and licenses have been obtained prior to any activities commencing on site and are strictly enforced/ adhered to;</li> <li>The Contractor shall maintain a database of all pertinent permits and licenses required for the contract as a whole and for pertinent activities for the duration of the contract</li> </ul>	Proponent/ Supervision team/ Contractor	<ul style="list-style-type: none"> <li>Copies of the licenses and permits to be kept on site and should be valid till project decommissioning phase.</li> </ul>	100,000
Commissioning of the Construction Works	<ul style="list-style-type: none"> <li>Site hand-over and Ground breaking</li> </ul>	Proponent/ Supervision team/ Contractor	<ul style="list-style-type: none"> <li>Presence of the project Team</li> </ul>	Part of/Covered in the Project Cost
Securing the Construction Site	<ul style="list-style-type: none"> <li>Construction of Perimeter Wall and Hoarding</li> </ul>	Contractor	<ul style="list-style-type: none"> <li>Presence of Perimeter Fence</li> </ul>	Part of/Covered in the Project Cost

Potential Impacts	Management Actions	Target Areas& Responsibilities	Monitoring Indicator	Budget
Housing for Construction/ Site staff	<ul style="list-style-type: none"> <li>Construction of Labour Camp</li> </ul>	Contractor	<ul style="list-style-type: none"> <li>Presence of Labour Camp</li> </ul>	200,000
Security for Construction Material	<ul style="list-style-type: none"> <li>Construction of Site Stores</li> <li>Construction materials to be delivered in small quantities to minimize storage problems</li> </ul>	Contractor	<ul style="list-style-type: none"> <li>Presence of Site store</li> </ul>	100,000
Extraction and Use of Building Materials	<ul style="list-style-type: none"> <li>Availability and sustainability of the extraction sites as they are non-renewable in the short term</li> <li>Landscape changes e.g. displacement of animals and vegetation, poor visual quality and opening of depressions on the surface</li> </ul>	Contractor	<ul style="list-style-type: none"> <li>Material site rehabilitation</li> </ul>	Part of/Covered in the Project Cost



**Table 8-2: Construction Phase Environmental and social Management Monitoring Plan**

Potential Impacts	Management Actions	Target Areas & Responsibilities	Monitoring Indicator	Budget
Vegetation Clearing, Soil Erosion and Sedimentation	<ul style="list-style-type: none"> <li>• Adopt selective de-vegetation that aims at clearing only the project site where necessary.</li> <li>• The proponent proposes to carry out landscaping of the area.</li> <li>• Unnecessary felling of the existing trees should be avoided.</li> <li>• Once the project lifespan ends, the proponent shall replant the field with appropriate vegetative cover including indigenous trees.</li> <li>• Planting trees, flowers and other green measures</li> </ul>	Contractor	<ul style="list-style-type: none"> <li>• Number of trees cut</li> <li>• Demarcated project area</li> <li>• Landscaped area.</li> <li>• Number of trees and flowers planted</li> </ul>	KShs. 100,000
Air Quality	<ul style="list-style-type: none"> <li>• Maintain construction equipment at high operational conditions maintained and serviced in accordance with the specifications such as to control emissions into the air.</li> <li>• Earth moving be done under damp conditions as much as possible to prevent emission of</li> </ul>	Contractor	<ul style="list-style-type: none"> <li>• Cases of respiratory complication at nearby health center</li> </ul>	KShs. 100,000

Potential Impacts	Management Actions	Target Areas& Responsibilities	Monitoring Indicator	Budget
	<p>dust into the air,</p> <ul style="list-style-type: none"> <li>• Similarly, piled materials (sand and aggregate) should be maintained dump to prevent dust emissions,</li> <li>• Use of sprinklers to regularly water construction site, this suppresses the dust menace at construction sites</li> <li>• Screening of the construction site to contain and arrest construction-related dust.</li> <li>• Vehicles delivering soil or dusty materials shall be covered to reduce spills and windblown dust.</li> <li>• The removal of vegetation/topsoil shall be avoided until such time as clearance is required.</li> </ul>			
Excessive Vibration and Noise Pollution	<ul style="list-style-type: none"> <li>• Limit the times of construction to daylight hours (8am-5pm).</li> <li>• Erect signage to prohibit unnecessary hooting at the project site.</li> </ul>	Contractor	<ul style="list-style-type: none"> <li>• No of complaints received from neighboring residents</li> </ul>	No direct cost associated

Potential Impacts	Management Actions	Target Areas & Responsibilities	Monitoring Indicator	Budget
	<ul style="list-style-type: none"> <li>• Ensure that noise &amp; excessive vibration from construction activities are within permissible levels as per the provision of Environmental Management and Coordination (Noise and Excessive Vibration Pollution) (Control) Regulations, 2009. This includes among others adhering to permissible noise and vibration levels.</li> <li>• Construction work should strictly be undertaken between permissible time periods as stipulated in the second Schedule– Maximum Permissible Noise Levels for Construction Sites of EMCA(Noise and Excessive Vibration Pollution) (Control) Regulations, 2009.</li> <li>• Provide PPEs such as ear muffs to the contractors.</li> <li>• Carry out baseline noise monitoring within the area before, during and after the construction</li> </ul>			

<b>Potential Impacts</b>	<b>Management Actions</b>	<b>Target Areas&amp; Responsibilities</b>	<b>Monitoring Indicator</b>	<b>Budget</b>
	<p>works.</p> <ul style="list-style-type: none"><li>• Acquire noise and excessive vibrations emission permit from NEMA when undertaking excessive noise and vibration emitting activities</li></ul>			

Potential Impacts	Management Actions	Target Areas& Responsibilities	Monitoring Indicator	Budget
Wastes removals and disposal	<ul style="list-style-type: none"> <li>• A site waste management plan should be prepared by the contractor prior to commencement of construction works. This should include designation of appropriate waste storage areas, collection and removal schedule and identification of approved disposal site;</li> <li>• The project proponent and contractor must ensure that collection bins/ receptacles are placed at strategic locations within project site as collection centres to facilitate separation and sorting of various types of wastes.</li> <li>• The waste shall be properly segregated and separated to encourage recycling of some useful waste materials i.e. some stone and concrete materials can be used as backfills.</li> <li>• Contract a licensed waste handler to collect solid wastes which cannot be reused at the site.</li> </ul>	Contractor	<ul style="list-style-type: none"> <li>• Waste segregated point</li> <li>• Availability of site waste management plan</li> <li>• Presence of collection bins/ receptacles</li> <li>• Presence of a NEMA licensed waste handler</li> </ul>	KShs. 100,000

Potential Impacts	Management Actions	Target Areas & Responsibilities	Monitoring Indicator	Budget
	<ul style="list-style-type: none"> <li>• Adopt the 3R waste management approach, that is (reduce, reuse and recycle) whereby waste shall be segregated – plastics, glass, tins, papers, wood, metals etc. (later to be re-used or recycled).</li> <li>• Avail colour coded waste bins for source waste sorting at the project site.</li> <li>• Recycling non-woven fabrics and PE films into plastic particles to make some daily plastic products like plastic slippers, plastic desks and chairs</li> </ul>			
<b>Public and Occupational Health and Safety Risks</b>	<ul style="list-style-type: none"> <li>• Ensure that all construction machines and equipment are in good working conditions to prevent occupational hazards during excavation activities;</li> <li>• Establish a Health and Safety Plan (HASP) for civil works areas ensuring the working hours are controlled and that employees are not allowed to extend the working hours beyond</li> </ul>	Contractor	<ul style="list-style-type: none"> <li>• Availability of Health and Safety Plan (HASP)</li> <li>• Availability of adequate labour force</li> <li>• Availability of a deployed health and</li> </ul>	KShs.250,000

Potential Impacts	Management Actions	Target Areas & Responsibilities	Monitoring Indicator	Budget
	<p>an acceptable limit for purposes of gaining extra pay;</p> <ul style="list-style-type: none"> <li>• Provide adequate manual labour to meet the requirements of the tasks;</li> <li>• Appoint a trained health and safety team for the duration of the construction work, monitor and advise appropriately on health and safety matters during the rehabilitation activities</li> <li>• Provide workers with gloves, ear gears, sturdy rubber boots and overalls to protect their skin from the effects of cement;</li> <li>• Provide workers training on safety procedures and emergency response such as fire and first aid measures;</li> </ul>		<p>saety offcer on site</p> <ul style="list-style-type: none"> <li>• Avelaibility of adequate appropriate protective gears</li> <li>• No of safety and emergency trainings conducted</li> </ul>	
HIV/AIDS prevalence and drug abuse	<ul style="list-style-type: none"> <li>• Conduct sensitization to the staff and community on drug abuse, irresponsible sexual behaviors, HIV and AIDS, stress management, and voluntary counseling and testing.</li> <li>• Avail condom dispensers at the site to the</li> </ul>	Contractor	<ul style="list-style-type: none"> <li>• Number of Trainings Held</li> <li>• Availability of Training reports</li> <li>• Attendance list of</li> </ul>	KShs.100,000

Potential Impacts	Management Actions	Target Areas& Responsibilities	Monitoring Indicator	Budget
	<p>construction staff and the latter occupants.</p> <ul style="list-style-type: none"> <li>Strengthen advocacy through awareness training in HIV/AIDS and other Sexually Transmitted</li> <li>Infections to the community members.</li> <li>Identify other players (local CBOs, NGOs, and government organizations) on HIV/AIDS for enhanced collaboration;</li> <li>Provide counseling and testing for HIV/AIDS.</li> <li>Prohibit smoking within the project site</li> </ul>		<p>participants during the training sessions</p> <ul style="list-style-type: none"> <li>Availability of condoms</li> </ul>	
Spread of COVID 19	<ul style="list-style-type: none"> <li>Strict compliance to WHO and GoK guidelines curbing/prevent spread of Covid -19 that include Maintaining the social distancing and Personnel hygiene which include frequent washing of hands and strict wearing of masks</li> <li>Provisioning of washing hand points that will have running water and detergents</li> <li>Ensuring constant use of thermo-guns for all</li> </ul>	Contractor	<ul style="list-style-type: none"> <li>Number of Trainings Held</li> <li>Availability of Training reports</li> <li>Attendance list of participants during the training sessions</li> <li>Availability of Hand</li> </ul>	KShs.250,000



Potential Impacts	Management Actions	Target Areas& Responsibilities	Monitoring Indicator	Budget
	<p>persons entering site to confirm no persons with temperatures above 37.5 degrees centigrade enter site</p> <ul style="list-style-type: none"> <li>• Provide labelled area of isolation for any affected persons</li> <li>• Allowing for immediate evacuation of any infected persons to designated hospitals</li> </ul>		<p>Washing Water points And Soap On Site</p> <ul style="list-style-type: none"> <li>• Availability of a thermo gun and records of temperature taken</li> <li>• Presence of an isolation room</li> </ul>	
Surface Drainage Wastewater, and Water Pollution/ Contamination	<ul style="list-style-type: none"> <li>• Ensure that hazardous materials are handled and stored in a good manner, to limit their movement into the environment.</li> <li>• Trenching during plumping works should not interfere with the existing drainage channels.</li> <li>• Ensure that open stockpiles of construction materials are covered with tarpaulin or similar fabric during rainy season.</li> <li>• Removal of soil vegetative cover should be kept at minimum and should only be carried</li> </ul>	Contractor	<ul style="list-style-type: none"> <li>• Covering of stockpiles</li> <li>• Strict removal of vegetation to project area</li> <li>• Installed grease trap or oil water separator</li> <li>• Connection of sewerage to the main sewerline</li> </ul>	No direct cost associated

Potential Impacts	Management Actions	Target Areas & Responsibilities	Monitoring Indicator	Budget
	<p>out with absolute necessity</p> <ul style="list-style-type: none"> <li>• Stockpile of construction materials i.e. sand, ballast, stones etc. be placed away from drainage system.</li> <li>• Monitor the natural flow system during heavy rains and make improvements where necessary.</li> <li>• Clear any blocked drainage channels.</li> <li>• Clear all soil residues/debris after trenching works.</li> <li>• The proposed site for construction must be free from floods and should have adequate drainage to prevent effects of soil erosion and surface run-offs.</li> <li>• Provide containments to used oils and also construct a bund wall to the generator set room (if any).</li> <li>• Install grease trap or oil water separator.</li> </ul>			

Potential Impacts	Management Actions	Target Areas& Responsibilities	Monitoring Indicator	Budget
	<ul style="list-style-type: none"> <li>During construction stage sanitary waste shall be managed through mobile toilets and if need be, temporary pit latrines shall be constructed connected to sewer line.</li> <li>Establish drainage channels to ensure that surface runoff do not mix with effluent from the sanitary facilities.</li> <li>Wastewater shall be managed through proper disposal into MAVWASCO Sewerage system</li> </ul>			
Water use and Increasing Demand	<ul style="list-style-type: none"> <li>During construction phase, use water economically to avoid wastage.</li> <li>Conducting regular water system audits to identify and rectify any possible water leakages.</li> <li>Used water can be sprinkled on the haulage road and dusty surfaces to reduce dust emissions.</li> <li>Provide additional source of water to reduce pressure on the existing water source. E.g.</li> </ul>	Contractor	<ul style="list-style-type: none"> <li>Recycling of used water</li> <li>Presence of installed water gutters</li> <li>Constructed separate storm water and waste water drain</li> <li>Implemented water saving devices in the ablution block use</li> </ul>	No direct cost associated

Potential Impacts	Management Actions	Target Areas& Responsibilities	Monitoring Indicator	Budget
	<p>through rainfall harvest.</p> <ul style="list-style-type: none"> <li>• Routine check-ups and monitoring of the drainage system to avoid leakages and blockages.</li> <li>• Construction of separate storm water and waste water drain.</li> <li>• Implement water saving devices in the ablution block use e.g. dual flush toilets, automatic shut-off taps, etc</li> <li>• The designs have water reservoirs for storage.</li> <li>• Re-use or use recycled water for dust suppression</li> <li>• Provide roof &amp; storm water harvesting facilities connected to underground water storage tanks</li> </ul>			
Security and crime	<ul style="list-style-type: none"> <li>• Sensitize construction workers, locals and security to be on the lookout on suspicious activities near the site.</li> <li>• Proper design incorporating lighting to</li> </ul>	Contractor	<ul style="list-style-type: none"> <li>• No of sensitization held</li> <li>• No of reported crimes cases</li> </ul>	KShs.50,000

Potential Impacts	Management Actions	Target Areas& Responsibilities	Monitoring Indicator	Budget
	<p>enhance security.</p> <ul style="list-style-type: none"> <li>• Liaise with the administration units such as the police, chiefs and District Officers to provide regular surveillance and patrols to protect workers and the neighborhood.</li> <li>• Conduct sensitization campaigns for the public on risks related to construction sites.</li> <li>• Body search workers on entry, to avoid getting weapons on site and upon leaving site, ensure nothing is stolen.</li> <li>• Ensure only authorized personnel get to the premise.</li> <li>• Ensure security alarms are installed.</li> </ul>		<p>associated with the project</p> <ul style="list-style-type: none"> <li>• Availability of security personnel</li> </ul>	
Traffic snarl-ups	<ul style="list-style-type: none"> <li>• Provide reflective road signs on both sides of the working area at a distance not less than</li> <li>• 50m from the works.</li> <li>• Hire traffic marshal to control movement of trucks, heavy equipment, and machineries.</li> </ul>	Contractor	<ul style="list-style-type: none"> <li>• Availability of temporary road signs or notices to indicate on-going works;</li> <li>• Availability of a traffic management</li> </ul>	KShs.50,000

Potential Impacts	Management Actions	Target Areas & Responsibilities	Monitoring Indicator	Budget
	<ul style="list-style-type: none"> <li>• Planned deliveries of materials.</li> <li>• Proper display of warning signs such as 'Road works ahead', 'slow down' among others.</li> <li>• Provide road diversions.</li> <li>• Acquisition of traffic disruption permits from Traffic Police Authority whenever necessary.</li> <li>• Expand the access road to accommodate both vehicular and non-vehicular traffic expected in the area</li> <li>• Contractor will develop and implement a traffic management plan to mitigate against possible accidents</li> <li>• Ensure road safety measures for the construction vehicles to the extent possible by observing all traffic regulations in the Traffic Act 2012</li> </ul>		plan	
<ul style="list-style-type: none"> <li>• <b>Total cost of CEMP</b></li> </ul>				Kshs 1,000,000

Table 8-3: Operation Phase Environmental and social Management Monitoring Plan

Potential Impacts	Management Actions	Target Areas& Responsibilities	Monitoring Indicator	Budget
Solid Waste Management	<ul style="list-style-type: none"> <li>The proponent will provide waste handling facilities such as waste bins and skips for temporarily holding domestic waste generated at the site.</li> <li>The proponent will ensure that such disposed of regularly and appropriately.</li> <li>It is recommended that the proponent put in place measures to ensure that the occupants of the Houses manage their waste efficiently through recycling, reuse and proper disposal procedures.</li> </ul>	Proponent	<ul style="list-style-type: none"> <li>Presence of waste handling facilities such as waste bins and skips for temporarily holding domestic</li> <li>Contracted NEMA Licensed waste handler</li> </ul>	To be established at operation phase and included in the operation of the projects
Sewage Release	<ul style="list-style-type: none"> <li>The proponent will ensure that there are adequate means for handling the large quantities of sewage generated by the units being directed to the Machakos County with a connection from the development</li> </ul>	Proponent	<ul style="list-style-type: none"> <li>Connection to the main sewer lines</li> </ul>	
Energy Consumption	<ul style="list-style-type: none"> <li>The proponent plans to install an energy-efficient lighting system for the project. This</li> </ul>	Proponent	<ul style="list-style-type: none"> <li>Installed energy-efficient lighting system</li> </ul>	

Potential Impacts	Management Actions	Target Areas & Responsibilities	Monitoring Indicator	Budget
	<p>will contribute immensely to energy saving during the operational phase of the project.</p> <ul style="list-style-type: none"> <li>In addition, occupants of the apartments will be sensitized to ensure energy efficiency in their domestic operations. To complement these measures, it will be important to monitor energy use during the occupation of the houses and set targets for efficient energy use</li> </ul>		<ul style="list-style-type: none"> <li>Number of sensitization meetings held</li> </ul>	
Water Use	<ul style="list-style-type: none"> <li>The proponent will install water-conserving automatic taps and toilets.</li> <li>Moreover, any water leaks through damaged pipes and faulty taps will be fixed promptly by qualified staff.</li> <li>In addition, the occupants of the apartments will be sensitized to use water efficiently.</li> </ul>	Proponent	<ul style="list-style-type: none"> <li>Installed water-conserving automatic taps and toilets.</li> <li>Number of sensitization meetings held</li> </ul>	



## 8.5 Decommissioning Flow Chart

Housing Projects of such nature are designed to have an average stability of between 70-100 years after which minor renovations might be recommended, however, in the event that the proponent prefers to decommission the project the following steps should be considered. Complying with the provisions below provides for minimum impact of the project to the environment.

**Table 8-4: Decommissioning Flow Chart**

	<b>Action</b>	<b>Actor</b>
<b>Step 1</b>	<b>Initiation</b> Development of an Objective Worksheet and checklist incorporating references, legal and policies	<b>Proponent then</b>
<b>Step 2</b>	<b>Prepare Road Map for Decommissioning Design</b> Conduct design review to validate elements of the design and ensure design features are incorporated in the decommissioning	<b>Proponent then</b>
<b>Step 3</b>	<b>Prepare and Award Contract</b> Prepare a contract that incorporates validated project information and award to a contractor as per the Procurement rules.	<b>Proponent then</b>
<b>Step 4</b>	<b>Execute Decommission Works</b> Implement design elements and criteria on the Project in accordance with specifications and drawings. Inspect during decommissioning and at Project completion to ensure that all design elements are implemented according to design	<b>Contractor</b>
<b>Step 5</b>	<b>Non-Conformance, Corrective/Preventive Action</b> Determine root cause Propose corrective measures	<b>Proponent</b>

## **CHAPTER 9 : ENVIRONMENTAL HEALTH AND SAFETY (EHS)**

### **9.1 EHS Management and Administration**

The EHS is a broader and holistic aspect of protecting the worker, the workplace, the tools/ equipment and the biotic environment. It is an essential tool in determining the ESIA study. The objective of the EHS on the proposed project is to develop rules that will regulate environmentally instigated diseases and occupational safety measures during construction and the operation phases of the proposed project by:

- Avoidance of injuries
- Provision of safe and healthy working environment for workers' comfort so as to enhance maximum output.
- Control of losses and damages to plants, machines, equipment and other products.
- Enhance environmental sustainability through developing sound conservation measures.

### **9.2 Policy, Administrative and Legislative Framework**

It is the primary responsibility of the Contractor to promote a safe and healthy environment at the workplace and within the neighborhood in which the proposed project will be constructed by implementing effective systems to prevent occupational diseases and ill-health, and to prevent damage to property. The EHS Management Plan when completed will be used as a tool and a checklist by the contracted engineers in planning and development of the construction of this project.

### **9.3 Organization and implementation of the EHS Management Plan**

The contractor shall use the EHS plan at the proposed project site both during construction and operation. The engineer will use it during construction phase with the assistance of an EHS consultant who shall enforce its provision throughout the life of the project.

### **9.4 The Guiding Principles to be adopted by the Contractor**

The company will be guided by the following principle: -

- It will be a conscious organization committed to the promotion and maintenance of high

standards of health and safety for its employees, the neighboring population and the public at large.

- Ensuring that EHS activities are implemented to protect the environment and prevent pollution.
- Management shall demonstrate commitment and exercise constant vigilance in order to provide employees, neighbors of the project and the environment, with the greatest safeguards relating to EHS.
- Employees will be expected to take personal responsibility for their safety, safety of colleagues and of the general public as it relates to the EHS management plan.

### **9.5 EHS management strategy to be adopted by the Contractor**

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

- Create an Environment Health and Safety Management committee and incorporate EHS as an effective structure at various levels and units to manage and oversee EHS programs in all construction and operation phases of the project
- Maintain an effective reporting procedure for all accidents.
- Provide appropriate tools and protective devices for the success of the project.
- Encourage, motivate, reward and support employees to take personal initiatives and commitment on EHS.

### **9.6 Safety Agenda for both the proponent and Contractor**

There will be a permanent EHS agenda during construction.

#### **a) Contractors**

The EHS management plan code of practice shall be applicable to the Contractors working in the premises, and shall be read and signed. It shall be incorporated into the contract to perform work. This should also remind the Contractor of his/her;

- Legal requirements.
- Statutory obligations.
- Obligation to lay-down a system for reporting accidents
- Responsibility to ensure that his/her employees are supplied with personal protective

equipment and where applicable as per the EHS management plan for the whole project.

- Responsibilities as it relates to contracting an EHS consultant in liaison with the proponent
- Obligation to ensure that he obtains detail of jobs and areas where permit-to-work must be issued

**b) All residents' and workers' responsibility**

- Know the location of all safety equipment, and learn to use them efficiently

**9.7 Safety requirement at the project site during construction and operation Period**

**a) The Contractor**

The Contractor will ensure that:

- Safe means of entry and exit at the proposed project site.
- Ensure adequate briefing of job at hand on the safe system of work before commencement of work.
- The EHS coordinator must be in attendance at all times throughout the duration of the project.
- The EHS consultant must maintain constant assessment of the risk involved as the work progresses
- A safety harness must be worn before entry into all confined spaces
- An EHS consultant must be posted at the entrance at the project site to monitor progress and safety of the persons working at the construction site.

**b) The Traffic / Drivers**

Within the construction premises, the following traffic rules will be observed: -

- Observe speed limits and all other signs and obey traffic rules.
- Use the vehicle for the purpose to which it is intended only.

**c) Fire hazard at the construction site,**

Workers at the site shall ensure that: -

- Oxy-acetylene cylinders are not contaminated with grease or oil.

- Oxy-acetylene cylinders are not subjected to direct sunlight or heat.
- Oxy-acetylene cylinders are not to be used or stored standing in a vertical position.
- When in use, ensure the inclination should never be over 30° from the vertical.

### **9.8 Welding at the construction site**

It is the responsibility of the Contractor during construction to: -

- Ensure that welding clamp is fixed such that no current passes through any moving parts of any machine.
- Ensure that all welding clamps are in good operating condition and conduct current without arcing at the point of contact.
- Ensure that welding clamps are free from any contact with explosive vapors i.e. Oil spillage, Fuel tanks, Coal dusts and miscellaneous combustible material (e.g. Cotton rags filter bags, rubber belting, and wood shavings).
- Ensure that any slag or molten metal arising from welding activities does not start up fires by:
  - ✓ Clearing combustible material to a distance of at least 3 meters away from the working area or covering area with metal or asbestos sheet.
  - ✓ Appropriate fire extinguisher is to be kept available for immediate use at all times

### **9.9 Emergency procedure during construction and operation**

An emergency situation means:

- Unforeseen happening resulting in serious or fatal injury to employed persons or the neighboring communities.
- Fire or explosion, Natural catastrophe.

In the event of such an emergency during construction, the workers shall:

- Alert other persons exposed to danger.
- Inform the EHS coordinator, Do a quick assessment on the nature of emergency.
- Call for ambulance on standby, when emergency is over the EHS coordinator shall notify the workers by putting a message: "ALL CLEAR"

## **: CONCLUSION AND RECOMMENDATIONS**

### **10.1 Overview**

From the foregoing analysis, the social and economic rating for this project is highly positive. Evaluation of alternatives has already shown that options are limited and costly. Already the proponent has sunk a substantial amount of resources in the project up to the design stage and implementation of phase 1 of the project is ongoing . Further delay of the project is denying all stakeholders the anticipated benefits of the investment especially the target beneficiaries. On the other hand, redesigning or relocation will lead to loss of time and money that is already tied in the preliminary costs of the project. The project does not pose any serious negative environmental and social impacts. Adequate mitigation measures have been proposed to address any of the negative impacts arising from the project.

The Main Findings from the assessment described in the Report are as follows:

- i. The project is to be implemented on 40 located on L.R. Nos. Mavoko Town Block 3/9798-10020, 10070-10075, 10077-10079 Lukenya ward, Mavoko Sub-County, Machakos county.
- ii. The property is registered under Harun Osoro Nyamboki of P.O Box 54867-00200 Nairobi under absolute tenure. Subdivision of the original land LR No. Mavoko Town Block 3/2410 was done on 11<sup>th</sup> November 2008. The original title was surrendered but processing of the individual titles for the new land parcels is yet to be done.
- iii. The original parcel, Mavoko Town 3/2410 measured about 16.12 Ha (39.5 acres). The area under consideration measures 14 Ha (34.6 acres )which inclusive of all the land parcels and roads. Each parcel measures 0.0405 Ha (1 acres) except for land parcels Nos 10073-10075 which are relatively bigger
- iv. Application for amendment of approved amalgamation, subdivision of land parcel NO. MAVOKO TOWN BLOCK 3/9798-10020, 10070-10075, 10077-10079 & change of use from maisonettes to include multi-dwelling units (apartments), shopping centre, day care centre, nursery and primary school, health centre, recreational areas and public

amenities, located in Lukenya area, Mavoko SubCounty, Machakos County was done, the proposed comprehensive land use layout plan is part of the annexure (Annex 3).

- v. The location currently has numerous existing land uses that include maisonettes, temporary road construction site, temporary workers structures, demonstration houses, boreholes, access roads and a mini-wastewater treatment plant.
- vi. The site has 51 maisonettes units where twenty-five (25) are complete and the remaining (26) are incomplete. Out of the complete units fifteen (15) are occupied while four (4) are sold out but yet to be occupied. This section constitutes the project phase one. Phase 1.
- vii. There also exists a road construction site, which is temporarily rented out to a road construction contractor. The temporary structures are set for demolition once the construction is concluded.
- viii. The site also has permanent demonstration units and temporary staff structures in the section earmarked for phase 4, adjacent to the maisonettes. These structures will be demolition once phase four commences.
- ix. Two boreholes also exist on site.
- x. The largest proportion of the site under consideration is undeveloped and covered with vegetation especially sections earmarked for phase two and three.

## **10.2 Conclusion**

This project is feasible with a perspective of social economic evaluation, financial evaluation and environmental assessment, which has stable economic benefit and strong anti-risk capacity. The analysis of the project alternative options showed that the project is indispensable. Therefore, the project is necessary, and should be implemented as soon as possible. A comprehensive Environmental Management Plan (EMP) and Environmental Monitoring Strategy has been developed of which the proponent will implement to ensure minimal damage to the environment. There are also guidelines for addressing environmental, occupational health and safety especially during project implementation.

We therefore, recommend the project for NEMA approval because it:- a) is well within the spirit of the National Constitution, b) will support in realization Nairobi Metro vision 2030: and the

President's Big 4 agenda of providing for affordable housing to Kenyans. Infrastructure services within Nairobi metropolitan area particular to Nairobi City County and Machakos Town satellite towns/centres like Athi River, Mlolongo and Machakos Junction area will also be enhanced., c) will contribute towards the realization of goals for Kenya' Vision 2030 goals, and d) will not violate the strategies for the National Spatial Plan 2015-2045.

In view of the findings of the ESIA, the proposed project is considered as environmentally sound. Further, the project proponent is willing to guarantee that the potential adverse impacts whose means of mitigation have been disclosed in this report and most of them have already been incorporated in the project design will be effectively implemented. On the basis of these findings, it is recommended that the proposed Moke Gardens Comprehensive Housing Development into Affordable Housing Units in Lukenya, Mavoko Sub-County, Machakos County be approved based on the willingness by the proponent to implement the proposed project in strict adherence to the Environmental and Social Management Plan (ESMP) and Environmental Monitoring Plan. Further, NEMA should issue the proponent with an EIA license as required by Kenya's environmental laws

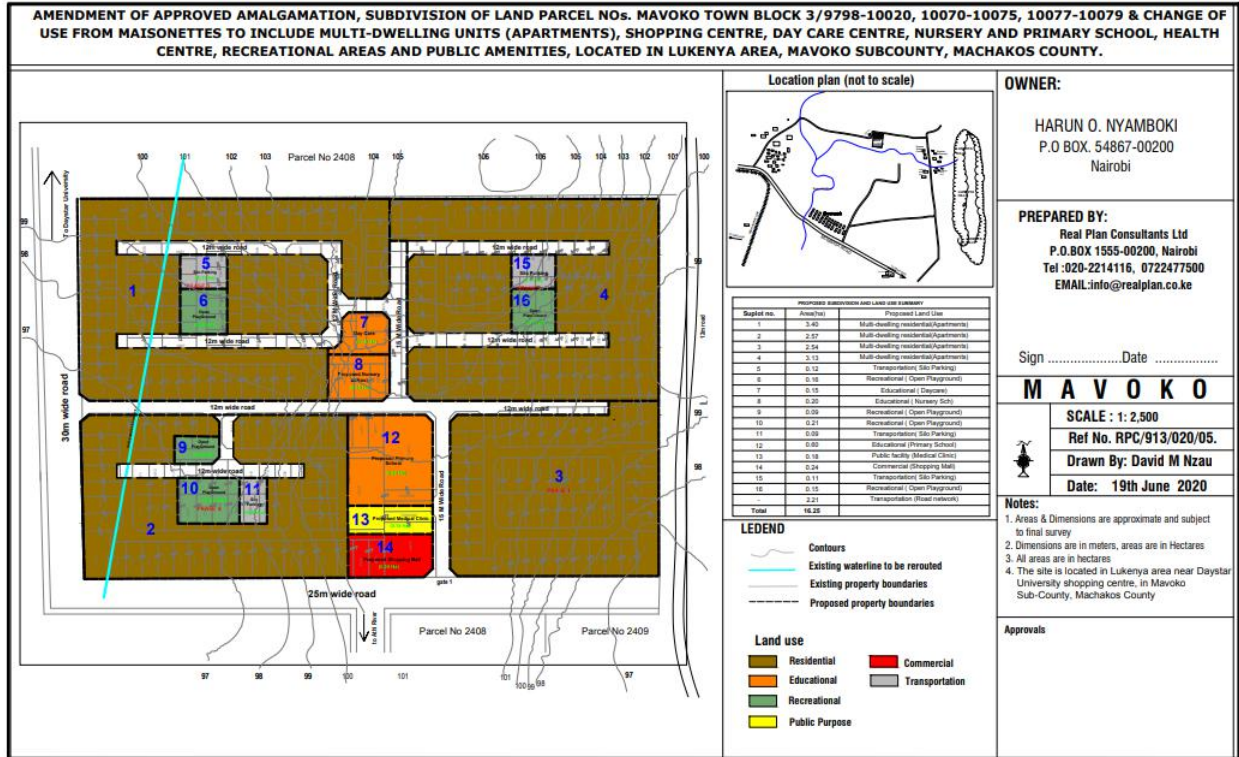
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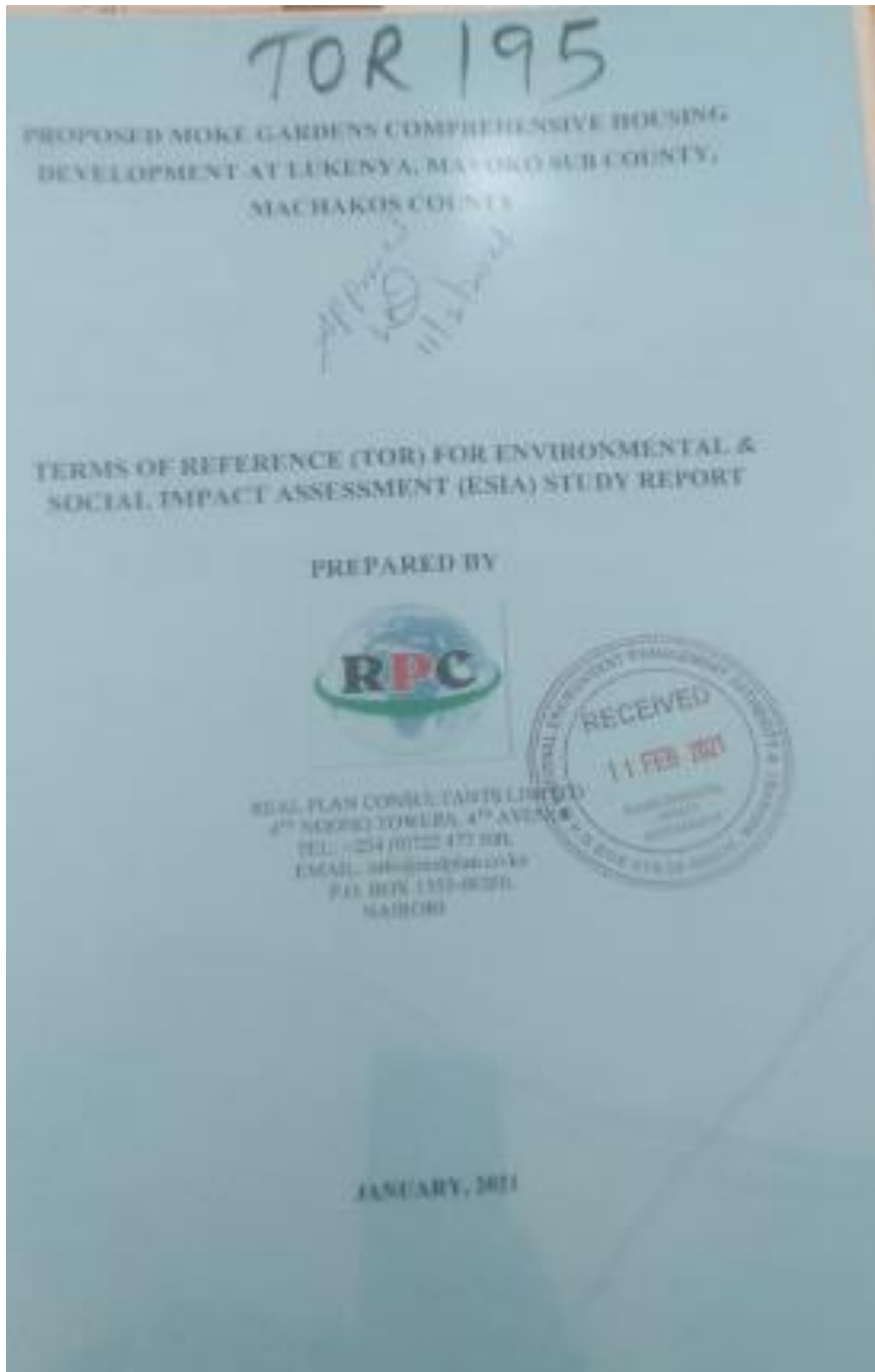
## **ANNEXES**

### **Annex 1:Lead Expert Practising License**

**Annex 2: Proposed Comprehensive Land Use Layout Plan**



**Annex 3:Approved TOR**



**Annex 4: Sample Site Photographs**



All-weather access road/perimeter wall for Moke Gardens



Neighboring primary school



Pine breeze hotel and restaurant in the neighbourhood



Existing social facility in the neighbourhood



Sample houses for viewing onsite



Existing Maisonette( Part of Moke Gardens

**Annex 5: Minutes of the Meetings Held and Attendance Sheet**

**MINUTES FOR THE CONSULTATIVE MEETING FOR THE ENVIRONMENTAL AND SOCIAL IMPACT  
ASSESSMENT (ESIA) FOR MOKE GARDENS AFFORDABLE HOUSING PROJECT HELD ON SITE IN  
KINANIE LOCATION, LUKENYA, MAVOKO SUB-COUNTY ON 21<sup>ST</sup> MAY 2021.**

**PRELIMINARIES.**

The meeting was called to order at 11.15am by the area Chief Josphat Musinga who chaired the meeting.

It started with a word of prayer by Pastor Darius Kimanzi.

A total of sixty-seven (67) participants were in attendance. The following were present.

No.	Name	Designation	Organization/Locality	Mobile No.
1.	Josphat Musinga Timothy	Chief	Kinanie -Chairing	0722 781 046
2.	David Muthini Kitonyi	Assistant Chief	Kinanie	-
3.	Harun o. Nyamboki	Director	Moke Gardens Ltd.	0722 224 277
4.	Esther Katheu	Director	Moke Gardens Ltd.	0722 718 294
5.	Philip Mutua	Village Manager	Mto wa Mawe	0720 670 051
6.	Winfred Ndunge	Village Manager	Pioneer	0716 423 832
7.	Mary Mukola	Village Manager	Daystar	0725 990 327
8.	Henry M. Mwau	EIA/EA Lead expert	RPC	0722 700 156
9.	Michael Babu	EIA/EA Expert	RPC	0726 237 769
10.	David Musyoki	GIS Expert	RPC	0726 707 455
11.	Amos Mutinda	Cartographer	RPC	0712 766 100
12.	Allan Muthoka	Planner	RPC	0724 084 825
13.	Roseline Moseti	Planner	RPC	0703 850 914
14.	Oscar Imo	Student	Daystar	0792 016 508
15.	Mbithi Nzau	Resident	Daystar	0723 359 708
16.	EstherNduku	Business Lady	Kinanie	0727 233 906
17.	Alex Munywoki	Resident	Kathama	-

No.	Name	Designation	Organization/Locality	Mobile No.
18.	Gabriel Munyao	Resident	Pioneer	0796 049 260
19.	Simon Mulonzi	Resident	Daystar	0746 942 333
20.	Andrew Muthami	Resident	Pioneer	0759 256 467
21.	Nicodemus Mutua	Resident	Kathama	0745 951 788
22.	Joseph	Resident	Kathama	0759 007 407
23.	Agnes	Resident	Kathama	0708 812 440
24.	Justinah Ndanu	Resident	Daystar	0708 073 263
25.	Philip Wambua Munyao	Resident	Pioneer	0748 462 870
26.	Victor Muluma	Resident	Pioneer	0716 733 854
27.	Charles Mbindyo	Resident	Daystar	0790 062 922
28.	Dennis Rop	Resident	Daystar	0795 438 949
29.	Iris Simiyu	Resident	Daystar	0713 961 541
30.	Esther Ambrose	Business Lady	Daystar	0718 024 172
31.	Martin Nzyoki	Resident	Daystar	0768 135 501
32.	Joshua Muasya	Resident	Pioneer	-
33.	Victorine Imali	Resident	Pioneer	0798 841 632
34.	Mary Munyao	Resident	Pioneer	0726 922 579
35.	Faith Mbinya	Resident	Pioneer	0719 372 518
36.	Vero Wanza	Resident	Pioneer	0706 716 814
37.	Patrick M. Munyao	Boda-boda operator	Pioneer	0759 007 335
38.	Benson N. Nzomu	Resident	Pioneer	0727 536 857
39.	Kelvin Mutinda	Resident	Kathama	0768 510 381
40.	Dickson Nthenge	Resident	Kathama	0729 016 155
41.	Alfred Mutiso	Welder	Kathama	0729 655 377
42.	Charles Ndegwa	Chef	Daystar	0728 913 423
43.	Gael Sibidagara	Resident	Daystar	0714 973 482

No.	Name	Designation	Organization/Locality	Mobile No.
44.	Robert Mbondo	Resident	Daystar	0710 942 507
45.	Musyoka Mutia	Resident	Daystar	0721 291 186
46.	Martin N. Mulwa	Resident	Daystar	0723 849 653
47.	Obed A. Omayio	Resident	Daystar	0715 680 245
48.	Mukundi Njeru	Resident	Pioneer	0740 903 782
49.	Bonface Wechuli	Resident	Kinanie	0791 768 466
50.	Yahya Hassan	Resident	Kinanie	0758 117 810
51.	Martin Mutua	Resident	Daystar	0723 095 609
52.	Simon Mumo	Resident	Daystar.	-
53.	George Kimani	Resident	Daystar	0713 799 425
54.	Moses Mukola	Resident	Daystar	0111 722 821
55.	Jacob Abuga	Resident	Daystar	0792 649 545
56.	Denis Macharia	Resident	Daystar	0798 039 288
57.	Nzau Mwende	Resident	Daystar	0748 262 590
58.	Samuel Kyuli	Resident	Daystar	0720 934 824
59.	Evans Ombaso	Resident	Daystar	0729 204 455
60.	David Munyao	Resident	Daystar	0712 236 598
61.	Darius Kimanzi	Resident	Pioneer	0726 394 809
62.	Jackson Kioko	Resident	Kinanie	0725 526 532
63.	Peter M. Nzioki	Resident	Pioneer	0728 312 490
64.	Vitalis Nyambega		Pillars of Hope Children's Home	0721 787 167
65.	Mary Ndeti	Resident	Kinanie	0723 052 995
66.	Goretti Muluka	Site Sales Rep.	Ark Consultants	0724 661 794
67.	Nancy Thande	Planner	RPC -Taking minutes	0708 412 014



## **AGENDA:**

The items on the agenda included:

1. Preliminaries
2. Remarks from Area Chief
3. Remarks from Director Moke Gardens Limited.
4. Remarks from EIA Lead Expert
5. Presentation by Environmental Experts.
6. Comments and Questions from Participants.
7. Responses to Comments
8. Resolution
9. Adjournment

### **MIN 1/05/2021: OPENING REMARKS FROM AREA CHIEF KINANIE LOCATION, JOSPHAT MUSINGA**

Chief Musinga welcomed the members to the meeting and thanked the participants who had honoured the invitations to attend the meeting. He requested the members present to introduce themselves by name, organization and locality that they were representing.

The chief set out the Agenda of the meeting. He explained to the participants that the meeting was a consultative forum aimed at getting the views of the residents on the proposed Moke Gardens affordable housing project. This is because the project would impact the neighbourhood.

The chief also expressed his appreciation to Moke Gardens Limited for their high degree of community involvement in the project through consultations and employment in the on-going phase one development constructions.



Participants during meeting proceedings

### **MIN 2/05/2021: REMARKS FROM MOKE GARDENS LIMITED DIRECTOR, HARUN NYAMBOKI**

Mr. Nyamboki, the director Moke Gardens Limited;

1. Welcomed the participants to the site and gave them a brief history of the project. He stated that it was initially planned to accommodate 500 low-density houses (maisonettes), but after commencement of work on phase one, the project stalled momentarily due to various constraints. The project was thereafter revived in 2018 when the government called for strategic partners for the Affordable Housing Program (AHP) for housing developers with 5 or more acres for development. Moke Limited took up the opportunity and gained AHP certification.
2. Explained that under the AHP, the government offered infrastructural support to developers including provision of water, power, electricity and roads which would benefit the other residents in the neighbourhood as well.
3. Stated that for this particular project, the State Department for Housing and Urban Development had committed to; completing the bridge across Stoni Athi River in Mavoko Sub-County along Athi River-Kinanie Road through the enables of the affordable Housing Program and completion of the trunk sewer line in Lukenya. He noted that work on the trunk sewer had already commenced and work on the bridge across Stoni Athi River had already been contracted out.
4. Assured the participants of Moke Gardens Limited's commitment to the welfare development of the local community. He stated that they had revised their building plans of

the high rise blocks from 10 floors to 6 floors after public comments requesting the same so as to lower the cost of housing.

5. Assured the participants that they were committed to creating employment opportunities for the locals during both the construction and operational phases of the project.
6. Assured the participants of their commitment to source raw materials used in the construction locally.

Mr. Nyamboki concluded by stating that the facilities to be developed in the area would be accessible to all residents in the locality. The facilities would include; a health facility to be put up by Agha Khan Hospital on 2-3 acres as well as Banks and a shopping centre.



Director Moke Gardens addressing participants

### **MIN 3/05/2021 REMAKS FROM EIA LEAD EXPERT HENRY MWAU**

Henry Mwau, the Lead Expert:

1. Thanked the participants for making time to learn about the project and give their input and introduced his team.
2. Gave a brief history of the project stating it started about 10 years ago, initially proposed as low-density housing development consisting of maisonettes and public facilities. The project was granted the relevant approvals and work on phase one of the project commenced. With the launch of Affordable Housing Program (AHP) in 2017 as part of the President's Big

Four Agenda, the developer saw it fit to align the project with the AHP to respond to the increased demand for affordable housing.

3. Explained that the new project consists of high-rise, higher density housing consisting of apartments and public facilities unlike
4. Informed the participants that Moke Gardens Limited was one of the approved strategic partners with affordable housing projects on private land. It is one of the certified Affordable Housing Program projects. This means that the State Department for Housing and Urban Development had committed to providing assistance including infrastructure facilitation under AHP. Additionally, the developers would receive tax rebates/incentives so as to keep the cost of production and subsequently cost at which the houses would be sold low.
5. Explained that the new project had received the requisite approvals from the County Government of Machakos including; the amalgamation, subdivision, change of use as well as approval for the building plans. He explained that NEMA approval was pending subject to an Environmental and Social Impact Assessment (ESIA) study.
6. Informed the participants that NEMA had already approved the project Terms of Reference (TORs) which are to guide the EIA process.
7. Informed the participants that the consultative meeting was a part of the ESIA process which required public participation to inform the residents of the proposed development, get their views and suggestions on how to make the project more environmentally conscious and sustainable.
8. Explained that development would include; approximately 4,000 high density multi-dwelling housing units, a shopping centre, day care centre, Nursery School, Health Centre, parking silo, recreational spaces and other public amenities and would be done in three phases. Phase one- which comprises of low density multi-dwelling housing units is on-going and nearing completion.
9. Explaining that the affordable housing units would be available through the Government *Boma Yangu* platform under the tenant purchase scheme and encouraged interested participants to register and learn more about it.

10. Concluded by inviting the participants to view the model of the proposed housing project to get a clear picture of the proposed development.



Lead Expert giving his remarks to participants. A model of the proposed housing project displayed.



Participants viewing the model for the proposed development

#### **MINUTE 4/05/2021: PRESENTATION BY ENVIRONMENTALIST- MICHAEL BABU**

The EIA expert, Michael Babu explained to the participants the significance and the process of carrying out an ESIA in accordance with the Environmental Management and Co-ordination (Amendment) Act, 2015.

Mr. Babu explained that;

1. An ESIA is an in-depth assessment of likely environmental and social impacts that are likely to be triggered by a project.
2. The ESIA analyses significant impacts of a proposed project during construction, operation and decommissioning phases such as; Impact on property and livelihood, impact on conservation areas , elevation of risk to life threatening circumstances, and effect on sensitive environmental factors.
3. The ESIA process required public and stakeholder consultation that would help in proposing alternatives to developments as well as preparation of the mitigation/monitoring plan.
4. The ESIA team would prepare an ESIA report and submit it to the National Environment Management Authority (NEMA).
5. NEMA would then publicize the report to receive public comments on the same.
6. NEMA would give approval for the project to proceed if they are satisfied that the project will have no adverse environmental and social impacts and any negative impacts would be

effectively mitigated. If they were not satisfied, they would reject the report with comments.

7. Thereafter, in line with regulations, NEMA will check on compliance of the project through annual environmental audits.

Mr. Babu then took the participants through possible positive and possible associated negative impacts of the project and mitigation measures.

The positive impacts highlighted included;

- i. Spur economic development the area due to the capital investment of the project.
- ii. Employment opportunities during construction and operational phases.
- iii. Increase affordable housing space available thus, help alleviate the housing shortage in the Nairobi Metropolitan area.
- iv. Provision of public facilities and amenities such as schools and commercial spaces to project neighbours.
- v. Completion of bridge across Stoni Athi River in Mavoko along Athi River- Kinanie Road through the enables of AHP
- vi. Completion of trunk sewer line in Lukenya.

The possible associated negative impacts and mitigation measures highlighted included;

Associated Impacts	Mitigation Measures
Dust and Exhaust emissions	<ul style="list-style-type: none"> <li>• Provide dust screens around construction perimeter.</li> <li>• Water active construction sites where necessary</li> <li>• Cover trucks hauling soil &amp; loose materials</li> </ul>
Increased solid waste generation	<ul style="list-style-type: none"> <li>• Use Integrated solid waste management system.</li> <li>• Recover, refurbish and reuse wasted construction materials</li> <li>• Ensure accurate estimation of sizes and quantities of materials required to avoid wastage</li> </ul>
Occupational Health and Safety	<ul style="list-style-type: none"> <li>• Provide workers with proper PPEs</li> <li>• Ensure all building plans are approved by local authority and the Occupational Health and Safety Office.</li> </ul>

	<ul style="list-style-type: none"> <li>• Hire the right number of trained and skilled workers.</li> </ul>
Noise & Excessive Vibrations	<ul style="list-style-type: none"> <li>• Ensure construction machinery is kept in good condition.</li> <li>• Insulate heavy-duty equipment.</li> <li>• Switch off machine &amp; vehicle engines when not in use</li> </ul>
Vegetation Clearing, soil erosion and Sedimentation	<ul style="list-style-type: none"> <li>• Adopt selective de-vegetation</li> <li>• Replant field with appropriate vegetation cover after project lifespan ends.</li> </ul>
Surface drainage, waste water and water pollution/contamination	<ul style="list-style-type: none"> <li>• Proper handling and storage of hazardous materials.</li> <li>• Cover open stockpiles of construction materials</li> </ul>
Traffic snarl-ups	<ul style="list-style-type: none"> <li>• Proper signage not less than 50m from construction works.</li> <li>• Provide and publicise road diversions.</li> </ul>
Increased social conflict and security	<ul style="list-style-type: none"> <li>• Engage local leaders to prevent labour influx</li> <li>• Provide security at construction sites</li> <li>• Put in place a Grievance Redress Mechanism to address and close on grievances</li> </ul>



The Environmentalist, Mr. Babu, making his presentation

## **MINUTE 5/05/2021: COMMENTS AND QUESTIONS FROM THE PARTICIPANTS**

Various participants in the meeting had comments and questions for the developer and the consultants which are captured below.

### **a. PHILIP MUTUA- REPRESENTATIVE MTO WA MAWE**

He inquired on the cost of the project as well as the developer's CSR commitment.

He also sought assurance that the contractors engaged by the developer in the construction would not discriminate against locals and would follow through on the promise by the developer to employ locals in the construction site.

He also requested that the developer sets up a formal channel through which locals can channel their grievances and give suggestions.

### **b. JOSEPH DUSH- RESIDENT KATHAMA**

He requested that the daily wages offered to casual labourers in the construction sites be reviewed upwards stating that the KShs. 450 daily wage offered in most construction sites was insufficient to cater for the expenses of the labourers.

### **c. VICTORINE IMALI- RESIDENT PIONEER**

She sought to know the accessibility and affordability of the proposed social amenities to the local community.

### **d. JACKSON KIOKO-BODA BODA OPERATOR KINANIE**

He sought assurance that the local residents would get employment opportunities in at the construction site.

He inquired about the mechanism in place to allow the residents to follow up on the promise made for employment by the developer.

He requested the developer to consider putting up a health facility or recreational centre for the local community as part of their CSR.

He proposed that the follow up committee should incorporate the area chief and village heads who would pass on the grievances of the local residents to the developer if need be.

### **e. VICTOR MULUMA – RESIDENT PIONEER**

He requested the developer to consider local sourcing of construction materials.



**f. MUSYOKA MUTIA- RESIDENT DAYSTAR**

He echoed the request to consider local sourcing of construction materials.

**g. JOSHUA MUASYA- RESIDENT DAYSAR**

He sought to know the mechanism in place to protect workers who could get hurt while on site.

**h. CHARLES NDEGWA- RESIDENT DAYSTAR**

He inquired on the basis on which the proposed developments were deemed to be “affordable” and wanted to know how the local communities could access the housing units.

He reiterated the need for the developer to increase the wages of the casual labourers to be employed on the construction site.

He stated that although the local community was often called upon to participate in consultative meetings, their suggestions were rarely implemented. Additionally, they are not provided any avenue to follow up on the same.

He requested the developer to ensure that there was a redress mechanism for the grievances of the local residents.



Participants asking questions.

**MINUTE 6/05/2021: RESPONSES TO QUESTIONS FROM THE PARTICIPANTS BY THE DEVELOPER AND ESIA EXPERTS**

1. The developer in his response stated that the project, on completion, would be valued at about KShs. 11Bn and assured the participants that the developer was committed to doing meaningful CSR throughout the construction and operationalization of the proposed development.

2. The developer reiterated his commitment to sourcing materials locally because it was convenient, affordable and also part of the Affordable Housing Strategic Partner Certification conditions as well as the development approval conditions.
3. The developer also assured the participants that the project would respect the local administration structure and the local community would be involved and their grievances addressed through the local leaders.
4. The developer noted that manual labourers on the construction site were paid a daily wage of KShs. 500 which was above market price. Additionally, artisans were paid KShs. 1,500, higher than the KShs. 1,000 offered locally.
5. The Lead expert explained to the participants that the nature of the project could not accommodate the construction of a health centre or recreational facility because it would drive the project cost too high to be financially feasible under the affordable housing concept. However, he reiterated that the local communities would be able to access the facilities put up within the project thereby bringing quality services closer to the people who currently have to travel for long distances to access them.
6. The Lead expert assured the participants that the project will be reviewed periodically to ensure compliance and check that it does not have adverse effects on the residents and the neighbourhood.
7. On the issue of affordability and accessibility of the social amenities the experts explained that the government affordable housing guidelines would be followed to determine the price of goods produced and services offered.
8. The Lead Expert also urged the locals to sign up on *Boma Yangu* and familiarise themselves with the application process, and payment and financing options so that they can be among the direct beneficiaries of the proposed project.
9. The EIA expert explained to the participants that project was highly regulated. The contractor was obligated to have a comprehensive insurance cover and all sub-contractors must be certified.

10. The EIA expert stated the contractors were bound by the Occupational Safety and HealthyAct-2007, which dictates that the contractors must put in place sufficient measures to protect workers on site.
11. The EIA expert explained that workers who will feel that they have been discriminated against as a result of work-place related injuries will present their grievances to the project's Safety, Health, Environment and Social Issues Committee that will be created at commencement of the project. In the event that they do not get redress, they can appear and be heard by the Directorate of Occupational Safety and Health Services (DOSHS) which is mandated to ensure compliance with the provisions of the Occupational Safety and Health Act 2007 and promotes safety and health of workers.
12. The EIA expert also explained that the project would have a Grievance Redress Committee comprising of the chief, village heads and different organization representatives to address and close on grievances from the residents.

#### **MINUTE 7/05/2021: RESOLUTION**

After successful deliberations and satisfactory responses given to the questions raised by participants, the chair sought to find out how many of the participants were in support of the project. This was done via a show of hands.

He asked participants who supported the project to raise their hands. All the participants present raised their hands. He then asked those opposed to the project to raise their hands, none of the participants raised their hands. ]



**Participants raising their hands to demonstrate support to the project**

**MINUTE 8/03/2021: ADJOURNMENT**

The chief thanked all the participants present for making time and for their contributions. He also assured them that he would work closely with the developer to realize maximum benefits for the residents in the area.

Pastor Darius Kimanzi said a closing prayer on request by the chief.

With no other business to discuss, the meeting was closed at 14.05 pm.

Chairman

Sign 

AREA CHIEF  
KINAMIE LOCATION  
7/6/2021

Date: 7/6/2021

Secretary

Sign 

Date: 7/6/2021





MOKE GARDENS AFFORDABLE HOUSING PROJECT ON LAND PARCEL No. MAVOKO TOWN BLOCK 3/ 46208 – 46242 (Old No's Mavoko Town Block 3 /9798-10020, 10070-10075, 10077-10079) AT LUKENYA, MAVOKO SUB COUNTY MACHAKOS COUNTY

## ATTENDANCE LIST

VENUE: MOKE GARDENS

DATE: 21<sup>ST</sup> MAY 2021

No.	Name	Designation	Organization	Mobile No.	Signature	ID NO.
1.	Oscar Imo	Student	Daystar	0792016508		36142428
2.	Alex Mungwoki	Resident	Kathanga	07 - <del>xxxx</del>		39116557
3.	Gabriel Mungao	Resident	Pioneer	0796049269		
4.	Simon Mlonzi	Resident	Daystar	0746942333		38680731
5.	Andrew Muthiani	Resident	Pioneer	0759256467		35083395
6.	Nicodemus mutua	Resident	Kathama	0745951788		33401137



MOKE GARDENS AFFORDABLE HOUSING PROJECT ON LAND PARCEL No. MAVOKO TOWN BLOCK 3/ 46208 – 46242 (Old No's Mavoko Town Block 3 /9798-10020, 10070-10075, 10077-10079) AT LUKENYA, MAVOKO SUB COUNTY MACHAKOS COUNTY

## ATTENDANCE LIST

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DATE: 21<sup>ST</sup> MAY 2021

No.	Name	Designation	Organization	Mobile No.	Signature	ID
7.	Joseph	Resident	Kathana	075000740	Col.	37515694
8.	AGNES	KALUKI	MONIRAH PAULONTIS	0708812440	SA	26412298
9.	JUSTINAH	NDANU	Day Star <del>WITNESS</del>	0708023263	J-D	4447498
10.	PHILIP WAMBWA	MUDYAO	PROSEKER	074846280	Ikungu	8833303
11.	Victor Muluma	Resident	Pioneer	0716733854	SA	24569862
12.	CHARLES MBINDYO	RESIDENT MBINDYO	MASHA DAYSTAR	0790062922	SA	3173310



MOKE GARDENS AFFORDABLE HOUSING PROJECT ON LAND PARCEL No. MAVOKO TOWN BLOCK 3/ 46208 – 46242 (Old No's Mavoko Town Block 3 /9798-10020, 10070-10075, 10077-10079) AT LUKENYA, MAVOKO SUB COUNTY MACHAKOS COUNTY

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DATE: 21<sup>ST</sup> MAY 2021

No.	Name	Designation	Organization	Mobile No.	Signature	ID No.
13.	PHILLIP MUTUA	VILLAGE manager	MTO WA MANG	0720670051	<i>[Signature]</i>	6049386
14.	MBITHI NZAU	clay star	mbithi	0723359708	<i>[Signature]</i>	2980252
15.	ESTHER NDIKIU	BUSINESS-LADY		0721232906	<i>[Signature]</i>	21847637
16.	DENNIS ROP	clay star		0795438949	<i>[Signature]</i>	36740620
17.	Iris Simiyu	claystar business		0713861541	<i>[Signature]</i>	
18.	Esther Ambrose	claystar Business		0718 024 172	<i>[Signature]</i>	





MOKE GARDENS AFFORDABLE HOUSING PROJECT ON LAND PARCEL No. MAVOKO TOWN BLOCK 3/ 46208 – 46242 (Old No's Mavoko Town Block 3 /9798-10020, 10070-10075, 10077-10079) AT LUKENYA, MAVOKO SUB COUNTY MACHAKOS COUNTY

ATTENDANCE LIST

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DATE: 21<sup>ST</sup> MAY 2021

No.	Name	Designation	Organization	Mobile No.	Signature	ID No.:
19.	MARTIN Nkyoki	Daystar		0768135501		25812009
20.	Joshua muasya	pioneer		07726259		24902330
21.	VICTORINE IMABI	PIONEER		0198841632		35701502
22.	MARI MUMTAO	PIONEER		0726922579		27475310 <del>27475310</del>
23.	FAITH MBINTA	PIONEER		071937208		30137834
24.	VERO WANZA	PIONEER		0706716814		32060901



MOKE GARDENS AFFORDABLE HOUSING PROJECT ON LAND PARCEL No. MAVOKO TOWN BLOCK 3/ 46208 – 46242 (Old No's Mavoko Town Block 3 /9798-10020, 10070-10075, 10077-10079) AT LUKENYA, MAVOKO SUB COUNTY MACHAKOS COUNTY

ATTENDANCE LIST

VENUE: MOKE GARDENS

DATE: 21<sup>ST</sup> MAY 2021

No.	Name	Designation	Organization	Mobile No.	Signature	ID No.
25.	PATRICK N. MUNYAO	PIONEER	BUDA BUDA	0759007335	<i>[Signature]</i>	16114951
26.	Benson N. NZOMU	Pioneer	-	0727538857	<i>[Signature]</i>	13523187
27.	Kevlin Mutinda	Kathama		0768510387	<i>[Signature]</i>	37308866
28.	DICKSON NTHENSE	Kathama		0729016155	<i>[Signature]</i>	8826333
29.	Alfred Mutiso	Kathama	welder	0729655377	<i>[Signature]</i>	34458855
30.	CHARLES NAEGWA	DAYSTAR	Chef	0728913423	<i>[Signature]</i>	24364070



MOKE GARDENS AFFORDABLE HOUSING PROJECT ON LAND PARCEL No. MAVOKO TOWN BLOCK 3/ 46208 – 46242 (Old No's Mavoko Town Block 3 /9798-10020, 10070-10075, 10077-10079) AT LUKENYA, MAVOKO SUB COUNTY MACHAKOS COUNTY

## ATTENDANCE LIST

VENUE: MOKE GARDENS

DATE: 21<sup>ST</sup> MAY 2021

No.	Name	Designation	Organization	Mobile No.	Signature	ID No.
31.	Gael Sibidagari	Daystar		0712 973482		
32.	ROBERT MBORLOO	DAYSTAR		0710 942 507		7042896
33.	MUSYAKA MUTIA	DAY STAR		0712 91186		13445847
34.	MARTIN N MULWA	DAY STAR		0723 849653		23699984
35.	OBED A. OMAIYO	DAYSTAR		0715 680245		2079990
36.	MUKUNDI NBERU	PIONEER		0740703782		28646450



MOKE GARDENS AFFORDABLE HOUSING PROJECT ON LAND PARCEL No. MAVOKO TOWN BLOCK 3/ 46208 – 46242 (Old No's Mavoko Town Block 3 /9798-10020, 10070-10075, 10077-10079) AT LUKENYA, MAVOKO SUB COUNTY MACHAKOS COUNTY

ATTENDANCE LIST

VENUE: MOKE GARDENS

DATE: 21<sup>ST</sup> MAY 2021

No.	Name	Designation	Organization	Mobile No.	Signature
37.	Bonface Wechuli			0791768466	
38.	VAHYA MASSAP			0758117810	
39.	Martin Mutua	Daystar		0793095809	
40.	Simon Mumo	Daystar		0793095809	
41.	GEORGE KIMANI	Daystar		0713799425	
42.	Moses Muxola	Daystar		011122821	

ID NO  
3530897  
36678801  
35453603  
37996607  
36573487  
33519098




MOKE GARDENS AFFORDABLE HOUSING PROJECT ON LAND PARCEL No. MAVOKO TOWN BLOCK 3/ 46208 – 46242 (Old No's Mavoko Town Block 3 /9798-10020, 10070-10075, 10077-10079) AT LUKENYA, MAVOKO SUB COUNTY MACHAKOS COUNTY

ATTENDANCE LIST

VENUE: MOKE GARDENS

DATE: 21<sup>ST</sup> MAY 2021

No.	Name	Designation	Organization	Mobile No.	Signature	ID NO
43.	JACOB ABUGA	Daystar		0792649545		33893439
44.	DAVIS MACHARIA	Daystar		0798039556		35138895
45.	NANI NISENDE	Daystar		0748262590		26227360
46.	MARY MUKOLA	DAYSTAR		0725990327		8634527
47.	KINTREB NDUNGO	MTO MAMUS -NORTH PLUMER		0716423 832		205810 47
48.	Samuel Kyui	DAYSTAR		0720734824		22539591
No.	Name	Designation	Organization	Mobile No.	Signature	

Open with 

MOKE GARDENS AFFORDABLE HOUSING PROJECT ON LAND PARCEL No. MAVOKO TOWN BLOCK 3/ 46208 – 46242 (Old No's Mavoko Town Block 3 /9798-10020, 10070-10075, 10077-10079) AT LUKENYA, MAVOKO SUB COUNTY MACHAKOS COUNTY

ATTENDANCE LIST

VENUE: MOKE GARDENS DATE: 21<sup>ST</sup> MAY 2021

49.	EVANS Ombalo	Daystar	0729204455	21/5/2021	Full	21570104
50.	David Mungoo	Daystar	0712236599	21/5/2021	Att.	31025140
51.	Darius Kimani	Pioneer	0726394509	21/5/2021	Att.	11426470
52.	Jackson Kioko	Kimani	0725526532	21/05/2021	P	2427773
53.	PETER M NZIOKI	PIONEER	0728312490	21/05/2021	Att.	26553016
54.	Harun O. Njambuki	Moke	0722224277	21/05/2021	<u>N</u>	4440028

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MOKE GARDENS AFFORDABLE HOUSING PROJECT ON LAND PARCEL No. MAVOKO TOWN BLOCK 3/ 46208 – 46242 (Old No's Mavoko Town Block 3 /9798-10020, 10070-10075, 10077-10079) AT LUKENYA, MAVOKO SUB COUNTY MACHAKOS COUNTY

ATTENDANCE LIST

VENUE: MOKE GARDENS

DATE: 21<sup>ST</sup> MAY 2021

55.	Henry M Mway	Lead Expert	Real Plan Consultants Ltd	0722700156		
56.	Esther Katheru	Director	Moke	0722718294		CK23366 PP
57.	Roseline Maseti	Urban Planner	Real Plan Consultants Ltd	0703850914		35354077
58.	Hany Thande	Planner	Real Plan Consultants Ltd	0708412014		33101875
59.	Goretti Muiuka	Sik Sales Rep	Ark Consultants	0724661794		24648607
60.	Michael Babu	EIA/EA Expert	RPC LTD	0726237769		250841667

15 PP

Dan



MOKE GARDENS AFFORDABLE HOUSING PROJECT ON LAND PARCEL No. MAVOKO TOWN BLOCK 3/ 46208 – 46242 (Old No's Mavoko Town Block 3 /9798-10020, 10070-10075, 10077-10079) AT LUKENYA, MAVOKO SUB COUNTY MACHAKOS COUNTY

ATTENDANCE LIST

VENUE: MOKE GARDENS

DATE: 21<sup>ST</sup> MAY 2021

61.	VITALIS NTHAMBICA	PILLARS of HOPE CHILDREN HOME		0717771167	
62.	MARY MDETI	MUSECOVE		0723052995	

63 Joseph M. Muthiri CHIEF

0722781000

64 David Musyoki AIC Expert RPC Lia

0726707455

65 Amos Mutunga Cartographer RPC

0712766100



Annex 6: Public Notice



**Real Plan Consultants Ltd**

*Physical Planning and Environment Consultants*

4<sup>TH</sup> AVENUE TOWERS 16<sup>TH</sup> FLR, 4<sup>TH</sup> NGONG AVENUE P. O. BOX 1555 – 00200, Tel: (020) 2214116, 0722477500 NAIROBI  
Email: [info@realplan.co.ke](mailto:info@realplan.co.ke)

Ref: RPC/913(c)/005/ntw

13<sup>th</sup> May 2021

To .....

.....

**RE: INVITATION TO AN ENVIRONMENTAL IMPACT ASSESSMENT (EIA) CONSULTATIVE MEETING FOR MOKE GARDENS AFFORDABLE HOUSING DEVELOPMENT PROJECT ON MAVOKO TOWN BLOCK 3/46208 TO 46242 SITUATED IN LUKENYA, MAVOKO SUB-COUNTY.**

Pursuant to the Environmental Management and Co-ordination Act 1999, the above-stated project requires an EIA study, as part of which we are conducting public participation on behalf of the developer.

We are, therefore, pleased to invite you to an EIA consultative meeting for Moke Gardens Affordable Housing Development, to be held on 21<sup>st</sup> March 2021, at the proposed site, along Daystar- Kananie-Devki Road, from 10.00 AM.

The purpose of the consultative meeting is to present a brief on the proposed project and allow the participants to give their views on how to make the project more sustainable and environmentally friendly.

Your attendance, participation, and punctuality will be highly appreciated.

Yours Sincerely,


Henry. M. Mwau  
LEAD EXPERT  
**For Real Plan Consultants Ltd**

cc: Moke Gardens Ltd.

Chief,  
Kinanie Location, Mavoko sub-county, Machakos County.

*Striving towards planned and sustainable environments.*

Annex 7: Sample Filled Questionnaires and list of people engaged in the interviews



**RPC Real Plan Consultants Ltd**  
*Physical Planning and Environment Consultants*

4<sup>th</sup> AVENUE TOWERS 16<sup>th</sup> FLR, 4<sup>th</sup> HOONG AVENUE, P.O. BOX 1255 - 00302, NAIROBI (KENYA) TEL: (011) 2244333 EXT: 2244333 FAX: (011) 2244337  
 NAIROBI  
 Email: [info@realplan.co.ke](mailto:info@realplan.co.ke)

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**PUBLIC CONSULTATION AND PARTICIPATION FORM**

**ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT STUDY REPORT FOR**  
**THE PROPOSED AFFORDABLE HOUSING UNITS AT LUKENYA, MAVOKO**  
**SUB-COUNTY, MACHAKOS COUNTY.**

Moke Gardens Limited a private company are planning to implement No. 4118 (four thousand one hundred and eighteen) housing units as at Mavoko Town Block 3/2410 Lukenya ward, Mavoko Sub-County, Machakos county the project is part of the government affordable housing units.

The Environmental (Impact Assessment and Audit) Regulation of 2003 require that all projects listed on the second schedule of the Environmental Management and Coordination Act must undertake an EIA and submit the report to the National Environment Management Authority (NEMA). Public participation and consultation are a key input in this process. Consultations are held with members of the immediate community, and the interested/ affected parties, in order to obtain their views regarding the project.

As part of the process, Moke gardens limited have appointed Real Plan Consultants Limited to conduct ESIA for the proposed development. This questionnaire is part of public consultation that will be included in the ESIA study report.

You have been selected to participate in this exercise and we would highly appreciate your assistance for responding to all questions in this questionnaire adequately and appropriately as possible. Please fill in the following questionnaire giving in your comments where necessary.

*Your response will be treated with confidentiality and will only be used for the purpose of this project.*

Name of the respondent Gabriel Mungu Gender Male  
 Date 16/10/2021 Phone Number 0796 04 92 69  
 Name of the project Area MOKE Designation Farmer

**Kindly fill in the questionnaire**

1. What is your proximity to the proposed site?

Length in M	Tick appropriately
Less than 50	
50-100	<input checked="" type="checkbox"/>
100-200	
More than 200	

2. Are you aware of the government plans on affordable housing project?  
 Yes  No

3. Are you aware of the proposed Moke Gardens affordable housing project?

Yes  No

4. Are you aware of any similar project in the neighboring premises?

Yes  No

5. If yes in 7 above please give brief details (the owner, location etc.)

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

6. Are you familiar with activities involved in construction of housing projects?

Yes  No

7. What are the likely impacts from the proposed project in terms of?

**i. Safety and health in the neighborhood**

How will the proponent activities affect current public safety and health in the area?

	Tick appropriately
Improve	<input checked="" type="checkbox"/>
deteriorate	<input type="checkbox"/>
no change	<input type="checkbox"/>

**ii. Traffic situation**

How will the proponent development contribute to the traffic situation?

	Tick appropriately
No significant impact	<input type="checkbox"/>
slight increase but flow manageable	<input checked="" type="checkbox"/>
A lot of congestion	<input type="checkbox"/>

**iii. Waste disposal**

Do you think you will be affected by the manner in which the proponent proposes to dispose their waste?

Yes  No

**iv. Noise pollution**

Do you think you will be affected negatively by noise during construction works?

Yes  No

**v. Water consumption**

Do you foresee your source of water being adversely affected by the proposed project?

Yes  No

8. If any of your answer in 7 above is yes please specify

N/A

9. What are the expected **POSITIVE** impacts of the project from construction phase through to commissioning and operations phases?

- Employment Opportunity  
- improve infrastructure  
- improve security  
- improve landscape

10. State any concerns regarding implementation of the proposed project?

11. What suggestions would you make to mitigate any adverse environmental impacts during the project construction, commissioning and operations?

- improve road condition  
- drill more boreholes  
- to increase water supply  
- increase for straight Street/Light

12. Do you support the project?

Yes

No

13. If your answer is No in 12 above briefly explain?

Signature Muya

Date 16/4/2021



# Real Plan Consultants Ltd

*Physical Planning and Environment Consultants*

4<sup>TH</sup> AVENUE TOWERS 10<sup>TH</sup> FLOOR, 4<sup>TH</sup> FLOOR AVENUE, P.O. BOX 1555 - 00100, TEL: (00254) 214106 972247300 FAX: (020) 2213397  
Nairobi  
Email: info@realplan.co.ke

**PUBLIC CONSULTATION AND PARTICIPATION FORM**  
**ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT STUDY REPORT FOR**  
**THE PROPOSED AFFORDABLE HOUSING UNITS AT LUKENYA, MAVOKO**  
**SUB-COUNTY, MACHAKOS COUNTY.**

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You have been selected to participate in this exercise and we would highly appreciate your assistance for responding to all questions in this questionnaire adequately and appropriately as possible. Please fill in the following questionnaire giving in your comments where necessary.

*Your response will be treated with confidentiality and will only be used for the purpose of this project.*

Name of the respondent Momanyi Rasaga Kipolisi Gender Male  
Date 16/04/2021 Phone Number 0718562909  
Name of the project Area Moke Gardens Designation Gate Guard

Kindly fill in the questionnaire

1. What is your proximity to the proposed site?

Length in M	Tick appropriately
Less than 50	<input checked="" type="checkbox"/>
50-100	<input type="checkbox"/>
100-200	<input type="checkbox"/>
More than 200	<input type="checkbox"/>

2. Are you aware of the government plans on affordable housing project?

Yes  No

3. Are you aware of the proposed Moke Gardens affordable housing project?

Yes  No

4. Are you aware of any similar project in the neighboring premises?

Yes  No

5. If yes in 4 above please give brief details (the owner, location etc.)

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

6. Are you familiar with activities involved in construction of housing projects?

Yes  No

7. What are the likely impacts from the proposed project in terms of?

**I. Safety and health in the neighborhood**

How will the proponent activities affect current public safety and health in the area?

	Tick appropriately
Improve	<input checked="" type="checkbox"/>
deteriorate	<input type="checkbox"/>
no change	<input type="checkbox"/>

**ii. Traffic situation**

How will the proponent development contribute to the traffic situation?

	Tick appropriately
No significant impact	<input type="checkbox"/>
slight increase but flow manageable	<input checked="" type="checkbox"/>
A lot of congestion	<input type="checkbox"/>

**iii. Waste disposal**

Do you think you will be affected by the manner in which the proponent proposes to dispose their waste?

Yes  No

**iv. Noise pollution**

Do you think you will be affected negatively by noise during construction works?

Yes  No

**v. Water consumption**

Do you foresee your source of water being adversely affected by the proposed project?

Yes  No

8. If any of your answer in 7 above is yes please specify

Noise pollution from the workers and employees

9. What are the expected **POSITIVE** impacts of the project from construction phase through to commissioning and operations phases?

- ✓ Employment opportunities
- ✓ Social Cohesion
- ✓ Improve the landscape of the area
- ✓ Increase amenities and education institutions

10. State any concerns regarding implementation of the proposed project?

No concern

11. What suggestions would you make to mitigate any adverse environmental impacts during the project construction, commissioning and operations?

- ✓ Control of Noise levels
- ✓ Improve Infrastructure

12. Do you support the project?

Yes

No

13. If your answer is No in 12 above briefly explain?

Signature

Date

16/04/2021



# Real Plan Consultants Ltd

*Physical Planning and Environment Consultants*

4<sup>th</sup> AVENUE TOWERS 3<sup>rd</sup> FLR, 4<sup>th</sup> MOONGI AVENUE, P.O. BOX 1225 - 00200, 1st (102) 224116, 0722473758 FAX: (020) 221587  
 NAIROBI  
 Email: info@realplan.co.ke

## PUBLIC CONSULTATION AND PARTICIPATION FORM

### ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT STUDY REPORT FOR THE PROPOSED AFFORDABLE HOUSING UNITS AT LUKENYA, MAVOKO SUB-COUNTY, MACHAKOS COUNTY.

Moke Gardens Limited a private company are planning to implement No. 4118 (four thousand one hundred and eighteen) housing units as at Mavoko Town Block 3/2410 Lukenya ward, Mavoko Sub-County, Machakos county the project is part of the government affordable housing units.

The Environmental (Impact Assessment and Audit) Regulation of 2003 require that all projects listed on the second schedule of the Environmental Management and Coordination Act must undertake an EIA and submit the report to the National Environment Management Authority (NEMA). Public participation and consultation are a key input in this process. Consultations are held with members of the immediate community; and the interested/ affected parties, in order to obtain their views regarding the project.

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You have been selected to participate in this exercise and we would highly appreciate your assistance for responding to all questions in this questionnaire adequately and appropriately as possible. Please fill in the following questionnaire giving in your comments where necessary.

*Your response will be treated with confidentiality and will only be used for the purpose of this project.*

Name of the respondent XGEDAES Gender MALE  
 Date 16/11/2021 Phone Number 0701299225  
 Name of the project Area Moke Designation DRIVER

**Kindly fill in the questionnaire**

1. What is your proximity to the proposed site?

Length in M	Tick appropriately
Less than 50	<input checked="" type="checkbox"/>
50-100	<input checked="" type="checkbox"/>
100-200	<input type="checkbox"/>
More than 200	<input type="checkbox"/>

2. Are you aware of the government plans on affordable housing project?

Yes  No



3. Are you aware of the proposed Moke Gardens affordable housing project?

Yes  No

4. Are you aware of any similar project in the neighboring premises?

Yes  No

5. If yes in 7 above please give brief details (the owner, location etc.)

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

6. Are you familiar with activities involved in construction of housing projects?

Yes  No

7. What are the likely impacts from the proposed project in terms of?

**i. Safety and health in the neighborhood**

How will the proponent activities affect current public safety and health in the area?

	Tick appropriately
improve	<input checked="" type="checkbox"/>
deteriorate	<input type="checkbox"/>
no change	<input type="checkbox"/>

**ii. Traffic situation**

How will the proponent development contribute to the traffic situation?

	Tick appropriately
No significant impact	<input type="checkbox"/>
slight increase but flow manageable	<input checked="" type="checkbox"/>
A lot of congestion	<input type="checkbox"/>

**iii. Waste disposal**

Do you think you will be affected by the manner in which the proponent proposes to dispose their waste?

Yes  No

**iv. Noise pollution**

Do you think you will be affected negatively by noise during construction works?

Yes  No

**v. Water consumption**

Do you foresee your source of water being adversely affected by the proposed project?

Yes  No

8. If any of your answer in 7 above is yes please specify

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

9. What are the expected **POSITIVE** impacts of the project from construction phase through to commissioning and operations phases?

Job opportunities  
Improvement of infrastructure and Security  
Good road condition  
Increase population neighbourhood

10. State any concerns regarding implementation of the proposed project?

Sta  
\_\_\_\_\_  
\_\_\_\_\_

11. What suggestions would you make to mitigate any adverse environmental impacts during the project construction, commissioning and operations?

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

12. Do you support the project?

Yes  No

13. If your answer is No in 12 above briefly explain?

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Signature .....

Date 16/04/2011

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## Real Plan Consultants Ltd

*Physical Planning and Environment Consultants*

4<sup>th</sup> AVENUE TOWERS 10<sup>th</sup> FLR, 4<sup>th</sup> NGONG AVENUE, P.O. BOX 1370 - 00300, Tel: (020) 220416, 012547590 FAX: (020) 221557  
NAIROBI  
Email: [info@realplan.co.ke](mailto:info@realplan.co.ke)

### PUBLIC CONSULTATION AND PARTICIPATION FORM

#### ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT STUDY REPORT FOR THE PROPOSED AFFORDABLE HOUSING UNITS AT LUKENYA, MAVOKO SUB-COUNTY, MACHAKOS COUNTY.

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*Your response will be treated with confidentiality and will only be used for the purpose of this project.*

Name of the respondent Carolina Lichuma Gender Female

Date 16/4/2021 Phone Number 0700218772

Name of the project Area ..... Designation Household

**Kindly fill in the questionnaire**

1. What is your proximity to the proposed site?

Length in M	Tick appropriately
Less than 50	
50-100	✓
100-200	
More than 200	

2. Are you aware of the government plans on affordable housing project?

Yes

No

8. If any of your answer in 7 above is yes please specify

✓ Noise from the tractor & and workers.

9. What are the expected **POSITIVE** impacts of the project from construction phase through to commissioning and operations phases?

imp create job employment:  
✓ Recreation area (Playing ground)  
✓ Security will improve.

10. State any concerns regarding implementation of the proposed project?

✓ Population Increase.

11. What suggestions would you make to mitigate any adverse environmental impacts during the project construction, commissioning and operations?

- Use noise proof  
- drill better borehole

12. Do you support the project?

Yes  No

13. If your answer is No in 12 above briefly explain?

Signature



Date

16/4/2021



## Real Plan Consultants Ltd

Physical Planning and Environment Consultants

4<sup>th</sup> AVENUE TOWERS 15<sup>th</sup> FLR, 4<sup>th</sup> NG'ONGO AVENUE, P.O. BOX 1555 - 00005, Tel: (020) 3214116, 072477388 FAX: (020) 3215557  
 NAIROBI  
 Email: [info@realplan.co.ke](mailto:info@realplan.co.ke)

**PUBLIC CONSULTATION AND PARTICIPATION FORM**  
**ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT STUDY REPORT FOR**  
**THE PROPOSED AFFORDABLE HOUSING UNITS AT LUKENYA, MAVOKO**  
**SUB-COUNTY, MACHAKOS COUNTY.**

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*Your response will be treated with confidentiality and will only be used for the purpose of this project.*

Name of the respondent Mary Dgutu Gender Female  
 Date 16/04/2021 Phone Number .....  
 Name of the project Area ..... Designation Resident

Kindly fill in the questionnaire

1. What is your proximity to the proposed site?

Length in M	Tick appropriately
Less than 50	
50-100	✓
100-200	
More than 200	

2. Are you aware of the government plans on affordable housing project?

Yes  No

3. Are you aware of the proposed Moke Gardens affordable housing project?  
 Yes  No

4. Are you aware of any similar project in the neighboring premises?  
 Yes  No

5. If yes in 7 above please give brief details (the owner, location etc.)  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

6. Are you familiar with activities involved in construction of housing projects?  
 Yes  No

7. What are the likely impacts from the proposed project in terms of?

**i. Safety and health in the neighborhood**  
 How will the proponent activities affect current public safety and health in the area?

	Tick appropriately
Improve	<input checked="" type="checkbox"/>
deteriorate	<input type="checkbox"/>
no change	<input type="checkbox"/>

**ii. Traffic situation**  
 How will the proponent development contribute to the traffic situation?

	Tick appropriately
No significant impact	<input type="checkbox"/>
slight increase but flow manageable	<input checked="" type="checkbox"/>
A lot of congestion	<input type="checkbox"/>

**iii. Waste disposal**  
 Do you think you will be affected by the manner in which the proponent proposes to dispose their waste?  
 Yes  No

**iv. Noise pollution**  
 Do you think you will be affected negatively by noise during construction works?  
 Yes  No

**v. Water consumption**  
 Do you foresee your source of water being adversely affected by the proposed project?  
 Yes  No

8. If any of your answer in 7 above is yes please specify

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

9. What are the expected **POSITIVE** impacts of the project from construction phase through to commissioning and operations phases?

Employment opportunity  
Increase in Amenities  
Increase in Security

10. State any concerns regarding implementation of the proposed project?

No Concern

11. What suggestions would you make to mitigate any adverse environmental impacts during the project construction, commissioning and operations?

✓ Improve Security  
✓ drill Noise Barriers.  
✓ Improve the Road Condition to prevent dust pollution.

12. Do you support the project?

Yes  No

13. If your answer is No in 12 above briefly explain?

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Signature M. Mwangi Date 16<sup>th</sup> April 2021

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# Real Plan Consultants Ltd

*Physical Planning and Environment Consultants*

4<sup>th</sup> AVENUE TOWERS 15<sup>th</sup> FLR, 4<sup>th</sup> NGONG AVENUE, P.O. BOX 1344 - 00201, Tel: (020) 221413, P/2547790 FAX: (020) 221537  
NAIROBI  
Email: info@realplan.co.ke

## PUBLIC CONSULTATION AND PARTICIPATION FORM

### ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT STUDY REPORT FOR THE PROPOSED AFFORDABLE HOUSING UNITS AT LUKENYA, MAVOKO SUB-COUNTY, MACHAKOS COUNTY.

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*Your response will be treated with confidentiality and will only be used for the purpose of this project.*

Name of the respondent Franc Omboro Gender Male  
Date 10/4/2021 Phone Number 0729204455  
Name of the project Area Moke Gardens Designation Resident

**Kindly fill in the questionnaire**

1. What is your proximity to the proposed site?

Length in M	Tick appropriately
Less than 50	
50-100	
100-200	<input checked="" type="checkbox"/>
More than 200	

2. Are you aware of the government plans on affordable housing project?

Yes  No



3. Are you aware of the proposed Moke Gardens affordable housing project?

Yes  No

4. Are you aware of any similar project in the neighboring premises?

Yes  No

5. If yes in #4 above please give brief details (the owner, location etc.)

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

6. Are you familiar with activities involved in construction of housing projects?

Yes  No

7. What are the likely impacts from the proposed project in terms of?

**i. Safety and health in the neighborhood**

How will the proponent activities affect current public safety and health in the area?

	Tick appropriately
Improve	<input checked="" type="checkbox"/>
deteriorate	<input type="checkbox"/>
no change	<input type="checkbox"/>

**ii. Traffic situation**

How will the proponent development contribute to the traffic situation?

	Tick appropriately
No significant impact	<input type="checkbox"/>
slight increase but flow manageable	<input checked="" type="checkbox"/>
A lot of congestion	<input type="checkbox"/>

**iii. Waste disposal**

Do you think you will be affected by the manner in which the proponent proposes to dispose their waste?

Yes  No

**iv. Noise pollution**

Do you think you will be affected negatively by noise during construction works?

Yes  No

**v. Water consumption**

Do you foresee your source of water being adversely affected by the proposed project?

Yes  No

8. If any of your answer in 7 above is yes please specify

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

9. What are the expected **POSITIVE** impacts of the project from construction phase through to commissioning and operations phases?

✓ Employment opportunity  
✓ Growth Development of this area  
✓ An increase of Amenities  
✓ Increase of security  
✓ Increase of educational facilities

10. State any concerns regarding implementation of the proposed project?

NO CONCERN  
\_\_\_\_\_  
\_\_\_\_\_

11. What suggestions would you make to mitigate any adverse environmental impacts during the project construction, commissioning and operations?

Improve Road Condition to Prevent dust Pollution  
\_\_\_\_\_  
\_\_\_\_\_

12. Do you support the project?

Yes  No

13. If your answer is No in 12 above briefly explain?

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Signature [Signature] Date 16/04/2021

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## Real Plan Consultants Ltd

*Physical Planning and Environment Consultants*

4<sup>th</sup> AVENUE TOWERS 5<sup>th</sup> FLR, 4<sup>th</sup> FLOOR AVENUE, P.O. BOX 1925 - 00100, NAIROBI, TEL: (020) 2214136, 0725477009 FAX: (020) 2215897  
NAIROBI

Email: [info@realplan.co.ke](mailto:info@realplan.co.ke)

### PUBLIC CONSULTATION AND PARTICIPATION FORM

#### ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT STUDY REPORT FOR THE PROPOSED AFFORDABLE HOUSING UNITS AT LUKENYA, MAVOKO SUB-COUNTY, MACHAKOS COUNTY.

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*Your response will be treated with confidentiality and will only be used for the purpose of this project.*

Name of the respondent Rosemary Auma Gender Female  
 Date 16/4/2021 Phone Number 0701465451  
 Name of the project Area Moke Gardens Designation Neighbour

**Kindly fill in the questionnaire**

1. What is your proximity to the proposed site?

Length in M	Tick appropriately
Less than 50	
50-100	<input checked="" type="checkbox"/>
100-200	
More than 200	

2. Are you aware of the government plans on affordable housing project?

Yes  No

3. Are you aware of the proposed Moke Gardens affordable housing project?

Yes  No

4. Are you aware of any similar project in the neighboring premises?

Yes  No

5. If yes in 7 above please give brief details (the owner, location etc.)

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

6. Are you familiar with activities involved in construction of housing projects?

Yes  No

7. What are the likely impacts from the proposed project in terms of?

**i. Safety and health in the neighborhood**

How will the proponent activities affect current public safety and health in the area?

	Tick appropriately
improve	<input checked="" type="checkbox"/>
deteriorate	<input type="checkbox"/>
no change	<input type="checkbox"/>

**ii. Traffic situation**

How will the proponent development contribute to the traffic situation?

	Tick appropriately
No significant impact	<input type="checkbox"/>
slight increase but flow manageable	<input checked="" type="checkbox"/>
A lot of congestion	<input type="checkbox"/>

**iii. Waste disposal**

Do you think you will be affected by the manner in which the proponent proposes to dispose their waste?

Yes  No

8. If any of your answer in 7 above is yes please specify

Waste disposal Management  
- Drills to be used -  
-  
-  
-

9. What are the expected **POSITIVE** impacts of the project from construction phase through to commissioning and operations phases?

10. State any concerns regarding implementation of the proposed project?

✓ Traffic  
✓ Noise pollution  
✓ Noddy the residents

11. What suggestions would you make to mitigate any adverse environmental impacts during the project construction, commissioning and operations?

✓ Improve parking  
- Increase parking lots.  
-  
-

12. Do you support the project?

Yes  No

13. If your answer is No in 12 above briefly explain?

Signature: *[Signature]*

Date: 15<sup>th</sup> April 2021

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# Real Plan Consultants Ltd

*Physical Planning and Environment Consultants*

4<sup>TH</sup> AVENUE TOWERS 16<sup>TH</sup> FLR, 4<sup>TH</sup> NGONG AVENUE, P.O. BOX 1551 - 00200, NAIROBI (TEL) 254 20 272307380 FAX: (20) 214507  
NAIROBI  
Email: info@realplan.co.ke

## PUBLIC CONSULTATION AND PARTICIPATION FORM

### ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT STUDY REPORT FOR THE PROPOSED AFFORDABLE HOUSING UNITS AT LUKENYA, MAVOKO SUB-COUNTY, MACHAKOS COUNTY.

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*Your response will be treated with confidentiality and will only be used for the purpose of this project.*

Name of the respondent Joel Kogab Gender M

Date 16/04/2021 Phone Number 0711242622

Name of the project Area Lukenya Designation Neighbourhood

#### Kindly fill in the questionnaire

1. What is your proximity to the proposed site?

Length in M	Tick appropriately
Less than 50	
50-100	<input checked="" type="checkbox"/>
100-200	
More than 200	

2. Are you aware of the government plans on affordable housing project?

Yes

No

3. Are you aware of the proposed Moke Gardens affordable housing project?

Yes  No

4. Are you aware of any similar project in the neighboring premises?

Yes  No

5. If yes in 7 above please give brief details (the owner, location etc.)

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

6. Are you familiar with activities involved in construction of housing projects?

Yes  No

7. What are the likely impacts from the proposed project in terms of?

**i. Safety and health in the neighborhood**

How will the proponent activities affect current public safety and health in the area?

	Tick appropriately
Improve	
deteriorate	
no change	<input checked="" type="checkbox"/>

**ii. Traffic situation**

How will the proponent development contribute to the traffic situation?

	Tick appropriately
No significant impact	
slight increase but flow manageable	
A lot of congestion	<input checked="" type="checkbox"/>

**iii. Waste disposal**

Do you think you will be affected by the manner in which the proponent proposes to dispose their waste?

Yes  No

**iv. Noise pollution**

Do you think you will be affected negatively by noise during construction works?

Yes  No

**v. Water consumption**

Do you foresee your source of water being adversely affected by the proposed project?

Yes  No



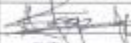






LIST OF PEOPLE CONSULTED ON PUBLIC CONSULTATION ON ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT STUDY REPORT FOR THE PROPOSED AFFORDABLE HOUSING UNITS AT LUKENYA, MAVOKO SUB-COUNTY, MACHAKOS COUNTY.






NO.	NAME.	PHONE NO.	ID NO.	SIGNATURE.
1.	MARY OUNDO	0722 65722	915522	
2.	IDENC NGACHA	0705736917	20694183	
3.	Caroline Kuthuma	0700200172	35200793	
4.	ROSELYNE NUMA	070116919	276113639	
5.	EVANS OMBASA	072928445	21570114	
6.	Ishter Chege	0723056006	11272210	
7.	Caroline Wiless	0745030452	35090399	
8.	Ruth Nduku	0702575220	91382607	
9.	Bonpas Naamo	0709102616	55244907	
10.	Joel Longot	0711124502		
11.	Josua Koino	0713679079		
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LIST OF PEOPLE CONSULTED ON PUBLIC CONSULTATION ON ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT STUDY REPORT FOR THE PROPOSED AFFORDABLE HOUSING UNITS AT LUKENYA, MAVOKO SUB-COUNTY, MACHAKOS COUNTY.

↑

NO.	NAME.	PHONE NO.	ID NO.	SIGNATURE.
1.	Jared Mwangi	0707060439	14457171	
2.	Nicholas M.	0722842772	354272271	
3.	FRANCIS MWINA	0746643823	36990739	
4.	Kelvin N. G	0788951465		
5.	Frederick Mwangi	0782483895	34472134	
6.				
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LIST OF PEOPLE CONSULTED ON PUBLIC CONSULTATION ON ENVIRONMENTAL AND SOCIAL  
IMPACT ASSESSMENT STUDY REPORT FOR THE PROPOSED AFFORDABLE HOUSING UNITS AT  
LUKENYA, MAVOKO SUB-COUNTY, MACHAKOS COUNTY.

NO.	NAME.	PHONE NO.	ID NO.	SIGNATURE.
1.	Moses Mukelo	09111722821	33519098	
2.	Kosai Mwangi	0708038180	29063283	
3.	Betty Nyangala	0769799976	N/A	
4.	Adhombi Jackline	0708291734	N/A	
5.	Jose	0759834652	N/A	
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LIST OF PEOPLE CONSULTED ON PUBLIC CONSULTATION ON ENVIRONMENTAL AND SOCIAL  
IMPACT ASSESSMENT STUDY REPORT FOR THE PROPOSED AFFORDABLE HOUSING UNITS AT  
LUKENYA, MAVOKO SUB-COUNTY, MACHAKOS COUNTY.

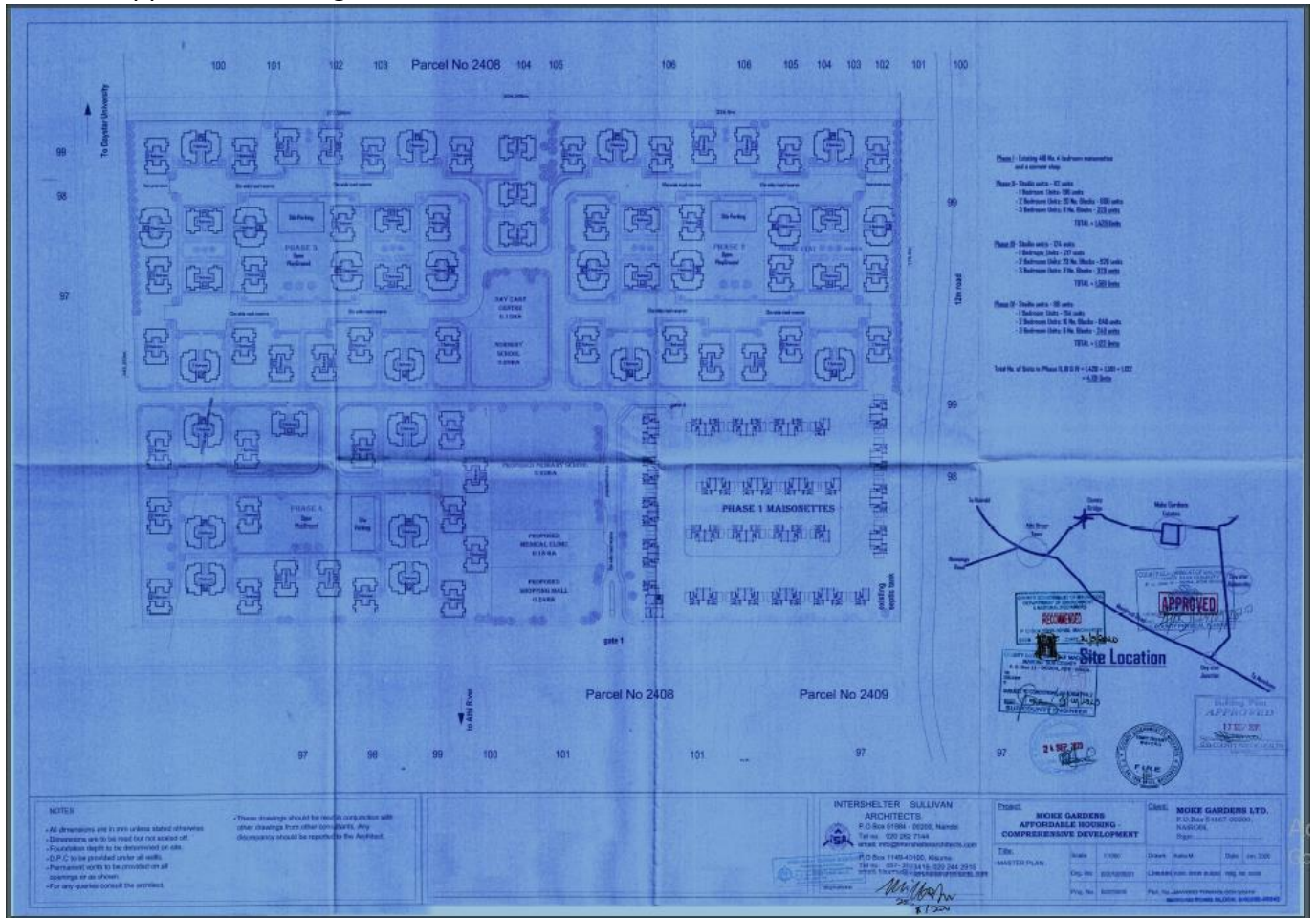
NO.	NAME.	PHONE NO.	ID NO.	SIGNATURE.
1.	Josephat Taa	0705054889		
2.	Marya Mueni	0759266019		
3.	Caroline Nduku	0701819393		
4.	MATHEW MBIRI	0722971338		
5.	Ransom Mutuu	0701115777		
6.	Margaret Mwangi	072-000099		
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LIST OF PEOPLE CONSULTED ON PUBLIC CONSULTATION ON ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT STUDY REPORT FOR THE PROPOSED AFFORDABLE HOUSING UNITS AT LUKENYA, MAVOKO SUB-COUNTY, MACHAKOS COUNTY.

NO.	NAME.	PHONE NO.	ID NO.	SIGNATURE.
1.	David Kenya	0768514575	24141904	
2.	Geoffrey Mwangi	0724661797	24678607	
3.	Thomas Waka	0745943646	24249686	
4.	Simeon Othman	0704928070	32681123	
5.	Grace Kenya	0722718922	0052821	
6.	Miriam Keros	0706949958	31589581	
7.	Jackline Nduchoko	0923746783	22721229	
8.	Okwena Azgel	0713312867	27301027	
9.	Joseph Mwangi	0112096883	2800789	
10.	Stephen Wambui	0712317490	25227851	
11.	Brian Mwangi	0743526242	216911572	
12.	Abraham Mwangi	0701059205	27020670	
13.	Gabriel Mwangi	0796049287	1195607	
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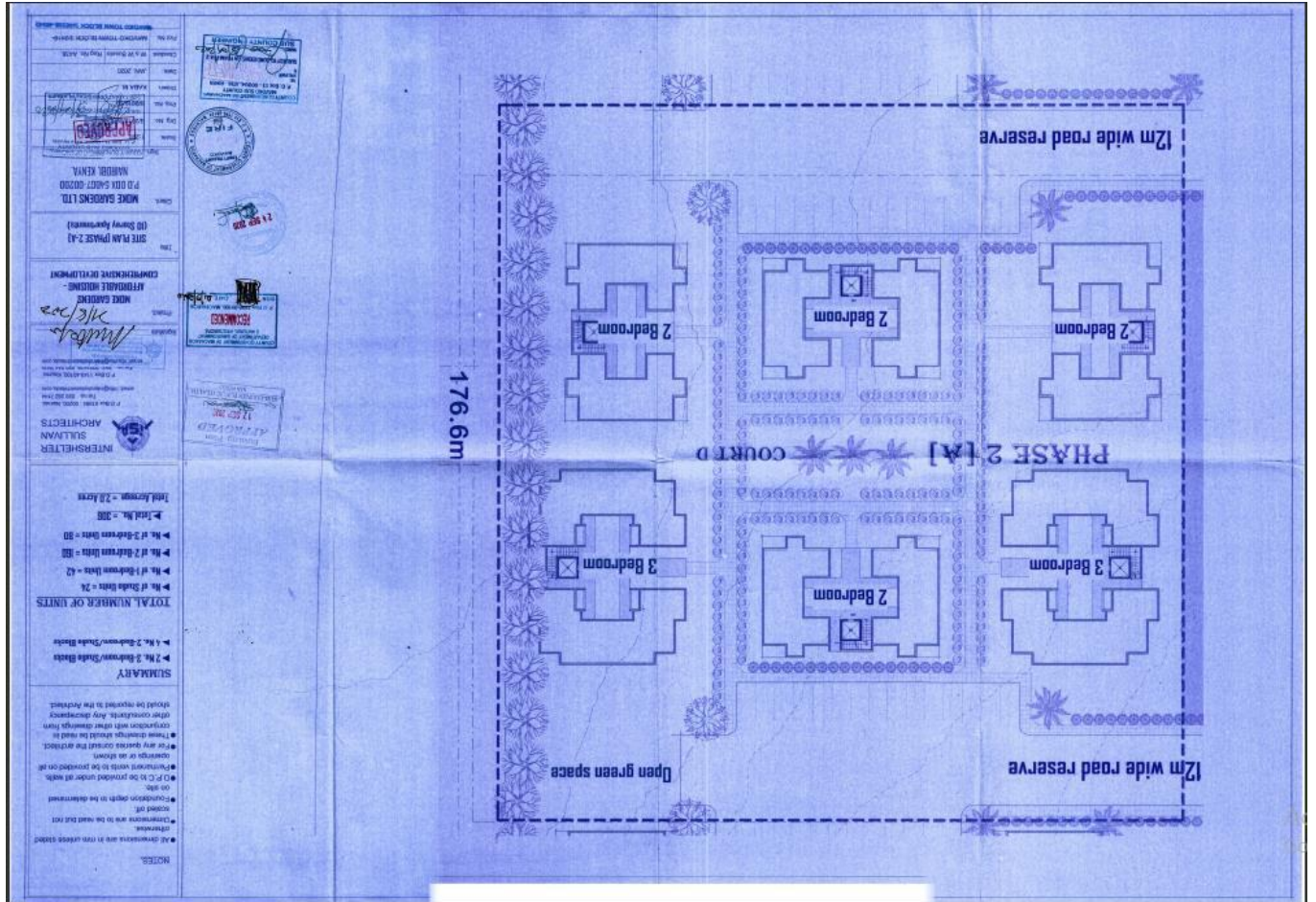


Annex 8: Approved Drawings

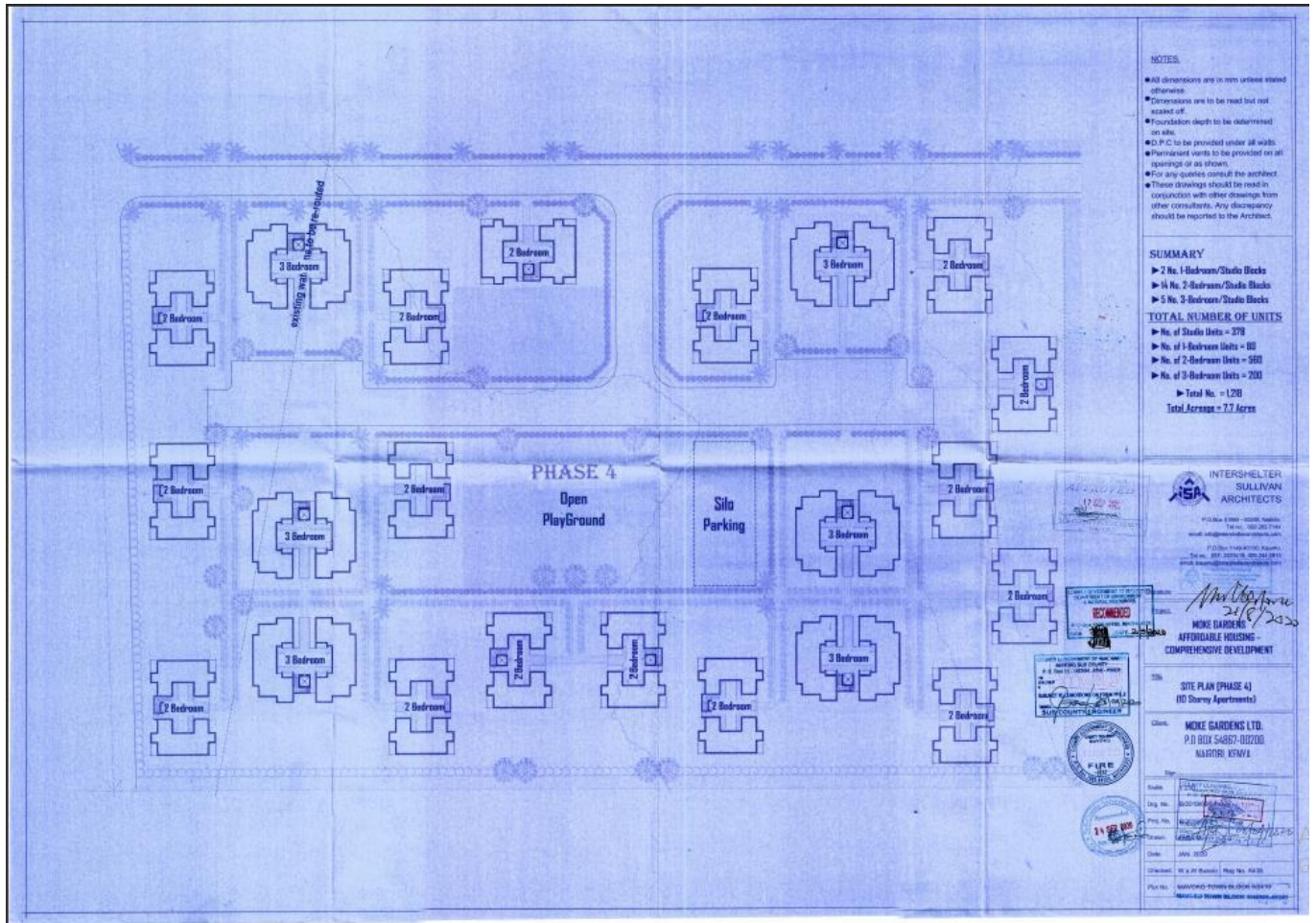




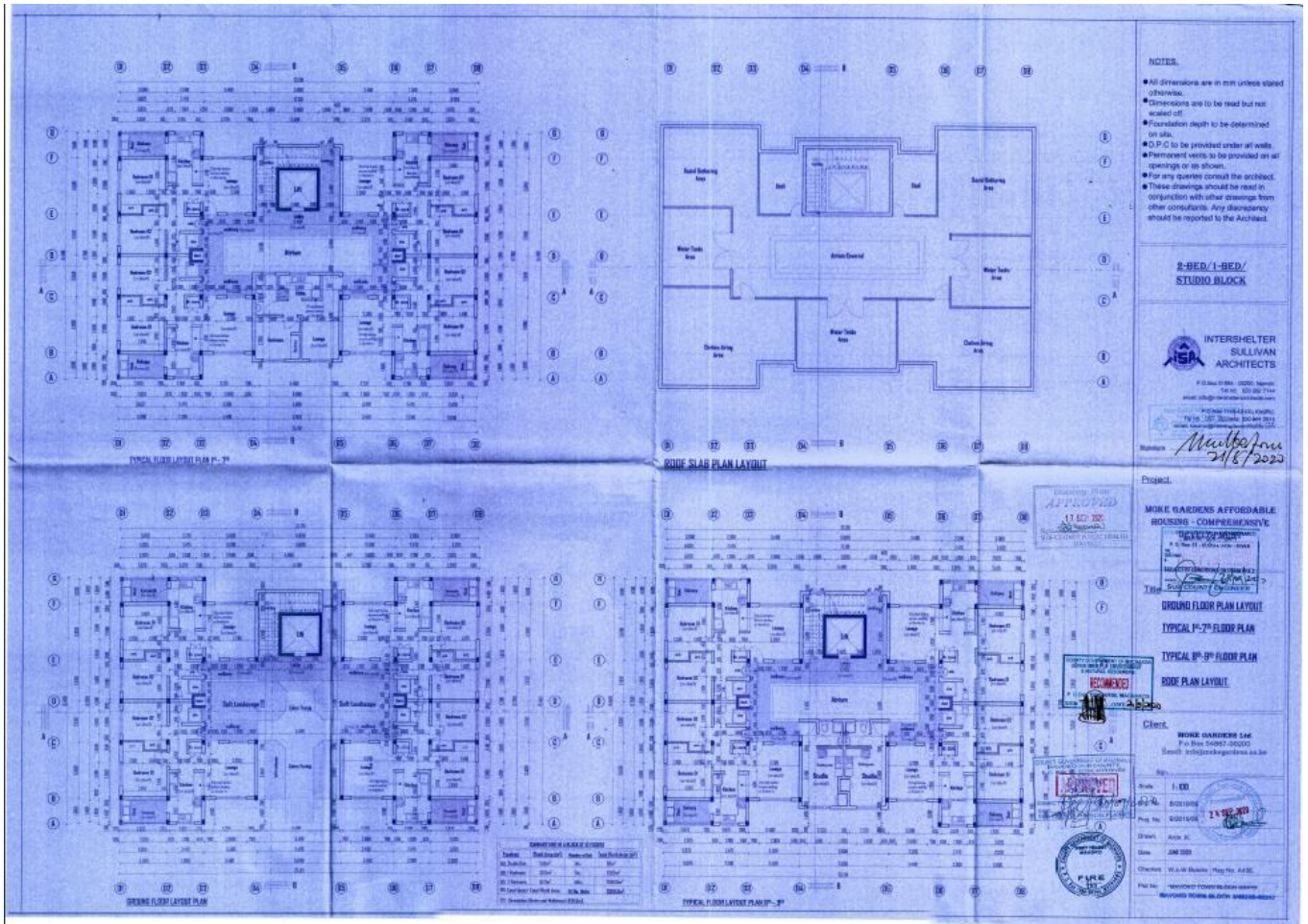














**NOTES**

- All dimensions are in millimetres unless otherwise stated.
- Dimensions are to be read but not scaled off.
- Foundation depth to be determined on site.
- D.P.C is to be provided under all walls.
- Permanent works to be provided on all openings or as shown.
- For any queries consult the architect.
- These drawings should be read in conjunction with other drawings from other consultants. Any discrepancy should be reported to the Architect.

**3-BED/1-BED/STUDIO BLOCK**

**INTERSHELTER SULLIVAN ARCHITECTS**

100-102 P.O. BOX 10000 NAIROBI  
Tel: 011 254 20 200 200  
www.intershelter.com

100-102 P.O. BOX 10000 NAIROBI  
Tel: 011 254 20 200 200  
www.intershelter.com

Project: **MOKE GARDENS AFFORDABLE HOUSING - COMPREHENSIVE DEVELOPMENT**

Client: **MOKE GARDENS LTD**  
P.O. BOX 10000 NAIROBI

Scale: **1:25**

Dwg No: **0001/000**

Proj No: **0001/000**

Drawn: **Arch. X**

Date: **04/08/2024**

Checked: **W. K. (Architect)** Proj No: **0001**

Proj No: **0001/000** (Machakos County Council)

14 SEP 2024


**APPROVED**

**FOR CONSTRUCTION**

**EXEMPT**

**FIRE**

Annex 9:Letter of Notification of Approved of Development Permission

  
**Republic of Kenya**  
**GOVERNMENT OF MACHAKOS COUNTY**  
**ENERGY, LANDS, HOUSING AND URBAN DEVELOPMENT**  
**MAVOKO MUNICIPALITY**

Office of The Chief Officer, Lands & Physical Planning,  
P.O. Box 1996-90100 **MACHAKOS**  
Tel: 0756299995/0746079365/0740697790/ 0773153437

County Director of Physical & Land Use Planning  
P.O. Box 11-00204 **ATHI RIVER**  
Email: [buildingapprovals@machakosgovernment.co.ke](mailto:buildingapprovals@machakosgovernment.co.ke)

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**PHYSICAL AND LAND USE PLANNING ACT, 2019**

S/No. 47/38 Registered Number of Application. **MVK/3326/09/2020**

**NOTIFICATION OF APPROVAL OF DEVELOPMENT PERMISSION**

**TO: MOKE GARDENS LIMITED**  
**P.O BOX 54867-00200,NAIROBI**

Your application, numbered as above, submitted on **16/09/2020** for Permission to build a **RESIDENTIAL MULTI-DWELLING(APARTMENTS) SHOPPING CENTRE, DAYCARE CENTRE, NURSERY AND PRIMARY SCHOOL, HEALTH CENTRE, RECREATIONAL AREA AND PUBLIC AMENITIES** on **MAVOKO TOWN BLOCK 1/9798-10020, 10070-10075, 10077-10079**, situated in **LUKENYA** has been granted **APPROVAL** on **29/09/2020** subject to the following/appended condition(s):

- a) Issuing the County with commencement notice at least 30 hours prior to.
- b) To obtain authority for excavation and construction of site house before commencement of works.
- c) **Renewing your approval if your construction is not completed within THREE (3) years and completed within FIVE (5) years.**
- d) The land not constituting part of disputed public land
- e) Abiding by all details and specifications of your approval
- f) Abiding with all other legal requirements of your application including NEMA license.
- g) **Shereke the recommended setbacks and building lines.**
- h) **Provide fire layout.**
- i) **Erection of a construction sign board ( see overleaf for instructions)**
- j) **Developer to construct a conservancy tank/septic tank at owner's risk and ensure that no spillage of waste water flows along the road or adjacent properties**
- k) **Approval issued under certificate of workmanship**
- l) **To ensure a copy of this form NOTIFICATION is attached to the original plan on site always.**
- m) **To ensure public utilities and way-leaves are not tampered with during excavation and/or construction**
- n) **Obtaining certificate of occupation from county before the building is occupied.**
- o) **Payments of monthly installments of Kshs 4,181,095.58 for a period of 12 months commencing 1<sup>st</sup> October, 2020 and ending on the 30<sup>th</sup> September, 2021 follow to which the approval stands revoked. (Refer MCG/CT/1/74/C/132 dated 11<sup>th</sup> September, 2020)**

1

Government of Machakos County, Mavoko Municipality Physical Planning Office



Dated 29/09/2020

Issued by **ANTHONY WAMBUA**  
**MUNICIPAL PHYSICAL PLANNER**  
**MAVOKO**

Signed \_\_\_\_\_

for County Director of Physical & Land Use Planning  
Government of Machakos County

**APPROVED**

**SITE SIGNBOARD DESIGN**  
**PROJECT:**

**CLIENT:**

**PLOT NO:**

**ARCHITECT:**

**STRUCTURAL**  
**ENGINEER:**

**MECHANICAL**  
**ENGINEER:**

**ELECTRICAL**  
**ENGINEER:**

**CONTRACTOR:**

**APPROVAL REF NO:**

**CONTRACT DURATION:**

**NOTE: Any other necessary information can be included on the signboard**

c.c.

1. Department of Lands & Physical Planning (Survey)
2. Department of Transport, Roads & Public Works
3. Department of Health & Emergency Services (Public Health)
4. Department of Environment & Natural Resources
5. Department of Housing & Urban Development