ENVIRONMENTAL IMPACT ASSESSMENT STUDY REPORT

PROPOSED CONSTRUCTION OF TWO BEDROOM HOUSING UNITS ON LR NO. 76/672, ALONG KABURU-GITHUA LANE IN THINDIGUA, KIAMBU COUNTY

GPS LOCATION CO-ORDINATES: 9,866,567.00 M S; 260,380.00 M E

APRIL, 2022

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT REPORT.

The environmental impact assessment has been carried out in accordance with the provisions of the Constitution of Kenya, 2010, the Environmental Management and Coordination Act (Cap.387) of 1999; Occupational Health and Safety Act; Public Health Act; County Government Act; Physical and Land Use Planning Act; Environmental (Impact Assessment and Audit) Regulations of 2003, Legal Notices No. s 31 and 32 of 2019 and Waste Management Regulations and Air Quality Regulations. The EIA team has ensured credible and exhaustive information.

PREPARED BY;

ENVIRONMENTAL IMPACT ASSESSMENT TEAM			
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FOR AND ON BEHALF OF;

Signature: _____ Date: _____

For; Jacqueline Wangari Kinuthia

SUBMITTED TO;

NATIONAL ENVIRONMENT MANAGEMENT AUTHORITY (NEMA)

_____

Official Rubber stamp

EXECUTIVE SUMMARY

The proposed 10-storey flat with one hundred and twenty (120) two-bedroom units shall be built on L.R. No. 76/672. This is a private initiative with the main objective of providing exclusive housing units in Thindigua, Kiambu County. Additionally, the proposed project shall provide the Client with economic benefits during the operational phase of the project. The Proponent/Client has applied and received approvals for Architectural and Structural Drawings/building plans from the County Government of Kiambu.

This study has focused on developing guidelines for protecting, managing and responding to processes, situations/conditions that might compromise health, safety and security of people and their ecological wellbeing. To achieve this throughout the project cycle, mitigation measures have been proposed through formulation of an environmental management plan (EMP).

The EIA team carried out the assessment using a combination of methods including ground surveys and interviews with the neighbors, project management and other interested people and parties. Documentary review on existing literature and relevant statutes and policies was also undertaken to gather information which helped in undertaking this study.

From the assessment, it was established that;

1. The project has environmental and socio-economic impacts of importance;
2. There could be significant negative environmental or social impacts resulting from the proposed project;
3. The proposed project is compatible with the existing land uses in the neighborhood and thus desirable.

To offset the negative impacts of the project, the consultant has provided a comprehensive EMP, detailing responsibilities, costs and expected timeframes for implementation of proposed mitigation measures. As such, the Client is expected to undertake recommendations as set out in this report and ensure monitoring of the project activities through annual environmental audits once the project is in operation.

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ACRONYMS

CoK	Constitution of Kenya, 2010
CGA	County Government Act
EA	Environmental Audit
EMCA	Environmental Management and Coordination Act
ESIA	Environmental and Social Impact Assessment
EMMP	Environmental Management and Monitoring Plan
NEMA	National Environment Management Authority
OSHA	Occupational Safety and Health Act
PLUPA	Physical and Land Use Planning Act
PWDs	Persons with Disability
SDGs	Sustainable Development Goals

1.0 INTRODUCTION.

1.1 BACKGROUND INFORMATION

Thindigua area has seen tremendous economic growth due to its close proximity to Nairobi, the Capital of Kenya and Kiambu town; the two most urbanizing areas in Kenya. The strategic location of Thindigua area has made it more attractive to aspiring home owners as well as potential tenants, hence increasing the demand for housing.

The proposed residential units have been designed to mainly target middle and high income earners within and around the area. As per the attached architectural plans, the proponent intends to construct a ten storey residential block, that shall have parking bays on the lower and upper ground floors. The typical floors i.e. 1st to 10th floors (3rd level to 13th level) shall each comprise of 12 two-bedroom units. The flat roof level shall accommodate the machine room, Generator room, switch room, transformer room and guard room.

The proposed 10-storey, 120No. of two bedroom units on L.R. No. 76/672, located at Thindigua in Kiambu County, is a private initiative with the main objective of providing exclusive housing units to meet the increasing housing demands in the area. This project shall also provide the Client with economic benefits, during its operation.

The proposed development shall ensure optimal development of the proposed land. It shall provide employment during both construction and operation phases. It will also create market for services and goods, such as building stones and blocks, sand, ballast, timber, steel etc. Many secondary businesses are also likely to spring up during the construction phase especially those providing food and beverages to the construction workers.

During the operational phase, the residential development will help in provision of modern and luxurious residential apartments, employment such as property management, security personnel and cleaners. It will as well increase revenue to national and local governments through payment of relevant taxes, rates and fees.

The implementation of the proposed project is likely to cause significant negative impacts to the environment. As such, an environmental impact assessment should be undertaken and a license issued prior to commencement of the project.

According to the Legal Notice No. 31, this type of project is categorized as a high risk project, as the housing development exceeds one hundred housing units. The proponent has therefore contracted Pleng Limited (registered firm of experts) to undertake and prepare an environmental impact assessment study report (ESIA).

Based on the provisions of the Environmental (Impact Assessment and Audit) Regulations of 2003, an environmental impact assessment licensed expert shall prepare and submit the Environmental Impact Assessment Study (ESIA) Report to the National Environmental Management Authority only after approval of the terms of reference by the authority. It is in this regard that Pleng Limited (hereinafter referred to as consultants), upon obtaining approval of the terms of reference, has prepared this report and submits to the authority on behalf of the proponent.

This Environmental Impact Assessment has been conducted by a team comprising of NEMA registered Environmental Experts, sociologists, engineers, planners and architects among others.

1.1.1 Objectives of the Assessment

In the interest of sustainable development, the proponent has commissioned an environmental expert to undertake environmental impact assessment for the proposed project in order to strike a balance between the social growth, economic development and environmental conservation.

The assessment aims to promote integration of environmental considerations into the proposed development. It also focuses on delivering a study report and license and all necessary documentation that may be required. This shall be after thorough studies and engagement of stakeholders to ascertain that all environmental and social impacts have been taken into consideration and mitigation measures to the negative impacts have been provided.

1.1.2 Justification of the Assessment

The proposed project is desirable and in compliance with the existing land uses in the neighborhood. However, there could be unforeseen impacts of the project that necessitate undertaking environmental and social assessment in order to identify them and develop mitigation measures for negative impacts.

This summary project report has ensured information about environmental and social impacts of the project is collected, analyzed and presented to approving authority (NEMA), in order to make a decision on whether or not to go on with the project. This study has worked to ensure minimization of negative impacts through providing a range of solutions to any given environmental problem if it is decided to carry out the activities. Moreover, proper public participation and involvement has also helped to lessen conflicts within the community as well as promoted project acceptance by the community.

1.1.3 Scope of the Assessment

The geographical scope of the study was mainly on the proposed project site and the immediate neighborhood.

The following was additionally covered;

- Description of the proposed project; location and size of proposed site, number of units, housing typology, key activities throughout all project cycles;
- A review of the legal, policy and institutional framework;
- Baseline information; biological, physical and socio-economic environment;
- Evaluation of the project alternatives;
- To use information on the ground so as to adequately identify the potentially undesirable environmental effects as a result of the project's implementation;
- To propose feasible mitigation measures on the significant negative impacts of the proposed project;
- To devise a comprehensive environmental management and monitoring plan articulating the identified negative impacts and their corresponding mitigation measures;
- To formulate an implementation framework for the proposed mitigation measures clearly indicating responsible persons, the required resources and to provide the necessary implementation schedule and identify financial implications;
- To ensure that the proposed project does not compromise the interests of the identified community where it will be implemented.

1.1.4 Roles and Responsibilities

The EIA team was expected to provide technical expertise on matters related to the physical, biological and socioeconomic environment. The team was expected to undertake the EIA Study and ultimately provide an EIA study report comprising of an executive summary, study approach, baseline conditions, existing and anticipated impacts and potential mitigation measures for anticipated negative impacts and a comprehensive environmental and social management plan (ESMP).

On the other hand, the proponent was expected to provide; a site map, design drawings, land ownership and site history, full details of proposed operations and activities, input materials, products and by-products and any other wastes to be generated and the measures to be put in place for handling wastes and hazardous materials on the site.

1.2 EIA METHODOLOGY

This study has been carried out in accordance with the requirements of the Environmental Management and Coordination Act(EMCA) 1999, Environmental (Impact Assessment and Audit) Regulations, 2003 and Legal Notices No. 31 and 32. The general steps/approach followed during the study was as follows:

1.2.1 Environmental Screening

This initial step was aimed at determining if the project required an evaluation of its impact on the environment and the level of evaluation required. This was based on preliminary assessments carried during the reconnaissance survey that took place on 8th December,2021. This phase aimed to determine nature, scale and magnitude of anticipated impacts.

It also entailed reviewing of the projects listed in the second schedule of EMCA, as well as the provisions of the environmental regulations. Consultations between environmental experts, structural engineers among other experts were also paramount during this phase.

The following factors were considered; The sensitivity of the area likely to be affected; Public health and safety; The possibility of uncertain, unique or unknown risks; The possibility of having individually insignificant but cumulatively significant impacts; Whether the proposed activity affects neighborhood developments, protected areas, endangered or threatened species and habitats, among other factors.

This proposed project was thus categorized as a high risk project or rather category 2 projects.

1.2.2 Environmental Scoping

In addition to the terms of reference provided by the project proponent, the consultant went further to determine the most critical issues to study, affected and interested stakeholders as well as the methods to be used. This exercise aimed to eliminate irrelevant impacts and focus the EIA on the key issues but at the same time ensure indirect and secondary effects are not overlooked.

It also aimed to obtain the views of the stakeholders on the proposed project as well as agree on the methods for the assessment. This thus ensured that all relevant environmental issues are covered by the EIA.

The public, competent authority and other responsible government agencies were in one way or another involved during this phase. The impacts were predicted using ad-hoc methods, checklists and networks.

- **Environmental Scoping Process**

This process sought to identify and obtain agreement on the relevant environmental issues that are likely to be associated with the proposed development in order to ensure that the EIA is correctly focused. It involved the following key steps;

1. Compiling a long list of concerns from the information available and the inputs of stakeholders.
2. Deriving a short list of key issues, based on their potential significance and likely importance. This basically involved evaluating these concerns to identify the significant issues (and to eliminate those issues which are not important).
3. Categorizing the key issues accordingly
4. Feedback to stakeholders
5. Development of Terms of Reference
6. Submission and Approval of Terms of Reference

1.2.3 Documentary Review

This entailed review of relevant laws and policies governing the EIA process. This helped determine the government institutions responsible for the project sustainability as well as anchor the whole process onto the provisions of these laws.

Other secondary materials reviewed included feasibility study reports, annual reports, development plans, demographic statistics, vegetation maps, meteorological reports, geological, existing land use and soil maps and reports, wildlife data and other reports, journals and publications. These secondary sources provided data that cannot be obtained through in situ observations.

1.2.4 Field Survey and Site Analysis

Site visits to the proposed project sites and the surrounding areas was undertaken on 10th December,2021. Baseline data was collected through; Observation, measurements, sampling, questionnaires, photography, GPS mapping, Noise mapping etc. The information obtained was on; Location and Size, Natural Environment (Soils, Rivers, trees, animals, microorganisms), Physical Infrastructure (Roads, sewer, power lines) and Socioeconomic Environment (population, employment rates).

1.2.5 Public Participation and Stakeholder Engagement

This was through interviews and administration of questionnaires. The aim of undertaking this exercise was to inform the public about the project and engage and consult them to provide their views on the proposed project and its impacts on the environment and the socioeconomic aspects. The public and other key stakeholders were engaged in project screening and scoping, determination of impacts of the project, analysis of project alternatives, and in coming up with mitigation measures for the predicted environmental impacts of the project.

1.2.6 Environmental and Social Impacts Analysis

Through public consultation and expert elicitation, a list of the probable impacts of the project, significance of these impacts and their sources was drawn. This was achieved using a combination of checklists, matrices and networks techniques.

These impacts were then classified based on their type (environmental, social or health impacts) and nature (adverse or beneficial/reversible or irreversible/long term or short term). The significance, magnitude and extent of these impacts was then predicted using case studies and professional judgement.

1.2.7 Mitigation Measures to Negative Impacts

Both affected and interested parties were involved in providing measures to eliminate/mitigate/compensate the negative impacts. Of importance, was to ensure that the proposed measures were technically feasible, economically sound and socially acceptable. This assessment provided a premise on which alternatives to the proposed project were compared and recommendations made on the best alternative.

1.2.8 Development of a Summary Project Report

This report entails among other components, a summary of the findings, analysis, results and recommendations regarding the proposed project. There is also the Environmental Management Plan that outlines the proposed and realistic mitigation measures giving cost estimates of each mitigation measure with mechanisms for monitoring compliance with the plans. The timeframe for implementing the measures proposed during construction, implementation and decommissioning phases of the project is also captured in these plans.

The draft summary project report was submitted to the client for their consideration and input. This final summary project report has incorporated all the comments from the client among other stakeholders.

1.2.9 Report Submission and Approval by the Authority

Upon receipt of this report by NEMA, it is anticipated that the authority will review the report and make a decision on whether to approve with conditions or reject with reasons.

1.2.10 Environmental Impact Assessment Methodological Framework

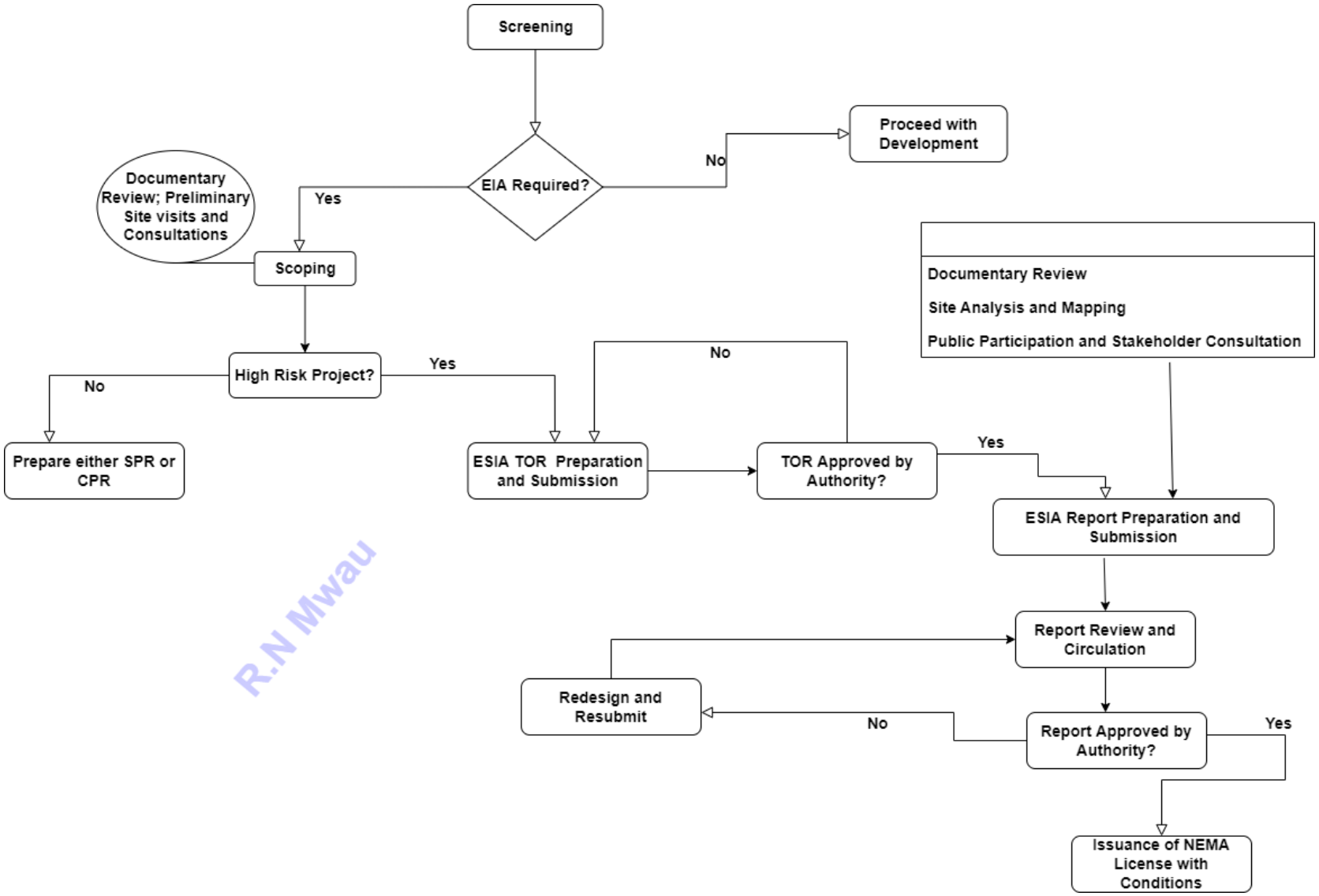


Figure 1: Environmental Impact Assessment Methodological Framework (Source: Pleng Ltd, 2022)

2.0 LEGAL, POLICY AND INSTITUTIONAL FRAMEWORK

2.1 LEGAL FRAMEWORK

2.1.1 The Constitution of Kenya, 2010

Article 42 of this statute stipulates that every citizen in Kenya is entitled to a clean and healthy environment and has a duty to safeguard it for the benefit of the current and future generations. Additionally, article 70 provides that a person may apply to a court for redress in addition to any other legal remedies that are available in respect to a violation to a clean and healthy environment.

Chapter five of this supreme law provides that land should be used and managed in a manner that is equitable, efficient, productive and sustainable. It further outlines the following principles of sound management of land; equitable access to land rights, security of land rights, sustainable and productive management of lnd resources, transparent and cost efficient administration of land, sound conservation and protection of ecologically sensitive areas.

In management of the environment to promote sustainable development, the constitution, under article 69 mandates the state to promote sustainable exploitation, utilization, management and conservation of the environment and natural resources; a tree cover of at least ten per cent of the land area of Kenya; public participation in the management of, protection and conservation of the environment, systems of environmental impact assessment, environmental audit and monitoring; genetic resources and biological diversity and eliminate processes and activities that are likely to endanger the environment.

Relevance:

In order to ensure development that is environmentally friendly, the proponent has contracted an environmental expert to assess the effects of this proposed development on the environment, the society and the economy.

This study has as well ensured effective public involvement for choice of project alternative and recommendations to the negative impacts of the adopted project alternative.

Further, the project should ensure the sustainability of livelihoods and biological resources within the project areas are protected.

2.1.2 The Environmental Management and Coordination Act, 2015

Part II of this act provides that every person in Kenya is entitled to a clean and healthy environment and has the duty to safeguard and enhance the environment. It is worth noting that the entitlement to a clean and healthy environment carries a correlative duty. Hence, there is not only the entitlement to a clean and healthy environment, but also the duty to ensure that the environment is not degraded in order to facilitate one's own as well as other persons' enjoyment of the clean environment.

According to this Act, an Environmental impact assessment study needs to be carried out on projects specified in the second schedule (now replaced by the legal Notice Number 31 of 2019) of the Act that are likely to have a significant impact on the environment. Section 63, provides that licensing (with conditions) of projects by the approving authority is acceptable only if the authority is satisfied as to the adequacy of an environmental impact assessment study, evaluation or review report.

Relevance:

The proponent has commissioned the EIA in compliance with the Act. It is anticipated that once NEMA is satisfied with the study, it will issue a license with conditions, which will enable the proponent undertake the project.

The proponent shall be required to commit to implementing the recommendations provided by the environmental management plan.

2.1.3 The Public Health Act (Cap. 242)

This act prohibits any accumulation or deposition of refuse or other matter, which is offensive or injurious or dangerous to health. It makes it an offence to emit or release any noxious matter or wastewater into any place, land, or watercourse not approved for the reception of such substances. It also prohibits the release of any gases, vapors, dust or other impurities generated that are deemed to be injurious or dangerous to the health of employees. It provides for the prevention of pools of standing water and for the repair and cleansing of open channels and drains.

The act stresses that no person shall cause a nuisance to exist from any land or premise occupied by him/her. Part IX further mandates all local authorities (now county governments) to take all lawful measures for maintaining its area of jurisdiction at all times in a clean and sanitary condition and preventing any nuisance or condition liable to be injurious or dangerous to health.

Section 130 also mandates local authorities to ensure prevention of pollution dangerous to health of any supply of water or water source which the public within its district has a right to use and does use for drinking or domestic purposes. The local authority is also tasked with purification of water supplies in case they get polluted.

Section 130 provides for making and imposing regulations by the local authorities (now County Governments) and others the duty of enforcing rules in respect to prohibiting use of water supply or erection of structures draining filth or noxious matter into water supply as mentioned in section 129. Part XII, Section 136, states that all collections of water, sewerage, rubbish, refuse and other fluids which permits or facilitates the breeding and multiplication of pests shall be deemed nuisances and are liable to be dealt with in the manner provided by this Act.

Relevance:

Environmental degradation may pose a health hazard to the general public. This study has as such proposed measures that when implemented, shall conserve the environment and consequently promote public health.

2.1.4 County Government Act, 2012

This Act of Parliament gives effect to Chapter Eleven of the Constitution; which provides for County Governments' powers, functions and responsibilities to deliver services and connected purposes.

Part VIII of the act provides a criterion for citizen participation through provision of information, appeals by citizens and responding to these appeals by the County Government. It also outlines modalities and platforms for citizen participation.

Further, this Act gives County Governments the responsibility of planning and coordinating all developments within their areas of jurisdiction. Part XI (sections 102-115) of the Act provides for planning principles and responsibilities of the county governments, including protection of minority and marginalized groups against any form of discrimination and development and protection of natural resources.

Relevance:

This study has ensured public involvement and stakeholder consultation and has obtained the views of all these stakeholders with regard to project alternatives, impacts and mitigation measures.

2.1.5 Occupational Safety and Health Act, 2007

This statute provides for the safety, health and welfare of workers and all persons lawfully present at workplaces, to provide for the establishment of the National Council for Occupational Safety and Health and for connected purposes. This Act applies to all workplaces where any person is at work, whether temporarily or permanently.

In this respect, the act stipulates that every workplace should be kept in a clean state, and free from effluvia arising from any drain, sanitary convenience or nuisance. An occupier shall ensure that his workplace shall not, while work is carried on, be so overcrowded as to cause risk of injury to the health of the persons employed therein.

An occupier shall ensure that effective and suitable provision is made for securing and maintaining, by the circulation of fresh air in each workroom, adequate ventilation of the room. An occupier shall ensure that effective provision is made for securing and maintaining sufficient and suitable lighting, whether natural or artificial, in every part of his workplace in which persons are working or passing.

2.1.6 Physical and Land Use Planning Act,2019

This act of Parliament was enacted to make provision for the planning, use, regulation and development of land and for connected purposes. It provides for preparation of Physical and Land Use Development Plans, control of development and outlines administrative parameters of planning.

This statute recommends promotion of sustainable use of land and livable communities; integration of human needs in any locality; integration of economic, social and environmental needs of present and future generations; consideration of long-term optimum utilization of land; conservation of scarce land resource including preservation of land with important functions and recognition of culture and heritage among other principles.

In this regard, PLUPA mandates county governments to prohibit or control the use and development of land and buildings in the interests of proper and orderly development of its area; control or prohibit the subdivision of land; and consider and approve all development applications and grant all development permissions.

Relevance:

The Proponent has secured all mandatory approvals and permits as required by the law. They have also ensured adequate public involvement through administering questionnaires and doing interviews with key stakeholders.

2.1.7 Water Act, 2016

This act provides for the regulation, management and development of water resources and water and sewerage services in line with the Constitution. It aims to enhance the right of access to clean and safe water in adequate quantities and to reasonable standards of sanitation.

The Act vests provision of water and sanitation services with the county governments through Water Services Providers (WSPs) whose operations must be in accordance with a Service Agreement entered between each WSP and WASREB. This act of parliament requires a person to notify the Water Resource Authority prior to constructing a borehole or a well and consequently obtain a permit to do so from the authority.

Relevance:

The source of water for the project during its implementation and operation shall be from the existing Nairobi water and sewerage company water connection. The proponent is expected to conserve this resource throughout the construction phase.

2.2 POLICY FRAMEWORK

2.2.1 The Kenya Vision 2030

This national development blueprint for period 2008 to 2030 aims to transform Kenya into a middle income country with a consistent annual growth of 10 % by the year 2030.

The 2030 goal for urban areas is to achieve "a well-housed population living in an environmentally-secure urban environment." This is achievable through provision of basic infrastructure and services namely roads, street lights, water and sanitation facilities, storm water drains etc.

Relevance:

In a bid to ensure clean, secure and sustainable environment, the proponent shall ensure that the proposed development is implemented only after obtaining approval from the Authority. Additionally, they shall ensure proper waste management, safety of the employees and residents among other environmental issues of concern.

It also seeks to ensure that Kenya has a clean, secure and sustainable environment by 2030.

2.2.2 Sessional Paper No. 6 of 1999 on Environment and Sustainable Development

This policy advocates for consideration of the environment in developments, plans and programs; undertaking of an environmental impact assessment prior to implementation of a project and conformity of effluent treatment standards to acceptable health standards.

It additionally seeks to promote increased public awareness raising, appreciation of clean environment as well as the participation of stakeholders in the management of wastes within their localities.

Regarding human settlements, the paper encourages better planning in both rural and urban areas and provision of basic needs such as water, drainage and waste disposal facilities among others for decent housing of every family.

Relevance:

The proponent seeks to provide housing to the burgeoning population of Thindigua in an environmentally friendly manner. As such, approvals from relevant authorities have been and/or are being sought.

2.2.3 Sessional paper no 10 of 2014 on the national environment policy

This Policy proposes a broad range of measures and actions responding to key environmental issues and challenges. It seeks to provide the framework for an integrated approach to planning and sustainable management of natural resources in the country. It recognizes the various vulnerable ecosystems and proposes various policy measures not only to mainstream sound environmental management practices in all sectors of society throughout the country but also recommends strong institutional and governance measures to support the achievement of the desired objectives and goal.

On environmental quality and health, this policy states that life depends on a clean and healthy environment. It states that the government will; promote environmental health impact analysis as a component of EIA for all development, enhance provision of occupational health and safety services and uphold capacity building in the field of health impact analysis.

Relevance:

The proponent shall promote wise use of resources and where possible, reuse or recycle some wastes. Proper management of wastes as well health and safety of occupants and employees shall be upheld.

2.3 INTERNATIONAL FRAMEWORK

2.3.1 The World Commission on Environment and Development

Also commonly referred to as "the Brundt land Commission" or "Our Common Future" was published by The UN's World Commission for Environment and Development in 1987. This commission aims to promote development that is environmentally friendly. It emphasizes this by insisting on promotion of sustainable development to protect against any damages to biosphere and the ecosystem. It additionally calls for establishment and strengthening of national environmental agencies as well as supporting community groups and NGOs that work to protect and improve the environment locally and nationally.

To bridge the gap between environmental assessment and management, this report proposes development of a Global Resource Information Database. This way, environmental data shall be collected and monitored closely helping authorities and other stakeholders to effectively set priorities and relevant policies. The United Nations Environmental Program (UNEP) is mandated to guide the global agenda for scientific research and technological development for environmental protection.

This report recommends that UNEP should focus on: developing, testing, and helping to apply practical and simple methodologies for environmental assessment at project and national levels;extending international agreements (such as on chemicals and hazardous wastes) more widely; extending the Regional Seas Programme; developing a similar programme for international river basins; and identifying the need for and advising other UN organizations and agencies in establishing and carrying out technical assistance and training courses for environmental protection and management.

Relevance:

Kenya is among the one hundred and ninety-three UNEP member states. The proponent has undertaken environmental assessment prior to development in order to promote sustainable development and enhance environmental protection.

2.3.2 Rio Declaration on Environment and Development

This is a set of principles compiled at the United Nations Conference for Environment and Development in Rio de Janeiro in 1992. This declaration aims to recognize the importance of preserving the environment and sets forth international guidelines for doing so. Adopted by more than 178 governments, the Rio Declaration serves as some of the standards by which UN Member countries create domestic and international environmental policies and by which they form agreements or organizations with one another, as it pertains to the environment and conservation.

The twenty-seven principles outlined and agreed upon during the earth summit all aim to promote sustainable development and protect people and the environment from any form of harm. The first principle specifically emphasizes that human beings are entitled to a healthy and productive life that is in harmony with nature. This is supported by the forth principle that categorically states that development cannot take place without environmental considerations coming into play. In this regard, the seventeenth principle proposes the need to undertake environmental impact assessment, as a national instrument that should be undertaken for activities likely to adversely impact the environment.

Principle No. 10 of the declaration underscored that environmental issues are best handled with participation of all concerned citizens at all the relevant levels. The twentieth principle further reiterates participation of women in environmental management and development.

Relevance:

The proponent is undertaking assessment of the environment prior to development of the proposed project. During this environmental impact assessment, the proponent ensured participation of indigenous communities and equally engaged all gender and all people above the age of consent.

2.3.3 Sustainable Development Goals

These set of seventeen goals were agreed upon by nearly all the world nations in 2015 and are to be achieved by the year 2030. The main vision of the goals is to encourage development by improving the social, economic and environmental conditions globally and more so in the world's poorest countries. They focus on areas such as health, gender, jobs, and poverty reduction etc. and are backed by 169 detailed targets. These goals serve as a guideline in directing growth; they set the standards to be met in sectors such as Education, Health, and Transportation.

These goals aim to counter environmental degradation, poverty and a lack of democracy, among other global problems. The SDGs provide a comprehensive framework which should be adopted in developments of any kind. The main focus of these goals is on the wellbeing of all people, protection of the earth's ecosystems, continued economic & technological growth, peace and improving international cooperation. For sustainable development to be achieved, it is crucial to harmonize three core elements: economic growth, social inclusion and environmental protection.

Relevance:

In a bid to promote sustainable development, the proponent has considered undertaking this assessment to identify any environmental impacts as a result of the project and undertake measures to avoid or mitigate these impacts.

2.3.4 Vienna Convention for the Protection of the Ozone Layer

These inter-governmental negotiations for an international agreement to phase out ozone depleting substances was concluded in March 1985 and universally ratified in 2009. The objective of this convention is to preserve human health, and to protect the environment from any harmful effects of the depletion of the ozone layer. This convention seeks to encourage Inter-governmental co-operation on research, systematic observation of the ozone layer, monitoring of CFC production and the exchange of this information across the globe.

Relevance:

This report recommends measures that are aimed at reducing the amount of greenhouse gases in the atmosphere.

2.3.5 Kyoto Protocol

This was drawn up in 1997, pursuant to the objectives of the United Nations (UN) Framework Convention on Climate Change and has since been ratified by 192 countries. This convention requires industrialized countries to commit to limit and reduce greenhouse gases (GHG) emissions in accordance with agreed individual targets and periodically report on their compliance.

2.4 ENVIRONMENTAL REGULATIONS

2.4.1 The Environmental (Impact Assessment and Audit) Regulations, 2019

These Regulations, made under section 147 of the Environmental Management and Coordination Act (EMCA), contain rules relative to content and procedures of an environmental impact assessment. It also regulates some other matters such as appeal and registration of information regarding environmental impact assessment.

Relevance:

The preparation of the terms of reference for this report were informed and guided by this regulation. Consequently, this report has been prepared by a licensed NEMA Expert and as per the provisions of this regulation.

2.4.2 Waste Management Regulations, 2006

The regulations are formed under sections 92 and 147 of the Environmental Management and Coordination Act, CAP 387. According to these regulations, no person should dispose of any waste on a public highway, street, road, recreational area or in any public place except in a designated waste receptacle. Any person whose activities generate waste shall collect, segregate and dispose or cause to be disposed of such waste in the manner provided for under these Regulations.

Any person whose activities generates waste has an obligation to ensure that such waste is transferred to a person who is licensed to transport and dispose of such waste in a designated waste disposal facility. Regarding transportation, licensed persons shall operate transportation vehicles approved by NEMA and will collect waste from designated areas and deliver to designated disposal sites.

Relevance:

This report proposes waste segregation at source through use of different waste bins for different types of waste.

2.4.3 Environmental Management and Coordination Act (Air Quality) regulations, 2009

The objective of these regulations is to provide for prevention, control and abatement of air pollution. This is with an aim of ensuring clean and healthy ambient atmosphere.

Under the general prohibitions (Part II), section 5 states that no person shall act in a way that directly or indirectly causes immediate or subsequent air pollution. It provides for the establishment of emission standards and emission limits for various sources such as mobile sources (e.g. motor vehicles) and stationary sources (e.g. industries) as outlined in the Environmental Management and Coordination Act, 1999.

Odors are also prohibited under section 9 of the regulations (offensive emissions). Emissions into controlled areas such as schools, hospitals, residential areas and populated urban centers are also prohibited.

Part VII on occupational air quality limits in section 29 states that an occupier of premises shall ensure that exposure of indoor air pollutants does not exceed the limits stipulated under the Factories and Other Places of Work rules or under any other law.

Relevance:
This report recommends activities that promote ambient air quality.

2.4.4 Water Quality Management Regulations, 2006 (Legal Notice No. 120)

These regulations were drawn under section 147 of the Environmental Management and Coordination Act, CAP 387. In accordance with the regulations, every person shall refrain from acts that could directly or indirectly cause immediate or subsequent water pollution and no one should throw or cause to flow into water resources any materials such as to contaminate the water. The regulation also provides for protection of springs, streams and other water sources from pollution.

Relevance:
This report advocates for conservation and management of water resources as well as prevention of pollution of these sources.

2.4.5 Noise and Excessive Vibration Pollution Control Regulations, 2009

Part II section 3(I) of these Regulations states that: no person shall make or cause to be made any loud, unreasonable, unnecessary or unusual noise which annoys, disturbs, injures or endangers the comfort, repose, health or safety of others and the environment.

Subsequently, section 4 provides that no person shall make or cause to be made excessive vibrations which annoy, disturb, injure or endanger the comfort, repose, health or safety of others and the environment; or cause to be made excessive vibrations which exceed 0.5 centimeters per second beyond any source property boundary or 30m from any moving source.

Section 13(1) states that no person shall operate construction equipment (including but not limited to any pile driver, steam shovel, pneumatic hammer, derrick or steam or electric hoist) or perform any outside construction or repair work so as to emit noise in excess of the permissible levels as set out in the Second Schedule to these Regulations. Additionally, section 14 states that defined work of construction, demolition, mining or quarrying shall be carried out as per the requirements imposed by the Authority. These requirements may include but not limited to the following; machinery that may be used and the permitted levels of noise as stipulated in the Second and Third Schedules to these Regulations.

2.5 INSTITUTIONAL FRAMEWORK

NEMA is responsible for supervision and co-ordination of all matters relating to the environment. It is the principal instrument of the government in the implementation of all policies relating to the environment. As such, it shall be responsible for providing the proponent with a license with conditions for which the proponent is supposed to adhere to throughout the project cycle.

The proposed project area falls under the Jurisdiction of Kiambu County. The office of the County Director of Environment shall offer their views towards the proposed project, most specifically regarding the environmental, social, health and safety aspects of the project.

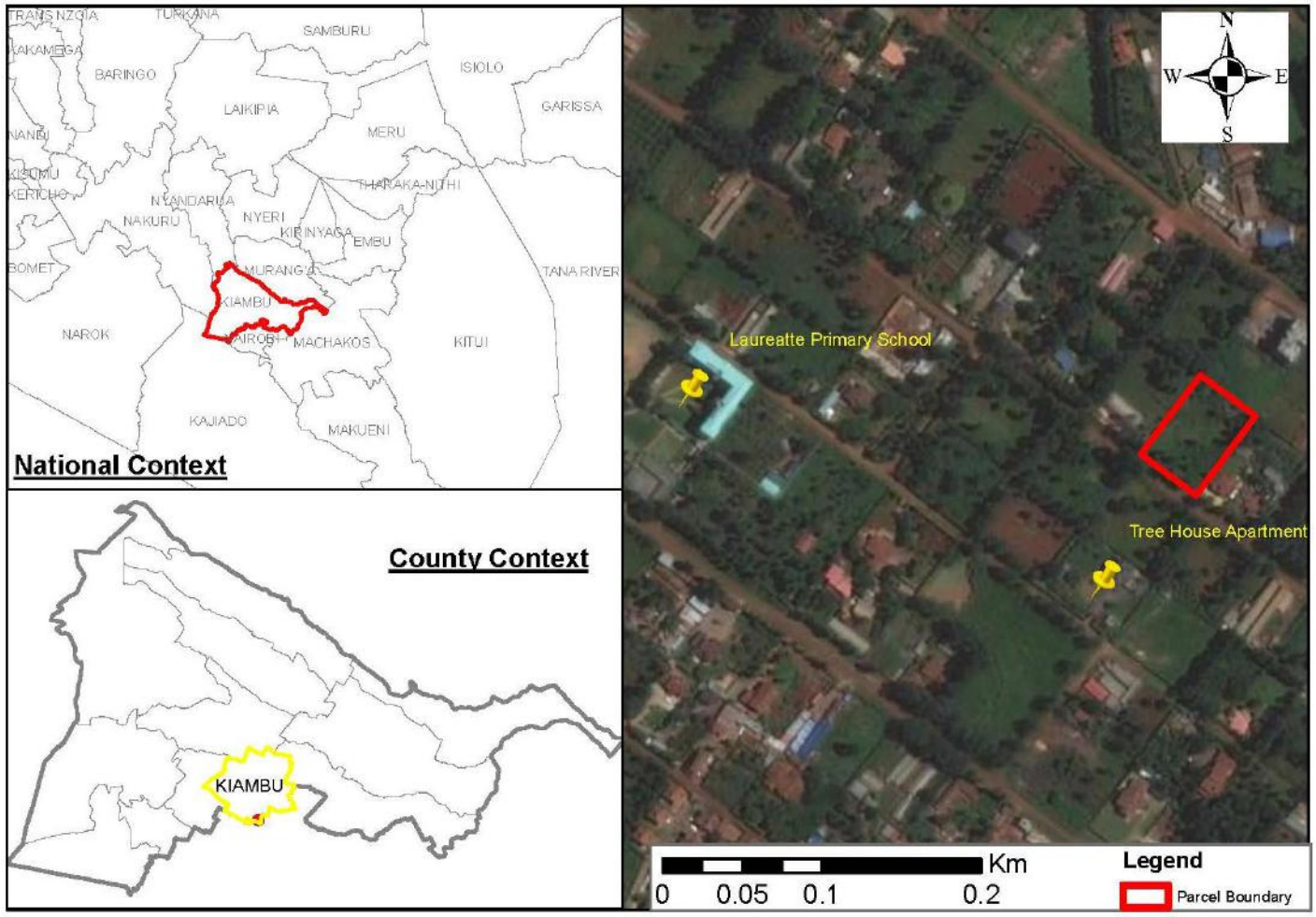
3.0 DESCRIPTION OF THE PROPOSED PROJECT

3.1 PROPOSED PROJECT LOCATION

The proposed site is located in Kihara Ward, which is in Kiambu Sub County- Kiambu County. The site is accessed through Kaburu-Githua Lane, a 9M wide road that is off Kigwa Road. It is situated approximately 364 Meters (as the crow flies) East of Laureatte Primary School. The site lies at longitude 260,380 M E and latitude 9,866,567 M S.

3.2 LAND OWNERSHIP AND SIZE

The land where the proposed project is to be located is registered under Jacqueline Wangari Kinuthia. It measures approximately 0.6593 acres. A copy of proof of land ownership is herein annexed to this report.



Map 1: Location of Proposed Site (Modified from Kenya GIS Data and Google Earth)

3.3 ONSITE LAND CHARACTERISTICS

The site currently hosts a care taker's house, a toilet and a cow shed. A better part of the site is covered by plants and trees. The minimum and maximum noise levels of the proposed site are 46.2 dbl and 67.2 dbl respectively.

Plate 1: Existing Developments within the Site (Source: Field Survey, 2022)

3.4 PROJECT SUMMARY

The project is necessitated by the need to create more quiet and comfortable living space for the burgeoning population in Thindigua area and its environments.

The objectives to be fulfilled by the proposed project include but not limited to the following;

a) Construction of safe, habitable and economical residential housing units in accordance with the local and internationally recognized standards,
b) Improving economy through job creation and by paying taxes to the central government,
c) Create employment throughout the project cycle

The proponent intends to construct a 10 storey residential flat that shall provide one hundred and twenty (120) two-bedroom housing units. The development is composed of three blocks that shall each have a total of four two bedroom units on each floor.

The lower and upper ground floors shall provide a total of one hundred and sixty-one (161) parking bays.

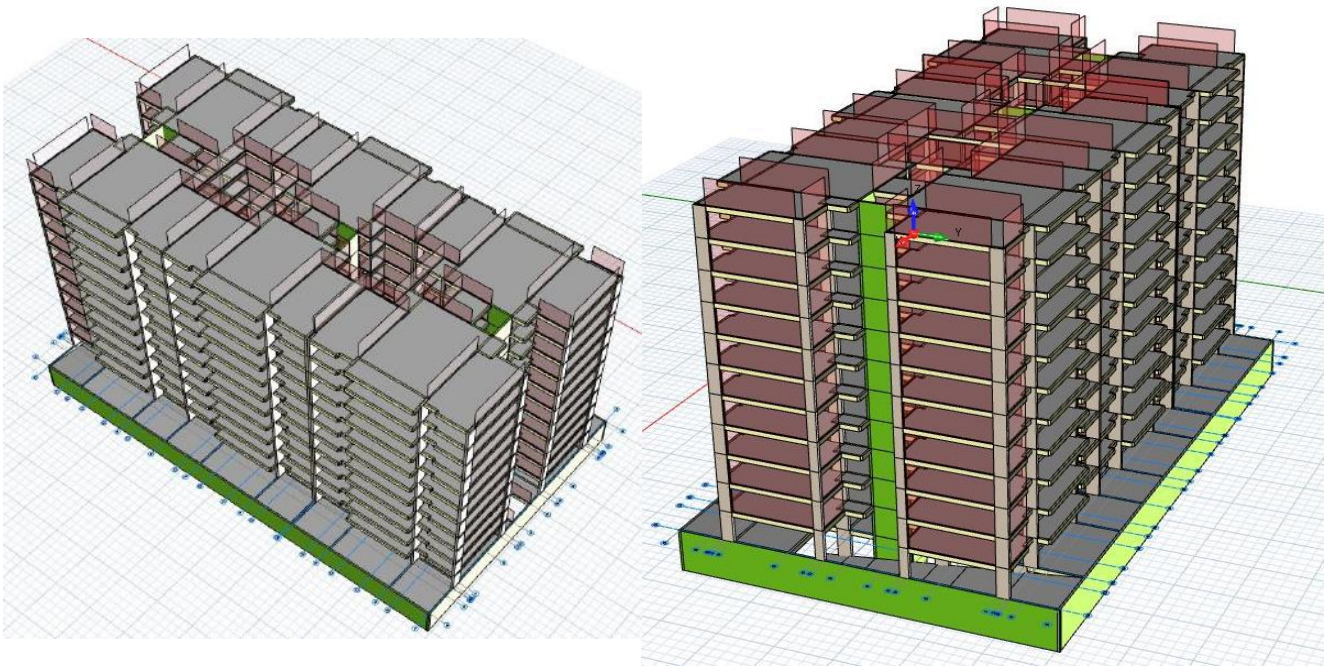


Plate 2: Snippets of 3D Design of the Proposed Development (Source: Pleng Ltd,2022)

Waste water that shall be generated during the project's operational phase shall be managed through the use of a bio digester that shall be installed on the basement floor. The following summarizes the onsite waste water treatment process;

Primary Waste Water Treatment: The sludge from the toilets shall be directed to a regulating tank through a sludge inlet, where the unwanted sediments shall be discarded through the manholes present in the tank. In the anoxic tank, the waste water shall be treated through anaerobic process. At this point, sedimentation of settleable solids shall as well take place, reducing the organic load of secondary treatment units.

Secondary Waste Water Treatment: Thereafter, the treated water shall be directed to the Baffle reactor for further treatment. This reactor shall use aerobic reaction to break down organic solids and reduce nutrient levels (phosphorous, nitrogen, carbon). The increased oxygen supply shall accelerate the activity of the naturally occurring micro-organism which degrade the solids to a clear effluent and a nontoxic sludge.

To ensure final effluent quality, the baffle reactor shall have four baffles, thus increasing contact time with the active biomass (sludge) resulting in improved waste water treatment.

Effluent Disposal: The treated water shall then be channeled to a storage tank to be reused for flushing the toilets.

Desludging: The removal of the settleable solids shall be undertaken annually through motorized emptying and transport technology.

The proposed project shall also be associated with other facilities which include parking area, pedestrian walk ways, drive ways, access road, lifts, water and sewerage reticulation, electrical infrastructure layout and other amenities.

3.5 PROJECT DESIGN COMPONENTS AND ACTIVITIES

The entire project will be constructed based on the applicable standards of Kenya and any other standard that might be incorporated including but not limited to; The Environmental Management and Co-ordination Act Amendment (EMCA), 2015, Occupation health and safety act, 2007, The Environmental Management and Co-ordination (Waste Management Regulations 2006), Public health act, Physical planning act CAP 286, Water act, National Environmental Policy 2013 and National environmental action plan.

Moreover, the proposed project design has put into consideration the provisions of the Kenya Building Code and the Euro Code. It has specifically addressed the following among other key occupational health and safety standards;

- Lighting and Ventilation

The buildings are designed in such a way as to allow free circulation of air and maximum penetration of natural light.

- Access

Access to the facility by all persons including Persons with Disabilities is well thought out and incorporated in the design. The driveways are as well separated from pedestrian walkways to promote the safety of the persons on foot.

- Sanitary Facilities

The design has provided adequate number of toilets, bathrooms and hand wash basins. Waste water from these facilities shall be managed through a bio digester.

- Fire Safety

There is consideration of emergency exits, installation of firefighting equipment and provision of open spaces that may act as fire assembly points in the proposed project design.

- Building Setbacks

A building line of at least 6M wide has been considered in the design. The proponent shall also ensure this is implemented during the construction phase.

A. Construction Phase		
Activities	**Resources, Machinery and Tools**	**By Products**
1. Mobilization of project workforce, resources and materials 2. Site/ bush clearing, removal of debris and any existing structures 3. Marking of Layout 4. Ground excavation 5. Placing of formwork and reinforcement for concrete 6. Pouring of concrete during the construction of the above items 7. Other activities include; • Column casting • Walling • Electrical installation • Plastering • Windows and doors installation • Roofing • Painting • Utility installations • Backfilling the excavated foundations • Carting away the remaining excavated material	Construction bricks, Construction sand, Ballast, Cement, Timber, Steel, PVC pipes, Galvanized wires, Galvanized iron sheets, Reinforced concrete slabs, Nails, Glass, Paint, Electrical wires, Water, Electricity, Hammers, mattocks, Wheelbarrows, Spades, Concrete mixer and Excavator	Construction debris, Wooden pieces, Waste water, solid waste such as cartons, cement bags, waste metal sheets etc.

B. Operation Phase		
Activities	**Resources, Machinery and Tools**	**By Products**
1. Facility occupation 2. Facility maintenance and monitoring 3. Water and waste water management 4. Solid waste management 5. Energy use and conservation 6. Security Management	Replacement/ maintenance items such as windows, paint, paving tiles, plumbing pipes and plastics; Cleaning equipment; Electrical equipment; Water; Security equipment etc.	Brocken chairs/tables, Solid waste, Dysfunctional machines and computers, Waste Water, faulty electrical equipment, waste plastics, pipes, paint etc.
C. Decommissioning Phase		
1. Existing Condition evaluation 2. Inventorying all existing structures 3. Demolition works 4. Collection of construction waste materials which can be reused and removal of all other non-native materials from the site 5. Re-vegetation and preparation of the site for reuse	Water, Electricity, Hammers, mattocks, Wheelbarrows, Spades, Tree seedlings, Excavator	Waste Water, Timber among other solid wastes

Table 1: Project Design Components and Activities (Source: Pleng Ltd,2022)

3.5.1 A SUMMARY OF CONSTRUCTION MATERIALS AND THEIR POSSIBLE IMPACTS

MATERIAL	SOURCE	USE(S)	POSSIBLE IMPACT(S)
Cement	♦ Hardware shops nearby	♦ Preparation of concrete	♦ Increased solid waste generation ♦ Air pollution ♦ Boost of businesses
Soil	♦ From site	♦ Ground levelling ♦ Landscaping	♦ Air pollution as a result of dust ♦ Soil erosion ♦ Loss of biodiversity
Sand	♦ Nearby suppliers	♦ Preparation of concrete for joining masonry stone	♦ Changes in river morphology
Building Stones	♦ Nearby suppliers	♦ Walling works	♦ Accidents and injuries if stored carelessly ♦ Business growth ♦ Employment creation e.g. drivers
Ballast	♦ Nearby suppliers	♦ Concrete mixing	♦ Promotion of businesses
Timber and poles	♦ Timber yards near the proposed site	♦ Roofing ♦ Supporting structural works ♦ Making doors	♦ Deforestation ♦ Loss of biodiversity ♦ Visual intrusion ♦ Promotion of businesses
Glass	♦ Hardware shops nearby	♦ Glazing windows	♦ Solid waste generation ♦ Injuries, such as cuts, bruises etc. ♦ Promotion of businesses

MATERIAL	SOURCE	USE(S)	POSSIBLE IMPACT(S)
Pipes	♦ Hardware shops nearby	♦ Water and waste water reticulation	♦ Solid waste generation ♦ Biodiversity disturbance ♦ Promotion of businesses
Nails	♦ Hardware shops nearby	♦ Joinery and roofing	♦ Injuries ♦ Solid waste generation ♦ Promotion of businesses
Gravel	♦ Quarries nearby	♦ Making ballast	♦ Land degradation ♦ Employment creation
Paint	♦ Hardware shops around	♦ External and internal finishes	♦ Air pollution
Paving blocks	♦ Nearby suppliers	♦ Designation of walkways and driveways	♦ Solid waste resulting from broken blocks
Water	♦ Nairobi Water and Sewer Company	♦ Mixing construction materials ♦ Cleaning ♦ Drinking ♦ Dust suppression	♦ Increased water demand ♦ Water shortages and/or reduced supply ♦ Increased waste water generation

Table 2: Summary of Construction Materials and their Possible Impacts (Source: Pleng Ltd,2022)

3.6 COST OF PROPOSED PROJECT

The estimated cost of the proposed project will be determined by a registered quantity surveyor, through preparation of the Bill of Quantities.

4.0 BASELINE INFORMATION ON THE EXISTING ENVIRONMENT

A reconnaissance Survey was undertaken on 8th December, 2021, whereby the team familiarized with the site conditions and were able to assess the scope of the environmental impact assessment study. Site survey and analysis was then conducted on 30th March, 2022.

4.1 PHYSIOGRAPHIC CHARACTERISTICS OF THE PROPOSED PROJECT AREA

4.1.1 Weather and Climate

The area experiences bi-modal type of rainfall, with long rains falling between Mid-March to May and the short rains between mid-October to November. The annual rainfall varies between 2,000 mm and 600 mm. The average rainfall received is 1,200 mm (County Government of Kiambu, 2018).

The mean temperature in the county is 26°C with temperatures ranging from 7°C to 34°C.

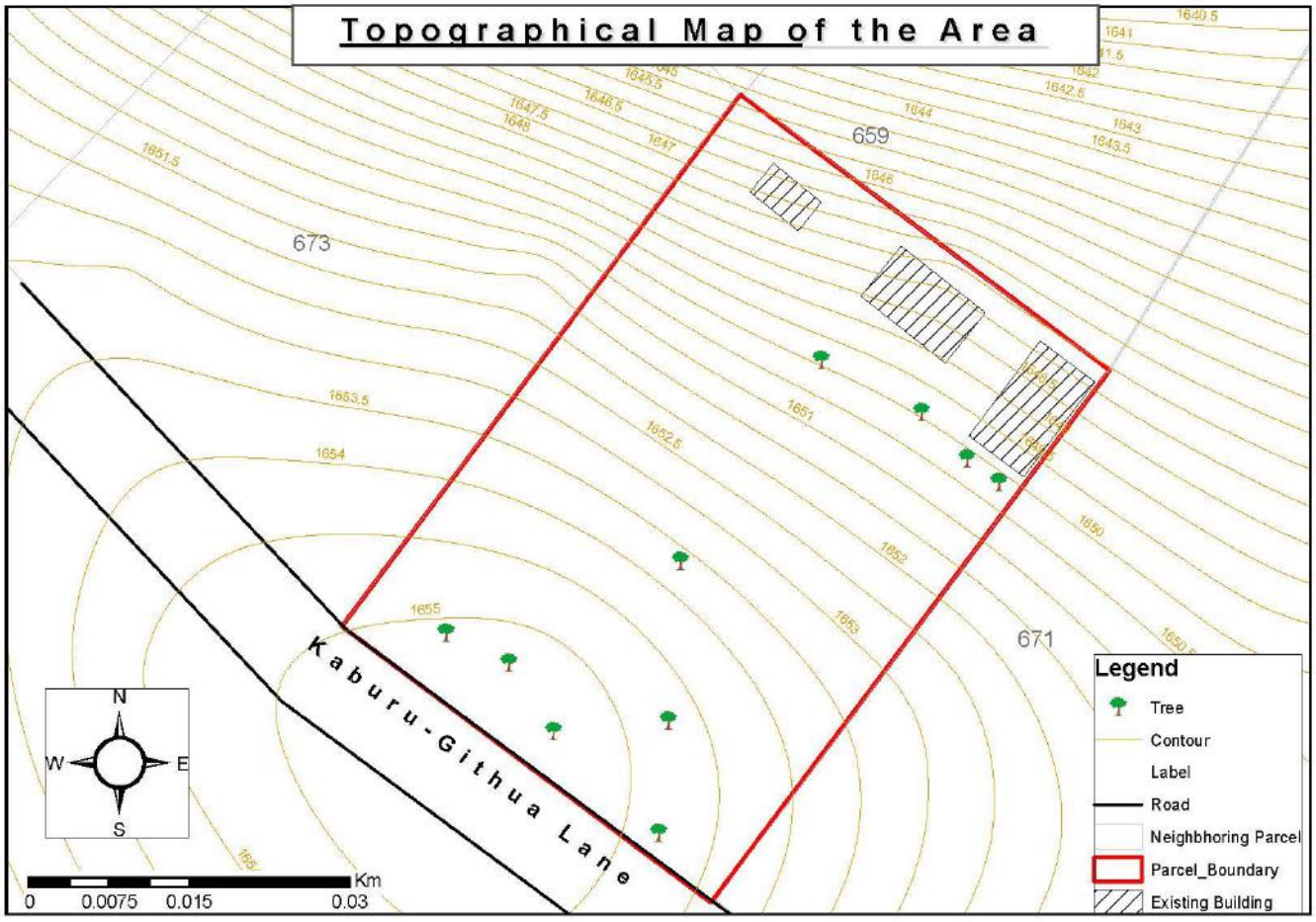
4.1.2 Rocks and soil

Red soils are the dominant types of soil in the area. These soils are fertile and support growth of crops such as tea, coffee*, zea mayze*, pumkin, beans etc. They also support construction activities. However, because of their poor drainage capacity, the earth roads in this area become impassable during rainy seasons.

Plate 3: Soil Type in the area (Source: Field Survey,2022)

4.1.3 Topography and Drainage

The proposed project site is gently sloping and slopes from south to North-East. It lies at an altitude of between 1640 metres and 1655 meters above sea level. Ihara river is about 5 Kilometers from the proposed site.



Map 2: Topographical Map of the Area (Source: Modified from Google Earth and Field Survey,2022)

4.1.4 Implication:

The materials used for construction should be able to withstand the high temperatures and high rainfall experienced in the area. The gentle slope shall promote ease of doing business during the construction of the eight (10) storey building.

4.2 ECOLOGICAL CONDITIONS OF THE PROPOSED PROJECT AREA

4.2.1 Animal species

The main type of animals found in the area is mostly domestic animals i.e. cows, goats and sheep that are kept by the community around the proposed project site. There are no animals in the proposed site apart from birds and microorganisms within the soil.

4.2.2 Vegetation

The vegetation typology around the site is mainly exotic species like *Mangifella indica, grevellia robusta, grass species, Musa Species, phaselous vulgaris and persear Americana.* The environment also supports growth of thick bush and shrubs.

Plate 4: Vegetation Type in the Area (Source: Field Survey, 2022)

4.2.3 Implication:

Roots of vegetation bind the soil, which helps in arresting soil erosion. They also serve as habitat and source of food for wild and domestic animals respectively. The small microorganisms living in soils are also protected when soil erosion is prevented. However, if vegetation is indiscriminately cleared, this can lead to alteration of the landscape integrity resulting in soil erosion and loss of biodiversity.

4.3 INFRASTRUCTURE AND UTILITIES

4.3.1 Transportation

The site is accessed through an earth road which is approximately 12m wide. The road is in good condition, but is mainly impassable during the rainy seasons. The most commonly used mode of transport in the area is by road, whereby people use privately owned cars, matatu and boda bodas. Storm water management is not catered for as there are no drainage channels along the access road.

Plate 5: Access Road (Source: Field Survey, 2022)

4.3.2 Energy and Electricity

The site is connected to the national electricity grid, making electricity the principal source of lighting in the site. Firewood and charcoal are the main sources of cooking in the area.

Plate 6: Electricity Connection (Source: Field Survey, 2022)

4.3.3 Water and Waste Water

The main source of water is piped water from Nairobi water and Sewerage company (NWSC). Additionally, NWSC caters for the disposal of the waste water in the area.

Plate 7: Waste Water Disposal (Source: Field Survey, 2022)

4.3.4 Solid Waste Management

The main type of solid waste in the site is paper waste and kitchen refuse. Paper waste is normally dumped in a shallow depression and burned regularly. Kitchen waste on the other hand is used as manure in the farm.

Plate 8: Solid Waste Management (Source: Field Survey, 2022)

4.3.5 Implication:

The access road to the site is wide enough to allow smooth transportation of construction materials, equipment and man power.

The cutting down of trees for fuel may in the near future lead to rising temperatures, soil erosion, flooding and loss of biodiversity. The population around should thus consider other alternatives, such as liquefied petroleum gas (LPG) which are environmentally friendly.

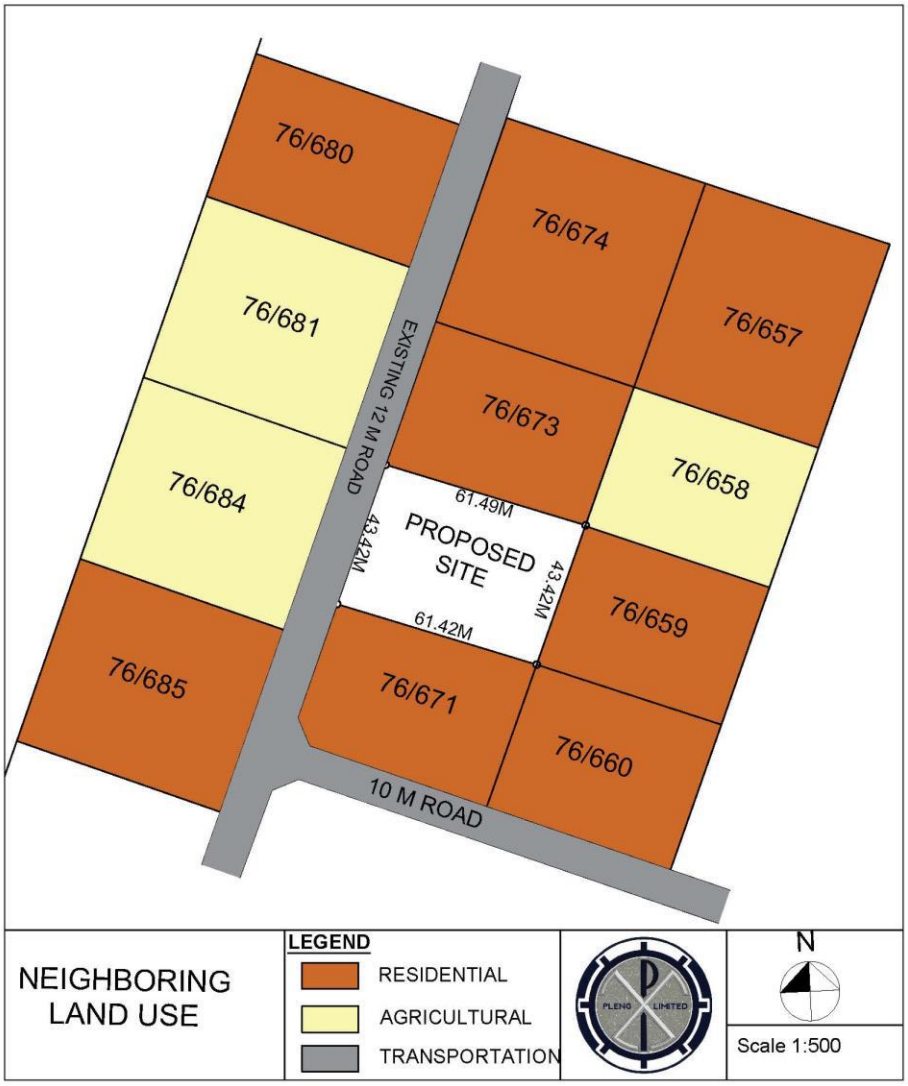
Water conservation strategies shall reduce water bills and arrest problems of water shortages. The open dumping of paper and plastic waste destroys the aesthetics of the area and destroys plans and animals' habitat.

4.4 LAND AND LAND USE

The surrounding land uses are mainly residential and agricultural. This means that the proposed project shall be in harmony with the surrounding land uses.

4.4.1 Implication:

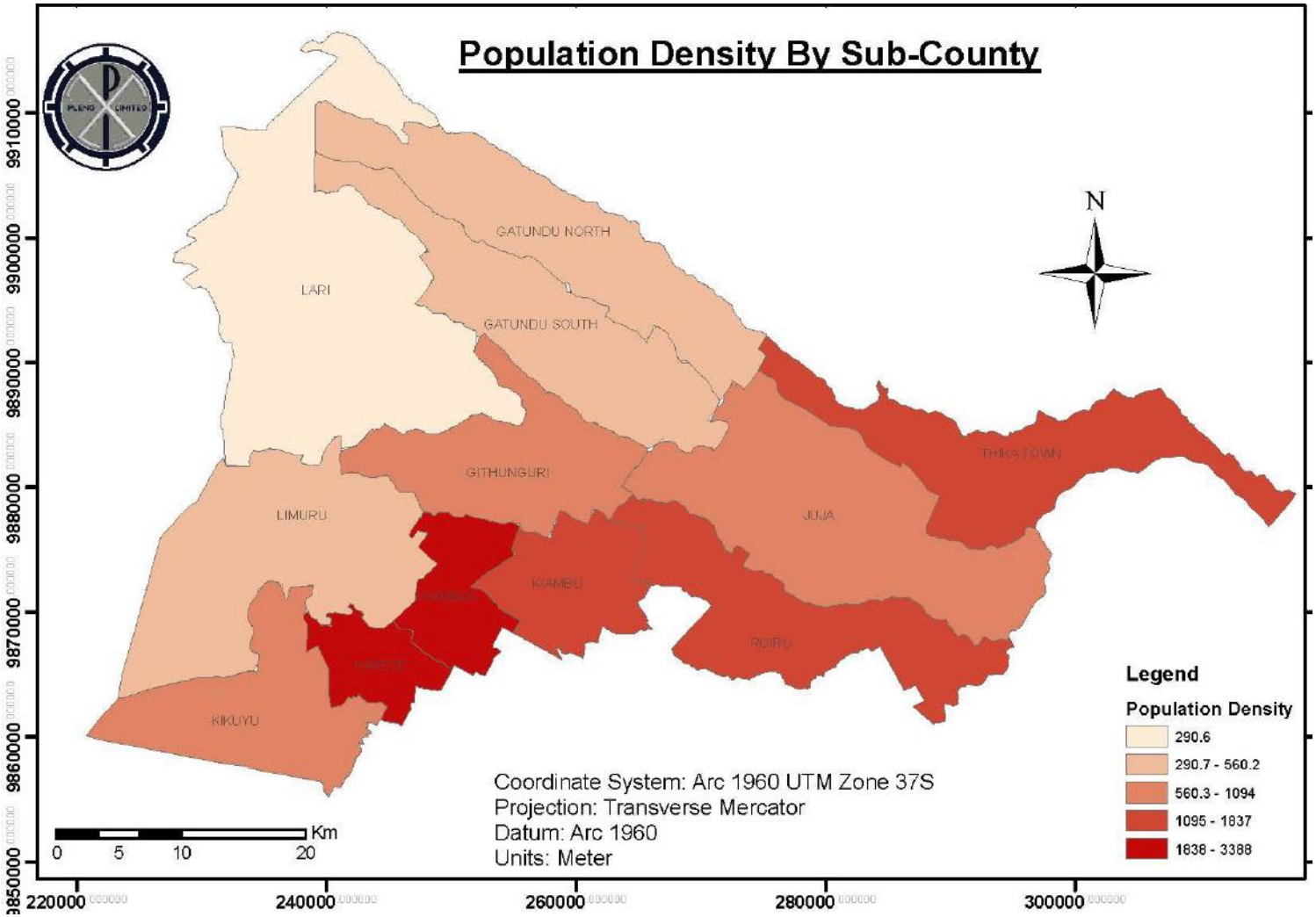
Increased land cover changes from agriculture and/or bare land to built-up areas (transportation, housing etc.), may lead to increased surface run-off and loss of top fertile soils in the farms. As such, the inhabitants of this area ought to promote afforestation to enhance the ecosystem of that area.



Map 3: Neighborhood Characteristics (Source: Modified from Google Earth and NeoPlan Drawing)

4.5 POPULATION AND DEMOGRAPHY

According to 2019 Kenya Population and Housing Census, Kiambu county had a total population of 2,417,735, with an average household size of 3.0. Additionally, Kiambu Sub-County is among the densely populated areas within the County.



Map 4: Population Density By Sub County (Source: Modified from KNBS,2019 Population Data and GIS Data)

With a population growth rate of 2.81%, the total population of the county is predicted to be 3,279,425 in the year 2030. This means that there will be increased demand for housing in the county.

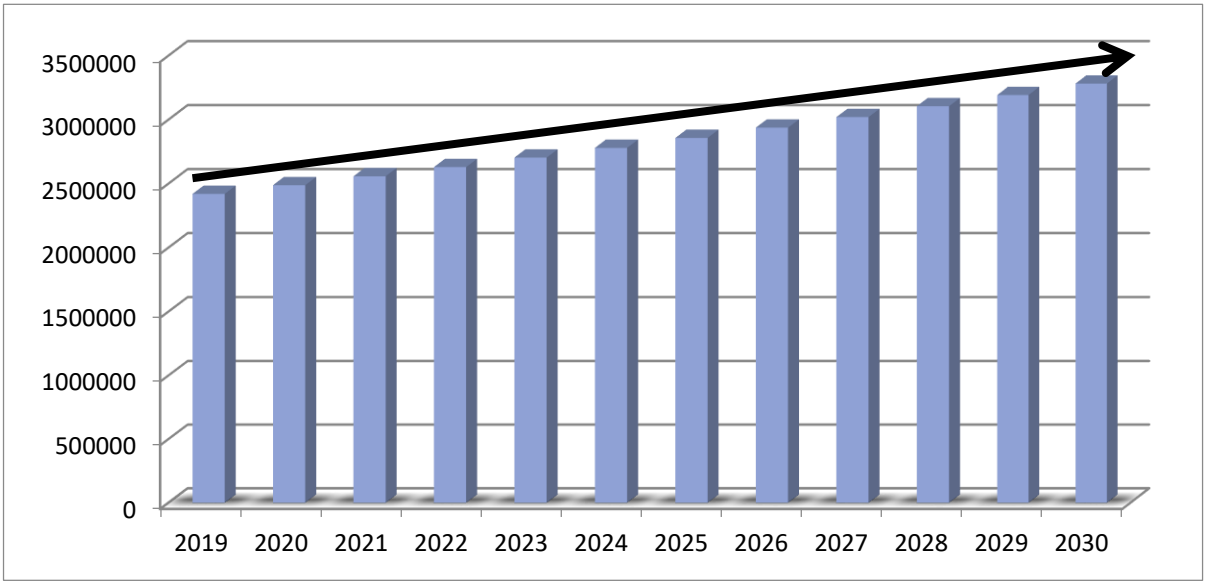


Chart 1: Population Projection (Source: Modified from Kenya Population and Housing Census, 2019)

4.5.1 Implication:

High population densities on the other hand affects the environment as land may not be used in a sustainable manner, hence deterioration of the quality of the land. Deforestation to pave way for settlements and farming activities may also become rampant in an area experiencing high population growth. This in turn affects surface waters, surface run-off rate, air quality as well as biodiversity of the area.

5.0 PUBLIC PARTICIPATION AND CONSULTATION.

Public Participation and Consultation form a vital component for gathering, understanding and establishing the target populations' understanding of the project, perceptions, expectations, level of involvement and views on its impacts during design, implementation, and operation.

Through public participation and consultation, it is possible to enhance project performance, acceptability, and sustainability.

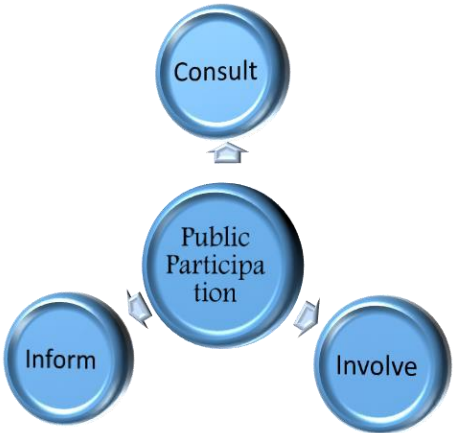


Figure 2: Public Consultation (Source: Pleng Ltd,2022)

Moreover, the Kenyan Constitution provides for public participation and consultation in all developments and projects that affect the public. This is also in line with the provisions of EMCA of 2015, PLUPA of 2019 and the CGA of 2012.

5.1 PUBLIC CONSULTATIVE MEETING

A public participation meeting was held at the proposed site on 4th March, 2022. The main agenda of the meeting was to inform the public on the proposed projects and obtain their views on the positive and negative impacts of the project on the environment, society and economy. The public was also engaged in proposing measures that could be employed to alleviate the negative impacts of the project.

Plate 9: Public Participation Meeting (Source: Field Survey,2022)

The meeting ensured equal representation of all gender, age as well as inclusion of vulnerable groups, like women, the elderly and the youth. Persons with disabilities (PWDs) were also not left out. Minutes of the meeting are herein attached.

5.2 HOUSEHOLD QUESTIONNAIRE ADMINISTRATION

A simple random sampling technique was applied in administering of the questionnaires. These questionnaires were administered on 30th March, 2022 during the site survey.

Plate 10: Public Participation and Consultation (Source: Field Survey, 2022)

Among those interviewed, 70% of the respondents were female while 30% were male.

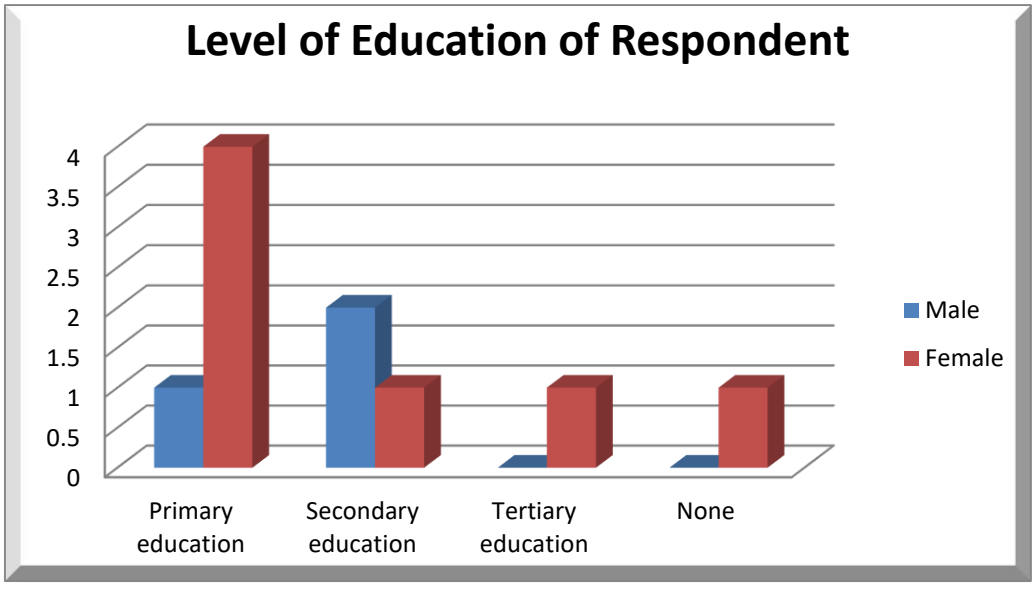


Chart 2: Education Levels of Respondent by Gender (Source: Field Survey, 2022)

5.1 SUMMARY OF STAKEHOLDER ENGAGEMENT AND PUBLIC INVOLVEMENT.

5.1.1 Acceptance of the Project by the Public.

All the persons interviewed and consulted had no objection to the proposed project but on condition that the negative impacts of the project would be mitigated. During the public participation meeting, the proposed project was unanimously accepted by members present.

5.1.2 Positive environmental, social and health impacts of the project.

There was a general acceptance of the proposed project by the community and other key stakeholders. Those involved and consulted hoped that the project could be fast tracked as it would be helpful to the community.

The respondents cited the following as the key benefits of the proposed project; Creation of Employment; Business Opportunities and Growth, especially to the nearby hardware shops and local suppliers; Improved living standards of the community; Increased access to decent housing and Improved Economy of the area and Kenya at large.

5.1.3 Negative environmental, social and economic impacts of the project.

In as much as the community supported the proposed project, they hoped that the following negative impacts of the project could be considered and mitigated so as to promote a clean and healthy environment in the area; Air Pollution from the machinery; Soil erosion due to excavation works in the area; Increased water demand and possible shortages; Loss of biodiversity due to clearance of the vegetation; Solid waste generation; Spread of water borne diseases and transmission of respiratory diseases; Overloading of the existing sewer system; congestion and destruction of the existing access road and Accidents as a result of not observing the health and safety guidelines.

5.1.4 Proposed mitigation measures.

To mitigate the negative environmental impacts of the project, the community proposed the following mitigation measures; Landscaping the undeveloped area to bind the soil particles together and prevent soil erosion; Proper servicing of the machinery; Recycling of the waste materials such as plastics and construction materials; Training of the personnel; Provide an evacuation plan such as having a fire assembly area; Providing PPEs for the workers on site; Adhering to county by-laws e.g. setbacks, building lines etc. and Upgrading of the drainage systems and road and walkways infrastructures .

6.0 ANALYSIS OF PROJECT ALTERNATIVES.

6.1 NO PROJECT ALTERNATIVE.

When it comes to protection of the environment and preservation of biodiversity, this option could be the most suitable alternative. However, if this option is adopted, then there would be no social development and economic prosperity as there shall be; no employment creation, no revenue from developer, unchanged standards of living and low or no investment in the area around. Additionally, the anticipated better living space and localized economic development may not be realized.

Thus, the No Project Alternative is not the appropriate alternative to the local people, Kenyans, and the Government of Kenya.

6.2 ALTERNATIVE LOCATION.

The Client currently does not have another land where he can develop other than the proposed project location. As such, consideration of this option would mean that the Client undertakes to buy land in some other location. This is not a guarantee that such land would be available. It's also worth noting that the said project is already underway in terms of seeking other development approvals in various government departments. Therefore, the project owner could end up spending more resources to purchase land, undertake design and follow up on approvals on the project. This could mean loss to the Client and the general public.

6.3 ALTERNATIVE LAND USE.

The area is in a mixed use development area, accommodating both residential and commercial land uses among other compatible land uses. Alternative land use activities such as farming may not be economically feasible. The proposed project is in conformity with the form and character of the neighborhood and thus much desirable.

6.4 ALTERNATIVE TECHNOLOGY

Steel buildings are durable, easy and faster to install. They are also lighter in weight. However, these buildings are prone to corrosion and fire outbreaks (since they are good conductors of heat and electricity). Semi-permanent buildings, such as wood are cheaper to construct but can easily be affected by weather conditions and they catch fire easily.

Portable buildings (Modular designs) are not limited to their initial placement and/or their design (can easily be dismantled and designed according to one's preference or current use). These buildings are also cost effective and easy to install.

However, they may be subject to rocking and movement if the ground is soggy, frozen or thaws, the room sizes are also limited since they are made at the factory and have to fit the road during transportation and require a client to be within a radius of like 500 miles from the factory to reduce on transportation costs and difficulties.

The proposed stone buildings are long lasting (can have a life span of over sixty years), are resistant to environmental conditions, like heat, wind etc., are not prone to fires and require minimal maintenance. They are however expensive to construct as compared to wood and steel buildings.

Currently, the sewer system in the area is not operational and as such, the proposed development may not bank on it. In as much as septic tanks are cost efficient compared to sewer connection, this technology does not treat the waste water and may hence lead to ground water contamination and ultimately, water borne diseases. Additionally, septic tanks require regular maintenance and are not suitable for high density developments.

The proposed bio digester on the other hand is environmentally friendly, cost efficient and can be combined with any type of toilet (including pour flush). The effluent from this system is also of high nutrient value and can be reused in the farms or for flushing the toilets. Unlike septic tank systems, the bio digester does not require frequent sludge removal.

6.4 PROPOSED ALTERNATIVE.

This proposed project, when implemented may have negative impacts on the environment, the society and the economy. However, these negative impacts, such as; Loss of biodiversity from clearing vegetation and excavation, Pollution, Soil erosion etc. can be curtailed through a number of mitigation measures.

If the negative impacts are well mitigated, this alternative may in the long and medium term bring a number of positive impacts such as; Employment opportunities through construction workers, suppliers, Increased revenue from wages and salaries, Improved livelihood and Improved economy.

6.5 COMPARISON OF ALTERNATIVES.

Both the no project alternative and alternative location could be the most environmentally friendly option but may not be significant to the economy of Kiambu County and Kenya at large. The alternative land use on the other hand may not augur well with promotion of increased access to housing. Other land uses, such as industrial use may not be in harmony with the neighborhood characteristics of the proposed project area.

If mitigation measures are implemented to the letter, the proposed alternative is much desirable as it is economically feasible, socially acceptable and environmentally friendly.

7.0 ENVIRONMENTAL AND SOCIAL IMPACTS OF THE PREFFERED PROJECT ALTERNATIVE.

7.1 POSITIVE ENVIRONMENTAL AND SOCIAL IMPACTS OF THE PREFFERED ALTERNATIVE.

7.1.1 Employment Opportunities and Business Growth.

It is anticipated that people will be employed onsite in all the phases of the project as contractors, supervisors, construction workers, managers, foremen, site agents, structural engineers, mechanical engineers, security agents, transporters among other employment opportunities.

This proposed project shall as well promote associated businesses as it shall require supply of materials for construction, water and food stuffs. This in turn shall promote market for locally produced farm products.

7.1.2 Improved Livelihoods.

Increased wealth creation as a result of employment and growth and expansion of businesses shall improve the living standards of the employees and their families as they will be able to acquire basic needs. As such, savings by the community shall improve due to reduced dependency and less money spent on water and in seeking health care services.

7.1.3 Increased Revenue.

The project shall generate revenue to the County Government through tax. Other economic activities that shall come up as a result of this project shall also contribute to the County revenue kitty. This project shall also attract other investments in the area and eventually, the value of land and property shall increase, promoting increased revenue collection in the area.

7.1.4 Increase in national housing stock

This proposed project shall in a way arrest the problems associated with inadequate supply of housing units that is faced by the country. In addition, it shall promote access to decent living spaces.

7.2 NEGATIVE ENVIRONMENTAL AND SOCIAL IMPACTS OF THE PREFFERRED ALTERNATIVE.

7.2.1 Air Pollution.

The construction activities on the site will result to increased dust and gaseous pollutants emissions. For instance, construction machinery and trucks generate hazardous exhaust fumes such as Carbon Oxides, Sulphur and Nitrogen oxide.

Dust on the other hand shall be generated from excavation, concrete mixing, levelling and the movement of construction vehicles.

Minimal air pollution shall as well occur during the operational phase of the project mainly due to entry and exit of private vehicles owned by the residents in the proposed project site.

Dust in the area can be suppressed through sprinkling areas with exposed soil surfaces and through regulating the speed of the vehicles to and from the project site. Machinery and vehicles can be serviced regularly to reduce greenhouse gas emissions.

7.2.2 Noise and Vibration

This shall be mainly as a result of transportation of materials and excavation works in the area. It shall be a nuisance to the neighbors and as such, the contractor is advised to undertake construction works only during the day when most of the neighbors are not in their houses.

To reduce the noise levels during the day and its impacts on the employees onsite, the vehicles and machinery shall be switched off when not in use; Personal Protective Equipment (PPE) to be provided to the workers; upheld regular servicing of machinery to reduce noise resulting from friction and fence off (acoustic fencing) proposed project site.

7.2.3 Loss of biodiversity.

The clearing of vegetation to pave way for the structures shall expose and set the soils loose to the agents of soil erosion. As such, soil erosion shall be experienced as well as disruption of the living organisms in the environment.

This can be curtailed through avoiding unnecessary movement of soil materials from the site and landscaping the undeveloped areas.

7.2.4 Increased solid waste generation.

During construction and decommissioning phases, there shall be increased generation of solid waste from construction materials, such as wood, broken glass, stones, cement bags etc.

Increased solid waste (household waste) generation shall also be witnessed during the operation phase due to high human traffic to the site and consequently increased activity on site.

Integrated solid waste management (reuse, reduce, recycle etc.) shall be promoted during throughout the project cycle. There is also need to hire the services of NEMA Licensed waste collectors who ensure waste is dumped in designated sites.

7.2.5 Oil Leaks and Spills

There could be incidences of oil leaks and spills on the proposed site during the construction phase of the project. oil/grease contain detrimental elements to the environment such as mercury, lead and Sulphur among others.

To prevent this, any maintenance work should be carried out in a designated area (protected service bays) and where oils spills are completely restrained from reaching the ground. Such areas should be covered to avoid storm water from carrying away oils into the soil. Additionally, oil interceptors should be installed along the drainage channels leading from such areas.

7.2.6 Impacts on Drainage and Hydrology.

The quality of water may be affected during excavation, drilling and transportation activities. This could be from dust, paint, debris, oil spills, poor waste management etc.

The construction will require water for mixing construction materials, curing, washing, drinking and bathing by construction workers. This may place a strain on water supply and cause conflicts with other users.

There could also be incidences of water shortage due to increased demand for water. Additionally, there shall also be increased surface run-off due to reduced area of pervious surfaces.

To curb these problems, it is suggested that water reuse and recycling should be upheld throughout the project cycle, water conservation strategies, such as rain water harvesting should be promoted and water conserving taps that turn-off automatically when water is not in use should be installed.

7.2.7 Impacts on Climate

The clearance of vegetation and presence of vehicles and machinery onsite shall promote increased greenhouse gasses in the atmosphere. This is mainly because of turning an area that was once a carbon sink to a carbon source. The degraded soils may also not be able to hold more carbon sucking vegetation. As such, the area could experience high temperatures.

It is anticipated that the contractor shall ensure all machinery and vehicles are serviced regularly and that the undeveloped part of the project area shall be landscaped to promote green spaces on the site.

7.2.8 Health and Safety Concerns.

This project may cause the following health and safety issues; Fire outbreak incidents; Risks of contracting air borne diseases like, Covid 19, TB, Flu; Accidents such as falls, burns, injuries etc. caused by machinery and equipment; Hearing complications due to noise from machinery and equipment; Water borne diseases and sanitation related diseases; Electric risks and Increased insecurity.

The following measures should be put in place to promote health and safety during project implementation, operation and decommissioning; install fully equipped first aid kits and firefighting equipment at strategic locations; erect billboards on the start of the project to psychologically prepare the neighbors and indicate the working hours; security should be beefed-up and movement within the site should be controlled; lighting systems that illuminate the area well should be provided; provide physical barriers at risky areas such as the stairways, elevated platforms, areas with moving machinery etc.; installation of security alarms in strategic points all over the site area after construction and provide unobstructed fire exits.

7.2.9 Impacts on Traffic

It is anticipated that there shall be increased traffic to the proposed project site especially during the construction and operational phases of the project. As such, there should be controlled access to the site.

7.3 SUMMARY OF ANTICIPATED IMPACTS OF PROPOSED PROJECT

IMPACT	IMPACT TYPE				
	Significance (High-H or Low-L)	Direct (D)/Indirect (ID)	Localized (Lo)/Widespread (W)	Short term (ST) /Long term (LT)	Reversible (R) / Irreversible (IR)
Creation of Employment	H	D	W	ST; LT	R
Business Growth.	H	D	W	LT	R
Improved Livelihoods	H	ID	W	LT	R
Increased Revenue	H	ID	W	LT	R
Increase in national housing stock	H	D	Lo	LT	R
Air Pollution.	L	D	Lo	LT	R
Noise and Excessive Vibration	L	D	Lo	ST	R
Loss of biodiversity	H	ID	W	ST	IR
Increased solid and Liquid waste generation	H	D	Lo	LT	R
Oil Leaks and Spills	L	D	Lo	ST	R
Soil Erosion	L	D	Lo	ST	R
Increased Water Demand	H	D	Lo	LT	IR
Impacts on Drainage	L	D	Lo	ST	R
Visual Intrusion	L	D	Lo	ST	R
Fire Outbreaks	H	D	Lo	LT	R
Accidents	H	D	Lo	LT	R
Spread of diseases	H	D	Lo	LT	R
Traffic Density	H	D	W	LT	IR
Insecurity	H	D	Lo	LT	R

Table 3:Summary of Anticipated Impacts (Source: Pleng Ltd,2022)

8.0 PROPOSED ENVIRONMENTAL AND SOCIAL MANAGEMENT AND MONITORING PLAN.

This EMMP has been developed to guide the project team in eliminating or reducing the project impacts to acceptable minimum/standards. It is based on good environmental practices of project implementation and safety of the operations. It has identified the anticipated impacts; measures to be undertaken; monitoring indicators; the party to implement the measures or control the indicators and the estimated cost likely to be incurred to undertake the measures. Moreover, the EMPs have considered construction, operation and decommissioning phases of the project.

The efficacy and adequacy of this plan can be checked through continuous monitoring and audits during project implementation. As such, this plan has provided relevant parameters to determine the effectiveness of actions to improve environmental quality.

8.1 CONSTRUCTION PHASE.

Detailed Overview of Environmental and Social Issues, Recommended Solution and Institutional Responsibility						
Environmental and Social Aspects	**Environmental and Social Concerns**	**Recommended Solution**	**Responsibility**	**Time frame**	**Monitoring Indicators**	**Budget (Kshs)**
Environmental Quality						
Air	– Air pollution from dust and emissions – Noise pollution from machinery	– Regular servicing of machinery – Undertake construction activities only during the day – Fence off proposed project area – Where possible, use low noise equipment – Use of ear muffs and other required PPEs by persons within the project site	– Contractor	– Throughout construction phase	– Records of respiratory diseases – Complaints from neighboring community – Records of air quality tests	– 300,000

		– Avoid burning waste materials at the site – Orient the exhaust away from nearby community				
Soil	– Soil contamination due to oil spills – Soil erosion	– Regular servicing of machinery – Backfilling – Proper storage of oil products	– Contractor	– Throughout construction phase	– Records of soil quality tests – Minimal incidents of oil spills on site	– 50,000
Water	– Increased water demand – Water shortages	– Promote water recycling and reuse – Ensure taps remain closed when not in use	– Contractor	– Throughout construction phase	– Complaints from the community	– Nil

Flora and Fauna	– Removal of vegetation – Disruption of microorganisms in the soil	– Ensure proper delineation of the project area – Design and implement an appropriate landscaping program to help in revegetation of part of the project area after construction	– Contractor	– Two months	– Landscaped areas within the project site	– 30,000
Waste Management						
Solid Waste Management	– Increased solid waste generation	– Promote integrated solid waste management; reuse, recycling and reducing – Provide facilities for proper handling and storage of	– Contractor	– Throughout construction phase	– Reduced waste generation – Waste segregation practices at source – Reduced open dumping	– 20,000

		construction materials to reduce the amount of waste caused by damage or exposure to the elements – Purchase of perishable construction materials such as paints should be done incrementally to ensure reduced spoilage of unused materials – Use building materials that have minimal or no packaging to avoid the generation of				

		excessive packaging waste – Well labeled waste collection bins for various wastes to be provided at designated points on site				
Liquid Waste Management	– Increased waste water generation – Increased run off	– Promote water recycling and reuse – Delineate interconnected drainage channels for proper disposal of waste water and run-off water – Levelling of the project site to reduce run-off	– Contractor	– Throughout construction phase	– Reduced waste water generation – Reduced run-off – No incidences of stagnant water on site	– 30,000

Fire Safety and Preparedness						
Fire Incident Prevention	– Increased risks of fire incidences due to increased population on site and machinery and other materials on site that can act as fuel	– Designate fire assembly points on site – Promote awareness on fire safety and preparedness – Use of warning signs to warn against fire risk – Install firefighting equipment at strategic areas to promote access to this equipment	– Contractor	– Throughout construction phase	– Increased awareness on fire safety and preparedness – Register of fire occurrence incidents – Availability of firefighting equipment and warning signs in strategic areas	– 50,000

Occupational Health and Safety						
Accidents and Incidents	– Risks of falling off, harm by machinery etc.	– Ensure that machinery, equipment, PPEs, appliances and hand tools used in construction do comply with the prescribed safety and health standards and be appropriately safeguarded – Ensure that materials are stored or stacked in such a manner as to ensure their stability and prevent any fall or collapse – Ensure provision of well stocked	– Contractor	– Throughout construction phase	– Safety records and reports	– 100,000

		first aid kit which is easily available and accessible within the premises – Training on first aid administration				
Health and general welfare of employees	– Risk of contraction of Covid 19 and other air borne diseases	– Promote extensive use of Personal Protective Equipment – Practice social distancing – Impose personnel limits at work place	– Contractor	– Throughout construction phase	– Notices on number of authorized personnel allowed at a given area – Extensive use of PPEs	– Nil
Food and Water Hygiene and Safety	– Water and food contamination risks	– Ensure supply of clean drinking water and food – Covering of food	– Contractor	– Throughout construction phase	– Reduced health risks	– Nil

Transportation Safety	– Accidents and other physical harm due to heavy and unorganized traffic	– Restrict unnecessary traffic to site – Reduced speed of vehicles to site – Ordered movement of vehicle to site	– Contractor	– Throughout construction phase	– Records of authorized vehicles to site	– Nil

Table 4: Construction Phase EMMP (Source: Pleng Ltd,2022)

8.2 OPERATION PHASE.

Detailed Overview of Environmental and Social Issues, Recommended Solution and Institutional Responsibility						
Environmental and Social Aspects	**Environmental and Social Concerns**	**Recommended Solution**	**Responsibility**	**Time frame**	**Monitoring Indicators**	**Budget (Kshs)**
Environmental Quality						
Air	– Air pollution	– Proper servicing of machinery – Promote use of zero or low VOC (Volatile Organic Compounds) paints	– Proponent	– Throughout operational phase	– Records of improved air quality – Complaints from residents	– Nil
Soil	– Soil erosion	– Designate walking areas and landscape the rest of the bare land	– Proponent	– One-off	– Minimal incidents of soil erosion	– 30,000
Water	– Increased water demand	– Promote water recycling and reuse – Support Water management strategies	– Proponent	– Throughout operational phase	– Reduction in water demand – Availability of water tanks	– 200,000

		– Monthly chemical and biological testing of the slurry for temperature, pH etc.			– Records of chemical and biological tests	
Flora and Fauna	– Loss of biodiversity	– Landscaping part of the remaining project site to promote aesthetics and biodiversity	– Proponent	– One-off	– Landscaped areas within the project site	– Nil
Waste Management						
Solid Waste Management	– Increased solid waste generation	– Promote integrated solid waste management; reuse, recycling and reducing – Promote solid waste segregation at the source through use of different garbage tins for different types of waste – Engagement of NEMA licensed waste	– Proponent	– Throughout operational phase	– Reduced waste generation and open dumping – Availability of different waste bins for different types of waste	– 50,000

		disposal company				
Liquid Waste Management	– Increased waste water generation	– Promote water reuse and recycling – Provide interconnected drainage channels for disposal of waste water	– Proponent	– Throughout operational phase – One-off	– Reduced waste water generation	– Nil
Fire Safety and Preparedness						
Fire Incident Prevention	– Increased risks of fire incidences	– Use of warning signs to warn against fire – Installation of firefighting equipment at strategic locations – Regular servicing of firefighting equipment – Pin building plans within the buildings to aid occupants during emergency	– Proponent	– Throughout operational phase	– Register of fire occurrence incidents – Availability of firefighting equipment and warning signs in strategic areas	– 50,000

Occupational Health and Safety						
Accidents and Incidents	– Risks of falling off, harm by machinery etc.	– Repair or remove unsafe equipment – Ensure extensive use of warning signs where applicable – Provide a hazard incident register and always compile reports on the incidents as and when they occur – Undertake surveys to understand incidents that occur or could occur	– Proponent	– Throughout operational phase – Throughout operational phase	– Safety records and reports	– 50,000
Health and general welfare of employees	– Risk of disease contraction and transmission	– Promote extensive use of PPEs – Promote proper sanitation	– Proponent	– Throughout operational phase	– Ill health incident records	– Nil

Food and Water Hygiene and Safety	– Water and food contamination risks	– Ensure supply of clean drinking water and food – Use of warning signs against water that is unsafe for drinking	– Proponent	– Throughout operational phase	– Reduced health risks	– 5,000

Table 5: Operational Phase EMMP (Source: Pleng Ltd,2022)

8.3 DECOMMISSIONING PHASE.

Detailed Overview of Environmental and Social Issues, Recommended Solution and Institutional Responsibility						
Environmental and Social Aspects	**Environmental and Social Concerns**	**Recommended Solution**	**Responsibility**	**Time frame**	**Monitoring Indicators**	**Budget (Kshs)**
Environmental Quality						
Air	– Air pollution from dust and emissions – Noise pollution from machinery	– Regular servicing of machinery – Undertake decommissioning activities only during the day – Fence off project areas – Use of ear muffs and other required PPEs by persons within the project site – Avoid burning waste materials at the site – Where possible, use low noise	– Contractor – Proponent	– Throughout decommissioning phase	– Records of respiratory diseases – Complaints from neighboring community	– 50,000

		equipment				
Soil	– Soil contamination due to oil spills – Soil erosion	– Backfilling – Proper storage of oil products – Revegetation of project sites to reduce soil erosion	– Contractor	– Throughout decommissioning phase	– Minimal incidents of soil contamination and erosion	– Nil
Water	– Water pollution – Increased water demand – Water shortages	– Promote water recycling and reuse – Promote use of alternative sources of water e.g. rain water	– Contractor	– Throughout decommissioning phase	– Reduced water demand	– 10,000
Flora and Fauna	– Biodiversity disturbance	– Removal of non-native materials from site – Revegetation of the project sites	– Contractor	– One month	– Landscaped areas	– 50,000

Waste Management						
Solid Waste Management	– Increased solid waste generation	– Promote integrated solid waste management; reuse, recycling and reducing – Waste collection bins to be provided at designated points on site	– Contractor	– Throughout decommissioning phase	– Reduced waste generation – Availability of waste bins on site	– 5,000
Liquid Waste Management	– Increased waste water generation – Increased run off	– Promote water recycling and reuse – Revegetation to reduce surface run-off	– Contractor	– Throughout decommissioning phase	– Reduced waste water generation – Reduced run-off	– Nil

Fire Safety and Preparedness						
Fire Incident Prevention	– Increased risks of fire incidences	– Designate fire assembly points on site – Promote awareness on fire safety and preparedness – Use of warning signs to warn against fire risk – Proper solid waste management – Avoid burning of waste on site	– Contractor	– Throughout decommissioning phase	– Increased awareness on fire safety and preparedness – Availability of firefighting equipment and warning signs	– 10,000

Occupational Health and Safety						
Accidents and Incidents	– Risks of falling off, harm by machinery etc.	– Ensure that equipment is stored or stacked in such manner as to ensure their stability and prevent any fall or collapse – Ensure well stocked first aid box which is easily available and accessible – Training on proper use of machinery	– Contractor	– Throughout decommissioning phase – One-off	– Safety records and reports	– 30,000
Health and general welfare of employees	– Disease contraction and transmission	– Use of PPEs – Promote proper sanitation	– Contractor	– Throughout decommissioning phase	– Register on health of workers – Safety records and reports	– 5,000

Table 6: Decommissioning Phase EMMP (Source: Pleng Ltd,2022)

9.0 CONCLUSION AND RECOMMENDATIONS.

9.1 CONCLUSION.

The proposed project will have both positive and negative impacts. However, the EIA team has endeavored to give comprehensive mitigation measures and environmental management and monitoring mechanisms which if put in place will minimize or completely eradicate the possible negative impacts.

9.2 RECOMMENDATIONS.

From the foregoing, it is recommended that the project proponent should adhere to the outlined mitigation measures. It is additionally recommended that;

(i) The Client should follow the guidelines as set by the relevant departments to safeguard and envisage environmental management principles throughout the project cycle

(ii) The Client should carry out Environmental Audit 12 months after the completion of construction and yearly throughout the project cycle.

10.0 ANNEXES.

10.1 Ownership document

10.2 Copy of National ID of proponent

10.3 Copy of KRA Pin of Proponent

10.4 Approved plans

10.5 Public Questionnaires

10.6 Public Participation Minutes

10.7 NEMA practicing licenses

10.1 Ownership document

I Received by Survey Plan Thindigwa
Lionel
Sign: [signature]
Date 24/10/2019.

The transferee is a member of the transferor company and had bought shares valued at Shillings Three Thousand Seven Hundred (Shs. 3,700.00) therein.

NOW THIS INSTRUMENT WITNESSETH THAT IN CONSIDERATION of the shares paid by the transferee to the transferor (the receipt whereof is hereby acknowledged by the transferor) the transferor doth hereby transfer unto the transferee all its title and interest in and to the said piece of land together with the buildings and improvements (if any) erected and being thereon.

IN WITNESS whereof the transferee has caused its Common Seal to be hereunto affixed the day and year first herein written.

Sealed with the common Seal of the transferor in the presence of:-

Director {*F.N. Gikonyo*

Director {*S.N. Mwangi*

Director {*Gichungu Chege*

Signed, Sealed and Delivered by the transferee

J.Thio...

in the presence of

ADVOCATE ID NO 7260140 70
P.O. BOX 21111
NAIROBI

Drawn by:

M/S Njoki Nduiga & Co.
P.O. Box 73840
NAIROBI-KENYA

REPUBLIC OF KENYA
GOVT ... REGISTRY
NAIROBI

Registered 11:46hrs on 6-10-97

Presentation No.	Vol. No.	Folio	
229	Nb4	370	2071

Registrar

229
-6 OCT 1997
11:40 Hrs

THIS INDENTURE of conveyance is made the 19th day of August
Ninety - Seven between THINDIGUA COMPANY LIMITED a limited liability company having its registered office at Kiambu in the Republic of Kenya of Post office Box Number 75 Kiambu (hereinafter called "the transferor" (which expression shall include its successors and assigns where the context so admits) of the one part AND JACQUELINE WANGARI KINUTHIA of Post office box Number in Kenya aforesaid (hereinafter called"the transferee" (which expression shall where the context so admits include his personal representative and assigns) of the other part.

KENYA REVENUE POUNDS 0010 1040 HR.

COLLECTOR OF STAMP DUTIES 1801 NAIROBI 2-3-98

WHEREAS the transferee is seized and possessed for an estate in fee simple in possession of All THAT piece or parcel of land comprising by measurement nought decimal TWO SIX SIX EIGHT (0.2668) hectares or thereabouts situate in the South East of Kiambu Township in the Kiambu District that is to say Land reference number 76/672 Original Number 76/381/289 which said piece of land is a portion of the premises conveyed by an indenture of conveyance dated 15th the day of July One Thousand Nine Hundred and Ninety Seven Four (registered in the Government Lands Registry at Nairobi in Volume U14 Folio 272/33 File 2466 which said piece of land with the dimensions abuttals and boundaries thereof is more particularly delineated and edged red in Survey Plan Number 182899 annexed hereto subject to the provisions of the Governments lands Ac t (1902) and the Rules for the time being in

20718 | Transfered from folio. 25/619

1. Conveyance dated 19th August 1997
Thindigua Company limited ---- Vendor
To Jacqueline Wangari Kinuthia ---- purchaser
0.2668Ha. LR 76/672 (orig 76/381/289)
for Kshs. 31,700/-
No. 229 dt. 6-10-97

REGISTRAR OF GOVT. LANDS

I hereby certify this to be a true copy of the original
Stamp duty Sh. 5/=
Copying fee Sh. 100/=
Sh. 105/=
Date 4th March 2005

REGISTRAR OF GOVERNMENT LANDS
F. I. Lubulellah 030

10.2 Copy of National ID of proponent

JAMHURI YA KENYA

REPUBLIC OF KENYA

SERIAL NUMBER: 703249520

ID NUMBER: 7260140

FULL NAMES

JACQUELINE WANGARI KINUTHIA

DATE OF BIRTH

25. 09. 1968

SEX

FEMALE

DISTRICT OF BIRTH

KIAMBU

PLACE OF ISSUE

HDM CBD

DATE OF ISSUE

18. 11. 2021

HOLDER'S SIGN.

DISTRICT

GITHUNGURI

DIVISION

GITHUNGURI

LOCATION

GITHUNGURI

SUB-LOCATION

KANJAI

PRINCIPAL REGISTRAR'S SIGN.

T0341917553

IDKYA7032495208<<2241<<<<<4712

6809250F2111186<B007260140F<<7

JACQUELINE<WANGARI<KINUTHIA<<<

10.3 Copy of KRA Pin of Proponent

KENYA REVENUE AUTHORITY

www.kra.go.ke

PIN Certificate

For General Tax Questions
Contact KRA Call Centre
Tel: +254 (020) 4999 999
Cell: +254(0711)099 999
Email: callcentre@kra.go.ke

Certificate Date : 12/05/2015

Personal Identification Number

A001106231Y

This is to certify that taxpayer shown herein has been registered with Kenya Revenue Authority

Taxpayer Information

Taxpayer Name	JACQUELINE WANGARI KINUTHIA
Email Address	JACQUELINEWANGARI@YAHOO.COM

Registered Address

L.R. Number :	**Building :** EMBASSY
Street/Road : PARLIAMENT LANE	**City/Town :** NAIROBI WEST
County : Nairobi	**District :** Dagoreti District
Tax Area : Dagoretti	**Station :** West of Nairobi
P. O. Box : 23009	**Postal Code :** 00200

Tax Obligation(s) Registration Details

Sr. No.	Tax Obligation(s)	Effective From Date	Effective Till Date	Status
1	Income Tax - Resident Individual	24/02/1993	N.A.	Active

The above PIN must appear on all your tax invoices and correspondences with Kenya Revenue Authority. Your accounting end date is 31st December as per the provisions stated in the Income Tax Act unless a change has been approved by the Commissioner-Domestic Taxes Department.The status of Tax Obligation(s) with 'Dormant' status will automatically change to 'Active' on date mentioned in "Effective Till Date" or any transaction done during the period. This certificate shall remain in force till further updated.

10.4 Approved plans

COUNTY GOVERNMENT OF KIAMBU
DIRECTOR PHYSICAL PLANNING DEPARTMENT
THIS PLAN
Reg No. KBU- CPD001- AAA 9448
IS APPROVED
30 NOV 2021
Approval of the Plan is Not Proof Of Land Ownership
Pursuant to Minute No. CPTC/086/2021/256
of the County Planning Technical Committee Meeting Held on 09/11/2021
and subject to conditions in the accompanying Construction Permit
Name. Charles Mwangi ..Signed.

Arch. P.W. Gitau (A985)
Signature
29-11-2021

BASEMENT FLOOR PLAN (parking 82 bays)

Scale 1:100

NOTES

1. Dimensions are in millimetres and should be read from the drawing and not scaled. Any discrepancies noted should be reported to the project architect before works commence.
2. All structural works to structural engineer's details
3. 'pv' denotes permanent ventilation and shall be provided at all positions shown on the drawing.
4. All drain pipes passing under buildings to be encased in 150mm concrete surround.
5. All walls less than 200mm thick to have hoop iron reinforcement at alternate courses.
6. 'ic' denotes inspection chamber.
7. 'RC' denotes reinforced concrete.
8. 'd.p.c' denotes one layer of bituminous felt to be provided under all walls 150mm above G. L..
9. All construction work is to comply with the latest KBS standard codes of practice, local Authority Bye-Laws and Fire regulations.
10. Water meters to be 300mm above G. L.
11. Provide 1no. row of 600x600x50mm precast concrete paving slabs around the building unless otherwise shown/indicated.
12. All levels shown are finished levels unless otherwise stated.
13. All surface beds to be cast on well compacted and well consolidated filling.
14. Depth of foundation trenches to be minimum 600mm below reduced ground level.
15. All pipes and services to be minimum 450mm below reduced ground level.
16. This drawing is protected under the Copyright Act, and cannot be used or reproduced in part or in whole without the authors' consent.

FIRE INSTALLATION

1. Reserve 1130 litres water tank with automatic booster pump.
2. Provide 2x30m long hydraulic hose reels each floor.
3. Provide 2x9 litres water CO2 fire extinguisher each floor.
4. Install emergency lighting systems.
5. Provide 1x4.5kg CO2 fire extinguishers, kitchen pals fire blankets.
6. Install manual electric break glass fire alarm system.

Revisions

Finishes

PROJECT

PROPOSED RESIDENTIAL FLATS ON PLOT L.R No. 76/672 THINDIGUA, KIAMBU.

CLIENT

JACQUELINE WANGARI KINUTHIA
P.O BOX 419984-00100, NAIROBI.

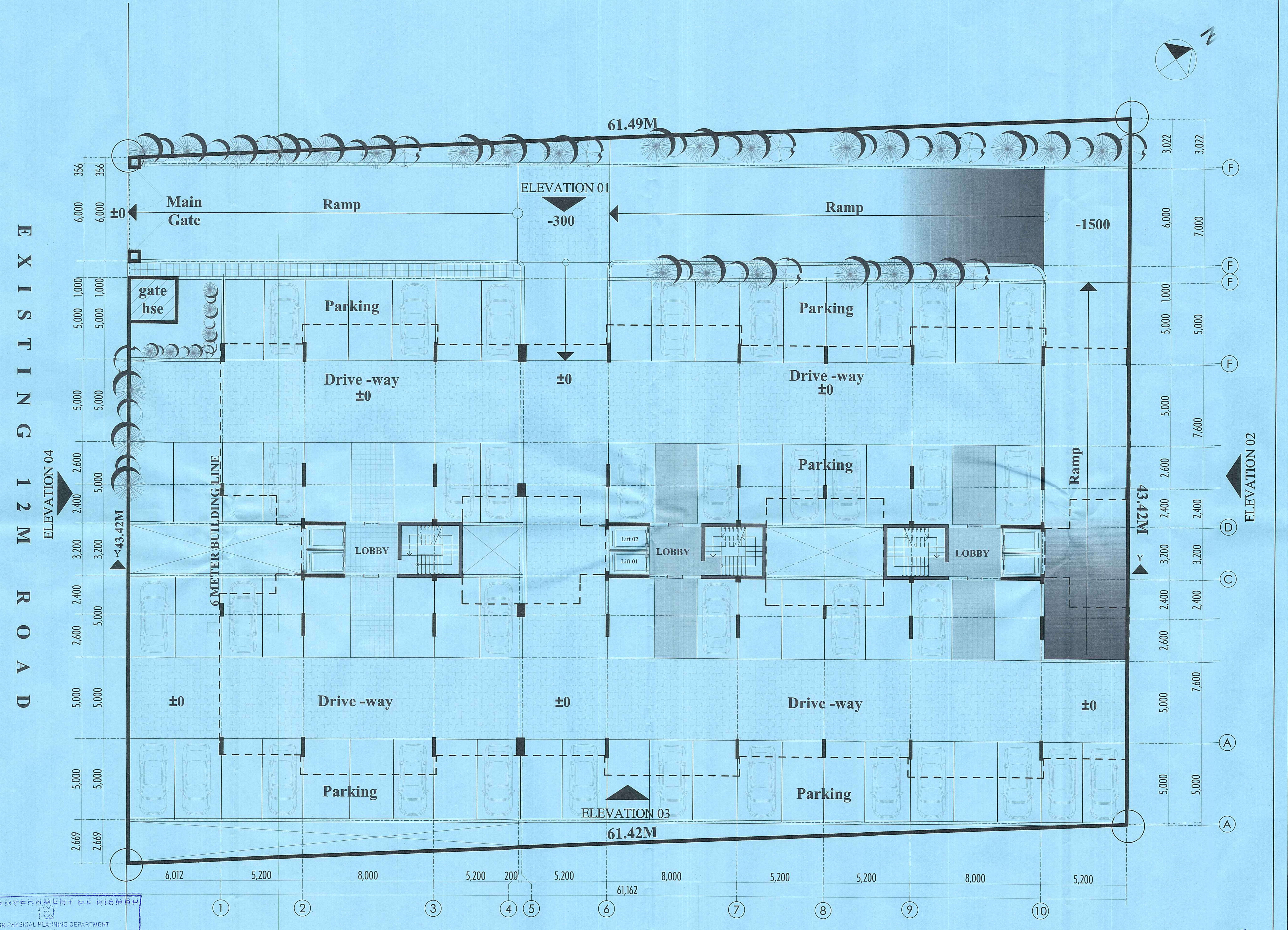
CONSULTANTS

Neoplan (K) Ltd.
architects & project managers
P.O Box 74850 - 00200, Nairobi, Kenya.
Tel : 020-2344904
E-mail : info@neoplankenya.com

TITLE

BASEMENT FLOOR PLAN

DATE	NOVEMBER 2021
SCALE	NTS
DEALT	S.N.M
CHECKED	K. THUO
ND/476/../2012	DRG NO. 02



Arch. P.W. ...(A985)
Signature
09.11.2021

GROUND FLOOR PLAN (parking 79 bays)

Scale 1:100

NOTES

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CONSULTANTS

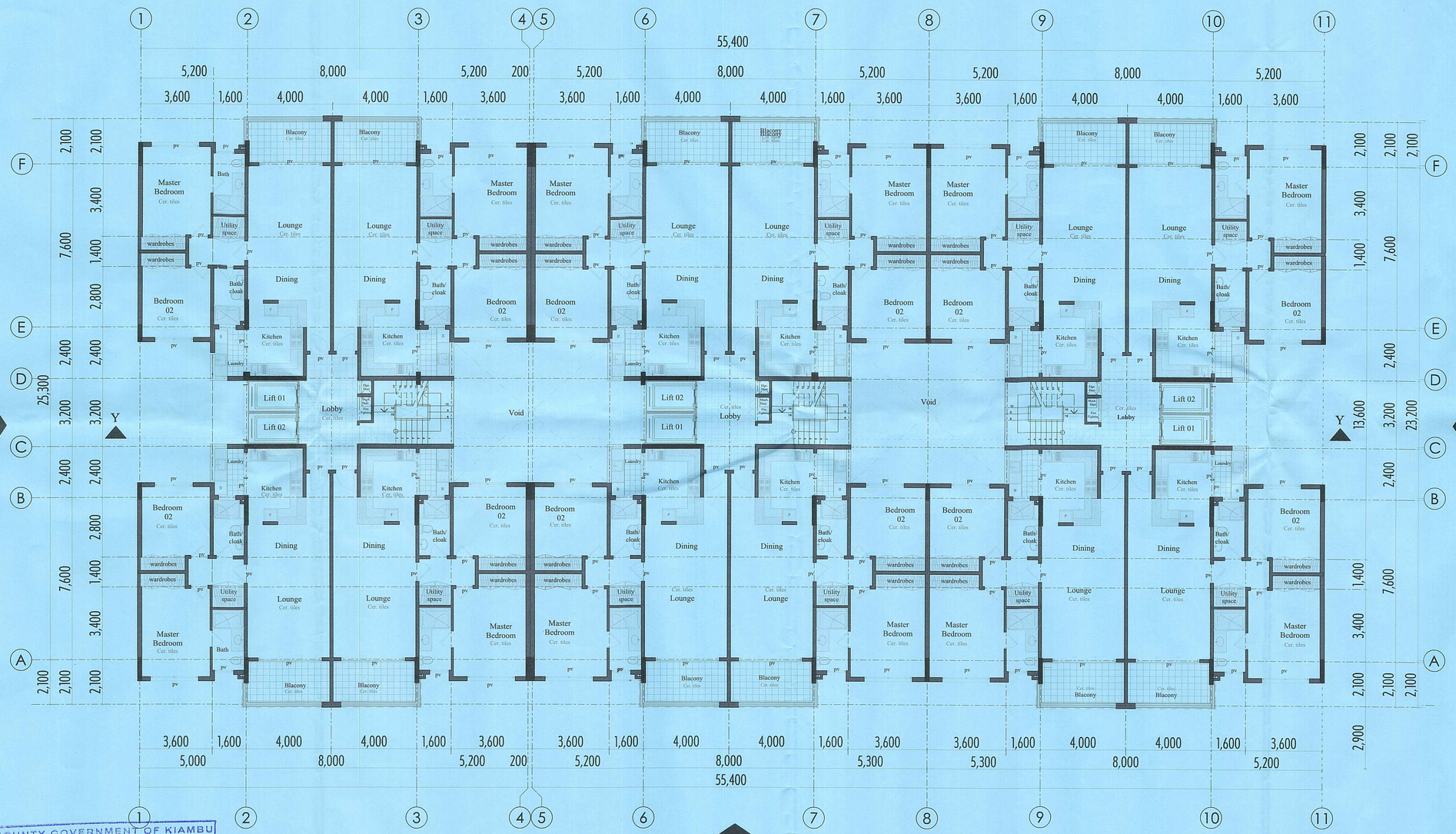
Neoplan (K) Ltd.
architects & project managers
P.O Box 74850 - 00200, Nairobi, Kenya.
Tel : 020-2344904
E-mail : info@neoplankenya.com

TITLE

GROUND FLOOR PLAN

DATE	NOVEMBER 2021	
SCALE	NTS	
DEALT	S.N.M	
CHECKED	K. THUO	DRG NO.
ND/476/../2012		03

ELEVATION 01



ELEVATION 04

ELEVATION 02

ELEVATION 03

TYPICAL FLOOR PLAN (1ST-10TH FLR) 120 No. Units

Scale 1:100

COUNTY GOVERNMENT OF KIAMBU
DIRECTOR PHYSICAL PLANNING DEPARTMENT
THIS PLAN
Reg No. KBU-CPD001-MM-9448
IS APPROVED 30 NOV 2021
Approval of the Plan is Not Proof Of Land Ownership
Pursuant to Minute No. CPTC/086/2021/256 of the County Physical Planning Technical Committee Meeting Held on 29/11/2021
and subject to compliance to the accompanying Conditions on Permit
Name Charles Mwangi Signed

Arch. P.W Jathaga (A985)
Signature
29-11-2021

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6. 'ic' denotes inspection chamber.
7. 'RC' denotes reinforced concrete.
8. 'd.p.c' denotes one layer of bituminous felt to be provided under all walls 150mm above G. L..
9. All construction work is to comply with the latest KBS standard codes of practice, local Authority Bye-Laws and Fire regulations.
10. Water meters to be 300mm above G. L.
11. Provide 1no. row of 600x600x50mm precast concrete paving slabs around the building unless otherwise shown/indicated.
12. All levels shown are finished levels unless otherwise stated.
13. All surface beds to be cast on well compacted and well consolidated filling.
14. Depth of foundation trenches to be minimum 600mm below reduced ground level.
15. All pipes and services to be minimum 450mm below reduced ground level.
16. This drawing is protected under the Copyright Act, and cannot be used or reproduced in part or in whole without the authors' consent.

FIRE INSTALLATION

1. Reserve 1130 litres water tank with automatic booster pump.
2. Provide 2x30m long hydraulic hose reels each floor.
3. Provide 2x9 litres water CO2 fire extinguisher each floor.
4. Install emergency lighting systems.
5. Provide 1x4.5kg CO2 fire extinguishers, kitchen pals fire blankets.
6. Install manual electric break glass fire alarm system.

Revisions

Finishes

PROJECT

PROPOSED RESIDENTIAL FLATS ON PLOT L.R No. 76/672 THINDIGUA, KIAMBU.

CLIENT

JACQUELINE WANGARI KINUTHIA
P.O BOX 419984-00100, NAIROBI.

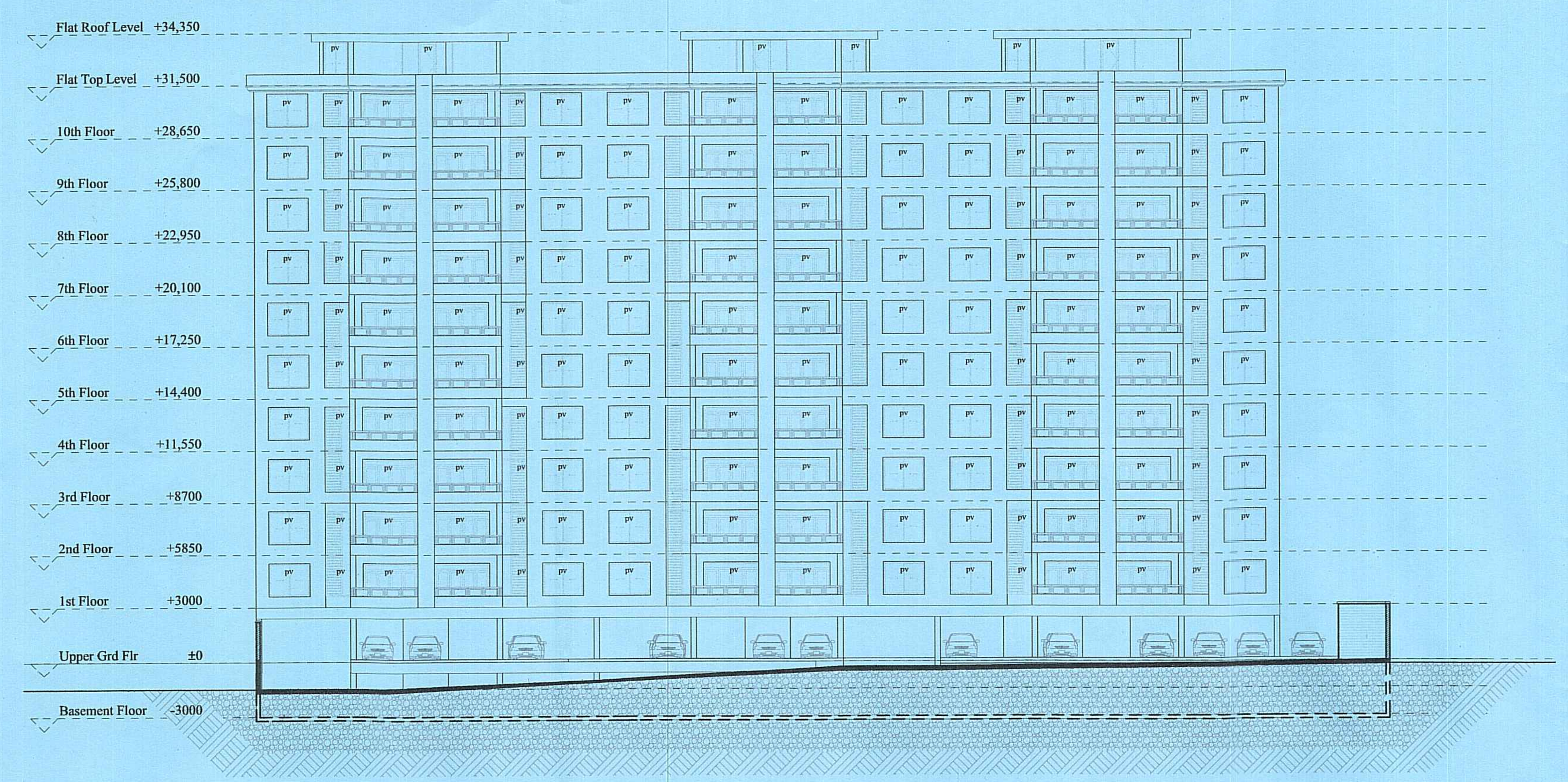
CONSULTANTS

Neoplan (K) Ltd.
architects & project managers
P.O Box 74850 - 00200, Nairobi, Kenya.
Tel : 020-2344904
E-mail : info@neoplankenya.com

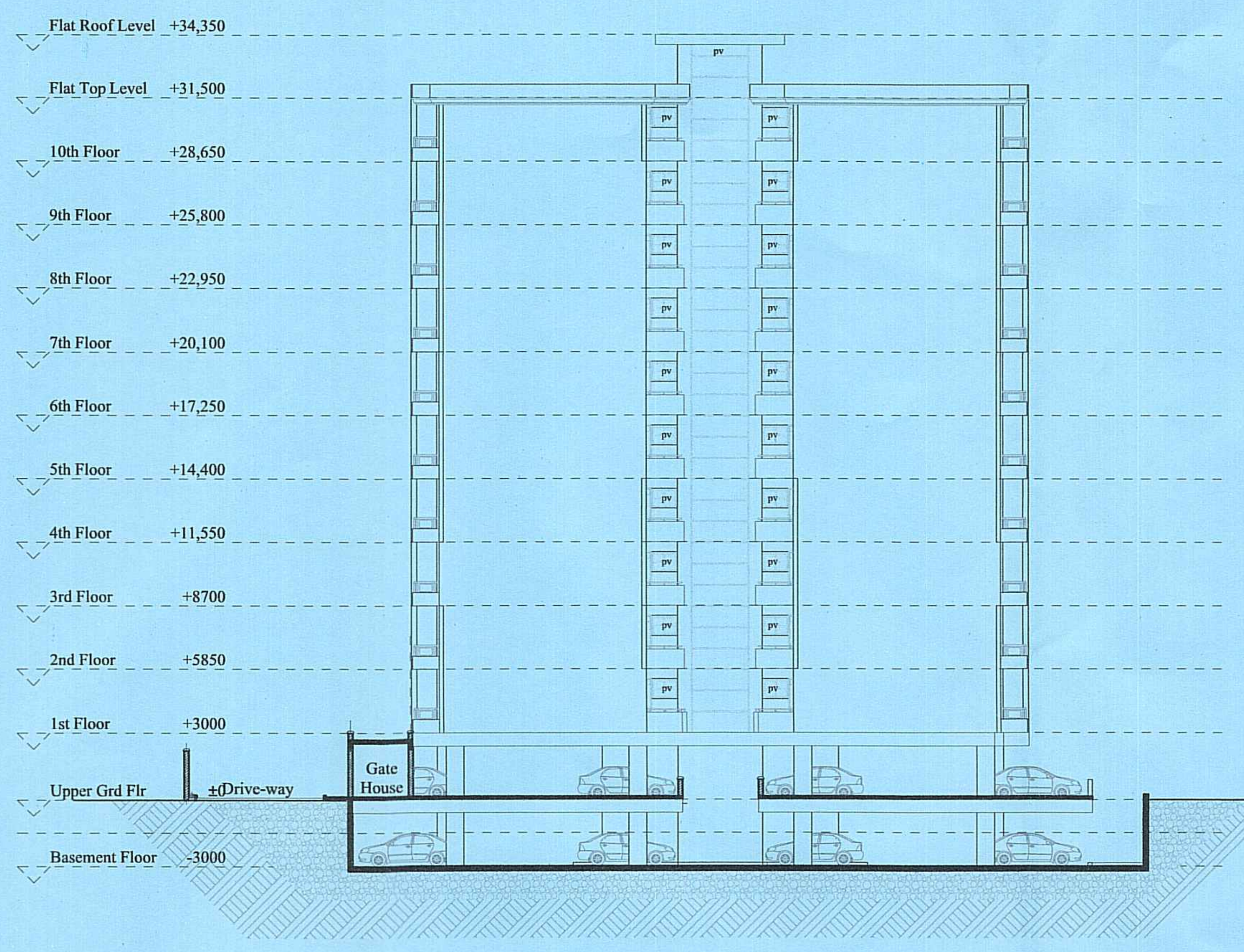
TITLE

TYPICAL FLOOR PLAN

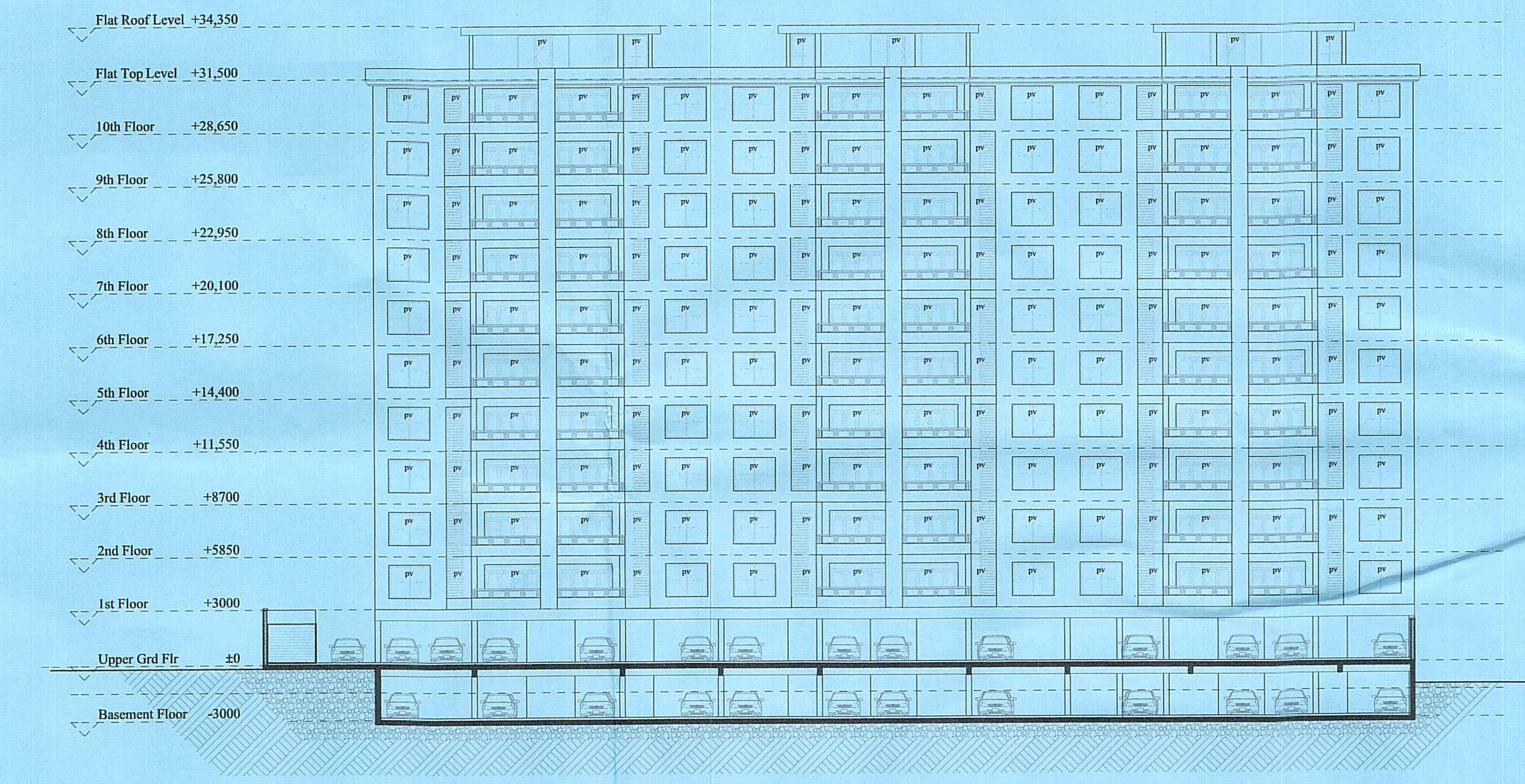
DATE	NOVEMBER 2021	
SCALE	NTS	
DEALT	S.N.M	
CHECKED	K. THUO	DRG NO.
ND/476/../2012		04



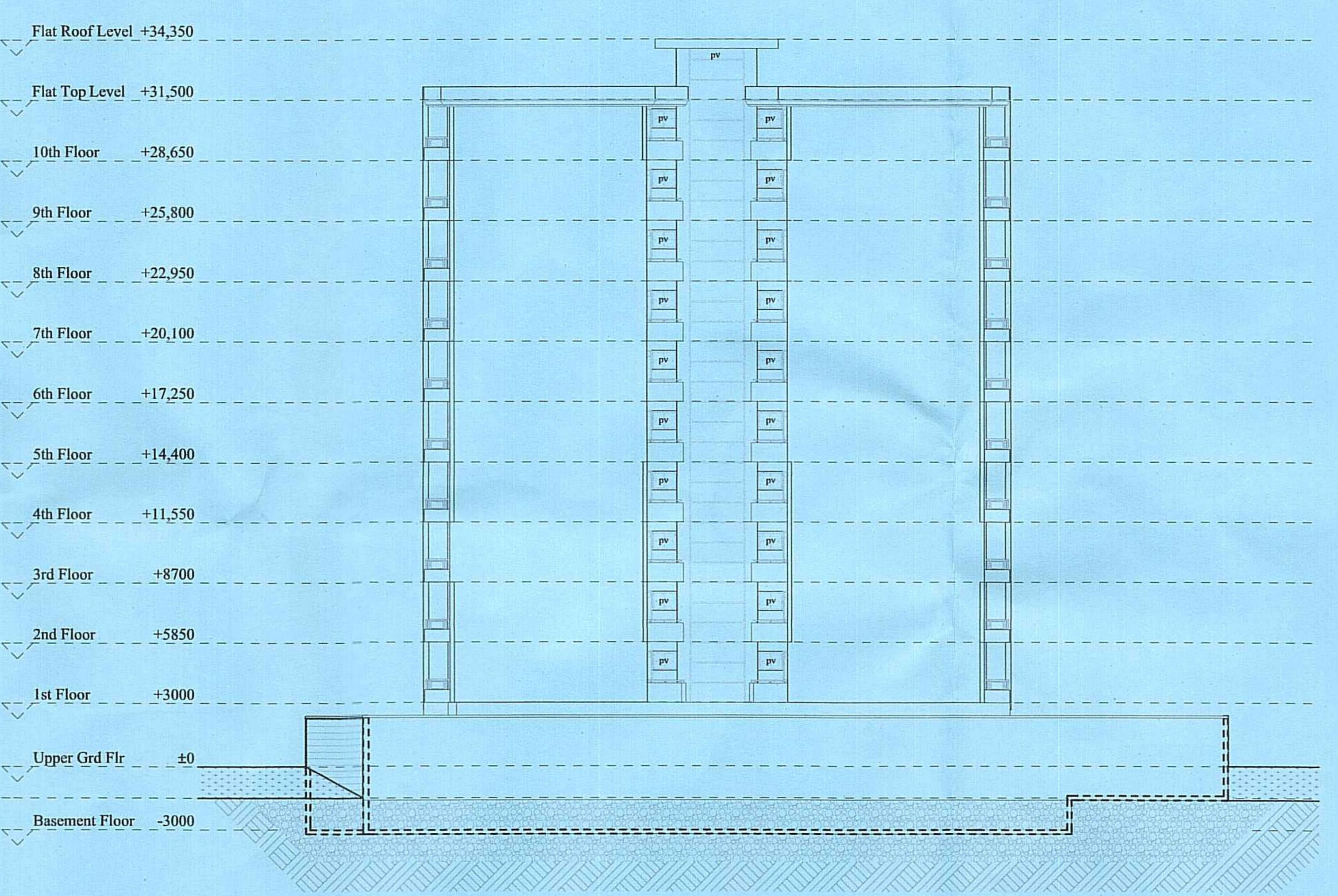
ELEVATION 01
Scale 1:200



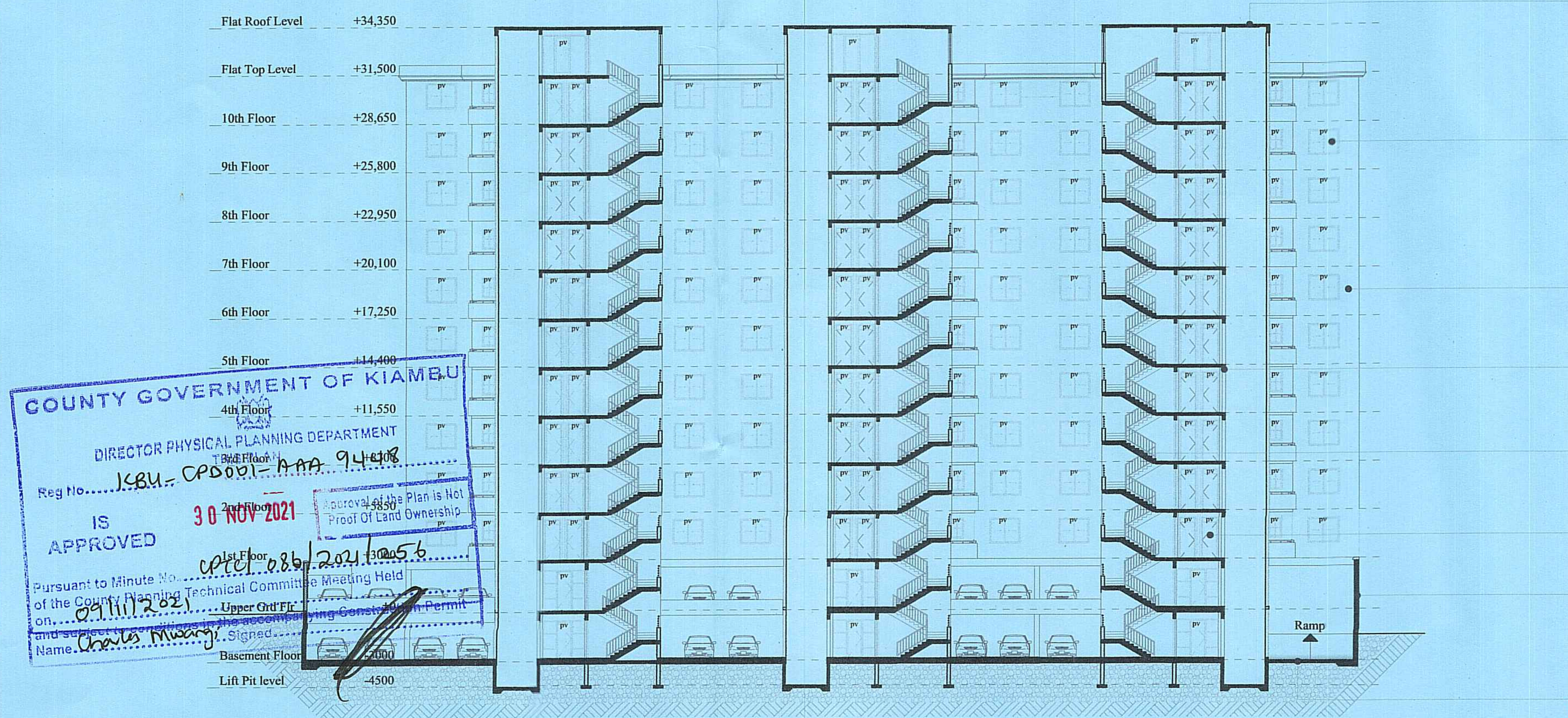
ELEVATION 02
Scale 1:200



ELEVATION 03
Scale 1:200



ELEVATION 04
Scale 1:200



150mm thick RC floor slab to S.E's details.

1500x900mm high Aluminium window in 60 x 50mm powder coated frames Complete with 5mm thick tinted glass and other window accessories as per the window schedules.

Plaster and painted to finish as per schedule

450mm x 200mm thick RC beam to S.E's details.

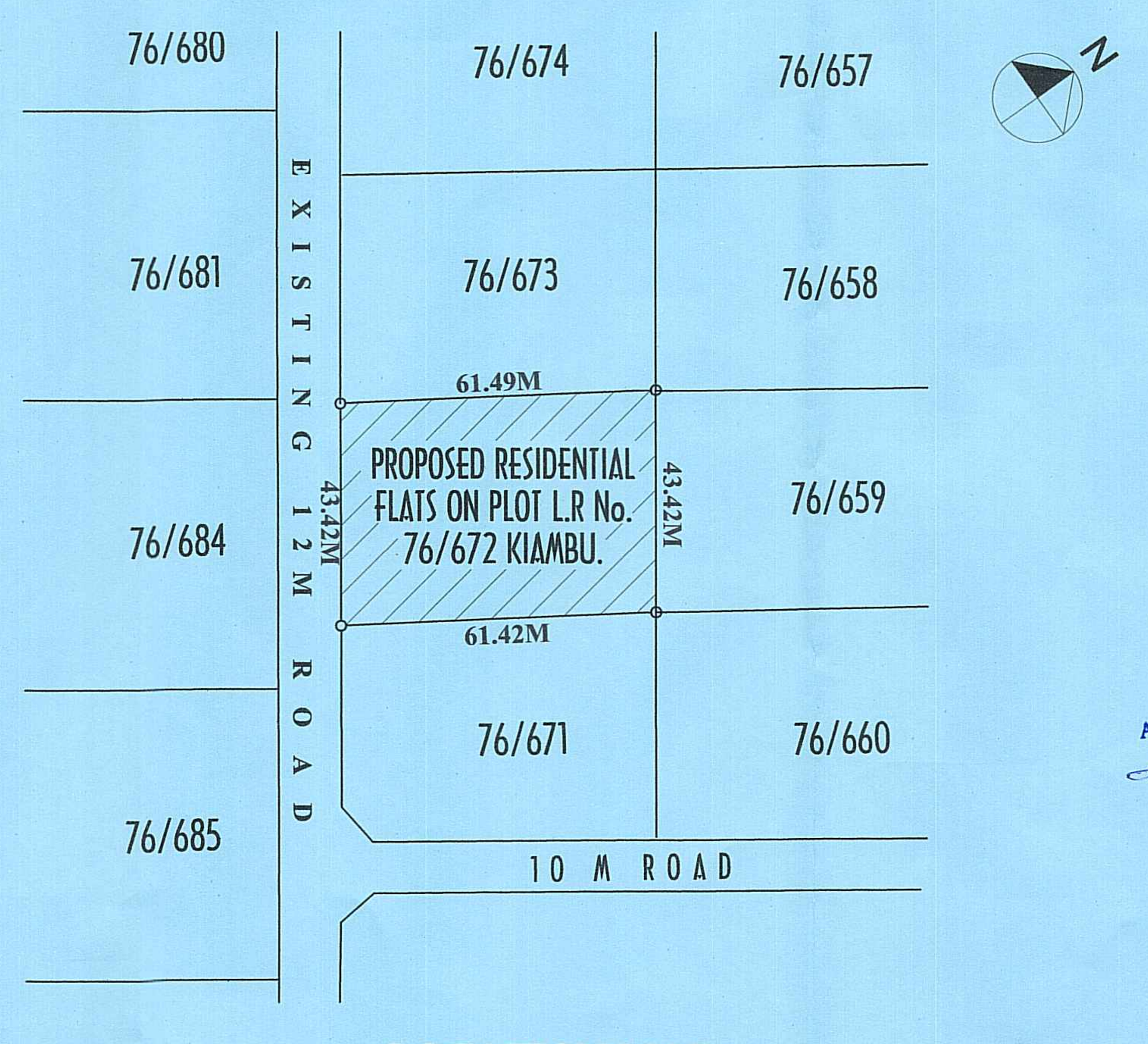
RC. Staircase
Riser 150mm
Tread 250mm

900mm x 2700mm High panel door to schedule

200mm thick RC retaining wall to S.E's details.

200mm thick RC Floor Slab on RC foundation as per S.E details

SECTION Y-Y
Scale 1:100



LOCATION MAP
Scale 1:500

Arch. P.W. Gathaga (A985)
Signature
29.11.2021

NOTES

1. Dimensions are in millimetres and should be read from the drawing and not scaled. Any discrepancies noted should be reported to the project architect before works commence.
2. All structural works to structural engineer's details
3. 'pv' denotes permanent ventilation and shall be provided at all positions shown on the drawing.
4. All drain pipes passing under buildings to be encased in 150mm concrete surround.
5. All walls less than 200mm thick to have hoop iron reinforcement at alternate courses.
6. 'ic' denotes inspection chamber.
7. 'RC' denotes reinforced concrete.
8. 'd.p.c' denotes one layer of bituminous felt to be provided under all walls 150mm above G. L..
9. All construction work is to comply with the latest KBS standard codes of practice, local Authority Bye-Laws and Fire regulations.
10. Water meters to be 300mm above G. L.
11. Provide 1no. row of 600x600x50mm precast concrete paving slabs around the building unless otherwise shown/indicated.
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4. Install emergency lighting systems.
5. Provide 1x4.5kg CO2 fire extinguishers, kitchen pals fire blankets.
6. Install manual electric break glass fire alarm system.

Revisions

Finishes

PROJECT

PROPOSED RESIDENTIAL FLATS ON PLOT L.R No. 76/672 THINDIGUA, KIAMBU.

CLIENT

JACQUELINE WANGARI KINUTHIA
P.O BOX 419984-00100, NAIROBI.

CONSULTANTS

Neoplan (K) Ltd.
architects & project managers
P.O Box 74850 - 00200, Nairobi, Kenya.
Tel : 020-2344904
E-mail : info@neoplankenya.com

TITLE

ELEVATION AND SECTION

DATE	NOVEMBER 2021	
SCALE	NTS	
DEALT	S.N.M	
CHECKED	K. THUO	DRG NO.
ND/476/../2012		05

10.5 Public Questionnaires

ENVIRONMENTAL IMPACT ASSESSMENT FOR PROPOSED CONSTRUCTION OF RESIDENTIAL UNITS ON LR NO. 76/672

PUBLIC QUESTIONNAIRE

Project Background

The owner of LR NO. 76/672 intends to construct residential units to cater for the housing needs of the ever increasing population in Thindigua area and Kiambu County at large. The proposed construction shall entail 96 No. of units that shall take up eight floors, while a total of 161 No. of parking bays shall occupy the basement and the ground floors.

GENERAL INFORMATION

Name of the respondent(Optional):	SAMSON K MUNDIMU
Gender:	M
Phone Number:	0711167316
Parcel/Plot No:	—
Distance from Proposed Site:	0.5 KM
Years lived/worked in the Neighborhood:	20
Level of Education:	PRIMARY

ENVIRONMENTAL AND SOCIAL ASPECTS OF THE PROPOSED PROJECT

1. Are you aware of the proposed project?

   NO

2. Do you have any objections to the proposed project?

   NO

3. Give reasons for your answer above

   IT WILL ADDRESS HOUSING NEEDS

DISCLAIMER: *Information given here is confidential, will be treated with ultimate confidentiality and will be used for the purpose of this project* ***ONLY.***

4. State the likely positive impacts of the Project

- IT WILL CREATE EMPLOYMENT

5. State the likely negative impacts of the Project

NONE.

6. Provide any health and safety concerns as a result of the Project

NONE

7. Propose strategies to mitigate the likely negative impacts of the Project

N/A.

Thank you for your Cooperation.....!!!!

ENVIRONMENTAL IMPACT ASSESSMENT FOR PROPOSED CONSTRUCTION OF RESIDENTIAL UNITS ON LR NO. 76/672

PUBLIC QUESTIONNAIRE

Project Background

The owner of LR NO. 76/672 intends to construct residential units to cater for the housing needs of the ever increasing population in Thindigua area and Kiambu County at large. The proposed construction shall entail 96 No. of units that shall take up eight floors, while a total of 161 No. of parking bays shall occupy the basement and the ground floors.

GENERAL INFORMATION

Name of the respondent(Optional):	MELVIS ARIRI
Gender:	F
Phone Number:	0783186462
Parcel/Plot No:	—
Distance from Proposed Site:	0.2KM
Years lived/worked in the Neighborhood:	4
Level of Education:	SECONDARY

ENVIRONMENTAL AND SOCIAL ASPECTS OF THE PROPOSED PROJECT

1. Are you aware of the proposed project?

   YES.

2. Do you have any objections to the proposed project?

   NO.

3. Give reasons for your answer above

   IT WILL ADDRESS HOUSING NEEDS OF THE AREA.

DISCLAIMER: *Information given here is confidential, will be treated with ultimate confidentiality and will be used for the purpose of this project* ***ONLY.***

4. State the likely positive impacts of the Project

IT WILL CREATE EMPLOYMENT

5. State the likely negative impacts of the Project

NONE.

6. Provide any health and safety concerns as a result of the Project

NONE.

7. Propose strategies to mitigate the likely negative impacts of the Project

N/A.

Thank you for your Cooperation.....IIII

DISCLAIMER: *Information given here is confidential, will be treated with ultimate confidentiality and will be used for the purpose of this project* ***ONLY.***

ENVIRONMENTAL IMPACT ASSESSMENT FOR PROPOSED CONSTRUCTION OF RESIDENTIAL UNITS ON LR NO. 76/672

PUBLIC QUESTIONNAIRE

Project Background

The owner of LR NO. 76/672 intends to construct residential units to cater for the housing needs of the ever increasing population in Thindigua area and Kiambu County at large. The proposed construction shall entail 96 No. of units that shall take up eight floors, while a total of 161 No. of parking bays shall occupy the basement and the ground floors.

GENERAL INFORMATION

Name of the respondent(Optional):	VIRGINIA WANGARI
Gender:	F
Phone Number:	0743809653
Parcel/Plot No:	
Distance from Proposed Site:	400 M
Years lived/worked in the Neighborhood:	9 years
Level of Education:	Class 8

ENVIRONMENTAL AND SOCIAL ASPECTS OF THE PROPOSED PROJECT

1. Are you aware of the proposed project?

   ..... Not .....

2. Do you have any objections to the proposed project?

   ..... No .....

3. Give reasons for your answer above

   ..... Job opportunity .....

   .....

DISCLAIMER: *Information given here is confidential, will be treated with ultimate confidentiality and will be used for the purpose of this project* ***ONLY.***

4. State the likely positive impacts of the Project

Job Creation

5. State the likely negative impacts of the Project

No

6. Provide any health and safety concerns as a result of the Project

No

7. Propose strategies to mitigate the likely negative impacts of the Project

N/A

Thank you for your Cooperation.....!!!!

ENVIRONMENTAL IMPACT ASSESSMENT FOR PROPOSED CONSTRUCTION OF RESIDENTIAL UNITS ON LR NO. 76/672

PUBLIC QUESTIONNAIRE

Project Background

The owner of LR NO. 76/672 intends to construct residential units to cater for the housing needs of the ever increasing population in Thindigua area and Kiambu County at large. The proposed construction shall entail 96 No. of units that shall take up eight floors, while a total of 161 No. of parking bays shall occupy the basement and the ground floors.

GENERAL INFORMATION	
Name of the respondent(Optional):	1 SAMWEL MBUGUA
Gender:	
Phone Number:	0722 793832
Parcel/Plot No:	76/806
Distance from Proposed Site:	Next Plot
Years lived/worked in the Neighborhood:	17
Level of Education:	Masters

ENVIRONMENTAL AND SOCIAL ASPECTS OF THE PROPOSED PROJECT

1. Are you aware of the proposed project?

   Yes

2. Do you have any objections to the proposed project?

   Not really

3. Give reasons for your answer above

   Freedom of choice on your Plot

DISCLAIMER: Information given here is confidential, will be treated with ultimate confidentiality and will be used for the purpose of this project ONLY.

4. State the likely positive impacts of the Project

Make the owner financially stable.

5. State the likely negative impacts of the Project

1. Water shortage
2. Overcrowding
3. Blocking of sunlight

6. Provide any health and safety concerns as a result of the Project

(1) Should adhere to bylaws - distance between one plot to the other to allow sunlight

7. Propose strategies to mitigate the likely negative impacts of the Project

Windows to face away from my plot to allow privacy.

Thank you for your Cooperation.....!!!!

DISCLAIMER: Information given here is confidential, will be treated with ultimate confidentiality and will be used for the purpose of this project ONLY.

ENVIRONMENTAL IMPACT ASSESSMENT FOR PROPOSED CONSTRUCTION OF RESIDENTIAL UNITS ON LR NO. 76/672

PUBLIC QUESTIONNAIRE

Project Background

The owner of LR NO. 76/672 intends to construct residential units to cater for the housing needs of the ever increasing population in Thindigua area and Kiambu County at large. The proposed construction shall entail 96 No. of units that shall take up eight floors, while a total of 161 No. of parking bays shall occupy the basement and the ground floors.

GENERAL INFORMATION

Name of the respondent(Optional):	RUTH WAIRIMU
Gender:	FEMALE
Phone Number:	-
Parcel/Plot No:	0715182160
Distance from Proposed Site:	0.15 KM
Years lived/worked in the Neighborhood:	15
Level of Education:	PRIMARY

ENVIRONMENTAL AND SOCIAL ASPECTS OF THE PROPOSED PROJECT

1. Are you aware of the proposed project?

   NO

2. Do you have any objections to the proposed project?

   NO

3. Give reasons for your answer above

   IT'S DEVELOPMENT

DISCLAIMER: *Information given here is confidential, will be treated with ultimate confidentiality and will be used for the purpose of this project* ***ONLY****.*

4. State the likely positive impacts of the Project

IT WILL LEAD TO ECONOMIC DEVELOPMENT OF THE AREA.

5. State the likely negative impacts of the Project

NONE.

6. Provide any health and safety concerns as a result of the Project

NONE.

7. Propose strategies to mitigate the likely negative impacts of the Project

N/A.

Thank you for your Cooperation.....!!!!

ENVIRONMENTAL IMPACT ASSESSMENT FOR PROPOSED CONSTRUCTION OF RESIDENTIAL UNITS ON LR NO. 76/672

PUBLIC QUESTIONNAIRE

Project Background

The owner of LR NO. 76/672 intends to construct residential units to cater for the housing needs of the ever increasing population in Thindigua area and Kiambu County at large. The proposed construction shall entail 96 No. of units that shall take up eight floors, while a total of 161 No. of parking bays shall occupy the basement and the ground floors.

GENERAL INFORMATION

Name of the respondent(Optional): Lucy WANJIKU

Gender: F

Phone Number: 0715399203

Parcel/Plot No:

Distance from Proposed Site: 400m

Years lived/worked in the Neighborhood: -12 years

Level of Education: Class 8

ENVIRONMENTAL AND SOCIAL ASPECTS OF THE PROPOSED PROJECT

1. Are you aware of the proposed project?

No

2. Do you have any objections to the proposed project?

No

3. Give reasons for your answer above

youth will get jobs

DISCLAIMER: *Information given here is confidential, will be treated with ultimate confidentiality and will be used for the purpose of this project* ***ONLY.***

4. State the likely positive impacts of the Project

Many Job will get Job

5. State the likely negative impacts of the Project

N/A

6. Provide any health and safety concerns as a result of the Project

No

7. Propose strategies to mitigate the likely negative impacts of the Project

No

Thank you for your Cooperation.....!!!!

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ENVIRONMENTAL IMPACT ASSESSMENT FOR PROPOSED CONSTRUCTION OF RESIDENTIAL UNITS ON LR NO. 76/672

PUBLIC QUESTIONNAIRE

Project Background

The owner of LR NO. 76/672 intends to construct residential units to cater for the housing needs of the ever increasing population in Thindigua area and Kiambu County at large. The proposed construction shall entail 96 No. of units that shall take up eight floors, while a total of 161 No. of parking bays shall occupy the basement and the ground floors.

GENERAL INFORMATION

Name of the respondent(Optional): Geofrey Wanyoike

Gender: M

Phone Number: 0725862185

Parcel/Plot No: ~~1500~~

Distance from Proposed Site: 150m

Years lived/worked in the Neighborhood: 24

Level of Education: Form 2

ENVIRONMENTAL AND SOCIAL ASPECTS OF THE PROPOSED PROJECT

1. Are you aware of the proposed project?

No

2. Do you have any objections to the proposed project?

No

3. Give reasons for your answer above

Creation of more job opportunities

more customers

DISCLAIMER: *Information given here is confidential, will be treated with ultimate confidentiality and will be used for the purpose of this project* ***ONLY.***

4. State the likely positive impacts of the Project

Customers increase : improve businesses

5. State the likely negative impacts of the Project

No - There is Sanitation

6. Provide any health and safety concerns as a result of the Project

No

7. Propose strategies to mitigate the likely negative impacts of the Project

No

Thank you for your Cooperation.....!!!!

DISCLAIMER: *Information given here is confidential, will be treated with ultimate confidentiality and will be used for the purpose of this project* ***ONLY.***

4. State the likely positive impacts of the Project

- Area development

5. State the likely negative impacts of the Project

~~No~~ Increased liquid waste

6. Provide any health and safety concerns as a result of the Project

~~Already~~

7. Propose strategies to mitigate the likely negative impacts of the Project

- Install a lift after fourth floor
- Utilize existing sewerline

Thank you for your Cooperation.....!!!!

ENVIRONMENTAL IMPACT ASSESSMENT FOR PROPOSED CONSTRUCTION OF RESIDENTIAL UNITS ON LR NO. 76/672

PUBLIC QUESTIONNAIRE

Project Background

The owner of LR NO. 76/672 intends to construct residential units to cater for the housing needs of the ever increasing population in Thindigua area and Kiambu County at large. The proposed construction shall entail 96 No. of units that shall take up eight floors, while a total of 161 No. of parking bays shall occupy the basement and the ground floors.

GENERAL INFORMATION

Name of the respondent(Optional):	DANIEL KIMANI
Gender:	M
Phone Number:	0740170175
Parcel/Plot No:	
Distance from Proposed Site:	
Years lived/worked in the Neighborhood:	20 years
Level of Education:	Form Four

ENVIRONMENTAL AND SOCIAL ASPECTS OF THE PROPOSED PROJECT

1. Are you aware of the proposed project?

   NO

2. Do you have any objections to the proposed project?

   NO

3. Give reasons for your answer above

   He own land

   Jobs

DISCLAIMER: *Information given here is confidential, will be treated with ultimate confidentiality and will be used for the purpose of this project* ***ONLY.***

ENVIRONMENTAL IMPACT ASSESSMENT FOR PROPOSED CONSTRUCTION OF RESIDENTIAL UNITS ON LR NO. 76/672

PUBLIC QUESTIONNAIRE

Project Background

The owner of LR NO. 76/672 intends to construct residential units to cater for the housing needs of the ever increasing population in Thindigua area and Kiambu County at large. The proposed construction shall entail 96 No. of units that shall take up eight floors, while a total of 161 No. of parking bays shall occupy the basement and the ground floors.

GENERAL INFORMATION

Name of the respondent(Optional):	ALPHAS KIVELEGE
Gender:	M
Phone Number:	0722548801
Parcel/Plot No:	
Distance from Proposed Site:	0.2KM
Years lived/worked in the Neighborhood:	28 YEARS.
Level of Education:	NONE.

ENVIRONMENTAL AND SOCIAL ASPECTS OF THE PROPOSED PROJECT

1. Are you aware of the proposed project?

   YES.

2. Do you have any objections to the proposed project?

   NO.

3. Give reasons for your answer above

   WILL IMPROVE VALUE OF THE SITE/LAND

DISCLAIMER: *Information given here is confidential, will be treated with ultimate confidentiality and will be used for the purpose of this project* ***ONLY.***

4. State the likely positive impacts of the Project

WILL IMPROVE OUR LIVELIHOODS.

5. State the likely negative impacts of the Project

NONE

6. Provide any health and safety concerns as a result of the Project

NONE

7. Propose strategies to mitigate the likely negative impacts of the Project

N/A

Thank you for your Cooperation.....IIII

ENVIRONMENTAL IMPACT ASSESSMENT FOR PROPOSED CONSTRUCTION OF RESIDENTIAL UNITS ON LR NO. 76/672

PUBLIC QUESTIONNAIRE

Project Background

The owner of LR NO. 76/672 intends to construct residential units to cater for the housing needs of the ever increasing population in Thindigua area and Kiambu County at large. The proposed construction shall entail 96 No. of units that shall take up eight floors, while a total of 161 No. of parking bays shall occupy the basement and the ground floors.

GENERAL INFORMATION

Name of the respondent(Optional): Jane Thuo

Gender: Female

Phone Number: 0700602990

Parcel/Plot No:

Distance from Proposed Site: 100M

Years lived/worked in the Neighborhood: One year

Level of Education: University

ENVIRONMENTAL AND SOCIAL ASPECTS OF THE PROPOSED PROJECT

1. Are you aware of the proposed project?

Yes

2. Do you have any objections to the proposed project?

NO

3. Give reasons for your answer above

It's good for the neighborhood to grow

DISCLAIMER: *Information given here is confidential, will be treated with ultimate confidentiality and will be used for the purpose of this project* ***ONLY.***

4. State the likely positive impacts of the Project

- Could create a rise in value of the land
- Increase in amenities

5. State the likely negative impacts of the Project

- Probably insecurity

6. Provide any health and safety concerns as a result of the Project

none

7. Propose strategies to mitigate the likely negative impacts of the Project

nyumba kumi

Thank you for your Cooperation.....IIII

ENVIRONMENTAL IMPACT ASSESSMENT FOR PROPOSED CONSTRUCTION OF RESIDENTIAL UNITS ON LR NO. 76/672

PUBLIC QUESTIONNAIRE

Project Background

The owner of LR NO. 76/672 intends to construct residential units to cater for the housing needs of the ever increasing population in Thindigua area and Kiambu County at large. The proposed construction shall entail 96 No. of units that shall take up eight floors, while a total of 161 No. of parking bays shall occupy the basement and the ground floors.

GENERAL INFORMATION

Name of the respondent(Optional):	Cathrine Vicals
Gender:	F
Phone Number:	0703281671
Parcel/Plot No:	
Distance from Proposed Site:	50m
Years lived/worked in the Neighborhood:	-6 months
Level of Education:	Class 3

ENVIRONMENTAL AND SOCIAL ASPECTS OF THE PROPOSED PROJECT

1. Are you aware of the proposed project?

   ..... No .....

2. Do you have any objections to the proposed project?

   ..... No .....

3. Give reasons for your answer above

   ..... Development improvement .....

   .....

DISCLAIMER: *Information given here is confidential, will be treated with ultimate confidentiality and will be used for the purpose of this project* ***ONLY.***

4. State the likely positive impacts of the Project

- Jobs creations
- More rentals hence low / Reduced Rent

5. State the likely negative impacts of the Project

Water usage will increase

6. Provide any health and safety concerns as a result of the Project

NIL

7. Propose strategies to mitigate the likely negative impacts of the Project

Dig boreholes to increase water supply.

Thank you for your Cooperation.....!!!!

10.6 Public Participation Minutes

PLENG LIMITED
Planning, Engineering & Environment

- Civil and Structural Engineering
- Urban & Regional Planning
- Construction Project Management
- Environmental Impacts Assessment
- Health & Safety Environment
- Quality and Environmental Audits
- Technical Training

Muthaiga North, off Kiambu Road.
P.O Box 24866-00100 Nairobi, Kenya.
Tel: 020-2321649
Cell: 0724 250 556 / 0713 256 669
Email: pleng@pleng.net
Website: www.pleng.net

MINUTES ON PUBLIC PARTICIPATION MEETING HELD ON LR NO. 76/672 IN THINDIGUA ON 4TH MARCH, 2022

In Attendance:

Name	Representation
1. Dr. (Eng.) Maina Kiambigi	Pleng Limited
2. Rossinah Mwau	Pleng Limited
3. Veronicah Kimani	Assistant chief
4. Community Members	Community members

AGENDA

1. Introduction
2. Project Background
3. Environmental and Social Aspects of the project
4. A.O.B

CALL TO ORDER

The meeting was called to order at 10:50 am by Dr. (Eng.) Maina Kiambigi, who thanked all members for finding time to attend the meeting. He then welcomed Mrs. Grace Muchira to open the meeting with a word of prayer.

Min. 1/03/022; INTRODUCTION

Eng. Kiambigi requested all members to introduce themselves, stating their names and the relationship between their plots and the proposed project sites (in terms of distance, orientation etc.).

Min. 2/03/022; PROJECT BACKGROUND

Eng. Kiambigi explained to the community that Pleng Ltd, was an environmental consultancy firm who had been contracted by the plot owner to undertake environmental impact assessment of the proposed project.

In explaining the proposed project, Eng. Kiambigi stated that the developer intends to construct a ten storey building with lower and upper ground floor parking.

Muthaiga North, off Kiambu Road.
P.O Box 24866-00100 Nairobi, Kenya.
Tel: 020-2321649
Cell: 0724 250 556 / 0713 256 669
Email: pleng@pleng.net
Website: www.pleng.net

He added that the project shall accommodate one hundred and sixty-one (161) parking spaces and one hundred and twenty (120) two-bedroom housing units.

He explained that the aim of the meeting was to obtain opinions of the members of the public on the environmental, social and health aspects of the project. He elucidated that the neighboring community are more alive to the likely benefits and negative impacts of the proposed project.

He thus urged members to freely air their views so as to ensure a more comprehensive analysis of the impacts of the proposed project on the physical and social environment and the economy of the area. He advised members to respect each other's opinions and allow enough time for anyone who may want to give their opinion.

MIN. 3/03/022: ENVIRONMENTAL AND SOCIAL ASPECTS OF THE PROJECT

Prior to getting views from the members, Miss Rossinah Mwau explained that the proposed project is categorized as a high risk project as per Legal Notices No. 31 and 32 of 2019. She went further and described that such high risk projects require public participation meeting during their environmental impact assessment.

a) Positive Environmental, Social and Economic Impacts of the Project:

Madam Veronicah stated that the project would offer job opportunities to the youth living in the area. She added that the businesses around shall as well be promoted.

b) Negative Environmental, Social and Economic Impacts of the Project:

Mr. Githe expressed a concern that the heavy lorries transporting construction materials would cause damage to the road. Further, he stated that there shall be air pollution due to excavation and transportation of construction materials.

Mr. Ngiru stated that storm water from the project site could flood low lying neighboring plots. He therefore requested to know how this would be mitigated.

Mr. Kinuthia mentioned that the project could put a strain on the current water source and required to know if the proponent shall consider using alternative water sources.

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P.O Box 24866-00100 Nairobi, Kenya.
Tel: 020-2321649
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Website: www.pleng.net

Madam Veronicah stated that the current sewer network by the Nairobi County Water and Sewer Company (NWSC) was not operational and as such, she needed to know how the waste water from the project site would be mitigated.

c) Health and Safety Concerns of the Project:

Mr. Kinuthia stated that falling debris from construction works would pose a health threat to the neighbors.

Madam Veronicah on the other hand, insisted that poor waste water disposal could pose a health threat to the communities. She added that the project may attract thieves and as such, recommended that the proponent should ensure maximum security of their materials.

Proposed Mitigation Measures:

To mitigate dust pollution, Mr. Githe suggested that the access road can be watered regularly. He also added that the contractor should maintain the road and take responsibility in case of any damages as a result of the project.
Madam Veronicah suggested that the contractor should employ adequate security officers on the proposed site to avoid theft of construction materials and other safety issues. She also proposed that construction activities should be undertaken during the day only.

Eng. Kiambigi stated that waste water shall be managed through the use of a bio digester. He added that the excess water from the bio digester shall be reused within the building for flushing the toilets. In addressing the issue of flooding of neighboring plots, Eng. Kiambigi mentioned that the flow of the storm water shall be towards the road. In addition, he stated that underground tanks shall be used to harvest the storm water.

On matters water supply and management, Eng. Kiambigi stated that the project shall conserve the available water and as well harvest the rain water. He added that the proponent may consider digging a borehole to supplement the current water source from the NWSC.

Mr. Kinuthia proposed that the contractor can use the construction scaffolding safety net to protect construction workers and neighbors from falling debris.

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Mr. Chege proposed that the client should build a retaining wall around the proposed project site so as to prevent destabilization of the foundation of surrounding developments. The retaining would as well prevent water from neighboring developments from seeping into the excavated foundation.

MIN. 4/03/022: A.O.B

Madam Veronicah requested to know if the developer had a Corporate Social Responsibility (CSR) plan for the area. She suggested that the developer could either repair the road, support in establishment of a youth center or share borehole water with the community members.

Mr. Kinuthia stated that the proponent shall be expected to pay Kshs. 20,000 for water connection to the project site.

The members requested Pleng Limited or the contractor to consider employing members of the general public in the proposed project.

There being no other business, the meeting ended at 11:50 am with a word of prayer from Pastor Kabiru.

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ENVIRONMENTAL IMPACT ASSESSMENT FOR PROPOSED RESIDENTIAL APARTMENT BLOCK IN THINDIGUA

PUBLIC PARTICIPATION MEETING ATTENDANCE LIST

PLOT NO.

~~S/NO.~~	NAME	PHONE NUMBER	SIGNATURE
76/376	PASTOR KABIRU	0724796795	
"	Robert Omosa	0796-230-959	
372	Peter Muhia	0790166090	
~~76~~/776	James Kamau	0720643553	
2.	Peter Ndung'u	0729273789	
76/187	J. Macharia	0706469775	
	Rose Lucy Wambui	0748099818	
	Elizabeth Waniiku	0794456296	
	Caroline Mwangi	0723 242119	
76/219	Grace Nyachira	0700 678890	
76/219	KINYANJUI RYAN MUGWE	0741319806	
	Hannah Kimani	0713 389 044	
76/717			
76/715	SIMON M. NGERI	0722 871341	SM
	John Gathungu Karani	0702250965	

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ENVIRONMENTAL IMPACT ASSESSMENT FOR PROPOSED RESIDENTIAL APARTMENT BLOCK IN THINDIGUA

PUBLIC PARTICIPATION MEETING ATTENDANCE LIST

PLOT NO.

S/NO.	NAME	PHONE NUMBER	SIGNATURE
	Phyllis Gathee	0721881479	
76/669	Peter M. Kimutai	0715628200	
	Angelica Wanjiku	0711357929	
	Phylis Wanjiru	0795773671	
	Triza Wambui	0707593732	
	Elfas kiverenge	0729548401	
	Christopher kamau Mwangi	0729282419	
76/673	Paul Chege	0736492085	
"	Chege Kimani	0722628543	
76/676	Veronica Kimani	0720099796	

10.7 NEMA practicing licenses

FORM 7 (r.15(2))

mazingira yetu | uhai wetu | wajibu wetu

NATIONAL ENVIRONMENT MANAGEMENT AUTHORITY(NEMA)

THE ENVIRONMENTAL MANAGEMENT AND CO-ORDINATION ACT

ENVIRONMENTAL IMPACT ASSESSMENT/AUDIT (EIA/EA) PRACTICING LICENSE

License No : NEMA/EIA/ERPL/16823

Application Reference No: NEMA/EIA/EL/22245

M/S **PLENG LIMITED**
(individual or firm) of address

P.O. Box 24866-00100 NAIROBI

is licensed to practice in the

capacity of a (Lead Expert/Associate Expert/Firm of Experts) **Firm of Experts**
registration number **293**

in accordance with the provision of the Environmental Management and Coordination Act Cap 387.

Issued Date: **3/14/2022** Expiry Date: **12/31/2022**

Signature…..

(Seal)
Director General
The National Environment Management Authority

P.T.O.

ISO 9001: 2015 Certified

FORM 7 (r.15(2))

mazingira yetu | uhai wetu | wajibu wetu

NATIONAL ENVIRONMENT MANAGEMENT AUTHORITY(NEMA)

THE ENVIRONMENTAL MANAGEMENT AND CO-ORDINATION ACT

ENVIRONMENTAL IMPACT ASSESSMENT/AUDIT (EIA/EA) PRACTICING LICENSE

License No : NEMA/EIA/ERPL/16822

Application Reference No: NEMA/EIA/EL/22244

M/S **Dr. James Maina Kiambigi**
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in accordance with the provision of the Environmental Management and Coordination Act Cap 387.

Issued Date: **3/14/2022** Expiry Date: **12/31/2022**

Signature.....

(Seal)
Director General
The National Environment Management Authority

P.T.O.

ISO 9001 BUREAU VERITAS Certification UKAS

ISO 9001: 2015 Certified