

ENVIRONMENTAL IMPACT ASSESSMENT STUDY REPORT

**PROPOSED CONSTRUCTION OF TWENTY SEVEN (27)
FLOORS CENTRAL BANK OF KENYA PENSION TOWER
ON L.R NO.209/4976 & 4977 NAIROBI CITY
CENTRE,NAIROBI COUNTY**

The GPS coordinates are (1.2921° S, 36.8219° E)

PROJECT PROPONENT:

**CBK PENSION FUND
P.O. Box60000-00200
NAIROBI**

APRIL 2016

Document Authentication

This study report on Environmental Impacts Assessment has been prepared by Katrina Management Consultants Limited; NEMA registered and licensed EIA/EA Firm of Experts.

This report has been done with reasonable skills, care and diligence in accordance with the Environmental Management and Coordination Act, 1999 and the Environmental (Impact Assessment and Audit) Regulations 2003.

We the undersigned, certify that the particulars given in this report are correct and righteous to the best of our knowledge.

PROJECT PROPONENT

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ANNEXES:

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Annex 2: Public consultation questionnaires

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ACRONYMS

EIA	-	Environmental Impact Assessment
EHS	-	Environmental, Health and Safety
EMCA-		Environmental Management & Coordination Act, 1999 and EMCA (Amendment) 2015
EMP-		Environmental Management Plan
KURA	-	Kenya Urban Roads Authority
NEMA-		National Environmental Management Authority
ISO	-	International Standard Organization
SERC	-	Standards and Enforcement Review Committee
CCN	-	City Council of Nairobi
CO	-	Carbon Monoxide
COD	-	Chemical Oxygen Demand
CO ₂	-	Carbon Dioxide
IUCN	-	International Union for Conservation of Nature
NCWSC-		Nairobi City Water and Sewerage Company Limited
NGOs	-	Non-Governmental Organization
NO _x	-	Nitrogen oxide
PPE	-	Personal Protective Equipments
PAP	-	Project Affected Population
T.I.A	-	Traffic Impact Assessment
Masl	-	Metre above sea level
WRMA	-	Water Resource Management Authorit

NON-TECHNICAL SUMMARY

The Proponent, CBK Pension Fund has proposed to embark on an iconic project development to build its Pension tower of twenty seven floors (27) on plot **L.R 209/4976 and 4977** within Nairobi city. The exact location of the mentioned proposed project is in between Harambee Lane and Haile Selassie Lane, situated behind **AGIP** house the proposed site is currently a parking area for the CBK pension fund staff.

The project shall be an upscale project that will fully showcase the urban vitality and modern atmosphere of Nairobi while making full use of the geographic advantage, the public interest and the profound local culture. The components of the project as shown in the architectural drawings include:

- Basement 01 carrying 48 Parking spaces
- Basement 02 carrying 35 parking spaces
- Ground floor contains Main entrance, commercial spaces 1-5, Transformer room, switch room, plant room among other components.
- 1st - 4th floor contains parking spaces each floor carrying 49 parking spaces,
- 5th floor has a restaurant and auditorium,
- 6th-25th office spaces,
- 26th -27th a pent house and office space.

The Kenyan Government policy on such projects and/or activities requires that an Environmental and Social Impact Assessment be carried out at the planning stages of the proposed undertaking to ensure that significant impacts on the environment are taken into consideration during the design, construction, operation and decommissioning of such projects, programmes and/or activities. Therefore, in compliance with the law and to avoid unnecessary conflicts that may retard development in the country, the proponent undertook this Environmental and Social Impact Assessment and incorporated environmental and social concerns as required. :

Environmental Impact Assessment is a tool for environmental Planning and has been identified as a key component in new projects. According to section 58 of the Environmental Management and Coordination Act (EMCA) No.8 of 1999-second

Section 9 (1), and Environmental (Impact Assessment and Audit) regulation, 2003, new projects of such magnitude must undergo Environmental Impact Assessment. The Report of the same must be submitted to National Environment Authority (NEMA) for approval and issuance of relevant certificates. This was necessary as many forms of developmental activities cause damage to the environment and

hence the greatest challenge today is to maintain sustainable development without interfering with the environment.

Scope Objective and Criteria of the Environmental and Social Impact Assessment (EIA)

Katrina management Consultants Limited (KMCL), a NEMA registered and licensed Firm of Experts in Environmental and Social Impact Assessment was contracted as the Environmental Consultant firm to conduct the Environmental and Social Impact Assessment for the proposed CBK Pension Tower in Nairobi city County. The scope of work entailed the independent verification of all environmental and social aspects of the project components and identifying the gaps with applicable Performance Standards of all construction works of the proposed development around the project site, associated facilities and temporary activities, from ground preparation, masonry, and installation of service lines as well as the utilities required. The output of this work was a comprehensive Environmental and Social Impact Assessment report for the purposes of applying for an EIA license and ensuring sustainable development.

The consultant on behalf of the proponent conducted the study by incorporating but not limited to the following terms of reference:

- The location of the proposed development project
- A concise description of the national environmental legislative and regulatory framework, baseline information, and any other relevant information related to the project.
- The objectives of the proposed project.
- The technology, procedures and processes to be used, in the implementation of the project.
- The materials to be used in the construction and implementation of the project.
- The products, by-products and waste to be generated by the project.
- A description of the potentially affected environment.
- The environmental effects of the project including the traffic, infrastructural, social, aesthetics, and cultural effects and the direct, indirect, cumulative, irreversible, short-term and long-term effects anticipated.
- Undertake a comprehensive public and stakeholders consultation and participation process through stakeholder analysis and appropriate identification of applicable consultation methodology.
- To recommend a specific environmentally sound and applicable wastewater management system.
- Provide alternative technologies and processes available and reasons for preferring the chosen technology and processes.
- Analysis of alternatives including project site, design and technologies.

- An environmental management and monitoring plan proposing the measures for eliminating, minimizing or mitigating adverse impacts on the environment, including the cost, timeframe, responsibility to implement the measures and monitoring mechanisms.
- Provide an action plan for the prevention and management of the foreseeable accidents and hazardous activities in the cause of carrying out development activities.
- Propose measures to prevent health hazards and to ensure security in the working environment for the employees, residents and for the management in case of emergencies.
- An identification of gaps in knowledge and uncertainties, which were encountered in compiling the information.
- An economic and social analysis of the project.
- Traffic Impact Assessment
- Geotechnical survey

Anticipated Environmental and Social Impacts

Both positive and negative impacts are anticipated to be associated with the proposed project development during the ground preparation, construction phase, operation phase and decommissioning phase. In general, the following positive and negative impacts are associated with the proposed project.

Positive Impacts

- Creation of employment opportunities,
- Increased business opportunities,
- Development of the Nairobi city by making more economic use of land,
- Provision of much needed office spaces, parking areas and restaurants ,
- Revenue to National and County governments amongst others,
- Improving growth of the Country's economy,
- Creation of market for supply of building materials.
- Improvement of areas general security
- Optimal use of land

Negative Impacts

- Displacement of the current parking area,
- Soil erosion and degeneration during construction period,
- Increased runoff from new impervious areas,
- Extraction of earth material and spoil and related Solid Waste generation,
- Noise and vibration caused by heavy trucks, and construction machinery,
- Effect on air quality-Dust generation and exhaust emissions,

- Oil Spills,
- Increased water demand,
- Increased Energy Consumption,
- Demand for building materials extracted from natural resource base,
- Workers accidents and hazards during construction.
- Traffic congestion and accidents
- Occupational Safety and Health issues
- Increased pressure on the existing Electricity power, water and sewerage infrastructure
- Increased pressure on the ground water resources as a result of the proposed bore hole that will supplement Nairobi City Water and Sewerage water supply.
- Loss of income for businesses currently on the plot
- Compromised privacy to the neighbours
- Security concerns
- Solar Radiation, Reflection, Heat and Shadowing effects on neighbouring premises.

Mitigation Measures

Summary of identified impacts and general initial Mitigation Measures.

Possible impact	Mitigation to be enhanced
Displacement of the current parking area,	Temporary impact that will be enhance after the construction of the tower. Arrangement will made for alternative parking areas within the CBD and staff will be encouraged to use pooled transport and/ or public transport during the construction phase
Soil erosion and degeneration during construction period,	Channel strom water through drains, set up measures to ensure maximum infiltration of rain water into the ground, harness rain water for re-use within the proposed development.
Increased runoff from new impervious areas,	
Extraction of earth material and spoil and related Solid Waste generation and	Use of integrated solid waste management strategy.

Risk of release of hazardous materials such as Oil Spills, solvents, paints, batteries and miscellaneous equipment maintenance supplies	Proper containment and disposal of hazardous material in line with the waste Management Regulation, 2006
Noise and vibration caused by heavy trucks, and construction machinery,	Use of silenced machines during construction, restrict construction activities to day time and proper servicing of equipments.
Effect on air quality-Dust generation and exhaust emissions,	Switch off machines when not in use, schedule construction works and install dust screens around the construction site.
Demand for building materials extracted from natural resource base,	Ensure that material sites have requisite approvals from NEMA and other relevant Agencies.
Traffic congestion and accidents	Plan movement of vehicles as will be guided by the Traffic impact Assessment
Increased pressure on the existing Electricity power, water and sewerage infrastructure	Adopt green building technologies in line with the LEEDS Certification. Incorporate solar energy, natural ventilation etc. The project will embrace Green building concept (also known as green construction or sustainable building) which refers to a structure that is environmentally responsible and resource-efficient throughout a building's life-cycle: from siting to design, construction, operation, maintenance, renovation, and demolition.
Increased pressure on the ground water resources as a result of the proposed bore hole that will supplement Nairobi City Water and Sewerage water supply.	Undertake hydro geological survey and obtain necessary approval from Water Resources Management Authority

Loss of income for businesses currently on the plot	Ensure notices are issued early enough on the proposed change of use.
Compromised privacy to the neighbours	Architectural designs will adhere to the Building code and zoning specifications
Solar Radiation, Reflection, Heat and Shadowing effects on neighbouring premises.	Architectural designs will adhere to the Building code and zoning specifications
Occupational Safety and Health issues	Adherence to the provisions of the occupational Safety and Health Act 2007
Project structural safety to with stand Earth quake loading and Wind Loading	Given engineering recommendations and conditions based on the geotechnical survey and structural system, the geology can anchor the multi storied structure.

Conclusion

It is quite evident that the proposed development by CBK Pension Fund will pioneer development and bring along with it positive effects in the project area. The positive impacts including creation of employment; improving growth of the economy; boosting of the formal and informal sector; optimal use of land; incorporation of collective waste management and increase in revenue among others will in turn benefit Kenya as a Nation. However, negative impacts will also be experienced hence the need to mitigate them in order to reduce their adverse effects to the environment.

Considering these positive socio-economic and environmental benefits which will accrue as a result of the development, and the ESIA study having found no major impacts to arise from the development, it is our recommendation that the project be allowed to proceed on the understanding that the proponent will adhere to the mitigation measures recommended herein and will further still implement the proposed Environmental Management and monitoring Plan (EMP) to the letter. Kenya as a country has a big shortage of such developments hence the construction of the proposed project goes a long way in solving part of the huge problem of availability of office spaces, parking areas and restaurants and commercial spaces.

1. INTRODUCTION

The Proponent, CBK Pension Fund has proposed to put up a pension fund tower of twenty seven floors (27) on plot L.R 209/4976 and 4977 within Nairobi city. The proposed site is located behind AGIP house, adjacent to Vigilance house, between Harambee avenue and Haile Selassie avenue, along Harambee lane. The proposed site is currently being used by the CBK staff and CFC bank staff as a parking ground.



Picture 1: The proposed area is currently used as parking

The project shall be an upscale project that will fully showcase the urban vitality and modern atmosphere of Nairobi while making full use of the geographic advantage, the public interest and the profound local culture. The components of the project as shown in the architectural drawings include:

- Basement 01 carrying 48 Parking spaces
- Basement 02 carrying 35 parking spaces
- Ground floor contains Main entrance, commercial spaces 1-5, Transformer room, switch room, plant room among other components.
- 1st - 4th floor contains parking spaces each floor carrying 49 parking spaces,
- 5th floor has a restaurant and auditorium,

- 6th-25th office spaces,
- 26th -27th a pent house and office space.

The Kenyan Government policy on such projects and/or activities requires that an Environmental and Social Impact Assessment be carried out at the planning stages of the proposed undertaking to ensure that significant impacts on the environment are taken into consideration during the design, construction, operation and decommissioning of such projects, programmes and/or activities. Therefore, in compliance with the law and to avoid unnecessary conflicts that may retard development in the country, the proponent undertook this Environmental and Social Impact Assessment and incorporated environmental concerns as required.

Environmental and Social Impact Assessment (ESIA) is a tool for environmental Planning and has been identified as a key component in new projects. According to section 58 of the Environmental Management and Coordination Act (EMCA) No.8 of 1999-second schedule 9 (1), and Environmental (Impact Assessment and Audit) regulation, 2003, new projects of such magnitude must undergo Environmental and Social Impact Assessment. The Report of the same must be submitted to National Environment Authority (NEMA) for approval and issuance of relevant certificates. This was necessary as many forms of developmental activities cause damage to the environment and hence the greatest challenge today is to maintain sustainable development without interfering with the environment.

This project will be one of the key projects for future developments of Nairobi. This location as well as the functional context is well chosen to support the proposed project as it conforms to the zoning plan issued by the Nairobi City County.

1.1 Scope and Criteria of the Environmental Impact Assessment (EIA)

1.1.1 Scope of the Report

The Kenya Government policy on all new development projects, programs or activities of such magnitude requires that an environmental and Social impact assessment be carried out at the implementation stage of the proposed undertaking to ensure that significant impacts on the environment are taken into consideration during the construction, operation and decommissioning of the facility. The scope of this Environmental and Social Impact Assessment therefore covers:

- The baseline environmental conditions of the project area
- Description of the proposed project,
- Provisions of the relevant environmental laws

- Identification and discussion of any adverse negative impacts to the environment anticipated from the proposed project,
- Appropriate mitigation measures,
- Provision of an environmental management plan.

1.1.2 Terms of Reference (TOR) for the EIA Process

Katrina Management Consultants limited a registered Firm of Experts was appointed by the proponent CBK Pension Fund as the Environmental consultant to conduct the Environmental and Social Impact Assessment of the proposed CBK Pension Tower in Nairobi City. The scope of the assessment will cover the project site, neighbors and interested stakeholders. The output of this work will be a comprehensive Environmental and Social Impact Assessment study report for the purposes of applying for an EIA license aimed at sustainable development.

The main objective of the assignment is to assist the proponent to prepare a study report after carrying out an Environmental and Social Impact Assessment (ESIA) of the proposed project, to ensure that the proposed development takes into consideration appropriate measures to mitigate any adverse impacts to the environment. The purpose of the study is to identify potential environmental and social impacts; and possible concerns that is associated with the development, as well as the associated prevention and mitigation measures for the negative impacts as stipulated in the Environmental Management and Monitoring Plan (EMP).

The consultant on behalf of the proponent will conduct the study by incorporating but not limited to the following terms of reference:-

- The location of the proposed development project
- A concise description of the national environmental legislative and regulatory framework, baseline information, and any other relevant information related to the project.
- The objectives of the proposed project.
- The technology, procedures and processes to be used, in the implementation of the project.
- The materials to be used in the construction and implementation of the project.
- The products, by-products and waste to be generated by the project.
- A description of the potentially affected environment.
- The environmental effects of the project including the traffic, infrastructural, social, aesthetics, and cultural effects and the direct, indirect, cumulative, irreversible, short-term and long-term effects anticipated.

- Undertake a comprehensive public and stakeholders consultation and participation process through stakeholder analysis and appropriate identification of applicable consultation methodology.
- To recommend a specific environmentally sound and applicable wastewater management system.
- Provide alternative technologies and processes available and reasons for preferring the chosen technology and processes.
- Analysis of alternatives including project site, design and technologies.
- An environmental management and monitoring plan proposing the measures for eliminating, minimizing or mitigating adverse impacts on the environment, including the cost, timeframe, responsibility to implement the measures and monitoring mechanisms.
- Provide an action plan for the prevention and management of the foreseeable accidents and hazardous activities in the cause of carrying out development activities.
- Propose measures to prevent health hazards and to ensure security in the working environment for the employees, residents and for the management in case of emergencies.
- An identification of gaps in knowledge and uncertainties, which were encountered in compiling the information.
- An economic and social analysis of the project.
- Traffic Impact Assessment
- Geotechnical survey

1.1.3 Data Collection Procedures

The data collection was carried out through questionnaires/standard interview schedules, stakeholders meeting was held on site, observations was made and photography, site visits and desktop environmental studies.

1.1.4 ESIA Organization and Structure

The ESIA study report was carried out to full completion within a period of 14 working days from the date of undertaking. The Consultant (Lead Expert) coordinated the day-to-day functions and any related institutional support matters in line with the TOR as approved by NEMA. All formal communications were directed to NEMA through the proponent.

1.1.5 Reporting and Documentation

The Environmental and Social Impact Assessment Report from the findings was compiled in accordance with the guidelines issued by NEMA for such works and was prepared and submitted by the proponent for review. The Consultant ensured constant briefing of the client during the exercise. Description project plans and architectural drawings showing various proposed developments are attached in this study report, among other relevant materials related to the proposed project as provided by the client.

1.1.6 Responsibilities and Undertaking

The Environmental Consultant undertook to meet all logistical costs relating to the assignment, including those of production of the report and any other relevant material. The consultant arranged for own transport and travels during the exercise. On the site of the proposed development project, the proponent CBK pension fund provided a contact person(s) to provide information required by the Consultant. The proponent also provided site plan(s) showing roads, service lines, buildings layout and the actual sizes of the sites, details of raw materials, proposed process outline and anticipated by-products, future development plans, operation permits and conditions, land-ownership documents, site history and estimated investment costs of the project, attached as annexes to this study report. The output from the consultants includes the following:

- An Environmental and Social Impact Assessment study report comprising of an executive summary, assessment approach, baseline conditions, anticipated impacts and proposed mitigation measures,
- An Environmental and Social Management Plan outline, which also forms part of the report recommendations.
- Traffic Assessment report analyzing how the project might interfere with the normal flow of the traffic within the City centre **(Report attached)**
- Geotechnical investigations report to establish existing ground conditions and further testing on usability of site materials and allowable bearing pressures for the proposed development is required.**(Report attached)**

1.1.7 Methodology

To achieve all this, a systematic approach shall be followed by the consultants, which include the general steps outlined below:-

- Environment screening
- Environmental scoping which provided the key environmental issues
- Desktop studies and interviews
- Physical inspection of the site and surrounding areas
- EIA Public participation via the use of questionnaires

- Discussions with the Proponent and project architect
- Reporting.

Some of the important steps that was applied in methodology.

1. **Environmental screening**-This step was applied to determine whether an environmental and social impact assessment was required and what level of assessment was necessary. This was done in reference to requirements of the EMCA, 1999, and specifically the second schedule. Issues considered included the physical location, sensitive receptors in close proximity to the site and the nature of anticipated impacts.
2. **Scoping**-The Scoping process helped narrow down onto the most critical issues requiring attention during the assessment. Environmental issues were categorized into physical, natural/ecological and social, economic and cultural aspects.
3. **Desktop study**-This included documentary review on the nature of the proposed activities, project documents, designs policy and legislative framework as well as the environmental setting of the area among others. It also included discussions with managers and design engineers as well as interviews with neighbors.
4. **Site assessment**-Field visits were meant for physical inspections of the site characteristics and the environmental status of the surrounding areas to determine the anticipated impacts. It also included further interviews with neighbors, surrounding enterprises and key stakeholders.
5. **Reporting**-In addition to constant briefing of the client, this environmental and social impact assessment study report was prepared. The contents were presented for submission to NEMA as required by law.

2. LEGAL AND LEGISLATIVE FRAMEWORK

2.1 Introduction

Environmental impact assessment is a tool for environmental conservation and has been identified as a key component in new project implementation. According to section 58 of the Environmental Management and Coordination Act (EMCA) No. 8 of 1999, EMCA (Amendment) 2015, second schedule 9 (I), and Environmental (Impact Assessment and Audit) Regulation, 2003, both new and old projects must undergo Environmental Impact assessment and Audits. The report of the same must be submitted to National Environmental Management Authority (NEMA) for approval and issuance of the relevant certificates.

There is a growing concern in Kenya and at global level that many forms of development activities cause damage to the environment. Development activities have the potential to damage the natural resources upon which the economy is based. Environmental Impact Assessment is a useful tool for protection of the environment from the negative effects of developmental activities. It is now accepted that development projects must be economically viable, socially acceptable and environmentally sound.

2.2 Environmental Policy

This ESIA has been prepared to fully comply with environmental and social safeguard policies and procedures as outlined in the World Bank Environmental and Social Performance Standards for Projects with regional impacts and as per various regulations by National Environment Management Authority, in Kenya.

2.3 Relevant Kenya Policies

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

2.3.1 Policy Paper on Environmental and Development (Sessional Paper No. 6 of 1999)

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

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

2.3.2 Physical Planning Policy

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

2.3.3 Public Health Policy

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

2.3.4 The Sessional paper No.4 on Energy

The Sessional paper No.4 on Energy of Kenya's vision is to promote equitable access to quality energy services at the least cost while protecting the environment and thus it does recognize the importance of harnessing and utilizing solar energy. Additionally, the Sessional Paper states that, The Government recognizes the great potential of this source of energy and will encourage the development and utilization of appropriate technologies in attaining its vision. It is recommended that the proponent consider harnessing solar energy that can be utilized to power common areas within the proposed office development.

2.3.5 The Kenya Vision 2030

The Economic Pillar of Vision 2030 seeks to improve the prosperity of all regions of the country and all Kenyans and as such the development blueprint recognizes projects such as the Proposed CBK pension fund tower to be a necessary prerequisite in attaining the Kenya's Vision 2030.

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

2.3.6 The Kenya National Climate Change Response Strategy

The purpose of this strategy is to put in place robust measures needed to address most of the challenges posed by climate variability and change through thorough impact assessments and monitoring of various projects. According to Climate Change Projections, in this country we are likely to experience hotter drier sunny seasons, warmer wetter rainy seasons, rise in sea levels and an increase in extreme weather events. These climactic changes will impact on our daily lives and the buildings that we work and live in must be adapted to cope with such changes. With time both existing buildings and the construction of new buildings will have to adapt to cope with the conditions climate change may produce. A range of new ways to design, construct, upgrade and occupy buildings so that they are more energy efficient as well as resilient to threats such as flooding and drought is proposed.

In the construction sector, priority inclusion areas should include energy efficient innovations and technologies, and utilization low-carbon appliances and tools; the utilization of eco-friendly energy resources such as wind, solar, biogas, small hydros, etc; as well as possible utilization of biofuels.

2.4 Institutional arrangements

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

2.5 Institutional Framework

At present there are over twenty (20) institutions and departments which deal with environmental issues in Kenya. Some of the key institutions include the National Environmental Council (NEC), National Environmental Management Authority (NEMA), the Forestry Department, Kenya Wildlife Services (KWS), Water

Resources Management Authority (WRMA) and others. There are also local and international NGOs involved in environmental issues in the country.

2.5.1 National Environmental Management Authority (NEMA)

The objective and purpose for which NEMA is established is to exercise general supervision and co-ordinate over all matters relating to the environment and to be the principal instrument of the government in the implementation of all policies relating to the environment. A Director- General appointed by the president heads NEMA. The Authority shall:

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

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

2.5.2 National Environment Complaints Committee

The Committee performs the following functions:

- Investigate any allegations or complaints against any person or against the authority in relation to the condition of the environment in Kenya and on its own motion, any suspected case of environmental degradation and to make a report of its findings together with its recommendations thereon to the Council.
- Prepare and submit to the Council periodic reports of its activities which shall form part of the annual report on the state of the environment under section 9 (3) and
- To perform such other functions and exercise such powers as may be assigned to it by the council.

2.5.3 National Environment Action Plan Committee

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

- Contain analysis of the Natural Resources of Kenya with an indication as to any pattern of change in their distribution and quantity over time.
- Contain analytical profile of the various uses and value of the natural resources incorporating considerations of intergenerational and intra-generational equity.
- Recommend appropriate legal and fiscal incentives that may be used to encourage the business community to incorporate environmental requirements into their planning and operational processes.
- Recommend methods for building national awareness through environmental education on the importance of sustainable use of the environment and natural resources for national development.
- Set out operational guidelines for the planning and management of the environment and natural resources.
- Identify actual or likely problems as may affect the natural resources and the broader environment context in which they exist.
- Identify and appraise trends in the development of urban and rural settlements, their impact on the environment, and strategies for the amelioration of their negative impacts.
- Propose guidelines for the integration of standards of environmental protection into development planning and management.
- Identify and recommend policy and legislative approaches for preventing, controlling or mitigating specific as well as general diverse impacts on the environment.
- Priorities areas of environmental research and outline methods of using such research findings.
- Without prejudice to the foregoing, be reviewed and modified from time to time to incorporate emerging knowledge and realities and;
- Be binding on all persons and all government departments, agencies, States Corporation or other organ of government upon adoption by the national assembly.

2.5.4 National Environmental Tribunal (NET)

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

2.5.5 National Environmental Action Plan (NEAP)

The NEAP for Kenya was prepared in mid 1990s. It was a deliberate policy effort to integrate environmental considerations into the country's economic and social

development. The integration process was to be achieved through a multi-sectoral approach to develop a comprehensive framework to ensure that environmental management and the conservation of natural resources are an integral part of societal decision-making.

2.6 Legal

Framework

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

2.6.1 The Environmental Management and Coordination Act, 1999, and EMCA (Amendment) 2015

The Act defines the legal and administrative co-ordination of the diverse sectoral initiatives in the field of environment. The Act harmonizes the sector specific legislations touching on the environment in a manner designed to ensure greater protection of the environment. This Act is guided Policy wise by the national environmental council, while the day-to-day enforcement falls under the Director General of the National Environmental Management Authority. Thus (NEMA) enforces the Act on behalf of the Cabinet Secretary responsible for Environment. Its functions include:-

- The coordination of various environmental management activities; Initiation of legislative proposals; Research, investigations, and surveys on the field of environment.
- Creation of environmental education and awareness programmes;
- Advise the government on regional and international agreements to which Kenya is party to;
- Executing the Environmental Impact Assessment (EIA) under the Environmental Impact (Assessment and Auditing) regulations, 2003, among other duties.

Under EMCA, 1999 there are a number of regulations geared towards sustainable development. The applicable regulation to the CBK pension tower development project are discussed below

2.6.1.1 The Environmental Impact (Assessment and Auditing) Regulations, 2003

Environmental Impact Assessment under the Act is guided by the Environmental Impact Assessment (Assessment and Auditing) Regulations of the year 2003, which is given under legal notice no. 101. The regulations stipulate the ways in which environment impact assessment and audits should be conducted. The project falls under the second schedule of EMCA, 1999 section 58 (1), (4) that require an Environmental Impact Assessment study report. As stipulated by the legal notice No. 101, 2003, PART V, Section 31 (3) (a) (i) and (ii) it is required that an environmental assessment be undertaken to provide baseline information upon which subsequent environmental control audit shall be based.

Environmental Impact Assessment (EIA) is a critical examination of the effects of a project on the environment. The goal of an EIA is to ensure that decisions on proposed projects and activities are environmentally sustainable. An EIA is conducted in order to identify impacts of a project on the environment, predict likely changes on the environment as a result of the development, evaluate the impacts of the various alternatives on the project and propose mitigation measures for the significant negative impacts of the project on the environment.

The EMCA, 1999 requires that during the EIA process a proponent shall in consultation with the Authority seek views of persons who may be affected by the project or activity through posters, newspaper, radio and hold at least three public meetings with the affected parties and communities. The Project proponent pays for the entire EIA process. The fee payable to NEMA is 0.1% of the project cost.

Environmental Audit (EA) is the systematic documentation, periodic and objective evaluation of activities and processes of an on-going project. The goal of EA is to establish if proponents are complying with environmental requirements and enforcing legislation. The purpose of EA is to determine the extent to which the activities and programs conform to the approved environmental management plan. A comprehensive EA ensures a safe and healthy environment at all stages of project operations and decommissioning.

An initial environmental audit and a control audit are conducted by a qualified and authorized environmental auditor or environmental inspector who is an expert or a firm of experts registered by the Authority. In the case of an on-going project the Authority requires the proponent to undertake an initial environmental audit study to provide baseline information upon which subsequent environmental audits shall be based.

Self-Audits are carried out after the environmental impact assessment study report has been approved by the Authority or after the initial audit of an on-going project.

The proponent shall take all practical measure to ensure the implementation of the environmental management plan by carrying out a self-auditing study on a regular basis.

This Report complies with the requirements of the Environmental Regulations in the coverage of environmental issues, project details, impacts, legislation, mitigation measures, management plans and procedures. The Proponent shall be required to commit to implementing the environmental management plan laid out in this report and any other conditions laid out by NEMA.

2.6.1.2 Environmental Management and Coordination (Water Quality Regulations) 2006)

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

The regulations also provide guidelines and standards for the discharge of poisons, toxins, noxious, radioactive waste or other pollutants into the aquatic environment in line with the Third Schedule of the regulations. The regulations have standards for discharge of effluent into the sewer and aquatic environment. While it is the responsibility of the sewerage service providers to regulate discharges into sewer lines based on the given specifications, NEMA regulates discharge of all effluent into the aquatic environment.

Everyone is required to refrain from any actions, which directly or indirectly cause water pollution, whether or not the water resource was polluted before the enactment of the Environmental Management and Coordination Act (EMCA) Gazetted in 1999. It is an offence to contravene the provisions of these regulations with a fine not exceeding five hundred thousand shillings.

2.6.1.3 Environmental Management and Coordination (Waste Management Regulations) 2006)

The Minister for Environment and Natural Resources gazetted these regulations in 2006. These Regulations may be cited as the Environmental Management and Co-ordination (Waste Management) Regulations, 2006. Waste Management Regulations are meant to streamline the handling, transportation and disposal of various types of waste. The aim of the Waste Management Regulations is to

protect human health and the environment. Currently, different types of waste are dumped haphazardly posing serious environmental and health concerns. The regulations place emphasis on waste minimization, cleaner production and segregation of waste at source.

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

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

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

These regulations also relate noise to its vibration effects and seek to ensure no harmful vibrations are caused by controlling the level of noise. Any person(s) intending to undertake activities in which noise is suspected to be injurious or endangers the comfort, repose, health or safety of others and the environment, must make an application to NEMA and acquire a license subject to payment of requisite fees and meeting the license conditions. Failure to comply with these regulations attracts a fine of KES 350,000 or 18 months jail term or both.

2.6.1.5 Environmental Management and Coordination (Air Quality Regulations, 2014)

This regulation is referred to as “The Environmental Management and Coordination (Air Quality) Regulations, 2014”. The objective is to provide for prevention, control and abatement of air pollution to ensure clean and healthy ambient air. It provides for the establishment of emission standards for various sources, including as mobile sources (e.g. motor vehicles) and stationary sources (e.g. industries) as outlined in the Environmental Management and Coordination Act, 1999.

Emission limits for various areas and facilities have been set. The regulations provide the procedure for designating controlled areas, and the objectives of air quality management plans for these areas. The following operations (provided they are not used for disposal of refuse), are exempt from these regulations:

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

2.6.2 The Traffic Act, 2012

The Traffic Act, 2012 gives provisions and guidelines that govern the Kenya roads transport sector. These guidelines are essential to private, public and commercial service vehicles in ensuring safety and sanity on the roads hence ensuring the environment; the human being a component is safeguarded. In section 41 The Act demands for installation and certification of speed governors for the commercial vehicles ferrying goods adjusted to the loading condition of such vehicles to a limit of 80 KPH, registration and competence of drivers.

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

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

In ensuring safety of all the persons in transit section 56 encourages that every public and commercial vehicle be fitted with inspected and first class first aid box and fire extinguisher. In ensuring compliance to this Act the contractor and developer shall ensure that all site drivers and all material suppliers to the site satisfy the provisions as stipulated in Act.

2.6.3 Public Health Act (Cap. 242)

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

2.6.4 Urban and Cities Act No 13 of 2011

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

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

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

The Nairobi City County Planning and Environment Department have been actively involved in the planning of this development as from its initial stages.

2.6.5 The Land Act, 2012

This is an ACT of Parliament to give effect to Article 68 of the Constitution, to revise, consolidate and rationalize land laws; to provide for the sustainable administration and management of land and land based resources, and for connected purposes. The Land Act of 2012 subsection (1) states that 'any land may be converted from one category to another in accordance with the provisions of this Act or any other written law.' it continues to state in subsection (2) that

Without prejudice to the generality of subsection (1)

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

(d) Community land may be converted to either private or public land in accordance with the law relating to community land enacted pursuant to Article 63(5) of the Constitution.

It is important to note that any substantial transaction involving the conversion of public land to private land shall require approval by the National Assembly or county assembly as the case may be.

Part I of the same Act states that title to land may be acquired through—

- (a) allocation;
- (b) land adjudication process;
- (c) compulsory acquisition;
- (d) prescription;
- (e) settlement programs;
- (f) transmissions;
- (g) transfers;
- (h) long term leases exceeding twenty-one years created out of private land; or
- (i) any other manner prescribed in an Act of Parliament.

Part viii of this ACT provides procedures for compulsory acquisition of interests in land. Section 111 (1) States that if land is acquired compulsorily under this Act, just compensation shall be paid promptly in full to all persons whose interests in the land have been determined. The Act also provides for settlement programmes. Any dispute arising out of any matter provided for under this Act may be referred to the Land and Environment Court for determination.

In ensuring that no contravention to this Act is done, the proponent acquired the land through a 99 years leasehold and has applied for necessary approvals requisite to the proposed development i.e. amalgamation and change of user approvals.

2.6.6 Water Act, 2002

The Water Act, 2002 provides the legal framework for the management, conservation, use and control of water resources and for the acquisition and regulation of right to use water in Kenya. It also provides for the regulation and management of water supply and sewerage services. In general, the Act gives provisions regarding ownership of water, institutional framework, national water resources, management strategy, and requirement for permits, state schemes and community projects. Part IV of the Act addresses the issues of water supply and sewerage. Specifically, section 59 (4) of the Act states that the national water services strategy shall contain details of:

- Existing water services
- The number and location of persons who are not being provided with basic water supply and basic sewerage
- Plans for the extension of water services to underserved areas
- The time frame for the plan; and
- An investment programme

Part II, section 18, of the Water Act 2002 provides for national monitoring and information system on water resources. Following on this, sub-section 3 allows the Water Resources Management Authority (WRMA) to demand from any person or institution, specified information, documents, samples or materials on water resources. Under these rules, specific records may require to be kept by a facility operator and the information thereof furnished to the Authority.

The proponent and all the allied stakeholders to the project shall ensure proper water use, management and conservation. In the event of borehole drilling WRMA shall be consulted by the project hydro-geologists for the purpose of attaining permits for borehole sinking.

2.6.7 Energy Act of 2006

The Energy Act 2006 was enacted on 2nd January 2007. The Act establishes an Energy Regulatory Commission mandated to perform all function that pertains to energy production, transmission, setting and enforcing of energy policies, Public education and enforcing energy conservation strategies, prescribing the energy licensing process and issuing of licenses that pertain to energy sector in Kenya. Section 30 of the Act provides the factors that shall be taken into consideration prior to issuance of license. It states the need and expression of an entity to conserve and protect the environment and natural resources in accordance to the Environmental and Coordination Act of 1999 (No. 8 of 1999), moreover, the Act gives provisions for the need to protect health and safety of users of energy by providing an enabling environment of operation that protects the health and safety of users of the service for which the license or permit is required and other members of the public affected by the undertaking.

The provisions of this Act have and will be enforced by the proponent in consultation with the project EHS experts, planners and electrical consultants in ensuring the best practices are ensured for sustainable energy use while attaining public health and safety.

2.6.8 Building Code 2000

Section 194 requires that where sewer exists, the occupants of the nearby premises shall apply to the Local Authority for a permit to connect to the sewer line and all the wastewater must be discharged into sewers.

The proponent will dully make the necessary application to the NCWSC for the connection of the sewer to the proposed development.

2.6.9 Occupational Safety and Health Act (OSHA 2007)

Before any premises are occupied, or used a certificate of registration must be obtained from the chief inspector. The occupier must keep a general register. The Act covers provisions for health, safety and welfare.

Health

The premise must be kept clean, daily removal of accumulated dust from floors, free from effluvia arising from any drain, sanitary convenience or nuisance and without prejudice to the generality of foregoing provision. A premise must not be overcrowded, there must be in each room 10 meters of space for each employee, not counting space 14 feet from the floor and a 9 feet floor-roof height.

The circulation of fresh air must secure adequate ventilation of workrooms. There must be sufficient and suitable lighting in every part of the premise in which persons are working or passing. There should also be sufficient and suitable sanitary conveniences separate for each sex, must be provided subject to conformity with any standards prescribed by rules. Food and drinks should not be partaken in dangerous places or workrooms.

Provision of suitable protective clothing and appliances including where necessary, suitable gloves, footwear, goggles, gas masks, and head covering, and maintained for the use of workers in any process involving expose to wet or to any injurious or offensive substances.

Safety

Fencing of premises and dangerous parts of other machinery is mandatory. Training and supervision of inexperienced workers, protection of eyes with goggles or effective screens must be provided in certain specified processes. Floors, passages, gangways, stairs, and ladders must be soundly constructed and properly maintained and handrails must be provided for stairs.

Special precaution against gassing is laid down for work in confined spaces where persons are liable to overcome by dangerous fumes. Air receivers and fittings must be of sound construction and properly maintained. Adequate and suitable means for extinguishing fire must be provided in addition to adequate means of escape in case of fire must be provided.

Welfare

An adequate supply of both quantity and quality of wholesome drinking water must be provided. Maintenance of suitable washing facilities, accommodation for clothing not worn during working hours must be provided. Sitting facilities for all female workers whose work is done while standing should be provided to enable them take advantage of any opportunity for resting.

Section 42 stipulates that every premise shall be provided with maintenance, readily accessible means for extinguishing fire and person trained in the correct use of such means shall be present during all working periods.

Section 45 states that regular individual examination or surveys of health conditions of industrial medicine and hygiene must be performed and the cost will be met by the employer. This will ensure that the examination can take place without any loss of earning for the employees and if possible within normal working hours.

Section 55B provides for development and maintenance of an effective programme of collection, compilation and analysis of occupational safety. This will ensure that health statistics, which shall cover injuries and illness including disabling during working hours, are adhered.

The proponent will ensure that safety is put first through by contacting at least four on-site EHS officer who will ensure adherence to proposed EHS bet practices and ESMP recommendations on all sections of the development.

2.6.10 The Standards Act Cap. 496

The Act is meant to promote the standardization of the specification of commodities, and to provide for the standardization of commodities and codes of practice; to establish a Kenya Bureau of Standards, to define its functions and provide for its management and control. Code of practice is interpreted in the Act as a set of rules relating to the methods to be applied or the procedure to be adopted in connection with the construction, installation, testing, sampling, operation or use of any article, apparatus, instrument, device or process.

The developer has to comply with the provisions of the Act to ensure the overall safety of the development by ensuring strict vetting of material to be used in the construction. Thorough scrutiny of these material and frequents monitoring will be done by the construction supervisory staff on site such the Resident Engineers', EHS and Clerk of Works office.

2.6.11 Physical Planning Act (Cap 286)

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

days' notice given to the developer such restoration has not been effected the concerned local authority shall restore the site to its original condition and recover the cost incurred thereto from the developer.

The developer has ensured this is affected and enforced at the initial stage.

2.6.12 Employment Act No 11 of 2007

The Act is enacted to consolidate the law relating to trade unions and trade disputes, to provide for the registration, regulation, management and democratization of trade unions and employers organizations and federations. Its purpose is to promote sound labour relations through freedom of association, the encouragement of effective collective bargaining and promotion of orderly and expeditious dispute the protection and promotion of settlement conducive to social justice and economic development for connected purposes. This Act is important since it provides for employer – employee relationship that is important for the activities that would promote management of the environment within the housing sector.

The developer, the contractor and the employees' relationship during the construction and later phases of this project shall be guided by this Act.

2.6.13 Penal Code Cap 63

Section 191 of the penal code states that if any person or institution that voluntarily corrupts or foils water from public springs or reservoirs, rendering it less fit for its ordinary use is guilty of an offence. Section 192 of the same Act says a person who makes or vitiates the atmosphere in any place to make it noxious to health of persons /institution, dwelling or business premises in the neighborhood or those passing along public way, commit an offence.

2.6.14 County Governments Act, 2012

This Act vests responsibility upon the County Governments in planning of development projects within their areas of jurisdiction be it projects of importance to the local County government or those of national importance.

Section 102 of the Act provides the principles of planning and development facilitation which include integration of national values in county planning, protect the right to self-fulfillment within the county communities and with responsibility to future generations, protection of rights of minorities and marginalized groups and communities, promotion of equity resource allocation, among others.

Section 103 of the Act outlines the prime objective of county planning which aligned to the bill of rights and the constitution of Kenya.

Section 114 and 115 indicate and give guidelines in planning of projects of national significance and instill the aspect of public participation in every aspect of the planning process through that: clear strategic environmental assessments; clear environmental impact assessment reports; expected development outcomes; and development options and their cost implications. Each county assembly is tasked with the role to develop laws and regulations giving effect to the requirement for effective citizen participation in development planning and performance management within the county.

The project proponent has initiated the process of County Government engagement in the initial project planning through application of essential development approvals from NCC.

2.7 World Bank Environmental and Social Performance Standards

2.7.1 World Bank Performance Standards,

The World Bank's environmental and social performance standards are a cornerstone of its support to sustainable poverty reduction. The objective of these policies is to prevent and mitigate undue harm to people and their environment in the development process. These policies provide guidelines for Bank and borrower staffs in the identification, preparation, and implementation of programs and projects. In essence, the performance standards ensure that environmental and social issues are evaluated in decision making, help reduce and manage the risks associated with a project or program, and provide a mechanism for consultation and disclosure of information.

2.7.2 Performance Standard 1 (Environmental Assessment)

Performance Standard 1 underscores the importance of managing environmental and social performance throughout the life of a project. An effective Environmental and Social Management System (ESMS) is a dynamic and continuous process initiated and supported by management, and involves engagement between the developer/proponent, its workers, local communities directly affected by the project and, where appropriate, other stakeholders. The Standard covers impacts on the natural environment (air, water and land); human health and safety; physical cultural resources; and trans-boundary and global environment concerns. A range of instruments can be used to conduct Environmental Assessments i.e. EIA,

Environmental Audit, hazard or risk assessment and Environmental Management Plan (EMP). The Borrower is responsible for carrying out the EIA.

The performance standard has the following objectives:

- To identify and evaluate environmental and social risks and impacts of the project.
- To adopt a mitigation hierarchy to anticipate and avoid, or where avoidance is not possible, minimize, and, where residual impacts remain, compensate/offset for risks and impacts to workers, Affected Communities, and the environment.
- To promote improved environmental and social performance of project proponent through the effective use of environmental management systems.
- To promote and provide means for adequate engagement with Affected Communities such as the immediate neighbors and project beneficiaries throughout the project cycle on issues that could potentially affect them and to ensure that relevant environmental and social information is disclosed and disseminated.

2.7.3 Performance standard 2 (Labour and Working Conditions)

This standard's provisions have been guided by the International Labor Organization (ILO) and the United Nation and it recognizes that the pursuit of economic growth through employment creation and income generation should be accompanied by protection of the fundamental¹ rights of workers. For any business, the workforce is a valuable asset, and a sound worker-management relationship is a key ingredient in the sustainability of a company. Failure to establish and foster a sound worker-management relationship can undermine worker commitment and retention, and can jeopardize a project.

Conversely, through a constructive worker-management relationship, and by treating the workers fairly and providing them with safe and healthy working conditions, project proponents/developer may create tangible benefits, such as enhancement of the efficiency and productivity of their operations.

With one of its key objectives being promotion of compliance with national employment and labor laws it thus gives provisions in ensuring Occupational Health and Safety of workers for any development projects.

2.7.4 Performance Standard 3 (Resource Efficiency and Pollution Prevention)

This performance standard recognizes that increased economic activity and development often generate increased levels of pollution to air, water, and land, and consume finite resources in a manner that may threaten people and the environment at the local, regional, and global levels. There is also a growing global

consensus that the current and projected atmospheric concentration of greenhouse gases (GHG) threatens the public health and welfare of current and future generations. At the same time, more efficient and effective resource use and pollution prevention and GHG emission avoidance and mitigation technologies practices have become more accessible and achievable in virtually all parts of the world. These are often implemented through continuous improvement methodologies similar to those used to enhance quality or productivity, which are generally well known to most industrial, agricultural, and service sector companies. This Performance Standard outlines a project-level approach to resource efficiency and pollution prevention and control in line with internationally disseminated technologies and practices.

The objectives of this standard are applicable to the Proposed AVIC International Africa Headquarters project:

- To avoid or minimize adverse impacts on human health and the environment by avoiding or minimizing pollution from project activities.
- To promote more sustainable use of resources, including energy and water.
- To reduce project-related GHG emission such as by use integrated Pest Management Methods (IPM) in agriculture hence reducing use of aerosols.

2.7.5 Performance Standard 4 (Community Health, Safety, and Security)

The standard recognizes that project activities, equipment, and infrastructure can increase community exposure to risks and impacts. In addition, communities that are already subjected to impacts from climate change may also experience an acceleration and/or intensification of impacts due to project activities. While acknowledging the public authorities' role in promoting the health, safety, and security of the public, this Performance Standard addresses the developer's responsibility to avoid or minimize the risks and impacts to community health, safety, and security that may arise from project related-activities, with particular attention to vulnerable groups.

In conflict and post-conflict areas, the level of risks and impacts described in this Performance Standard may be greater.

The risks that a project could exacerbate an already sensitive local situation and stress scarce local resources should not be overlooked as it may lead to further conflict.

The objectives that are in line with the Proposed CBK pension tower are:

- To anticipate and avoid adverse impacts on the health and safety of the Affected Community during the project life from both routine and non-routine circumstances.
- To ensure that the safeguarding of personnel and property is carried out in accordance with relevant human rights principles and in a manner that avoids or minimizes risks to the Affected Communities.

2.7.6 Performance Standard 5 (Land Acquisition and Involuntary Resettlement)

Performance Standard 5 identifies that project-related land acquisition and restrictions on land use can have adverse impacts on communities and persons that use this land. Involuntary resettlement involves both to physical displacement (relocation or loss of shelter) and to economic displacement (loss of assets or access to assets that leads to loss of income sources or other means of livelihood) as a result of project-related land acquisition and/or restrictions on land use. Resettlement is considered involuntary when affected persons or communities do not have the right to refuse land acquisition or restrictions on land use that result in physical or economic displacement. This occurs in cases of (i) lawful expropriation or temporary or permanent restrictions on land use and (ii) negotiated settlements in which the buyer can resort to expropriation or impose legal restrictions on land use if negotiations with the seller fail.

To help avoid expropriation and eliminate the need to use governmental authority to enforce relocation, clients are encouraged to use negotiated settlements meeting the requirements of this Performance Standard, even if they have the legal means to acquire land without the seller's consent.

The objectives of this standard are:

- To avoid, and when avoidance is not possible, minimize displacement by exploring alternative project designs.
- To avoid forced eviction.
- To anticipate and avoid, or where avoidance is not possible, minimize adverse social and economic impacts from land acquisition or restrictions on land use by (i) providing compensation for loss of assets at replacement cost and (ii) ensuring that resettlement activities are implemented with appropriate disclosure of information, consultation, and the informed participation of those affected.
- To improve, or restore, the livelihoods and standards of living of displaced persons.
- To improve living conditions among physically displaced persons through the provision of adequate housing with security of tenure⁵ at resettlement sites.

2.7.7 Performance Standard 7 (Indigenous People)

Performance Standard 7 recognizes that Indigenous Peoples, as social groups with identities that are distinct from mainstream groups in national societies, are often among the most marginalized and vulnerable segments of the population. In many cases, their economic, social, and legal status limits their capacity to defend

their rights to, and interests in, lands and natural and cultural resources, and may restrict their ability to participate in and benefit from development. Indigenous Peoples are particularly vulnerable if their lands and resources are transformed, encroached upon, or significantly degraded. Their languages, cultures, religions, spiritual beliefs, and institutions may also come under threat. As a consequence, Indigenous Peoples may be more vulnerable to the adverse impacts associated with project development than non-indigenous communities. This vulnerability may include loss of identity, culture, and natural resource-based livelihoods, as well as exposure to impoverishment and diseases. Private sector projects can create opportunities for Indigenous Peoples to participate in, and benefit from project related activities that may help them fulfill their aspiration for economic and social development. Furthermore, Indigenous Peoples may play a role in sustainable development by promoting and managing activities and enterprises as partners in development. Government often plays a central role in the management of Indigenous Peoples' issues, and clients should collaborate with the responsible authorities in managing the risks and impacts of their activities.

The major objectives these standards are:

- To ensure that the development process fosters full respect for the human rights, dignity, aspirations, culture, and natural resource-based livelihoods of Indigenous Peoples.
- To anticipate and avoid adverse impacts of projects on communities of Indigenous Peoples, or when avoidance is not possible, to minimize and/or compensate for such impacts.
- To promote sustainable development benefits and opportunities for Indigenous Peoples in a culturally appropriate manner.
- To establish and maintain an ongoing relationship based on Informed Consultation and Participation with the Indigenous Peoples affected by a project throughout the project's life-cycle.
- To ensure the Free, Prior, and Informed Consent of the Affected Communities of Indigenous Peoples when the circumstances described in this Performance Standard are present.

2.7.8 Performance Standard 8 (Cultural Heritage)

Performance Standard 8 affirms the importance of cultural heritage for current and future generations. Consistent with the Convention Concerning the Protection of the World Cultural and Natural Heritage, this Performance Standard aims to ensure that developers protect cultural heritage in the course of their project activities. In addition, the requirements of this Performance Standard on a project's use of cultural heritage are based in part on standards set by the Convention on Biological Diversity. Objectives

- The objectives the standards are:-To protect cultural heritage from the adverse impacts of project activities and support its preservation.
- To promote the equitable sharing of benefits

3. DESCRIPTION OF THE PROJECT

3.1 Introduction

The Proponent, CBK Pension Fund has proposed to embark on an iconic project development to build its Pension tower of twenty seven floors (27) on plot **L.R 209/4976 and 4977** within Nairobi city. The location of the mentioned proposed site is in between Harambee Lane and Haile Selassie Lane behind AGIP house, adjacent to vigilance house, now being used by CBK staff as a parking space. It is an enclosed area.

The project shall be an upscale project that will fully showcase the urban vitality and modern atmosphere of Nairobi while making full use of the geographic advantage, the public interest and the profound local culture. The components of the project as shown in the architectural drawings include:

- Basement 01 carrying 48 Parking spaces
- Basement 02 carrying 35 parking spaces
- Ground floor contains Main entrance, commercial spaces 1-5, Transformer room, switch room, plant room among other components.
- 1st - 4th floor contains parking spaces each floor carrying 49 parking spaces,
- 5th floor has a restaurant and auditorium,
- 6th-25th office spaces,
- 26th -27th a pent house and office space.

This project will be one of the key projects for future developments of Nairobi. This location as well as the functional context is well chosen to support the proposed project as the project conforms to zoning specifications as issued by the Nairobi City County.

3.2 Project location

The proposed project is on plot **L.R 209/4976 and 4977** behind AGIP house between Harambee and Haile selassie lane. The proposed development is a 27th floors building nearing the tallest building in the city which is the Times tower which is about 20metres from the site. Other buildings neighboring the site include the CFC bank who are the tenants of the CBK pension fund and are occupying the

CBK pension fund house, the vigilance house which is the police headquarters in Kenya and that will enhance or boost the security of the proposed CBK tower.

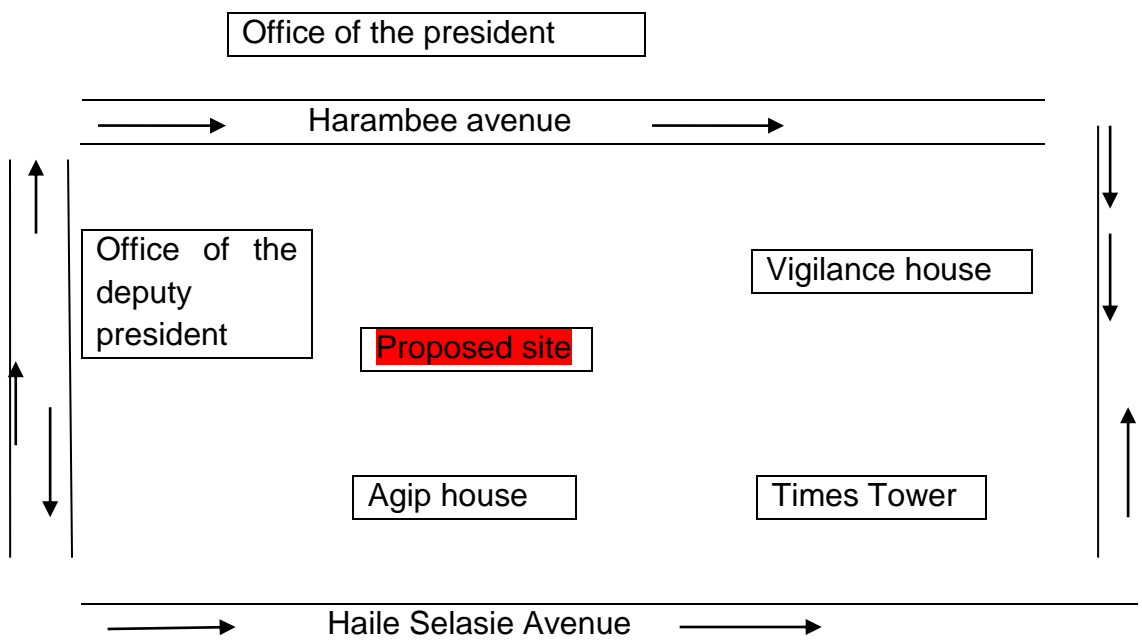
Other great neighbors include

- The office of the president
- The office of the deputy president
- Agip house

The GPS coordinates are (1.2921° S, 36.8219° E)

3.3 Access to the Proposed Project site

The proposed project site is located within Nairobi CBD, it is located in between Harambee avenue and Haile Selasie avenue along Harambee lane and Haile Selasie lane and behind Agip house. Other neighbouring buildings is times tower to the right, directly adjacent to vigilance house.



3.4 General Site Analysis

From the initial analysis of the site by the project implementation team, the site was found to be good and of pleasant weather. Wind direction was found to move east to West. The site has is currently serving as parking lot for the tenant CFC

bank staff, the staff and visitors of pension fund house. Within the parking ground there are two back up generators. The CBK pension house and its tenants enjoy the water supply by the Nairobi water and back up water from the borehole in the site that is also supplying water to CBK headquarters. Being a neighbor to the vigilance house the headquarters of the police in Kenya, office of the president and deputy president the proposed site is and will enjoy the privileges of security.



Picture 2: The backup generator on site

Proposed project site is well connected to the national electric grid (KPLC) and Nairobi City Water and Sewerage Systems. Hydro-geological studies show potential ground water that can be utilized during the project implementation. One main borehole supplying the Central Bank of Kenya headquarters is in place and the proponent says there is a possibility of drilling another borehole. The proponent is advised to provide the plans and Report to the relevant Authorities before drilling .

It is also noted that the proposed project is in tandem with its neighbors, which are mostly commercial developments. The area has been zoned as commercial and Offices by the City Council of Nairobi –City planning department.

3.5 Project Description and design

The project shall be an upscale project that will fully showcase the urban vitality and modern atmosphere of Nairobi while making full use of the geographic advantage, the public interest and the profound local culture. The components of the project as shown in the architectural drawings include:

- Basement 01 carrying 48 Parking spaces
- Basement 02 carrying 35 parking spaces

- Ground floor contains Main entrance, commercial spaces 1-5, Transformer room, switch room, plant room among other components.
- 1st - 4th floor contains parking spaces each floor carrying 49 parking spaces,
- 5th floor has a restaurant and auditorium,
- 6th-25th office spaces,
- 26th -27th a pent house and office space.
- Roof top restaurant will be all above 3rd floor and at the lower level outside there will be a sitting area
- Main entrance will be on the left side, along Haile Selasie lane .the main entrance will be on the existing building that will be renovated.

N/B for more understanding of the design check the attached architectural drawings

3.5.1 Infrastructure

The premise will have a comprehensive infrastructure including adequate parking space as described in the architectural drawings .Basement 01 carrying 48 Parking spaces ,basement 02 carrying 35 parking spaces 1st - 4th floor contains parking spaces each floor carrying 49 parking spaces and driveways, water storage facilities, electricity distribution, garden, security considerations and water and sewer connections amongst other facilities. Being 27 floors there will be an elevator for easy transportation services to different destinations within the building

3.5.2 Water reticulation system

Water from the city council of Nairobi and the existing borehole water will be used during construction and occupation phases. The proponent is proposing another borehole within the site to supplement the existing water sources. More so there will be water storage tanks to increase water capacity at the project site to the required amount.

3.5.3 Waste / Sewerage

The building will be connected to the Nairobi City Water and Sewerage Company sewerage system within the town centre. Solid waste management will consist of dustbins cubicles (waste receptors) located appropriately within the compound and building to the main entrance of the compound. The wastes will be protected from rain and scavenging animals. This waste will then be collected by a contracted waste transporter registered as such by NEMA as per the Environmental Management and Coordination (Waste Management) Regulations 2006.

3.5.4 Fire fighting Systems

All floors, including the car park, will be protected by sprinklers designed in accordance with NFP. All areas will be protected with the exception of electrical equipment rooms, lift shafts, small washrooms and cupboards. Hose reels will be provided for the use of occupants in event of fire. Various protection systems including oil leak detection, local water leak detection, major water leak protection, water supply protection and high temperature alarms will be installed for critical installations and where required. A fire lane and security checks have also been incorporated in the design to cater for the emergencies around the building.

3.5.5 Lighting Systems

Corridor and security lighting will be managed by a lighting control system comprising central controllers, area controllers, lighting control modules, occupation sensors, LED Lighting, multi sensors and software. Lighting will be dimmable and be under daylight and occupancy controls. To save energy, provision is made for lighting controls with; daylight linked dimming, occupancy controls in spaces which are not continuously occupied including the car park, time and daylight sensor controls on external lighting, energy management, lamp management monitoring for failure and integration for control and monitoring of emergency lighting.

3.5.6 Electricity supply and Back-up Power Supply

The proposed project development will get its power supply from the nationwide power distributors KPLC. In case of any black out there are two high voltage diesel using generators that will provide power backups.

3.5.7 Safety and Security Systems

A fully automatic fire alarm system will be installed incorporating the functions of fire detection and alarm, voice alarm and emergency voice communication. The building will be provided with a distributed type Fire Alarm System comprising multiple alarm collection panels, linked into the a high integrity data collection reporting to the building Fire Command Centre and repeater panels as agreed with the fire service. A CCTV system will be installed with fixed and cameras monitoring the main access points and final escape exits and additional key internal areas, including the car park, lift lobbies/communication corridors on each floor. The system will incorporate monitoring and recording facilities.

3.5.8 Traffic Management

Traffic Impact Assessment (TIA) on the proposed Development has been undertaken. A TIA is required in order to demonstrate compliance with the Nairobi County Council development regulations and to provide traffic engineering input to add value to the design process by considering access and car parking issues in the early stages of design. The TIA also provides information on the following:

- Current traffic situation
- Construction traffic situation
- Operation/occupation traffic situation
- Pedestrian consideration
- Integration of the traffic management with security consideration

This report will be submitted in support of a development application to Nairobi County Council (NCC) and Kenya Urban Roads Authority (KURA). Traffic has been put into consideration in the design with a clear separation of external and internal traffic and a minimum number of entry and exit points to the public street during and after construction phase. **(Check the attached Traffic Assessment report)**

3.5.9 Green Building Technologies

Green building (also known as green construction or sustainable building) has been incorporated in the design of the structures, using processes that are environmentally responsible and resource-efficient throughout a building's life-cycle: from siting to design, construction, operation, maintenance, renovation, and demolition. Green building has been considered to find the balance between the proposed development and the sustainable environment. A close cooperation of the design team, the architects, the engineers, and the client at all project stages has ensured that most the green building technologies have been considered in the planning and design stage of the proposed development. Some of the technologies adopted include:

3.5.10 Parking area and driveway

From the architectural drawings 181 well demarcated spacious and provided with lights parking spaces are proposed with driveways. The parking bays will be inclined to a degree that does not allow stagnation of water and thus linked to storm water drainage system.

3.5.11 Landscaping

The site will be landscaped after construction, using plant species available locally. This will include establishment of flower gardens to improve the visual quality of the site.

A functional landscaping and tree planting scheme as approved by the department of environment, city council of Nairobi shall be put in place to guide the aesthetic and beautification programme. A designer will be contracted for that purpose.

3.6 Description of the project's construction activities

3.6.1 Pre-construction investigations

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

3.6.2 Clearing the proposed area

The proposed site is currently occupied by parking structures and the CBK pension fund house. There site clearance will involve demolition and renovation of the existing CBK pension house structures to pave way for the constructions of the proposed 27 floors CBK pension tower.

3.6.3 Sourcing and transportation of building materials

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

Furthermore selection of contractor and transporter will be determined by their environmental credentials. For instance, company's environmental practices, compliance to Environmental Audit Requirements and compliance to Waste Management Regulations 2006 will form part of environmental credentials to be considered.

3.6.4 Storage of materials

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

3.6.5 Excavation and foundation works

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

3.6.6 Masonry, concrete work and related activities

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

3.6.7 Structural steel works

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

3.6.8 Roofing

Roofing activities will include galvanized steel hollow sections as shades to the roof terrace.

3.6.9 Electrical work

Electrical work during construction of the premises will include installation of electrical gadgets and appliances including electrical cables, lighting apparatus, sockets etc. In addition, there will be other activities involving the use of electricity such as welding and metal cutting. As per the architectural designs advice is that all conducts must be laid before plastering

3.6.10 Plumbing

Installation of pipe-work for water supply and distribution will be carried out within the building and associated facilities. In addition, pipe-work will be done to connect sewage from the premises to the Nairobi City Water and Sewerage Company (NCWSC) sewer system, and for drainage of excess storm water from the rooftop into the peripheral city council storm water drainage system. Plumbing activities will include metal and plastic cutting, the use of adhesives, metal grinding and wall drilling among others.

The proponent is also advised to submit proposed design drawings for water and sewerage reticulation system to NCWSC for scrutiny and approval.

3.7 Description of the project's operational activities

3.7.1 Occupation

During operation phase there will be production of wastes which has to be disposed off in an environmentally sound manner as discussed below.

3.7.2 Solid waste and waste water management

The occupants will provide facilities for handling solid waste generated within the facility. These will include dustbin cubicles for temporarily holding waste within the premises before final collection and disposal by appropriate contracted firm licensed by NEMA as per the Waste Management Regulations, 2006. Segregation at source will be emphasized.

Sewage generated from the building will be discharged into NCWSC sewerage system, while storm water from the project area will be channeled into the council's storm water drainage system.

3.7.3 Cleaning

The proponent will contract a licensed cleaning firm to undertake the cleaning of the building, compound and to maintain gardens. Rainwater harvested and stored will be used to water the gardens and cleaning of the pavements. This will minimize and conserve water use from the NCWSC mains and borehole supplement.

3.7.4 General repairs and maintenance

The building and associated facilities will be repaired and maintained regularly during the operational phase of the project. Such activities will include repair of building walls and floors, repairs and maintenance of electrical gadgets and

equipment, repairs of leaking water pipes, painting, maintenance of flower gardens and replacement of worn out materials among others.

3.8 Description of the Project's Decommissioning Activities

3.8.1 Demolition Works

Upon decommissioning, the project components including buildings, pavements, drainage systems, parking areas and perimeter wall will be demolished. This will produce a lot of solid waste, which will be reused where feasible for other construction works or if not reusable, disposed of appropriately by a licensed waste disposal company.

3.8.2 Dismantling of Equipment

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

3.8.3 Site Restoration

Once all the waste resulting from demolition and dismantling works is removed from the site, the site will be restored/ rehabilitated through replenishment of the top soil and vegetation using indigenous plant species.

3.8.4 Building Materials and Energy Used

During the construction phase, several building materials will be required. Where possible, building materials will be sourced locally, with importation sought where necessary e.g. finishes & fittings. Materials such as sand, ballast and hard core can be obtained from quarrying companies in the surrounding areas.

The main sources of energy required for construction of the mixed development complex include mains electricity and fossil fuels (especially diesel). The proponent will promote efficient use of building materials and energy through proper planning to reduce economic and environmental costs of construction activities.

3.8.5 Solid Waste Generated

A lot of solid waste is expected to be generated during construction of the project and these will include metal cuttings, rejected materials, surplus materials, surplus spoil, paper bags, empty cartons, empty paint and solvent containers, broken glass among others. The proponent has plans to minimize the generation of such waste and to ensure proper disposal procedures.

Where possible this waste shall be put into use within the same project.

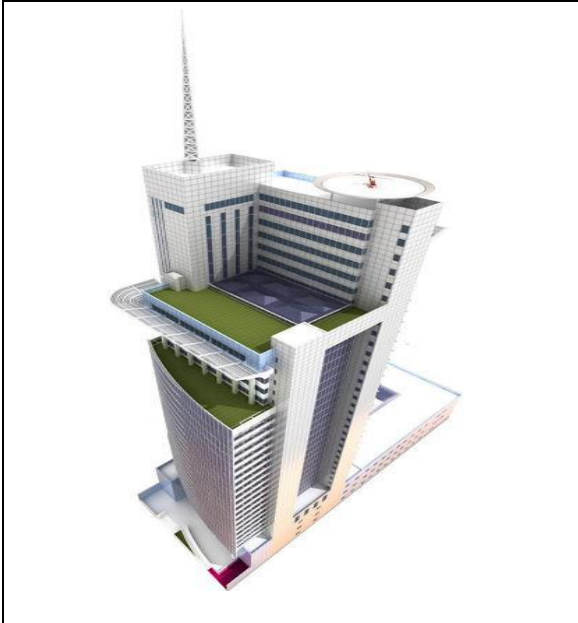
3.8.6 Liquid Effluents Generated by the Project

During construction, liquid effluents emanating from the project site will include site drainage and run-off. Such run-off may result from curing processes and drainage of areas filled with storm water. The major liquid effluent during the operation of the project will be sewage. In addition, cleaning/washing operations will lead to generation of substantial amounts of liquid effluents.

3.9 Other Similar (Completed and Ongoing) Projects within Nairobi County

Buildings remained relatively short in Nairobi city until the late 1960s when the city experienced its first skyscraper boom. From 1960 to 1980, Nairobi witnessed a major expansion of skyscraper and high-rise construction. Hilton Nairobi (1969), the NSSF Building (1973), and the Kenyatta International Conference Centre (KICC) in 1974 are among the oldest tall buildings within Nairobi. Many of the city's office towers were completed during this period, such as the New Central Bank Tower. A near twenty-year lull in building construction came after this expansion, though Nairobi has experienced a smaller second building expansion beginning in the late 1990s and continuing into the present.

The current completed tallest tower in Nairobi is the UAP Park Towers which is 143 m (469 ft) tall with 33 levels. Other similar ongoing landmark projects within Nairobi include the Britam Towers (38 levels) in Upper Hill, Hazina Trade Centre in Nairobi (38 levels) CBD, Jabavu Towers in Upper Hill (45 levels), FCB Tower in Kilimani, KCB Plaza in Upper Hill (20 levels), UAP Park Towers in Upper Hill, University of Nairobi's Chandaria Towers among other proposed and ongoing Large scale master plans in the outskirts of Nairobi region including: the Konza City in Konza, Tatu city in Ruiru, Garden City in Nairobi, Kasarani Hills,



Architectural impression of Hazina Trade Centre Within Nairobi CBD



Perspective of the FCB Tower within Kilimani Area



UAP Park Towers within Upper Hill area



Britam Towers in Upper Hill

3.10 Project Design and Cost

The Proponent, CBK pension fund has commissioned qualified consultants to undertake detailed investigations and detailed design for the proposed

development project to prepare tender documents and determine the project cost among other aspects as per specified project timelines. The projects' gross cost estimates as per the Design Engineers amounts to Kshs. 2.49 Billion. The EIA License fee, prescribed as 0.1% of the total project cost, (to a minimum of Kshs. 10,000) payable to NEMA is **Kshs. 2.49 million** Payable on submission of the project Report.

(Check annex for the project cost estimates)

4. PUBLIC PARTICIPATION

4.1 Introduction

This chapter describes the process of the public consultation/participation followed to identify the key issues and impacts of the proposed CBK pension tower. Views from the general public, local leaders, surrounding institutions and development partners who in one way or the other would be affected by the proposed project were sought. The purpose for such consultations is to identify the positive and negative impacts and subsequently promote proposals on the best practices to be adopted and mitigate the negative impacts respectively. It will also help in identifying any other miscellaneous issues which may bring conflicts in case project implementation proceeds as planned.

4.2 Methodology used in the CPP

In general, the following Steps will be followed in carrying out the entire CPP process:-

- I. Identification of institutions and individuals interested in the process- database of the interested and affected parties
- II. Administration of questionnaires to the different target groups and local community members along the proposed project Site
- III. Hold on site meeting with the stakeholders

Oral interviews and administering of questionnaires was undertaken. Door to door public consultations were conducted for the stakeholders neighbouring the project site. A public meeting (baraza) was also held in order to solicit the opinion of the neighbouring community and also ensure comprehensiveness in the ESIA study

as stipulated in the Environment Management and Coordination Act, 1999. Public consultation was conducted by a team of qualified EIA experts on Thursday of 31st March 2016 in CBK pension fund house in their parking ground which is the proposed site at 10:00 AM.

The various concerns and proposed mitigation measures suggested by the public, neighbours and other stakeholders have been integrated in the report.

(Annexed is the minutes of the meeting, the attendants list and some few questionnaires that were responded to before the meeting).

4.3 Objectives of the consultation and public participation

The objective of the Consultation and Public Participation (CPP) as required in EMCA, 1999 was to:-

1. Disseminate and inform the public and other stakeholders about the proposed CBK Pension Tower project with special reference to its key components, location and anticipated impacts.
2. Create awareness among the public on the need for the ESIA for the proposed project.
3. Gather comments, concerns and suggestions of the interested and, would be affected/interested parties.
4. Ensure that the concerns of the interested and, would be affected/interested parties were known to the decision-making bodies and the proponent at an early phase of project development planning.
5. Establish a communication channel between the interested, would be affected/interested parties, the team of consultants and the Government.
6. Incorporate the information collected in the study by EIA Experts.

The purpose for such a process was to identify the positive and negative impacts of the project and subsequently suggest mitigation measures. It also helped in identifying other miscellaneous issues which may bring conflicts during project implementation phase.

4.4 Stakeholders' consultation

Various stakeholders and affected parties were consulted during the ESIA process (see list of the people/Stakeholders consulted in the table below). A comprehensive list of the people/stakeholders who participated in the interviews and public meeting and the respective minutes are attached as annex and also

the questionnaires that provides the stakeholders comments, opinions, views and concerns.

List of members of the public consulted

No.	Name	Institution	E-Mail
1	Gardy Onguru	Katrina Management Consultants	katrinamcl@yahoo.com
2	Moses Okemwa	ARPRIM Consultants	moses.okemwa@gmail.com
3	Jacton Mwembe	Shomax	jmwembe@gmail.com
4	Enos Alolo	Shomax	enos@shomax.co.ke
5	David Mwangi	ARPRIM Consultants	iamdavidmwangi@gmail.com
6	Jane M. Kott	CBK Pension Fund	kotyne@centralbank.go.ke
7	A. T. Onyango	CBK Pension Fund	onyangoat@centralbank.go.ke
8	M. Shoni	Shomax	shoni@shomax.co.ke
9	Justus K.	KICC	Justus.kivindyo@kicc.co.ke
10	F. Ambuche	KURA	fambuche@kura.go.ke
11	Hayowa Hesbon	ARPRIM Consultants	hesbon.hesbon@gmail.com
12	Stella Mwikali	WRMA	stellarmwikali@gmail.com
13	Eunice Waema	Vigilance House	waemaeunice@yahoo.com
14	MwangiNg'anga	Vigilance House	mzalendooh@gmail.com
15	Zephania Ouma	NEMA	zouma@nema.go.ke
16	Eric Ndiga	ARPRIM Consultants	ndigaeric@yahoo.com

4.5 List of identified key stakeholders to be consulted

- CBK Pension Fund
- Arprim Consortium (project designers and Architects)
- The Environmental Consultants (Katrina Management Consultants Ltd)

- Traffic Engineers
- Project Planners
- Nairobi City County Planning Department
- National Environment Management Authority
- Nairobi City Water and Sewerage Company
- Water Resources Management Authority
- Chamber of commerce and industry
- Management of Times Tower
- Management of AGIP House
- Management of Vigilance House
- Management of CFC Bank
- Management of the Office of President
- Management of the Office of Deputy President
- Management of KICC
- Management of Electricity House
- Kenya Urban Roads Authority
- Kenya Civil Aviation Authority
- Quantity Surveyor
- Management of Extelecom House
- Kenya Polytechnic
- Kenya Railways

4.6 Background of CPP

From the field work, it was apparent that the majority of the stakeholders were aware of the proposed project development and the direct impacts. The proposed construction of the commercial, hotel and office development units was nevertheless received with mixed reactions by the stakeholders as they anticipated numerous impacts both negative and positive. The local communities and major stakeholders independently gave their views, opinions, and suggestions as in the best of their interest and in the interest of the factors that affected the circumstances, influences, and conditions under which their organizations exist.

4.7 Issues identified during the site visit and the public meeting

This sub-section covers the views, concerns and opinions of the key stake holders (local leaders, neighbors, institutions/organizations, interested persons or groups and affected persons). It highlights both positive and negative socio-economic and environmental impacts anticipated during the construction and operational phases of the project. This is followed by suggested mitigation measures that the developer should incorporate to minimize environmental degradation and promote

sustainable development. This section ends by highlighting the opinions and expectations of the stakeholders.

4.8 Positive issues raised

4.8.1 Creation of Employment Opportunities

The local community was optimistic that the construction of the proposed AVIC International Africa Headquarters project will open up new fields of employment. Despite the fact that most of the project will need skilled labour force, the people expressed hope that they will be able to access employment once the project commences mostly as casual workers. However, they wanted assurance that the locals will be given the first priority for employment once the construction of the project begins. This will be a source of income for several individuals and households and hence is expected to boost the GDP and improve the living standards of the local people.

4.8.2 Increased office, conference rooms and restaurants

Neighbours and the general public interviewed were of the opinion that the proposed development will come along with a gain in the general availability of office space, restaurants, conference rooms and auditorium which are not adequate at the moment. Such facilities are limited within the project area, and Nairobi at large, hence the implementation of the proposed project will be beneficial.

4.8.3 Potential growth of the economy

Through the use of locally available materials during the construction phase of the proposed project, material such as cement, concrete and ceramic tiles, timber, sand, ballast electrical cables etc., the project will contribute towards growth of the economy by contributing to the gross domestic product. The consumption of these materials, fuel, oil and others will attract taxes including VAT which will be payable to the government hence increasing government revenue while the cost of these raw materials will be payable directly to the producers.

4.8.4 Provision of market for supply of building materials

During the construction phase of the proposed project, it was found out that the neighbouring businesses and locals interviewed who dealt with supply of building materials will benefit from supplying the materials and this will improve their business opportunities. Among the identified materials which can be supplied included cement, steel, timber, pipes, sand, ballast iron sheets, Nails glasses among others.

4.8.5 Increase in government revenue

The public and the various stakeholders interviewed expressed their optimism that there will be an increase in revenue collection due to the fact that there will be an increase in business opportunities within the project area and beyond.

4.8.6 Optimal use of land

The public interviewed were optimistic that the construction of the CBK pension tower within the proposed location will lead to opening up the area by adding more office, conference rooms, restaurants and auditorium and parking space that ensures optimal land use as compared to the current use or any perceived future use of the said plot.

4.8.7 Increased value of land

The public expressed confidence that once the project will be completely constructed; many investors will opt to buy land near the project site. This they say is bound to push high the demand for land along and near the site which in turn will increase the value of land in the areas surrounding.

4.8.8 Increased Security in the area due to lighting provision at night and 24 hour CCTV surveillance.

The local residents and businesses were optimistic that the establishment of the project will lead to improved security situation in the neighbourhood due to the lighting provisions at night and 24 hours CCTV surveillance which is currently not in place. This will also enhance the working morale in the neighbouring businesses.

4.8.9 Improvement of road infrastructure

The neighbours were optimistic that once the proposed project is completed, the nearby roads will be repaired and pathways established. The current road is narrow and does not have a paved pathway. The proposed project encompasses the widening of the nearby road Harambee and Haile Selassie lanes and avenues and paving walkways used by pedestrians.

4.9 Negative Issues

4.9.1 Potential Water Pollution

From the public consultation conducted, it was found out that there will be a potential pollution of the water resources nearby. The waste water which will emanate from the construction activities together with the storm water runoff will all contribute to the water pollution of the borehole water existing in the proposed site.

4.9.2 Noise Pollution

The residents and neighbours expressed their fears over noise pollution that would emanate from the construction works and the vehicles during the operation phase. Sensitive neighbouring businesses like the KRA in the Times tower, Agip house, vigilance house and also the office of the deputy president stated that noise may interfere with their quiet working environment.

The lead expert indicated that appropriate measures to minimize noise impacts will be put in place. Construction activities that produce too much noise will be limited to daytime. Appropriate protective equipment will be issued to construction workers to protect them from construction noise. Proper planning will also minimize the frequency of materials transportation. The contractor and/or the proponent should ensure that works are carried out during daytime i.e. from 8 a.m. to 5 p.m.

4.9.3 Vibrations

The most immediate residents expressed fear over vibration produced by the construction machines and other moving machines in the construction site and this has likely effects on the strength of the buildings nearby. Most of them were worried about the blasting activities and excessive vibrations from construction and compaction activities that may cause buildings and structures develop cracks.

As a mitigation measure, the lead environmental said that this proposed activity is guided by the Environmental laws and regulations which did not exist in the time of earlier quarrying activities and hence they were now protected from unnecessary harm from these activities. He indicated that the contractor will employ the latest technology, which produces fewer vibrations as the requisite licenses may require. The Environmental Consultant indicated that the project will employ an Environment Health and Safety Officer to advise the contractor and monitor the activities of the quarry to ensure compliance. He also advised the local liaison and monitoring committee to work closely with the contractor officials to resolve such cases.

4.9.4 Traffic congestion and accidents due to the size of the project

Nairobi city is the hub of businesses where vehicular movement is high. This is usually observed in the busy morning and late evenings. The vehicular movement during construction phase will worsen the situation in the locality. The public sought to know what options have been put in place to reduce the traffic snarl-ups and accidents.

The traffic consultant through his traffic assessment report attached to this report informed the public that the designs have incorporated to expand the current narrow Harambee lane. Decelerating lanes and accelerating lanes have also been incorporated to reduce the piling up of traffic on major entry points to the project site. The extension of the lanes is meant to enhance access control into the development. The extra Lanes shall therefore hold the traffic waiting for security checkups at the access control centers without affecting the normal traffic not leading to the property along these roads.

4.9.5 Drainage within the proposed project site

Among the issues raised was the concern on the road design drainage. According to the traffic assessment expert the drainages has been incorporated and during rains, the drainage structures often block leading to flooding of the roads. The public that drainage consideration along the roads neighboring the property shall be incorporated to ensure proper flow of storm water.

It was also stated that proposal has been made to relevant agencies in addressing the current inadequacies.

4.9.6 Social amenities

One member from the public inquired what social amenities shall be incorporated in the project for the public. The public was informed that the project shall have a

number of social amenities open to the public such as restaurants, shops largely on the office and hotel development' side. For the residential apartment, there shall be private amenities for the residents alone and their visitors.

4.9.7 Effects of wind and sunlight

Times tower representative sought to know if measures have been put in place for the reflection and temperature effect of the towering building heights (effects of wind shadows). The architect informed the meeting that the development will use modern building technology in design, construction and its entire equipment hence minimal disturbance shall be recorded to the neighborhood and normalcy in their operations shall be ensured.

The architect further stated that adequate ventilation spaces between the roads and neighbors and respective setbacks shall be followed and maintained. The buildings shall use reflection reduction glasses with high specifications and reducing to a large degree the glare, heat and reflectivity effect of the glasses.

4.9.8 CFC bank business disruption and loss of parking space

CFC bank being the tenants to CBK pension fund house will lose their businesses after being given a notice to vacate the building because of the coming project which will affect the building they are occupying currently. The proposed project will be developed where currently is serving as a parking ground so those people who used to park their cars there including the staff of CBK pension house and those of CFC bank will lose parking ground.

4.9.9 Waste Management challenges

Residents in the neighbourhood expressed their concerns about the large amounts of solid waste that will be generated during construction of the project. These includes metal cuttings, rejected materials, surplus materials, surplus spoil, excavated materials, paper bags, empty cartons, empty paints and solvent containers, broken glass among others. Solid wastes if not well managed have a potential of causing accidents and disease outbreaks as they form suitable breeding grounds for vectors of cholera and typhoid. Malaria outbreak could also be exacerbated by the presence of open water ditches for breeding of anopheles mosquitoes.

Some of the excavation material will be rendered unusable and thus will have to be disposed off. This also applies to some of the soil/rocks which may not be reusable

after excavation processes are complete. Neighbours requested for an affirmative mitigation measures whereby all these materials to be collected, transported and disposed of appropriately in approved designated areas. Also, they requested that other alternative uses of these materials should be found e.g. filling excavated areas at the site. The lead expert reaffirmed that four (4) EHS officers will be stationed on site to ensure the EMP and all the recommendations are adhered to during construction period.

4.9.10 Dust Emissions

The neighbouring businesses and residents expressed concern over possibility of generation of large amount of dust and fumes within the project site and surrounding areas as a result of excavation works and transportation of construction materials.

The lead expert indicated that measures will be put in place to ensure that dust levels at the site are minimized through sprinkling water in areas being excavated and along the trucks used by the transport trucks and diversions within the site and use of dust nets. These measures will be supervised by the on-site EHS officers.

4.9.11 Occupational, Health and Safety Issues

During construction, it is expected that construction workers are likely to have accidental injuries and hazards as a result of accidental occurrences, handling hazardous waste, lack or neglect of the use of protective wear etc. The participants requested that all necessary health and safety guidelines should be adhered to so as to avoid such circumstances during operation phase.

4.9.12 Increased pressure on the existing water and energy resources

The neighboring buildings representative raised the issue of water shortage and power due to the upcoming development but they were informed that CBK has their own borehole and that even now they are supplying their water to some of the neighbors plus they are going to add another borehole .About the energy they are going to install solar systems to help boost the KPLC power supply

As way of ensuring that the contractor complies with the prescribed mitigation measures, the stakeholders recommended the following:

- All relevant approvals must be obtained prior to commencement of construction works.
- Contractor shall provide Construction methodology that should conform with the mitigation measures on some of the adverse impact such as noise, vibrations, dusts, traffic inconveniences, pedestrian safety, occupational safety and health, Reflection, heat and shadowing effects, drainage works, impacts associated with material sites among others as will be prescribed in the Environmental, Social and Occupational Safety and Health Management Plan.
- Environmental, social and occupational Safety and Health consultant (Katrina Management Consultants) to be on site to monitor construction phase of the project to ensure that the Environmental, Social and Occupational Safety and Health Management Plan is adhered to and reporting done to Regulatory Authorities as required.
- As effective Grievance Redress Mechanism (GRM), monthly consultative meeting will be held during construction phase to ensure that any emerging concerns are addressed promptly and with the finality required.

5. BASELINE INFORMATION OF THE STUDY AREA

5.1 Introduction/Data information gathering procedure

Project information was gathered through discussions with the project proponent. Site visits were also undertaken for investigation of the site status and environmental status in the immediate neighbourhood. In addition, a review of the proposed project operations and activities and the intended raw materials inputs was carried out at the preliminary stages of this assessment. Project records on approvals and permits from the relevant Government Departments were reviewed. Other physical observation taken into consideration were the geological status, drainage systems, water supply and waste disposal in the area, land-use patterns as well the typical socio economic activities around the proposed site.

A field database addressing various aspects of the proposed project and the environment had been pre-prepared for use in the data/information gathering. The datasheet was adopted from the international Environmental protocol, tailored to address issues listed in the Environmental (Impact Assessment and Audit) Regulations 2003.

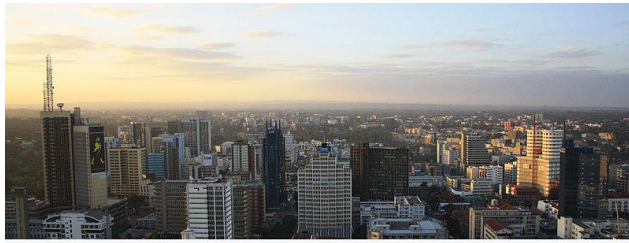
5.2 Description of the area.

5.2.1 The site Location

The Proponent, CBK Pension Fund has proposed to embark on an iconic project development to build its Pension tower of twenty seven floors (27) on plot **L.R 209/4976 and 4977** within Nairobi city. The exact location of the mentioned proposed site is in between Harambee Lane and Haile Selassie Lane behind AGIP house adjacent to vigilance house.

Nairobi locally is the capital and largest city of Kenya. It is famous for having the Nairobi National Park, the world's only game reserve found within a major city. The city and its surrounding area also form Nairobi County, whose current governor is Dr. Evans Kidero.

The name "Nairobi" comes from the Maasai phrase *Enkare Nairobi*, which translates to "cool water". The phrase is also the Maasai name of the Nairobi river, which in turn lent its name to the city. However, it is popularly known as the "Green City in the Sun", and is surrounded by several expanding villa suburbs



Nairobi city

Harambee Avenue

5.2.2 Political divisions

The City of Nairobi enjoys the status of a full administrative County. The Nairobi province differs in several ways from other Kenyan regions. The county is entirely urban. It has only one local council, Nairobi City Council. Nairobi Province was not divided into "districts" until 2007, when three districts were created. In 2010, along with the new constitution, Nairobi was renamed a County.

5.2.3 Economy



CBK headquarters in Nairobi.

Nairobi is home to the Nairobi Securities Exchange (NSE), one of Africa's largest. The NSE was officially recognized as an overseas stock exchange by the London Stock Exchange in 1953. The exchange is Africa's 4th largest in terms of trading volumes, and 5th largest in terms of Market Capitalization as a percentage of GDP.

Nairobi is the regional headquarters of several international companies and organizations. In 2007, General Electric, Young & Rubicam, Google, Coca-Cola, IBM Services, Airtel, and Cisco Systems relocated their African headquarters to the city. The United Nations Office at Nairobi hosts UNEP and UN-Habitat headquarters.

Several of Africa's largest companies are headquartered in Nairobi. KenGen, which is the largest African stock outside South Africa is based in the city. Kenya Airways, Africa's fourth largest airline, uses Nairobi's Jomo Kenyatta International Airport as a hub.

Nairobi has a large tourist industry, being both a tourist destination and a transport hub.

5.2.4 Land use

Land use/cover in Nairobi City is changing rapidly because of the increased interactions of human activities with the environment as population increases. The project site lies within the City Council of Nairobi in an area zoned for mixed development use and mostly commercial use; it is rare to find residential uses within the city.

5.2.5 Topography

Nairobi lies at an average altitude of 1,680m above sea-level, but this height ranges from 1500m (to the East) to 2300m (to the West). It is located at longitude 36o 50'East and latitude 1o 18' South about 140 km South of the Equator and situated at an elevation of about 5,500 feet above sea level, placing its high affect for the cooler air to keep its temperatures moderate

5.2.6 Geology and Soils

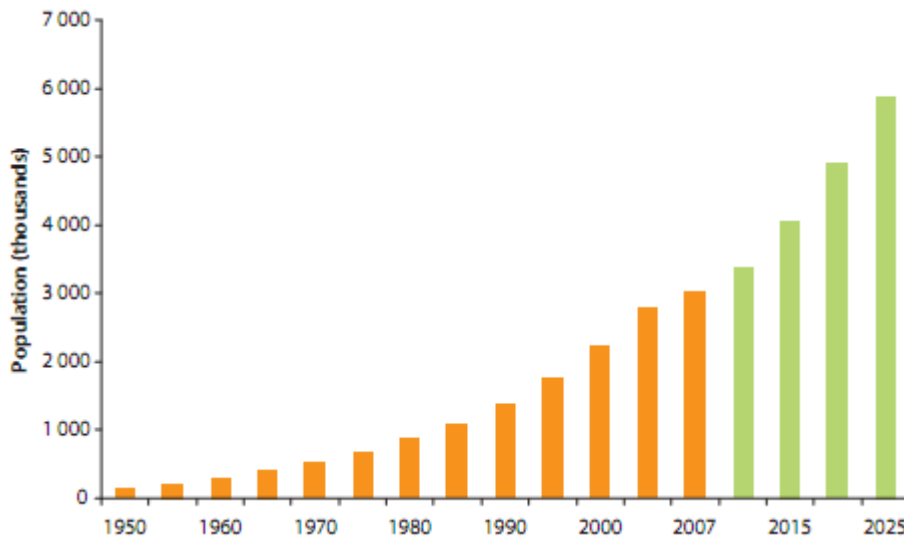
The soils in Nairobi are products of mainly weathering and erosion of underlying volcanic rocks under relatively high temperatures, rainfall and poor drainage. As a result of impeded drainage of the plains, the soils are black to dark grey clays (Grumosolic) comprising black cotton soils with calcareous and non-calcareous variants. The project will not cause physical change to the environment because in terms of topography, slope and stability of the soils.

The rocks in the Nairobi area mainly comprise of a succession of lavas and Pyroclastics of the Cainozoic age and overlying the foundation of folded Precambrian schists and gneisses of the Mozambique belt. The crystalline rocks are rarely exposed but occasionally fragments and found as agglomerates derived from the former Ngong volcano. The soils of the Nairobi area are products of weathering of mainly volcanic rocks. Weathering has produced red soils that reach more than 15m in thickness in some parts of Nairobi.

5.2.7 Population

In the year 1901, an estimate of about 8,000 people lived in Nairobi. By 1948, the number had grown to 118,000 and by 1962, the city had a population of 343,500 people. From the 2009 census estimates, recorded city's population had risen to 3.363 million (Source: KNBS Census). Nairobi's early growth was fuelled by rural migrants and an exponential growth was experienced between the years 1979 and 1989 when 772,624 rural-urban migrants moved to the city (NEMA 2003). The forces motivating rural-urban migration to Nairobi included better economic prospects, opportunities for higher education and higher wage employment, and the attraction of Nairobi as a market for goods and services.

Nairobi is currently houses over 3.363 million people and an overall population density of 3,079 people per square kilometer. A growing economy and swelling population numbers from both in-migration and natural growth are continually increasing the city's population size. A significant number of commuters from satellite towns such as Thika, Naivasha, Ngong, and Machakos commute to Nairobi daily to work or bring goods and supplies. Daily commuters from such satellite towns contribute an estimated additional half-million people to the city's population.



Nairobi's Historical and Projected Population, 1950-2025 (Source: KNBS 2008)

Nairobi's large and growing population is one of the main forces driving the city's overwhelming environmental challenges. Ongoing rural to urban migration, high natural birth rates, and poor/inappropriate city planning conspire to continue degrading the city's water and air quality. In turn, environmental degradation has impacts on human health and the economy. For the country to achieve the MDGs, progress must be made in Nairobi, as Kenya's capital city and its largest urban center.

5.2.8 General Climate

At 1,795 meters above sea level, Nairobi experiences a moderate climate. Under the Koppen climate classification, Nairobi has a subtropical highland climate. The altitude makes for some cold evenings, especially in the June/July season when the temperature can drop to 10 °C (50 °F). The sunniest and warmest parts of the year are from December to March, when temperatures average the mid-twenties during the day. The mean maximum temperature for this period is 24 °C (75 °F). There are two rainy seasons but rainfall can be moderate. The long rains form the first season and fall in the months of March to May, and the short rains forming the second rainy season, fall between October and December. The cloudiest part of the year is just after the first rainy season, when, until September, conditions are usually overcast with light drizzles. The mean annual rainfall ranges between 850-1050mm. As Nairobi is located close to the Equator, the differences between the seasons are minimal.

5.2.9 Average Daily Temperatures

The average daily temperature throughout the year varies slightly from month to month with average temperatures of around 17°C during the months of July and August to about 20°C in March. But, the daily range is much higher, with the differences between maximum and minimum temperatures each day around 10 degrees in May and up to 15 degrees in February. Between the months of June to September, South East winds prevail in the coastal parts of Kenya and last up to several days without a break. The clouds cause day temperatures to remain low and most times the maximum temperature stay below 18 degrees Celsius. The minimum temperatures also remain low during cloudy nights, usually hovering around 8 degrees Celsius and sometimes even reaching 6 degrees Celsius. Clear skies in January and February also bring colder nights. The highest temperature ever reached in Nairobi was 32.8 degrees Celsius and the lowest was 3.9 degrees Celsius.

Average Daily Temperature in Nairobi City

Month	Mean Maximum °C	Mean Minimum °C	Mean Range °C
January	26.8	13.1	13.7
February	28.0	13.4	14.6
March	27.4	14.4	13.0
April	24.6	14.3	10.3
May	24.1	14.2	9.9
June	23.1	12.6	10.5
July	22.3	11.5	10.8
August	22.7	11.8	10.9
September	25.3	12.2	13.1
October	26.2	13.7	12.5
November	23.6	14.4	9.2
December	25.1	13.8	11.6
Year	24.9	13.3	11.6

5.2.10 Average Rainfall Amounts

With these routinely high relative humidity figures, it is not surprising that the Nairobi climate is one that produces much rain annually. In fact, from the past 50 years, the expected amount of rain could be anywhere in the range of 500 to 1500 mm, with the average ringing in at 900 mm. The majority of these rainfall figures crash down in Nairobi in one major and one minor monsoon seasons respectively.

The major monsoon season occurs within the months of March to May, and is called the “Long Rains” by the locals. The minor monsoon seasons emerges within the October to December Months, and is called the “Short Rains” by the Nairobi citizens. That is what the meteorologists as a whole know about the monsoon seasons. What they do not know is exactly when these seasons will start. There is usually not an indication of when these rainy seasons will start, since it is difficult to determine when one starts and when the other finishes. Consequently, one may think there is only one rainy season when looking at the annual rainfall amounts .

Annual mean rainfall (mm) based on the records for 50 years

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
48	48	115	195	137	42	15	21	24	52	114	77

5.2.11 Solid Waste Management

Out of 1,600 metric tons of solid wastes generated daily in the City by 2002, only 40 per cent was being collected (Kibwage, 2002). Out of this total the Nairobi City Council and Private Companies combined, only manage to dispose only 47.1 per cent of the total garbage turnover. The accumulated mess of waste collection over the years has continued to be a bottle neck to Nairobi City administrators. By 1986, some of the City residents, who were able and willing to pay for the refuse-collection service, opted for Private Companies (PCs). BINS (Nairobi) Services Limited (BINS Ltd) and Domestic Refuse Disposal Services Limited (DRDS Ltd) were the two private companies that came into the field of Household Waste Management (HWM) in 1986 and 1987 respectively. Since then, over 70 companies have emerged in the city targeting large waste producers like supermarkets, offices, Hotels and residential apartments. The prevailing waste disposal need therefore calls for the need of waste disposal facilities like an incinerator.

5.2.12 Waste Water Management

Nairobi River Basin is the major points of organic, solid waste, and heavy metal pollutants within the basin. Improperly treated sewerage and uncollected garbage have contributed to a vicious cycle of water pollution, water-borne diseases, poverty, and environmental degradation. Water pollution carries environmental and health risks to communities within Nairobi, especially the poor who may use the untreated water directly from the River sources available.

Waste water from homesteads and industries is collected in Nairobi via a system of interconnected channels and flows to Ruai Treatment works where it’s treated and effluent released to the Nairobi River.

However, due to the higher population in the slums within Nairobi, most of the waste water is directly released to the nearby streams and rivers, accounting for the high level of pollution in the rivers. This is currently being addressed by the Rehabilitation and Restoration programme by the Ministry of Environment, Water and Natural Resources. The programme began in 2010 and is aimed at rehabilitation, restoration and sustainable management of the Nairobi River Basin in order to provide improved livelihoods, enhance environmental quality and values through well regulated economic and recreational ventures.

5.2.13 Water source

Ndakaini, Ruiru, and Sasumua dams are the principal sources of water for Nairobi. These dams are all on rivers emanating from the Aberdare Forest (one of Kenya's five "water towers"). Several factors compromise the city's water quality, ranging from natural phenomena such as the high fluoride content in groundwater, to anthropogenic factors such as poor wastewater treatment and environmental degradation both within the city and in the surrounding countryside.

The proposed project's major source of water is the water supplied by the Nairobi City Water and Sewerage Company. This will be boosted by an onsite borehole to supplement water demand in the proposed development. The project area and indeed many areas within Nairobi have a high potential for underground water use by constructing boreholes to supplement the other sources of water supply.

5.2.14 Electricity Source

The project site is connected to electricity supplied by Kenya Power & Lighting Corporation (KPLC).

5.3 Sewerage and other services

The area is served with sewerage services by the Nairobi City Water and sewerage company mains. The proponent will submit proposed design drawing for sewerage reticulation system to Nairobi City Water and Sewerage Company Limited for evaluation and approval.

There are also waste disposal services provided by the council and private companies licensed by NEMA as per the Waste Management Regulations 2006. provision of segregation based dustbin cubicles protected from rain and scavenging animals have been incorporated in the design.

6. POTENTIAL ENVIRONMENTAL IMPACTS

6.1 Introduction

The environmental baseline information and the project characteristics discussed earlier form the basis for impact identification and evaluation. The impacts that are expected to arise from the project could either be termed as positive, negative, direct, indirect, short-term, long-term, temporary and permanent depending on their area of cover and their stay in the environment. This assessment is done for all the project phases namely; construction, operational and decommissioning phases.

6.2 Siting and Construction Phase

During the siting and construction period there may be various impacts which may include;

6.2.1 Positive Impacts

6.2.1.1 Improved Security

With the coming up of the proposed project, cases of insecurity will reduce given that the project will attract more people hence improving security of the area. The project will come along with security details including night time lighting, installation of CCTVs and employing of security guards which will be a benefit to the surrounding as well.

6.2.1.2 Employment opportunities

The project will create a number of job opportunities especially to casual workers. Employment opportunities are a benefit both in economic and social sense. In the economic sense it means abundant unskilled labour will be involved in economic production. In the social sense these young and energetic otherwise poor people will be engaged in productive employment other than being jobless. Idleness in society may attract the unemployed to social vices like drug abuse and other criminal activities like robberies. Several workers including casual labourers,

masons, carpenters, joiners, electricians and plumbers are expected to work on the site for a period that the project will start to the end. Apart from casual labour, skilled, semi-skilled and unskilled labour and formal employees are also expected to be hired during the period of construction.

6.2.1.3 Gains in the Local and National Economy

There will be great gains to the County and National economy. Through consumption of locally available materials including: steel, concrete, tiles, timber and cement. The consumption of these materials and others will attract taxes including VAT which will be payable to the government. The cost of the materials will be payable directly to the producers as income through profits gained.

6.2.1.4 Provision of Market for Supply of Building Materials

The project will require supply of large quantities of building materials most of which will be sourced locally within Westlands and the surrounding areas such as the expansive Nairobi City County and the immediate neighbouring counties. This project therefore provides ready market for building material suppliers such as quarrying companies, hardware shops and individuals who sell such materials.

6.2.1.5 Improved local trade

The construction activities will involve buying of materials from both the local and international market. Local Market will benefit from selling the construction materials to the contractor and as a result boost the local trade. Waste products from the construction activities will also be handled by local NEMA registered waste handlers and this will also enhance local trade.

6.2.1.6 Increased business opportunities for the informal sector

During construction period the informal sector will benefit from the operations. This will involve kiosk operators who will be selling food to the workers on site and *Juakali* entrepreneurs in the local areas. In turn, this will considerably improve their living standards from the income they get from their businesses.

6.2.1.7 Improved building technology/ knowledge transfer

With the commencement of the project, construction workers will gain new building technology including the Green Building Technology that will be incorporated in the project's construction activities. This skill and technology gained will help them in executing other projects they will be involved.

6.2.2 Negative Impacts

6.2.2.1 Increased storm water

Paving of the ground structures and roofing will increase water collection and runoff as opposed to the infiltration. The increased storm water runoff will as a result lead to soil erosion if proper channels will not be put in place.

6.2.2.3 Soil Erosion

Clearance of land and excavation works will lead to increase soil erosion especially during rainy seasons and could release of sediments into the drainage systems. Uncontrolled soil erosion can have adverse effects on the local storm water drains, road network and sewer line blockages.

Excavation works shall be undertaken to remove the black soil prior to installation of a foundation. The removal of this harmless overburden presents a disposal problem. It is suggested that the excavated soil be used to backfill/infill an identified abandoned quarry sites within the city to assist in its rehabilitation and after-use plans.

6.2.2.4 Oil spills

The motor- powered construction machines on site will need to be regularly serviced. This thus requires continuous oiling to minimize the usual corrosion or wear and tear. Possibilities of such oils spilling and contaminating the soil and water on site are real. Likewise, moving vehicles on site may require oil change. But these dangers are contained by maintaining the machinery in specific areas designed and designated for this purpose. In event of soil contamination it will be prudent for the service to contact the project EHS staff for advice on how to handle such as per the ESMP table provided in this report.

6.2.2.5 Solid waste generation

Large quantities of solid waste will be generated at the site during construction of the buildings and related infrastructure. Such waste will consist of metal cuttings, rejected materials, surplus materials, surplus spoil, excavated materials, paper

bags, empty cartons, empty paint and solvent containers, broken glass among others. Such solid waste materials can be injurious to the environment through blockage of drainage systems, choking of water bodies and negative impacts on human and animal health. This may be accentuated by the fact that some of the waste materials contain hazardous substances such as paints, cement, adhesives and cleaning solvents, while some of the waste materials including metal cuttings and plastic containers are not biodegradable and can have long-term and cumulative effects on the environment.

6.2.2.6 Dust emissions

During construction, the project will generate substantial quantities of dust at the construction site and its surrounding. The sources of dust emissions will include excavation and leveling works, and to a small extent, transport vehicles delivering building materials. Emission of large quantities of dust may lead to significant impacts on construction workers and the local/neighboring facilities, which will be accentuated during dry weather conditions.

6.2.2.7 Noise and vibration

The construction works, delivery of building materials by heavy trucks and the use of machinery/equipment including bulldozers, generators, metal grinders and concrete mixers will contribute high levels of noise and vibration within the construction site and the surrounding area. Elevated noise levels within the site can affect project workers and the residents, passers-by and other persons in within the vicinity of the project site.

6.2.2.8 Water use

The construction activities will require large quantities of water that is supplied by the NCWSC. Water will mainly be used for concrete mixing, sanitary and washing purposes. Excessive water use may negatively impact on the supply to neighbouring facilities.

6.2.2.9 Energy consumption

The project will consume fossil fuels (mainly diesel) to run transport vehicles and construction machinery. Fossil energy is non-renewable and its excessive use may have serious environmental implications on its availability, price and sustainability.

The project will also use electricity supplied by Kenya Power & Lighting Company (KPLC) Ltd. Electricity in Kenya is generated mainly through natural resources, namely, water and geothermal resources. In this regard, there will be need to use

electricity sparingly since high consumption of electricity negatively impacts on these natural resources and their sustainability.

6.2.2.10 Extraction and use of building materials

Building materials such as hard core, ballast, cement, rough stone and sand required for construction of the project will be obtained from quarries, hardware shops and sand harvesters who extract such materials from natural resource banks such as rivers and land. Since substantial quantities of these materials will be required for construction of the buildings, the availability and sustainability of such resources at the extraction sites will be negatively affected, as they are not renewable in the short term. In addition, the sites from which the materials will be extracted may be significantly affected in several ways including landscape changes, displacement of vegetation, poor visual quality and opening of depressions on the surface leading to several human and animal health impacts.

6.2.2.11 Exhaust emissions

The trucks used to transport various building materials from their sources to the project site will contribute to increases in emissions of CO₂, NO_x and fine particulate along the way as a result of diesel combustion. Such emissions can lead to several environmental impacts including global warming and health impacts. Because large quantities of building materials are required, some of which are sourced outside Nairobi, such emissions can be enormous and may affect a wider geographical area. The impacts of such emissions can be greater in areas where the materials are sourced and at the construction site as a result of frequent gunning of vehicle engines, frequent vehicle turning and slow vehicle movement in the loading and offloading areas.

6.2.2.12 Risks of accidents and injuries to workers

Because of the intensive engineering and construction activities including erection and fastening of roofing materials, metal grinding and cutting, concrete work, steel erection and welding among others, construction workers will be exposed to risks of accidents and injuries. Such injuries can result from accidental falls from high elevations, injuries from hand tools and construction equipment cuts from sharp edges of metal sheets and collapse of building sections among others.

6.2.2.13 Traffic inconveniences

Site Hoarding and Lorries transporting building materials to and from site will present traffic inconveniences to public and nearby offices and institutions as highlighted in the Traffic Assessment Report.

6.2.2.14 HIV/AIDS

Construction activities usually involve people from different regions, with different backgrounds, whereby they interact on daily basis. If these workers are not properly educated on HIV/AIDS, their health will be at risk. Provisions of such contraceptives by a licensed institution and frequent trainings on prevention methods will reduce the risks that the workers will be exposed to.

6.3 Operational phase

Some of the impacts both positive and negative that may be as a result of the proposed project during the operation stage will include;

6.3.1 Positive Impacts

6.3.1.1 Employment creation

Employment opportunities are one of the long-term major impacts of the development project that will be realized after construction and during the operation and maintenance of all the towers and associated facilities. These will involve security personnel, solid waste management staff, businesses that will be located within the project. Other sources of employment will involve direct service provision to the office services.

6.3.1.2 Optimal use of land

The proposed project will see optimal use of land. Land is a scarce resource in Kenya and through implementation of the proposed project will ensure optimal use of land to the great benefit of the country and its people.

6.3.1.3 Increase in national office, and commercial Space

In Kenya the office space demand by far outstrips the unit supply. This has led to the scramble for the fewer available spaces, which are usually charged expensively. These will add to the supply of office, Conference rooms and parking space which is currently a major socio-economic problem for Kenya and especially in Nairobi's Metropolis and its vicinity.

6.3.1.4 Increased security in the area

With the installation of the CCTVs, night time lighting and recruitment of security attendants, the general security of CBD area will be greatly improved with the project implementation.

6.3.1.5 Increased property value

The proposed development together with its associated facilities will enhance the general look of the surrounding and this will have an impact on the neighbouring land and property value. The proposed development will generally enhance the property value of the neighbouring buildings.

6.3.1.6 Creation of Landmarks

The proposed CBK tower will itself be an Iconic project, and once complete will be a landmark (possessing one of the tallest skyscraper in Nairobi and East Africa). This will add value to Nairobi as a capital city in terms of infrastructural development.

6.3.1.7 Reduced Traffic Congestion

The design of the whole project presents a 'smart office' approach with adequate parking spaces and widened drive ways. Over 200 parking spaces has been incorporated in the design.

6.4 Negative environmental impacts of operational activities

6.4.1 Solid waste generation

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

6.4.2 Water use

The activities during the operation phase of the project will involve the use of large quantities of water.

6.4.3 Energy consumption

During operation, the family units will use a lot of electrical energy mainly for domestic purposes including lighting, running of air conditioning equipment, running of refrigeration systems, pumping water into reservoirs. Since electricity generation involves utilization of natural resources, excessive electricity consumption will strain the resources and negatively impact on their sustainability.

6.4.4 Increased storm water flow

The building roofs and pavements will lead to increased volume and velocity of storm water or run-off flowing across the area covered by the building. This will lead to increased amounts of storm water entering the drainage systems, resulting in overflow and damage to such systems in addition to increased erosion or water logging in the neighboring areas.

6.5 Negative environmental impacts of decommissioning activities

6.5.1 Solid waste

Demolition of the project buildings and related infrastructure will result in large quantities of solid waste. The waste will consist of demolition debris including concrete, metal, drywall, wood, glass, paints, adhesives, sealants and fasteners. Although demolition waste is generally considered as less harmful to the environment since they are composed of inert materials, there is growing evidence that large quantities of such waste may lead to release of certain hazardous chemicals into the environment. In addition, even the generally non-toxic chemicals such as chloride, sodium, sulphate and ammonia, which may be released as a result of leaching of demolition waste, are known to lead to degradation of groundwater quality.

6.5.2 Dust

Large quantities of dust will be generated during demolition works. This will affect demolition staff as well as the neighboring residents.

6.5.3 Noise and vibration

The demolition works will lead to significant deterioration of the acoustic environment within the project site and the surrounding areas.

6.6 Decommissioning Phase

Some of the anticipated impacts during the decommissioning phase of the proposed project include;

6.6.1 Positive Impacts

6.6.1.1 Rehabilitation and restoration of the site to its original status

Upon decommissioning of the project, rehabilitation of the project site will be carried out to restore the site to its original status. This will include replacement of topsoil and re-vegetation which will lead to improved visual quality of the area.

6.6.1.2 Employment opportunities

Several employment opportunities will be created for the demolition staff.

6.6.2 Negative Impacts

6.6.2.1 Solid waste generation

Demolition of the project buildings and related infrastructure will result in large quantities of solid waste. The waste will contain the materials used in construction including concrete, metal, drywall, wood, glass, paints, adhesives, sealants and fasteners. Although demolition waste is generally considered as less harmful to the environment since they are composed of inert materials, there is growing evidence that large quantities of such waste may lead to release of certain hazardous chemicals into the environment. In addition, even the generally non-toxic chemicals such as chloride, sodium, sulphate and ammonia which may be released as a result of leaching of demolition waste, are known to lead to degradation of groundwater quality.

6.6.2.1 Dust emission

Large quantities of dust will be generated during demolition works. This will affect demolition staff as well as the neighbouring residents.

6.6.2.2 Noise and Vibration

The demolition works will lead to significant deterioration of the acoustic environment within the project site and the surrounding areas.

7. ANALYSIS OF PROJECT ALTERNATIVES

This section analyses the project alternatives in terms of site, technology scale and waste management options.

7.1 No project alternative

The No Project option in respect to the proposed project implies that the status quo is maintained. This option is the most suitable alternative from an extreme environmental perspective as it ensures non-interference with the existing conditions. This option will however, involve several losses both to the landowner and the community as a whole. The landowner will continue to pay land rates on the plot while the property is underutilized. The No Project Option is the least preferred from the socio-economic and partly environmental perspective due to the following factors:

- The economic status of the Kenyans and the local people would remain unchanged.
- Reduced commercial activities.
- Reduced interaction both at local, national and international levels.
- No employment opportunities will be created for numerous numbers of Kenyans who will work in the project area.
- Increased urban poverty and crime in Kenya.

From the analysis above, it becomes apparent that the No Project alternative is no alternative to the local people, Kenyans, and the government of Kenya as compared to the development of the housing estate.

7.2 Analysis of alternative construction materials and technology

The building will be developed using modern, locally and internationally accepted materials to achieve public health, safety, security and environmental aesthetic requirements. Equipment that saves energy and water will be given first priority without compromising on cost or availability factors. The concrete pillars and walls will be made using locally sourced stones, cement, sand, metal bars and fittings that meet the Kenya Bureau of Standards requirements.

Heavy use of timber during construction is discouraged because of destruction of forests. The exotic species would be preferred to indigenous species in the construction where need will arise.

7.3 Solid waste management alternatives

A lot of solid wastes will be generated from the proposed project. An integrated solid waste management system is recommendable. First, the proponent will give priority to reduction at source of the materials. This option will demand a solid waste management awareness programme for the incoming tenants and/or owners and adherence to provisions of Environmental Management and Coordination (Waste Management) Regulations 2006.

Secondly, Recycling, Reuse and composting of the waste will be the second alternative in priority. This will call for a source separation programme to be put in place. The waste will be collected by municipal council or be collected by a private waste management company licensed by NEMA for sanitary land filling or ultimate appropriate disposal.

The third priority in the hierarchy of options is combustion of the waste that is not recyclable and this is NOT acceptable.

7.4 The proposed development alternative

Under the proposed development alternative, the developer of the proposed CBK pension tower would be issued with an EIA License. In issuing the license, NEMA would approve the proponent's proposed development project, provided all environmental measures are complied with during the construction period and operational phases. This alternative consists of the applicant's final proposal with the inclusion of the NEMA regulations and procedures as stipulated in the environmental impacts to the maximum extent practicable.

8. IMPACTS MITIGATION AND MONITORING

8.1 Introduction

The proponent of the proposed project acknowledges the fact that the proposed project activities will have some impacts on the biophysical environment, health and safety of its employees and members of the public, and socio economic wellbeing of the local residents. Thus, the main focus will be on reducing the negative impacts and maximizing the positive impacts associated with the project activities through a programme of continuous improvement.

An environmental management/monitoring plan will be developed to assist the proponent in mitigating and managing environmental impacts associated with the life cycle of the project

8.1 Mitigation of construction phase Impacts

8.1.1 Minimization of Environmental disturbance

The proponent will ensure proper demarcation of the project area to be affected by the construction works. This will be aimed at ensuring that any disturbance to flora and fauna is restricted to the Actual project area and avoid spill over effects on the neighbouring areas. In the same vein, there will be strict control of construction vehicles to ensure that they operate only within the area to be disturbed by access routes and other works.

In addition, the proponent will re-vegetate some of the disturbed areas through implementation of a well-designed landscaping and tree planting programme.

The contractor shall only clear the vegetation that needs to be cleared in accordance with the structure plan. These protection measures apply to both the construction areas as well as to any associated Activities such as sites for stockpiles, disposal of clean fill and construction of diversion roads.

Management of borrow pits and quarries-The contractor undertakes to source materials only from licensed quarries as provided for under EMCA 1999 and the second schedule to the Act. Where the contractor has entered into an agreement with the land owner for this purpose, he should undertake an EIA study and seek the necessary approval from NEMA.

The contractor, where applicable develop, implement and keep relevant records of quarry/borrow pit lease agreements, rehabilitation/restoration management plans. The contractor shall also undertake measures to prevent persons, or stocks other

than dogs or poultry, from inadvertently entering the pit as provided for in the mining Act (revised in 1987). The contractor shall ensure that borrow pits and quarries are properly secured (fenced with access limited to authorized persons only).

8.1.2 Minimization of run-off, soil erosion and Nuisance

The proponent will put in place some measures aimed at minimizing soil erosion and associated sediment release from the project site during construction. These measures will include terracing and leveling the project site to reduce run-off velocity and increase infiltration of rainwater into the soil. In addition, construction vehicles will be restricted to designated areas to avoid soil compaction within the project site, while any compacted areas will be ripped to reduce run-off.

The proponent shall also ensure that transportation of building materials and construction debris is undertaken during weekdays, off peak hours. Construction works shall be restricted to daytime and No construction Activity shall be undertaken at night.

The contractor shall apply appropriate measures to control runoff, erosion and sediment including but not limited to the following:

- Divert natural runoff around construction areas prior to any site disturbance;
- Install protective measures on site prior to construction, for example, storm water basins or sediment traps;
- Temporary diversion pipe outlets beyond the fill toe line to avoid erosion of embankments; install "cutoff drains " where long cut/fill batter slopes occur to control water runoff speed
- Protect the toe of all stockpiles, where erosion is likely to occur, with silt fences, hay bales or bunds;
- Restrict vehicular movements over cleared areas;
- Limit equipment and vehicular movements to within the approved construction zone;
- Construct temporary access tracks to cross concentrated water flow lines at right angles;
- Plan construction access to make use, if possible, of the final road alignment;
- Use vehicle- cleaning devices, for example, ramps or wash down areas;
- Remove debris from drainage part and sediment control structures;
- Observe the performance of drainage structures and erosion controls during rains and modified as required.

8.1.3 Minimization of construction waste

It is recommended that construction waste be recycled or reused to ensure that materials that would otherwise be disposed of as waste are diverted for productive uses. In this regard, the proponent is committed to ensuring that construction materials left over at the end of construction will be used in other projects rather than being disposed of. In addition, damaged or wasted construction materials including cabinets, doors, plumbing and lighting fixtures, marbles and glass will be recovered for refurbishing and use in other projects. Such measures will involve the sale or donation of such recyclable/reusable materials to construction companies, local community groups, and institutions.

The proponent shall put in place measures to ensure that construction materials requirements are carefully budgeted and to ensure that the amount of construction materials left on site after construction is kept minimal.

It is further recommended that the proponent should consider the use of recycled or refurbished construction materials. Purchasing and using once-used or recovered construction materials will lead to financial savings and reduction of the amount of construction debris disposed of as waste.

Additional recommendations for minimization of solid waste during construction of the project include:-

- i. Use of durable, long- lasting materials that will not need to be replaced as often, thereby reducing the amount of construction waste generated over time.
- ii. Provision of facilities for proper handling and storage of construction materials to reduce the amount of waste caused by damage or exposure to the elements of nature i.e. sunshine, rain etc
- iii. Use of building materials that have minimal packaging to avoid the generation of excessive packaging waste
- iv. Use of construction materials containing recycled content when possible and in accordance with accepted standards.
- v. Locate site storage depots away from watercourses and danger areas, areas prone to flooding, Avoid spillage during refueling and servicing of plants and equipment

It is further suggested that the excavated top soil be used to backfill/infill an identified abandoned quarry sites within Ruiru or nearby town to assist in its rehabilitation and after-use plans.

8.1.4 Reduction of dust generation and emission

Dust generation is the main air quality issue on construction sites. Dust is a nuisance in the environment that can be a health hazard and a risk to traffic safety. Dust emission during construction will be minimized through strict enforcement of onsite speed controls as well as limiting unnecessary traffic within the project site. In addition, it is recommended that excavation works be carried out in wet weather or sprinkle water to control dust and install appropriate dust screens; and traffic routes on site be sprinkled with water regularly to reduce amount of dust generated by the construction trucks especially during dry seasons. Furthermore the contractor is required to Limit the extent of disturbed areas and restore disturbed areas as soon as practicable to limit construction Activities (including blasting on windy days); Water construction materials prior to loading and transport; use equipment and vehicles fitted with appropriate emission controls; and Service all equipment and vehicles regularly to minimize emissions; spray with water and/or cover pavement materials and aggregates before transporting; and dispose of any harmful solid and liquid waste at an approved and licensed disposal facility.

8.1.5 Minimization of noise and vibration

Noise and vibration will be minimized in the project site and surrounding areas through sensitization of construction truck drivers to switch off vehicle engines while offloading materials. In addition, they will be instructed to avoid gunning of vehicle engines or hooting especially when passing through sensitive areas such as churches, residential areas and hospitals. In addition, construction machinery shall be kept in good condition to reduce noise generation. It is further recommended that:

- All generators and heavy duty equipment be insulated or placed in enclosures to minimize ambient noise levels;
- Use the quietest available equipment or modify equipment to reduce noise;
- Use the correct equipment within the defined operating hours and locations;
- Install temporary noise control barriers where appropriate;
- Notify affected people if noisy Activities will be undertaken, eg pile driving, blasting;
- Plan deliveries to and from site to minimize Impacts;
- Secure areas prior to blasting and inspect the area immediately afterwards to visually monitor for any incidence;
- Select all equipments having regard to its published sound power level;
- Investigate an alternative technique if an Activity is inherently noisy (e.g. a driven piling) plant and equipment should be located having regard to its proximity to sensitive receptors (e.g. school, hospitals and residential property);

- Anti-social behavior involving loud talking, shouting or whistling, radios, sirens or hooters and motor revving should be avoided.

The contractor will undertake to comply with all the relevant legislation (existing and emerging) and regulations governing the generation of excessive noise and vibration. This includes:

-Using engineering controls by segregating or enclosing machinery which emits noise levels exceeding 90 dB(A) and providing suitable hearing protection for affected workers as prescribed under factories and other places of work (noise prevention and control) Rules, 2005-Rule 10 and 12.

-Conducting (occupational) noise measurements at least once every 12 months to determine prevailing noise conditions as provided under factories and other places of work (noise prevention and control) Rules 2005-Rule 6

-Limiting construction Activities within the normal working hours as provided for under factories and other places of work (noise and excessive vibration pollution) (control) Rules 2009-Rule 13. The same rule prescribes for even distribution of equipment used and avoiding concentrated usage of equipment at the same time.

-Acquiring requisite license to generate excessive noise and vibration as provided for under legal notice No.90 of 2009.

The contractor shall apply the appropriate measures to prevent or mitigate construction noise and vibration including but limited to;

8.1.6 Minimization of water use and Water Quality Protection

The proponent shall ensure that water is used efficiently at the site by sensitizing construction staff to avoid irresponsible water usage.

The contractor shall apply the following measures to manage water quality
Leaving the site:

- Divert runoff from undisturbed areas around the construction site;
- Limit the area of disturbed land—progressively clear the site in accordance with construction needs and rehabilitate as soon as possible;
- Protect drainage lines with sediment basins, silt fences and hay bales;
- Dewater sites by pumping water to a sediment basin prior to release off site- do not pump directly;
- Monitor the water quality in the runoff from the site or areas affected by dredge plumes, and improve work practices as necessary;

- Stockpile materials away from drainage lines;
- Maintain equipment to prevent fuel and oil leaks; prevent all solid and liquid waste entering waterways by collecting solid waste;
- Oils, chemicals, bitumen spray waste and waste waters from brick, concrete and asphalt cutting where possible and transport to a licensed waste disposal site or recycling depot;
- Minimize surplus waste water from brick and pavement cutting;
- Store all chemicals, fuels and other hazardous materials within bundled and covered areas.

8.1.7 Reduction of energy consumption

The proponent shall ensure responsible electricity use at the construction site through sensitization of staff to conserve electricity by switching off electrical equipment or appliances when they are not being used.

In addition, proper planning of transportation of materials will ensure that fossil fuels (diesel, petrol) are not consumed in excessive amounts. Complementary to these measures, the proponent shall monitor energy use during construction and set targets for reduction of energy use.

8.1.8 Efficient sourcing and use of raw materials

The proponent will source building materials such as sand, ballast and hard core from registered quarry and sand mining firms, whose projects have undergone satisfactory environmental Impact assessment/audit and received relevant licences from NEMA. Since such firms are expected to apply acceptable environmental performance standards, the negative Impacts of their Activities at the extraction sites are considerably well mitigated.

To reduce the negative Impacts on availability and sustainability of the materials, the proponent will only order for what will be required through accurate budgeting and estimation of Actual construction requirements. This will ensure that materials are not extracted or purchased in excessive quantities. Moreover, the proponent will ensure that wastage, damage or loss (through run-off, wind, etc) of materials at the construction site is kept minimal, as these would lead to additional demand for and extraction or purchase materials.

In addition to the above measures, the proponent shall consider reuse of building materials and use of recycled building materials. This will lead to reduction in the amount of raw materials extracted from natural resources as well as reducing Impacts at the extraction sites

8.1.9 Minimization of exhaust emissions

This will be achieved through proper planning of transportation of materials to ensure that vehicle fills are increased in order to reduce the number of trips done or the number of vehicles on the road. In addition truck drivers will be sensitized to avoid unnecessary racing of vehicle engines at loading/offloading areas, and to switch off or keep vehicle engines at these points. The contractor shall be required to adhere to the recommendations of the Traffic Impact Assessment Report.

8.1.10 Reduction of risks of accidents and injuries to workers

Pre-Construction/Planning Phase

i. Approval of Architectural Plans

Pursuant to section 125 of OSHA, 2007, no building shall be erected or converted for use as a workplace and no structural alteration and no extension shall be made to any existing workplace except in accordance with plans showing details of the proposed construction, conversion, alteration or extension, approved by the Director of Occupational Safety and Health Services.

The proponent will ensure arrangements are made for submission of the architectural plans for approval at the offices of the Directorate of Occupational Safety and Health Services before commencement of construction. Upon satisfaction that the plans provide for suitable premises for use of a workplace of the type proposed, an approval for such plans will be issued by the Directorate of Occupational Safety and Health Services.

ii. Notification of Building Operations and Works of Engineering Construction

It is required of the contractor engaged by the proponent to give notice, in a prescribed form, of the building operations and works of engineering construction at least 10 days before commencement of the construction phase of the project to the Directorate of Occupational Safety and Health Services. This is a provision in the Building Operations and Works of Engineering Construction Rules, 1984 Legal Notice No.40.

Upon receipt of the notice, the Director of Occupational Safety and Health Services shall take such steps as may be necessary to satisfy himself that the site is suitable for use as a workplace of the nature stated in the notice, and upon being so satisfied, shall cause the site to be registered and shall issue to the applicant (the contractor in this case), upon payment of a prescribed fee, a certificate of registration which is renewable annually until the construction phase is over.

Construction Phase

The proponent will set it out as preconditions for every contractor to adhere to during award of the contract so that aspects of occupational safety and health are factored in financial allocations. During the construction, the contractor is expected to adhere to the requirements in the following table so as to uphold safety, health and welfare of persons employed at the site.

Requirements to be adhered to during the construction phase of the project

Requirement	Relevant clause in the Law
1. Appoint a Site Safety Supervisor	Legal Notice No.40 of 1984
2. Provide Personal Protective and Equipment (PPE) to site workers i.e. <ul style="list-style-type: none"> a) Helmets/hard hats for head protection b) Goggles/shields for eye protection when necessary c) Ear protection (ear muffs or ear plugs) for those workers exposed to high noise levels d) Dust masks/respirators for protection from inhalation of air contaminants when necessary d) Body protection (overalls, reflector jackets or aprons as appropriate) e) Gloves for hand protection when necessary f) Foot protection (safety boots or safety shoes) g) Safety harnesses, when necessary, for prevention of falls from height 	Legal Notice No.40 of 1984 as read together with Section 101 of OSHA, 2007
3. Acquire and display at a prominent place within site offices an abstract of Building Operations and Works of Engineering Construction Rules.	Section 121 of OSHA, 2007
4. Acquire and maintain a General Register	Section 122 of OSHA, 2007
5. Develop an occupational safety and health policy and ensure all workers are informed of its content.	Legal Notice No.31 of 2004 as read together with Section 7 of OSHA, 2007
6. Undertake the risk assessment exercise, compile a report and submit a copy to the Directorate of Occupational Safety and Health Services.	Section 6 of OSHA, 2007
7. Form a workplace Safety and Health Committee and have it trained on matters relating to Occupational Safety and Health.	Legal Notice No.31 of 2004 as read together with Section 9 of OSHA, 2007
8. Provide first aid i.e. <ul style="list-style-type: none"> a) Appoint and train using a government recognized trainer, first aiders b) Provide and maintain, to the prescribed standard, first aid 	Legal Notice No. 160 of 1977 as read together with Section 95 of OSHA, 2007

<p>box(es)/cupboards</p> <p>c) Provide and maintain a stretcher</p> <p>d) Provide and maintain a first aid room</p>	
<p>9. Ensure safe Housekeeping by:-</p> <p>a) Placing barrier tapes around pits, excavations and areas where construction works are ongoing</p> <p>b) Designating walkways and driveways for site safe movement.</p> <p>c) Neat arrangement of site material like timber, iron rods, cement, boards, used materials etc.</p>	<p>Legal Notice No.40 of 1984 as read together with Section 77 of OSHA, 2007</p>
<p>10. Ensure safety of workers at height by :-</p> <p>a) Providing and maintaining safe work platforms of the standards prescribed</p> <p>b) Providing and maintaining safe scaffolds of the standards prescribed</p> <p>c) Providing and maintaining safe harnesses</p> <p>d) Development of a permit to work document to be used risky work at height</p> <p>e) Providing and maintaining safe ladders</p>	<p>Legal Notice No.40 of 1984</p>
<p>11. Protect of Workers from adverse weather conditions by providing and maintaining adequate shelter at the site.</p>	<p>Legal Notice No.40 of 1984</p>
<p>12. Ensure medical examination is done to workers exposed to classified hazards e.g. excessive noise levels, hazardous dusts, chemicals, radiation etc.</p>	<p>Legal Notice No.24 of 2005</p>
<p>13. Cause the safety and health audit of the construction works to be conducted on an annual basis</p>	<p>Legal Notice No.31 of 2004 as read together with section 11 of OSHA, 2007</p>
<p>14. Cause the fire safety audit of the construction works to be conducted on an annual basis</p>	<p>Legal Notice No.59 of 2007</p>
<p>15. Provide adequate and suitable sanitary conveniences to all persons employed</p>	<p>Section 52 of OSHA, 2007</p>
<p>16. Provide and maintain fire safety at site and camp by:-</p> <p>a) Providing fire fighting appliances and instruction workers in their use</p> <p>b) Conducting fire drills as necessary</p> <p>c) Providing a documented fire emergency procedure</p> <p>d) Ensuring proper storage of highly flammable materials</p>	<p>Legal Notice No.59 of 2007 as read together with sections 78, 81 and 82 of OSHA, 2007</p>
<p>17. Ensure general welfare provisions to site workers by:-</p> <p>a) Providing clean wholesome drinking water</p> <p>b) Providing washing facilities</p> <p>c) Providing accommodation for clothing not worn during working hours</p>	<p>Sections 91, 92 and 93 of OSHA, 2007</p>
<p>18. Ensure plant and machinery safety at the site by:-</p> <p>a) Ensuring proper maintenance and repair of plant and</p>	<p>Section 55 and 72 of OSHA, 2007</p>

<p>machinery</p> <p>b) Guarding, fencing and encasing of dangerous parts, whichever the case may be, of plant and machinery</p> <p>c) Ensuring prescribed statutory examinations are carried out on plants e.g. cranes, air receiver etc. at prescribed intervals</p>	
<p>19. Notify occurrence of accidents and incidents to the Directorate of Occupational Safety and Health Services and ensure compensation when work injuries occur.</p>	<p>Section 31 of OSHA, 2007 and WIBA, 2007</p>

8.1.11 Minimization of Traffic congestion and possible accidents

The Traffic Management Plan for the proposed project has been developed as part of the TIA. The various recommendations made by the traffic engineers are summarized below while much detail is presented in the Traffic Assessment report attached as annex. To mitigate the development of traffic, the following road upgrades are necessary and should be negotiated between NCC, KURA and the developer for implementation

- A 2m paved pedestrian sidewalks should be provided for the development on both Harambee and Haile selasie lanes along the property boundary.
- Provision of adequate parking spaces. The parking spaces will be appropriately be allocated.
- All servicing needs must be accommodated on site.
- A construction traffic management plan must be implemented. The plan will take into consideration traffic accommodation, road safety, pedestrian welfare, construction
- Integration of the traffic management with security consideration

8.1.12 HIV/AIDS

During the construction phase, workers will come from different places with different backgrounds. The workers will be at risk if proper training of HIV/AIDS is not conducted by trained experts/individuals. The distribution of the necessary contraceptives and training on their proper usage is highly recommended.

8.1.13 Controlling oil spills during construction phase

The proponent will control the dangers of oil, grease and fuel spills during construction by maintaining the machinery in specific areas designed for this purpose. Machinery site repair will be discouraged and repair work restricted to only approved garages to avoid pollution from oil, grease and fuel.

8.2 Mitigation of operation phase Impacts

8.2.1 Ensuring efficient solid waste management

The proponent will be responsible for efficient management of solid waste generated by the project during its operation. In this regard, the proponent will provide waste handling facilities such as waste bins and skips for temporarily holding waste generated at the premise. In addition, the proponent will ensure that such wastes are disposed of regularly and appropriately. It is recommended that the proponent puts in place measures to ensure that the occupants manage their waste efficiently through recycling, reuse and proper disposal procedures with emphasis on segregation at source.

8.3.2 Ensuring Safety, Health and Welfare of workers

To ensure safety and health workers employed during the operational phase of the project, a number of requirements to be adhered to by the proponent are outlined in table hereunder.

Requirements to be adhered to during the construction phase of the project

Requirement	Relevant clause in the Law
1. Ensure acquisition and annual renewal of registration certificate of the workplace by lodging an application and remitting prescribed fees to the Directorate of Occupational Safety and Health Services	Legal Notice No.14 of 2011 as read together with Section 44 of OSHA, 2007
2. Provide Personal Protective and Equipment (PPE) to factory workers i.e. a) Helmets/hard hats for head protection b) Goggles/shields for eye protection where necessary c) Ear protection (ear muffs or ear plugs) for those workers exposed to high noise levels d) Dust masks/respirators for protection from inhalation of air contaminants where necessary and as applicable d) Body protection (overalls, reflector jackets, aprons dust coats as appropriate) e) Gloves for hand protection where necessary f) Foot protection (safety boots or safety shoes) g) Safety harnesses, when necessary, for prevention of falls from height	Section 101 of OSHA, 2007
3. Acquire and display at a prominent place within workplace an abstract of OSHA, 2007	Section 121 of OSHA, 2007
4. Acquire and maintain a General Register	Section 122 of OSHA, 2007

5. Develop an occupational safety and health policy and ensure all workers are informed of its content.	Legal Notice No.31 of 2004 as read together with Section 7 of OSHA, 2007
6. Undertake the risk assessment exercise, compile a report and submit a copy to the Directorate of Occupational Safety and Health Services.	Section 6 of OSHA, 2007
7. Form a workplace Safety and Health Committee and have it trained on matters relating to Occupational Safety and Health.	Legal Notice No.31 of 2004 as read together with Section 9 of OSHA, 2007
8. Provide first aid i.e. a) Appoint and train using a government recognized trainer, first aiders b) Provide and maintain, to the prescribed standard, first aid box(es)/cupboards	Legal Notice No. 160 of 1977 as read together with Section 95 of OSHA, 2007
9. Ensure safe Housekeeping by:- a) Ensuring good machine layout and arrangement b) Designating and marking walkways, gangways and driveways for workplace safe movement. c) Proper arrangement of stocks and products	Section 77 of OSHA, 2007
10. Ensure safety of workers engaged in high risk activities by development of a permit to work document to be used in such activities	Section 77 of OSHA, 2007
11. Ensure good health of workers employed by:- a) Causing prescribed periodical medical examinations to be done on workers exposed to classified hazards e.g. excessive noise levels, hazardous dusts, chemicals, radiation etc. b) Causing pre-employment medical examinations to be done on workers to be employed in areas with classified hazards c) Causing post-employment medical examinations to be done on workers formerly employed in areas with classified hazards d) Causing prescribed medical surveillance to be done on workers employed in areas with classified hazards	Legal Notice No.24 of 2005 as read together with section 103 of OSHA, 2007
12. Cause the safety and health audit of the workplace to be conducted on an annual basis	Legal Notice No.31 of 2004 as read together with Section 11 of OSHA, 2007
13. Cause the fire safety audit of the workplace to be conducted on an annual basis	Legal Notice No.59 of 2007
14. Provide adequate and suitable sanitary conveniences to all persons employed	Section 52 of OSHA, 2007
15. Provide and maintain fire safety at workplace by:- a) Providing fire fighting appliances and instruction workers in their use	Legal Notice No.59 of 2007 as read together with sections 78, 81 and 82 of

<ul style="list-style-type: none"> b) Conducting fire drills as necessary c) Providing a documented fire emergency procedure d) Ensuring proper storage of highly flammable materials 	OSHA, 2007
<p>16. Ensure general welfare provisions to factory workers by:-</p> <ul style="list-style-type: none"> a) Providing clean wholesome drinking water b) Providing washing facilities c) Providing accommodation for clothing not worn during working hours 	Sections 91, 92 and 93 of OSHA, 2007
<p>17. Ensure plant and machinery safety at the workplace by:-</p> <ul style="list-style-type: none"> a) Ensuring proper maintenance and repair of plant and machinery b) Guarding, fencing and encasing of dangerous parts, whichever the case may be, of plant and machinery c) Ensuring prescribed statutory examinations are carried out on plants at prescribed intervals 	Section 55 and 72 of OSHA, 2007
<p>18. Ensure control of air pollution, noise and vibration. The proponent will put measures in place to prevent the pollutant from accumulating in any workroom, and in particular, where the nature of the process makes it practicable, exhaust appliances shall be provided and maintained, as near as possible to the point of origin of the dust or fume or other impurity, so as to prevent it entering the air of any workroom and the dust, fumes or impurity shall not be allowed to enter into the atmosphere without undergoing appropriate treatment to prevent air pollution or other ill-effect to life and property.</p>	Section 89 of OSHA, 2007
<p>19. Notify occurrence of accidents and incidents to the Directorate of Occupational Safety and Health Services and ensure compensation when work injuries occur.</p>	Section 31 of OSHA, 2007 and WIBA, 2007

8.3.3 Ensure efficient water use

The proponent will install water-conserving automatic/push taps and toilets. Moreover, any water leaks through damaged pipes and faulty taps will be fixed promptly by qualified staff. In addition, the occupants will be sensitized to use water efficiently. Furthermore, rainwater harvesting is emphasized for use in gardening and pavement washing.

8.3.4 Ensure efficient energy consumption

The proponent should install energy-efficient lighting system. This will contribute immensely to energy saving during the operational phase of the project. In addition, occupants will be sensitized to ensure energy efficiency in their Activities.

To complement these measures, it will be important to monitor energy use and set targets for efficient energy use.

8.3.5 Minimization of sewage release

The proponent will ensure that there are adequate means for handling the large quantities of sewage generated at the premise. It will also be important to ensure that sewage pipes are not blocked or damaged since such vices can lead to release of the effluent, resulting in land and water contamination. Such blockages or damages will be fixed expeditiously.

8.3.6 Increased pressure on the existing infrastructure

It is recommended that the proponent should liaise closely with other development partners and relevant Government Departments and the County Government to upgrade the existing shared facilities including roads, water distribution systems etc. The proponent should as well explore alternative means which are environmentally sound like employing the Green Energy Technologies when and where applicable like the proposed use of Solar Panels in water heating among others. This will rather reduce the over dependence on fossils based energy sources which are arguably presently threatened with the idea of having a private borehole in itself being a way of relieving an existing water supply system..

8.4 Mitigation of decommissioning phase Impacts

8.4.6 Efficient solid waste management

- i. Use of durable, long- lasting materials that will not need to be replaced as often, thereby reducing the amount of construction waste generated over time.
- ii. Provision of facilities for proper handling and storage of construction materials to reduce the amount of waste caused by damage or exposure to the elements of nature i.e. sunshine, rain etc.
- iii. Use of building materials that have minimal packaging to avoid the generation of excessive packaging waste
- iv. Use of construction materials containing recycled content when possible and in accordance with accepted standards.

- v. Locate site storage depots away from watercourses and danger areas, areas prone to flooding, avoid spillage during refueling and servicing of plants and equipment.

8.4.7 Reduction of dust concentration

- Watering all Active construction areas when necessary.
- Cover all trucks hauling soil, sand and other loose materials or require all trucks to maintain at least two feet of freeboard.
- Pave, apply water when necessary, or apply (non-toxic) soil stabilizers on all unpaved access roads, parking areas and staging areas at construction sites.
- Sweep daily (with water sweepers) all paved access roads, parking areas and staging areas at construction sites.
- Re-vegetating of exposed and dust prone surfaces.

8.4.8 Minimization of noise and vibration

- Installing portable barriers to shield compressors and other small stationary equipment where necessary.
- Use quiet equipment (i.e. equipment designed with noise control elements).
- Co-ordinate with relevant agencies regarding construction activities near the residential and commercial areas.
- Install sound barriers for pile driving activity.
- Limit pickup trucks and other small equipment to an idling time when necessary, observe a common-sense approach to vehicle use, and encourage workers to shut off vehicle engines whenever possible.
- Ensure regular servicing of machines to avoid noise that may result due to un-serviced parts.

9. ENVIRONMENTAL MONITORING PLAN AND AUDITS

9.1 Introduction

The proponent of the proposed project acknowledges the fact that the proposed project activities will have some impacts on the biophysical environment, health and safety of its employees and members of the public and socio-economic wellbeing of the local residents. Thus, the main focus will be on reducing the negative impacts and maximizing the positive impacts associated with the project activities through a programme of continuous improvement.

An Environmental Management/Monitoring Plan has been developed to assist the proponent in mitigating and managing environmental impacts associated with the life cycle of the project. The EMP has been developed to provide a basis for an Environmental Management System (EMS; ISO 14001 principles) for the project. It is noteworthy that key factors and processes may change through the life of the project and considerable provisions have been made for dynamism and flexibility of the EMP. As such, the EMP will be subject to a regular regime of periodic review.

Tables below form the core of this EMP for the construction, operational and decommissioning phases of the proposed project respectively. In general, the tables outline the potential safety, health and environmental risks associated with the project and detail all the necessary mitigation measures, their financial costs, as well as the persons responsible for their implementation and monitoring. The EMP will be used as checklist in future environmental audits.

9.2 Construction Phase Environmental Management Plan

The necessary objectives, activities, mitigation measures, and allocation of costs and responsibilities pertaining to prevention, minimization and monitoring of significant negative impacts and maximization of positive impacts associated with the construction phase the proposed project are outlined in Table below.

Construction Phase Environmental Management Plan (EMP) for the Proposed CBK pension tower Project

EXPECTED NEGATIVE IMPACTS	RECOMMENDED MITIGATION MEASURES	RESPONSIBLE PARTY	TIME FRAME	COST (KSHS)
1. Minimize extraction site impacts and ensure efficient use of raw materials in construction				
High Demand of Raw material	Source building materials from local suppliers who use environmentally friendly processes in their operations	Project Manager & Contractor	Throughout construction period	
Ensure accurate budgeting and estimation of actual construction material requirements to ensure that the least amount of material necessary is ordered	Project Manager & Contractor	Throughout construction period	10,000	
Ensure that damage or loss of materials at the construction site is kept minimal through proper storage.	Project Manager & Contractor	Throughout construction period	8,000	
Use at least 5%-10% recycled, refurbished or salvaged materials to reduce the use of raw materials and divert material from landfills	Project Manager & Contractor	Throughout construction period	0	

EXPECTED NEGATIVE IMPACTS	RECOMMENDED MITIGATION MEASURES	RESPONSIBLE PARTY	TIME FRAME	COST (KSHS)
2. Minimize disturbance at and or around construction site				
	Ensure proper demarcation and delineation of the project area to be affected by construction works.	Contractor, Civil engineer & Project Manager	1 month	10,000
	Specify locations for trailers and equipment, and areas of the site which should be kept free of traffic, equipment, and storage	Civil Engineer, Architect and Project Manager	1 month	5,000
	Designate access routes and parking within the site	Civil Engineer, Architect and Project Manager	1 month	5,000
	Introduction of vegetation (frontage aesthetics and on other open spaces) and their maintenance	Architect & Landscape specialist	Monthly to Annually	8,000
	Design and implement an appropriate landscaping programme to help in frontage aesthetics of the project	Architect & Landscape specialist	2 months	7,000
4. Reduce traffic congestion and possible accidents				
Traffic Congestion	Minimize the haulage and transportation of construction of materials during peak hours using public roads Adopt a Traffic Management Plan to enhance the traffic movement within the site and the public road Use of signs for diversion and to warn motorists against dangers at or near construction site	Contractor, Civil engineer & Project Manager	Throughout construction period	10,000/ Month

EXPECTED NEGATIVE IMPACTS	RECOMMENDED MITIGATION MEASURES	RESPONSIBLE PARTY	TIME FRAME	COST (KSHS)
Traffic Accidents	Employ traffic marshals to control the movement of vehicles during the construction phase of the project. Adopt a Traffic Management Plan to enhance the traffic movement within the site and the public road Use of signs for diversion and to warn motorists against dangers at or near construction site Use of reflective jackets among other PPEs to avoid accidents	Contractor, Civil engineer & Project Manager	Throughout construction period	10,000/ Month
5. Reduce storm-water, runoff and soil erosion				
Increased storm water, runoff and soil erosion	A storm water management plan that minimizes impervious area infiltration by use of recharge areas and use of detention and/or retention with graduated outlet control structure will be designed	The Civil Engineer, Mechanical Engineer and Project Manager	1 month	15,000

Apply soil erosion control measures such as leveling of the project site to reduce run-off velocity and increase infiltration of storm water into the soil.	The Civil Engineer, Mechanical Engineer and Project Manager	1 months
Ensure that construction vehicles are restricted to existing graded roads to avoid soil compaction within the project site	The Civil Engineer, Mechanical Engineer and Project Manager	Throughout construction period
Ensure that any compacted areas are ripped to reduce run-off.	The Civil Engineer, Mechanical Engineer and Project Manager	2 months

EXPECTED NEGATIVE IMPACTS	RECOMMENDED MITIGATION MEASURES	RESPONSIBLE PARTY	TIME FRAME	COST (KSHS)
	Open drains all interconnected will be provided on site	Civil Engineer	Throughout construction period	5,000 per unit
6. Minimize solid waste generation and ensure efficient solid waste management during construction				
Increased solid waste generation	Use of an integrated solid waste management system i.e. through a hierarchy of options: 1. Source reduction 2. Recycling 3. Composting and reuse 4. Combustion 5. Sanitary land filling	Project Manager & Contractor	Throughout construction period	10,000
	Through accurate estimation of the sizes and quantities of materials required, order materials in the sizes and quantities they will be needed rather than cutting them to size, or having large quantities of residual materials	Project Manager & Contractor	One-off	0

	Ensure that construction materials left over at the end of construction will be used in other projects rather than being disposed off.	Project Manager & Contractor	One-off	0
	Ensure that damaged or waste construction materials including cabinets, doors, plumbing and lighting fixtures, marbles and glass will be recovered for refurbishing and use in other projects	Project Manager & Contractor	One-off	0
	Donate recyclable/reusable or residual materials to local community groups, institutions and individual local residents or homeowners.	Project Manager & Contractor	One-off	0
	Use of durable, long-lasting materials that will not need to be replaced as often, thereby reducing the amount of construction waste generated over time	Project Manager & Contractor	Throughout construction period	-
	Provide facilities for proper handling and storage of construction materials to reduce the amount of waste caused by damage or exposure to the elements	Project Manager & Contractor	One-off	20,000
	Purchase of perishable construction materials such as paints should be done incrementally to ensure reduced spoilage of unused materials.	Project Manager & Contractor	Throughout construction period	0
	Use building materials that have minimal or no packaging to avoid the generation of excessive waste	Project Manager & Contractor	Throughout construction period	0
	Use construction materials containing recycled content when possible and in accordance with accepted standards.	Project Manager & Contractor	Throughout construction period	0
	Dispose waste more responsibly by dumping at designated dumping sites or landfills only.	Project Manager, Mechanical Engineer & Contractor	Throughout construction period	10,000/ Month

	Waste collection bins to be provided at designated points on the site	Project Manager, Mechanical Engineer & Contractor	Throughout construction	
	Private waste disposal company to be contracted to transport and dispose the solid waste from site	Project Manager, Mechanical Engineer & Contractor	Throughout construction period	15000/month
	Running an educational campaigns amongst employees, e.g. through use of posters, to encourage reuse or recycling of the solid waste	Project Manager, Mechanical Engineer & Contractor	Throughout construction period	15000/month

EXPECTED NEGATIVE IMPACTS	RECOMMENDED MITIGATION MEASURES	RESPONSIBLE PARTY	TIME FRAME	COST (KSHS)
7. Reduce dust emissions				
Dust emission	Ensure strict enforcement of on-site speed limit regulations/ Installation of dust nets	Project Manager & Contractor	Throughout construction period	15,500
	Avoid excavation works in extremely dry weathers	Project Manager & Contractor	Throughout construction period	
	Sprinkle water on graded access routes when necessary to reduce dust generation by construction vehicles	Project Manager & Contractor	Throughout construction period	
	Personal Protective equipment to be worn always when at work place	Project Manager	Throughout construction period	
8. Minimization of exhaust emissions				
Exhaust emission	Vehicle idling time shall be minimized Throughout construction period	Project Manager & Contractor	Throughout construction period	0
	Alternatively fuelled construction equipment shall be used where feasible equipment shall be properly tuned and maintained	Project Manager & Contractor	Throughout construction period	0

	Sensitize truck drivers to avoid unnecessary racing of vehicle engines at loading/offloading points and parking areas, and to switch off vehicle engines at these points	Project Manager & Contractor	Throughout construction period	0
9.Minimization of noise and vibration				
Noise and vibration	Sensitize construction vehicle drivers and machinery operators to switch off engines of vehicles or machinery not being used.	Project Manager & Contractor	Throughout construction period	0
	Sensitize construction drivers to avoid gunning of vehicle engines or hooting especially when passing through sensitive areas such as churches, residential areas and hospitals	Project Manager & Contractor	Throughout construction period	0
	Ensure that construction machinery are kept in good condition to reduce noise generation	Project Manager & Contractor	Throughout construction period	25,000
	Ensure that construction machinery are kept in good condition to reduce noise generation	Project Manager & Contractor	Throughout construction period	25,000
	Ensure that all generators and heavy-duty equipment are insulated or placed in enclosures to minimize ambient noise levels	Project Manager & Contractor	Throughout construction period	10,000
	The noisy construction works will entirely be planned to be during daytime when most of the neighbours will be at work.	Project Manager & all site foremen	Throughout construction period	0
	Comply with the provisions of Noise Prevention and Control Rules 2005, Legal notice no. 24 regarding noise limits at the workplace	Project Manager & all site foremen	Throughout construction period	0
10. Minimization of energy consumption				

Increased energy consumption	Ensure electrical equipment, appliances and lights are switched off when not being used	Project Manager & Contractor	Throughout construction period	0
	Install energy saving fluorescent tubes at all lighting points instead of bulbs which consume higher electric energy	Project Manager & Contractor	Throughout construction period	5,000
10. Minimize water consumption and ensure more efficient and safe water use				
High water demand	Install water conserving taps that turn-off automatically when water is not being used	Project Manager & Contractor	One-off	10-40 % higher
	Promote recycling and reuse of water as much as possible	Project Manager & Contractor	Throughout construction period	2,000
	Install a discharge meter at water outlets to determine and monitor total water usage	Project Manager & Contractor	One-off	2,000
	Promptly detect and repair water pipe and tank leaks	Project Manager & Contractor	Throughout construction period	5000 per month
	Sensitise staff to conserve water by avoiding unnecessary water use	Project Manager & Contractor	Throughout construction period	0
	Ensure taps are not running when not in use	Project Manager & Contractor	Throughout construction period	1,500
12. Minimize release of liquid effluent				
	Ensure that liquid effluent generated by construction workers is directed to the existing sewerage treatment plant.	Mechanical Engineer & Project Manager	One-off	15,000

	Conduct regular checks for pipe blockages or damages since such vices can lead to release of the effluent into the land and water bodies	Mechanical Engineer & Project Manager	Throughout construction period	3,000/ Month
	Monitor effluent quality regularly to ensure that the stipulated discharge rules and standards are not violated	Mechanical Engineer & Project Manager	Throughout construction period	3,000/ Month
Minimize occupational health and safety risks				
Approval of building plans	Ensure that all building plans are approved by the Local Authority and the local Occupational Health and Safety Office	Developer	One-off	5,000
Registration of the premises	Occupational Safety and Health Act, 2007 Laws of Kenya is mandatory	Developer	One-off	5,000
General register	A general register should be kept within the facility as stipulated in Sec 122&123 of the Occupational Safety and Health Act, 2007	Project Manager & Contractor	One-off	0
Posting of abstract of Act, rules and notices	There shall be displayed at prominent places within the site the prescribed abstract of the OSHA and the relevant notices as stipulated in section 121 of the OSHA, 2007	Project Manager & Contractor	One-off	2,500
Incidents, accidents and dangerous occurrences.	Ensure that provisions for reporting incidents, accidents and dangerous occurrences during construction using prescribed forms obtainable from the local Occupational Health and Safety Office (OHSO) are in place.	Project Manager, Developer & Contractor	Continuous	5,000/ Month
	Enforcing adherence to safety procedures and preparing contingency plan for accident response in addition safety education and training shall be emphasized.	The Contractor, Project Manager & Site Safety Officer	Continuous	11,600

Insurance	Ensure that the premises are insured as per statutory requirements (third party and workman's compensation)	Developer	Annually	-
Safety, health and environment (SHE) policy	Develop, document and display prominently an appropriate SHE policy for construction works	Project Manager, Developer & Contractor	One-off	2,300
Health and safety committee	Provisions must be put in place for the formation of a Health and Safety Committee, in which the employer and the workers are represented	Project Manager	One-off	5,500
Sanitary conveniences	Suitable, efficient, clean, well-lit and adequate sanitary conveniences should be provided for construction workers	Project Manager	one-off	9000
Medical examination	Arrangements must be in place for the medical examination of all construction employees before, during and after termination of employment	Project Manager, Developer & Contractor	Continuous	500 per examination
Machinery/equipment safety	Ensure that machinery, equipment, personal protective equipment, appliances and hand tools used in construction do comply with the prescribed safety and health standards and be appropriately installed maintained and safeguarded	Project Manager, Developer & Contractor	One-off	-
	Ensure that equipment and work tasks are adapted to fit workers and their ability including protection against mental strain	Project Manager, Developer & Contractor	Continuous	-
	All machines and other moving parts of equipment must be enclosed or guarded to protect all workers from injury	Project Manager, Developer & Contractor	One-off	-

Safe means of access and safe place of employment	All floors, steps, stairs and passages of the premises must be of sound construction and properly maintained	Project Manager & Contractor	Continuous	–
	Securely fence or cover all openings in floors	Project Manager & Contractor	One-off	–
	Provide all staircases within the premises with suitable handrails on both sides	Project Manager & Contractor	One-off	
	Ensure that construction workers are not locked up such that they would not escape in case of an emergency	Project Manager & Contractor	Continuous	–
	All ladders used in construction works must be of good construction and sound material of adequate strength and be properly maintained	Project Manager & Contractor	One-off	–
Emergency preparedness and evacuation procedures	Design suitable documented emergency preparedness and evacuation procedures to be used during any emergency	Project Manager & Contractor	One-off	4,000
	Such procedures must be tested at regular intervals	Project Manager & Contractor	Every months 3	4,000
	Ensure that adequate provisions are in place to immediately stop any operations where there is an imminent and serious danger to health and safety and to evacuate workers	Project Manager & Contractor	One-off	6,000
	Ensure that the most current emergency telephone numbers posters are prominently and strategically displayed within the construction site	Project Manager & Contractor	One-off	2,000
	Provide measures to deal with emergencies and accidents including adequate first aid arrangements	Project Manager & Contractor	Continuous	5,000
First Aid	Well stocked first aid box which is easily available and accessible, should be provided within the premises	Project Manager & Contractor	One-off	5,000

	Provision must be made for persons to be trained in first aid, with a certificate issued by a recognized body.	Project Manager & Contractor	One-off	5,000
Ensure the general safety and security of the site and surrounding areas				
Increased Pressure on Infrastructure	Coordinate with other planning goals and objectives for the region	Architect, Project Manager, Contactor and the Developer	Continuous	18,000
	Upgrade existing infrastructure and services, where feasible.	Architect, Project Manager, Contactor and the Developer	Continuous	18,000
Insecurity	Ensure the general safety and security at all times by providing day and night security guards and adequate lighting within and around the construction site.	Security Officer, Project Manager & Police	Continuous	15,000
	Body-search the workers on entry, to avoid getting weapons on site, and leaving site to ensure nothing is stolen.	Security Officer	Continuous	
	Ensure only authorized personnel get to the site	Security Officer	Continuous	
	Security alarms will be installed	Security Officer	Continuous	
16. Environmental monitoring of the project				
	<p>Due to the magnitude of the project the proponent will liaise with the environmental consultants throughout the construction phase and ensure that the conditions of approval are adhered to.</p> <p>As effective Grievance Redress Mechanism (GRM), monthly consultative meeting will be held during construction phase to ensure that that any emerging concerns are addressed promptly and with the finality required.</p>	Proponent, Contractor and KATRINA Management Consultants	Throughout construction phase	

9.3 Operational Phase EMP

The necessary objectives, activities, mitigation measures, and allocation of costs and responsibilities pertaining to prevention, minimization and monitoring of significant negative impacts and maximization of positive impacts associated with the operational phase of the Proposed CBK pension tower are outlined in Table below

Operation Phase Environmental Management Plan (EMP) for the Proposed CBK pension tower

Expected Negative impact	Recommended Mitigation Measures	Responsible Party	Time Frame	COST (KSHS)
1 Minimization of solid waste generation and ensuring more efficient solid waste management				
Solid waste generation	Use of an integrated solid waste management system i.e. through a hierarchy of options: 1. Source reduction 2. Recycling 3.Composting and reuse 4. Combustion 5. Sanitary land filling.	Proponent/Property Managers	One-off	5,000/Month
	Provide solid waste handling facilities such as waste bins and skips	Proponent/Property Managers	One-off	10,000
	Ensure that solid waste generated is regularly disposed of appropriately at authorized dumping sites	Proponent/Property Managers	Continuous	10,000/month
	Donate redundant but serviceable equipment to charities and institutions	Proponent/Property Managers	Continuous	0
	Comply with the provisions of Environmental Management and Co-ordination (Solid Waste) Regulations 2006	Proponent/Property Managers	Continuous	0
2 Minimize risks of liquid waste release into environment				

Liquid waste release into the environment	Provide adequate and safe means of handling liquid waste at the premises	Proponent/Property Managers	One-off	
	Conduct regular inspections for pipe blockages or damages and fix them appropriately	Proponent/Property Managers	Continuous	500 per inspection
	Ensure regular monitoring of the sewage discharged from the project to ensure that the stipulated sewage/effluent discharge rules and standards are not violated	Proponent/Property Managers	Continuous	500/parameter
	Comply with the provisions of Environmental Management and Co-ordination (Water Quality) Regulations 2006	Proponent/Property Managers	Continuous	0
3. Minimize energy consumption				
Energy Use	Switch off electrical equipment, appliances and lights when not in use	Proponent/Property Managers	Continuous	–
	Install occupation sensing lighting at various locations such as the parking areas which are not in use all the time	Proponent/Property Managers	One-off	10-40 % higher than ordinary lighting
	Install energy saving fluorescent tubes at all lighting	Proponent/Property Managers	One-off	10-40 % higher than ordinary lighting

	points within the building instead of bulbs which consume higher electric energy			
	Monitor energy use during the operation of the project and set targets for efficient energy use	Proponent/Property Managers	Continuous	5,000/month
	Sensitize workers on how to use energy efficiently	Proponent/Property Managers	Continuous	500/month
4. Minimize water consumption and ensure more efficient and safe water use				
Water management	Promptly detect and repair water pipe and tank leakages	Proponent/Property Managers	Continuous	5,000/month
	Workers/visitors to conserve water e.g. by avoiding unnecessary toilet flushing	Proponent/Property Managers	Continuous	500/month
	Ensure taps are not running when not in use	Proponent/Property Managers	Continuous	500/month
	Install water conserving taps that turn-off automatically when water is not being used	Proponent/Property Managers	One-off	10-40 % higher than ordinary taps
	Install a discharge meter at water outlets to determine and monitor total water usage	Proponent/Property Managers	One-off	5,000
5.Minimization of health and safety impacts				
Health and safety impacts	Implement all necessary measures to ensure health and safety of workers and the general public during operation of the offices as stipulated in the Occupational Safety and Health Act,2007	Proponent/Property Managers	Continuous	–

6.Ensure the general safety and security of the premises and surrounding areas				
General safety and security	Ensure the general safety and security at all times by providing day and night security guards and adequate lighting within and around the premises	Proponent/Property Managers	Continuous	10,000/month
7. Ensure environmental compliance				
Environmental compliance	Undertake an environmental audit within 12 months after operation commences as required by law	KATRINA Management Consultants	12 months after operation commences	100,000

9.4 Decommissioning Phase

In addition to the mitigation measures provided in Tables above, it is necessary to outline some basic mitigation measures that will be required to be undertaken once all operational activities of the project have ceased. The necessary objectives, mitigation measures, allocation of responsibilities, time frames and costs pertaining to prevention, minimization and monitoring of all potential impacts associated with the decommissioning and closure phase of the proposed project are outlined in table below

Decommissioning Phase Environmental Management Plan (EMP) for the Proposed CBK tower

Expected Negative Impacts	Recommended Mitigation Measures	Responsible Party	Time Frame	Cost (KShs)
1. Demolition waste management				
Demolition waste	Use of an integrated solid waste management system i.e. through a hierarchy of options: 1. Source reduction 2. Recycling 3.Composting and reuse 4. Combustion 5. Sanitary land filling.	Project Manager & Contractor	Once-off	5,000
	All buildings, machinery, equipment, structures and partitions that will not be used for other purposes must be removed and recycled/reused as far as possible	Project Manager & Contractor	Once-off	15,000
	All foundations must be removed and recycled, reused or disposed of at a licensed disposal site	Project Manager & Contractor	Once-off	7,000
	Where recycling/reuse of the machinery, equipment, implements, structures, partitions and other demolition waste is not possible, the materials should be taken to a licensed waste disposal site	Project Manager & Contractor	Once-off	0
	Donate reusable demolition waste to charitable organizations, individuals and institutions	Project Manager & Contractor	Once-off	0
Site degradation	Implement an appropriate re-vegetation programme to restore the site to its original status	Project Manager & Contractor	Once-off	0
	Consider use of indigenous plant species in re-vegetation	Project Manager & Contractor	Once-off	0
	Trees should be planted at suitable locations so as to interrupt slight lines (screen planting), between the adjacent area and the development.	Project Manager & Contractor	Once-off	0

10 CONCLUSION AND RECOMMENDATION

The ESIA study has established that the proposed development project CBK pension tower is a worthy investment by the proponent and broadly with no doubt will contribute significantly to the economic development of the country. This will be achieved through the prior discussed positive impacts namely; growth of the economy, boosting of the informal sector during the construction phase, provision of market for supply of building materials, employment generation, increase in government revenue and optimal use of land.

However, the ESIA study has established that the proposed project will also come along with some negative impacts. The negative environmental impacts that will result from establishment of the proposed project which include pressure on the existing traffic and parking facilities, hydrology and water quality degradation, noise pollution, dust emissions, solid waste generation, increased water demand, increased energy consumption, generation of exhaust emissions, workers accidents and hazards during construction, possible exposure of workers to diseases, increased storm water among others can however be sufficiently mitigated.

The proponent of the proposed project shall be committed to putting in place several measures to mitigate the negative environmental, safety, health and social impacts associated with the life cycle of the project. It is recommended that in addition to this commitment, the proponent shall focus on implementing the measures outlined in the EMP as well as adhering to all relevant national and international environmental, health and safety standards, policies and regulations that govern establishment and operation of such projects. It is expected that the positive impacts that emanate from such activities shall be maximized as much as possible as exhaustively outlined within the report. These measures will go a long way in ensuring the best possible environmental compliance and performance standards.

It is our recommendation that the project be allowed to go on provided the mitigation measures outlined in the report are adhered to, Environmental Management Plan (EMP) is implemented and the developer adhere to the conditions of approval of the project.

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ANNEXES

1. Copy of Land Ownership Documents/Title Deeds/Lease Documents.
2. CBK Certificate of Registration
3. CBK KRA PIN Certificate
4. Approved Architectural Drawings
5. Bill of quantities for the proposed project
6. Minutes of the Consultative Stakeholders meeting and list of attendants
7. Sample of Public Consultation Questionnaires
8. Traffic Assessment report
9. Geotechnical survey report