Environmental Impact Assessment Report for the Construction of Access Road and Footbridge to Imara Daima Railway Station in Nairobi City County

REPUBLIC OF KENYA

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT STUDY REPORT FOR THE CONSTRUCTION OF ACCESS ROAD AND FOOTBRIDGE TO IMARA DAIMA RAILWAY STATION IN NAIROBI CITY COUNTY

September 11, 2014

PROPOONENT
The Senior Principal Superintending Engineer
Ministry of Land, Housing and Urban Development,
Directorate of Nairobi Metropolitan Development,
P.O. Box 30130 - 00100
NAIROBI

LEAD EXPERT
Eng. Stephen Mwaura,
P. O. Box 16320-00100,
NAIROBI
TEL 0729 377 629
Certificate of Declaration and Document Authentication

This document has been prepared in accordance with the Environmental (Impact Assessment and Audit) Regulations, 2003 of the Kenya Gazette Supplement No.56 of 13th June 2003, Legal Notice No. 101.

This report is prepared for and on behalf of:

The Proponent
The Senior Principal Superintending Engineer
(Transport), Ministry of Land, Housing and Urban Development, Directorate of Nairobi Metropolitan Development,
P.O. Box 30130-00100,

Nairobi - Kenya.

Designation ________________________________
Name ________________________________
Signature ________________________________
Date ________________________________

Lead Expert

Eng. Stephen Mwaura is a registered Lead Expert on Environmental Impact Assessment/Audit (EIA/A) by the National Environment Management Authority – NEMA (Reg. No. 0193), confirms that the contents of this report are a true representation of the Environmental Impact Assessment of the proposed Construction of Access Road and Foothbridge to Imara Daima Railway Station in Nairobi City County. This report is issued without prejudice.

Lead Expert – Eng. Stephen Mwaura

Signature: ________________________
Date: ________________________
## ACRONYMS

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DONMED</td>
<td>Directorate of Nairobi Metropolitan Development</td>
</tr>
<tr>
<td>EA</td>
<td>Environmental Audit</td>
</tr>
<tr>
<td>ESIA</td>
<td>Environmental &amp; Social Impact Assessment</td>
</tr>
<tr>
<td>EHS</td>
<td>Environment, Occupational Health and Safety</td>
</tr>
<tr>
<td>EMCA</td>
<td>Environmental Management &amp; Coordination Act, 1999</td>
</tr>
<tr>
<td>EMMP</td>
<td>Environmental Management &amp; Monitoring Plan</td>
</tr>
<tr>
<td>EMS</td>
<td>Environmental Management System</td>
</tr>
<tr>
<td>ISO</td>
<td>International Standards Organizations</td>
</tr>
<tr>
<td>MoLH&amp;UD</td>
<td>Ministry of Land, Housing &amp; Urban Development</td>
</tr>
<tr>
<td>NaMSIP</td>
<td>Nairobi Metropolitan Services Improvement Project</td>
</tr>
<tr>
<td>NCC</td>
<td>Nairobi City County</td>
</tr>
<tr>
<td>NEMA</td>
<td>National Environment Management Authority</td>
</tr>
<tr>
<td>NMT</td>
<td>Non-Motorized Transport</td>
</tr>
<tr>
<td>OHS</td>
<td>Occupational Health &amp; Safety</td>
</tr>
<tr>
<td>OSHA</td>
<td>Occupational Safety &amp; Health Act</td>
</tr>
<tr>
<td>PPC</td>
<td>Public Participation &amp; Consultation</td>
</tr>
<tr>
<td>PSP</td>
<td>Private Sector Participation</td>
</tr>
<tr>
<td>ToR</td>
<td>Terms of Reference</td>
</tr>
</tbody>
</table>
TABLE OF CONTENTS

ACRONYMS ............................................................................................................................. III

EXECUTIVE SUMMARY ........................................................................................................... VIII

SCOPE OF ENVIRONMENTAL ASSESSMENT ......................................................................... X

CHAPTER ONE: INTRODUCTION ............................................................................................ 11
  1.1 Background ....................................................................................................................... 11
  1.2 Need for the project ......................................................................................................... 11
  1.3 Scope and content of project .......................................................................................... 11
  1.4 Duties of the Proponent ................................................................................................. 13
  1.5 Duties of the Contractor ............................................................................................... 13

CHAPTER TWO: LEGAL, INSTITUTIONAL AND LEGISLATIVE FRAMEWORK ............................... 16
  2.1 Environmental Management and Coordination Act No 8 of 1999 ............................... 16
  2.2 Occupational Health and Safety, 2007 ......................................................................... 16
  2.3 Public Health Act Cap 242 ............................................................................................. 16
  2.4 Physical Planning Act, 1999 ........................................................................................ 16
  2.5 Land Planning Act Cap 303 ........................................................................................... 17
  2.6 Building Code 2000 ....................................................................................................... 17
  2.7 Other Relevant Laws ...................................................................................................... 17
      2.7.1 EMCA (Waste Management) Regulations, 2006 ................................................... 17
      2.7.2 EMCA (Noise and Vibrations Control) Regulations, 2009 ................................. 18
      2.7.3 Way Leave Act Cap 292 ....................................................................................... 19
      2.7.4 Public Roads and Roads of Access Act (Cap 399) ............................................... 19
      2.7.5 Traffic Act Chapter 403 ....................................................................................... 19
      2.7.6 The National Environment Management Authority ....................................... 20
  2.8 World Bank Environmental and Social Safeguard Policies ........................................... 20

CHAPTER THREE: DESCRIPTION OF THE PROJECT ............................................................. 23
  3.1 Introduction and Project Objectives ............................................................................... 23
3.2 Project Description and design................................................................. 24
3.3 Project Justification.................................................................................. 24
3.4 Scope of Works........................................................................................ 24

3.5 Description of the Project’s Construction Activities ................................ 27
3.5.1 Pre-construction investigations ............................................................. 27
3.5.2 Demolition works.................................................................................. 28
3.5.3 Sourcing and transportation of construction materials ...................... 28
3.5.4 Storage of materials .......................................................................... 28
3.5.5 Excavation and foundation works...................................................... 28
3.5.6 Landscaping ....................................................................................... 28

3.6 Description of the Project’s Operational Activities ..................................... 28
3.6.1 General repairs and maintenance......................................................... 28

3.7 Description of the Project’s decommissioning activities ......................... 28
3.7.1 Demolition works................................................................................ 28
3.7.2 Site restoration .................................................................................. 29

3.8 Public Participation and Consultation......................................................... 29
3.8.1 Noise and Vibration ......................................................................... 29
3.8.2 Infrastructure and Natural Resources ............................................... 30
3.8.3 Dust generation ................................................................................. 30
3.8.4 Transport trucks .............................................................................. 30
3.8.5 Aesthetics ......................................................................................... 30

CHAPTER FOUR: BASELINE INFORMATION OF THE STUDY AREA ............31

4.1 Introduction.................................................................................................. 31
4.2 Climate ....................................................................................................... 31

4.3 Infrastructure .............................................................................................. 32
4.4 Population .................................................................................................. 32
4.5 Economic Activities .................................................................................. 33
4.6 Waste Management ................................................................................... 33

CHAPTER FIVE: ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT. 34

5.2 Introduction ................................................................................................ 34
5.2.1 Negative environmental impacts of construction activities ................ 34
5.2.2 Extraction and use of construction materials ...................................... 34
5.2.3 Dust emissions .................................................................................... 34
5.2.4 Exhaust emissions .............................................................................. 35
5.2.5 Noise and vibration ........................................................................... 35
5.2.6 Risks of accidents and injuries to workers ........................................ 35
5.2.7 Increased soil erosion ......................................................................... 35
5.2.8 Solid waste generation ..................................................................... 35
5.2.8 Energy consumption ................................................................. 36
5.2.9 Water use ........................................................................... 36

5.3 Positive environmental impacts of construction activities .............. 37
5.3.1 Creation of temporary employment opportunities........................ 37
5.3.2 Provision of market for supply of construction materials ............. 37
5.3.3 Increased business opportunities ............................................. 37

5.4 Negative environmental impacts of operational activities ............... 37
5.4.1 Increased storm water flow .................................................... 37

5.5 Positive environmental impacts of operational activities .................. 37
5.5.1 Revenue to national and local governments ............................... 37

5.6 Positive social impacts of operational activities ............................. 37

5.7 Negative environmental impacts of decommissioning activities ........ 38
5.7.1 Solid waste ........................................................................ 38
5.7.2 Dust ................................................................................ 39
5.7.3 Noise and vibration ............................................................... 39

5.8 Positive environmental impacts of decommissioning activities ......... 39
5.8.1 Rehabilitation .................................................................. 39
5.8.2 Employment Opportunities .................................................. 39

CHAPTER SIX: ANALYSIS OF PROJECT ALTERNATIVES ................ 40
6.1 Relocation Option .................................................................... 40
6.2 Zero or No Project Alternative .................................................... 40
6.3 Analysis of Alternative Construction Materials and Technology .... 40
6.4 Solid waste management alternatives ......................................... 41

CHAPTER SEVEN: IMPACTS MITIGATION AND MONITORING ........ 42
7.1 Introduction .......................................................................... 42

7.2 Mitigation of construction phase impacts ....................................... 42
7.2.1 Efficient sourcing and use of raw materials ................................ 42
7.2.2 Demolitions ....................................................................... 42
7.2.3 Minimization of run-off and soil erosion .................................. 43
7.2.4 Minimization of construction waste ........................................ 43
7.2.5 Reduction of dust generation and emission ................................ 44
7.2.6 Minimization of exhaust emissions ........................................ 44
7.2.7 Minimization of noise and vibration ...................................... 44
7.2.8 Reduction of risks of accidents and injuries to workers ............ 44
7.2.9 Reduction of energy consumption ......................................... 44
7.2.10 Minimization of water use ................................................... 45

7.3 Mitigation of operation phase impacts .......................................... 45
Environmental Impact Assessment Report for the Construction of Access Road and Footbridge to Imara Daima Railway Station in Nairobi City County

7.3.1 Management of storm-water runoff ................................................................. 45

7.4 Mitigation of decommissioning phase impacts .................................................. 45
7.4.1 Efficient solid waste management ................................................................. 45
7.4.2 Reduction of dust concentration .................................................................... 45
7.4.3 Minimization of noise and vibration ............................................................. 45

CHAPTER EIGHT: ENVIRONMENTAL MANAGEMENT AND MONITORING PLAN .......................................................................................................................... 46

8.1 Significance of an EMMP .................................................................................... 46
8.1.1 Pre-Construction & Construction Phases EMMP ........................................... 46

Table 3: The EMMP for the Construction Phase of Imara Daima Roads and Bridge Project 47

8.1.2 Operational Phase EMMP .............................................................................. 52

Table 4: EMMP for the Operational Phase of the Project ......................................... 53

8.1.3 Decommissioning Phase ................................................................................. 53

Table 5: EMMP for the Decommissioning Phase ...................................................... 54

CHAPTER NINE: AUXILIARY INFORMATION .................................................. 55

9.1 Budget ............................................................................................................... 55

9.2 Monitoring Guidelines ...................................................................................... 55

9.3 Reporting .......................................................................................................... 55

CHAPTER TEN: CONCLUSION AND RECOMMENDATIONS .......................... 56

REFERENCES ........................................................................................................ 57
EXECUTIVE SUMMARY

This Environmental & Social Impact Assessment (ESIA) project report was prepared as per the provisions of the Environmental Management and Coordination Act No. 8 of 1999, and more specifically to Environmental Impact Assessment Regulations 2003. It is also in line with the World Bank Safeguards Policies and specifically OP4.01 (Environmental Assessment). These Safeguard policies are a set of instruments to ensure that the Bank supported lending operations minimize any adverse impacts on local people, their livelihoods, culture and the environment and are a mandatory mechanism for evaluating Bank financed projects during design, implementation and completion, mainly through environmental and social impact assessments.

More so, the ESIA is a way of promoting benign environmental management for sustainable development. It is for this reason that this ESIA was commissioned. The Lead Expert registered with NEMA was contracted by the proponent to undertake the study with the objective of identifying both the negative and the positive impacts of the proposed project and identify areas that are likely to be impacted on by the project in accordance with the laid down environmental legislation and guidelines, carry out a systematic ESIA report that should contain among other issues, identification of key environmental aspects, recommendations on appropriate mitigatory measures to minimize or prevent adverse impacts and develop an environmental management plan outline.

The proponent aims to construct access roads and a footbridge to Imara Daima Railway Station in Nairobi City, Embakasi Constituency of Nairobi City County. The design for the construction works will include upgrading to bitumen standards various roads leading to the railway station as well as erecting a footbridge from the Mombasa Road side for use by pedestrians accessing and leaving the railway station. The project is well presented in drawings and has been approved by the Nairobi City County.

The proponents are required to present this report in order to comply with the Environment Management Co-ordination Act 1999 and in particular part II of the Environmental (Impact Assessment and Audit) Regulations, 2003. The report has provided a summary statement of the likely environmental effects of the proposed project.

Our investigation examined the potential impact of the project on the immediate surroundings with due regard to all the phases from construction through to completion and operational phase. It encompassed all aspects pertaining to the physical, ecological, socio-
cultural, health and safety conditions at the site and its environs during and after construction. The study was based on laid down scientific qualitative procedures with the most recent methodologies and analysis required in ESIA and, strictly adheres to the relevant legislative framework governing the construction industry. Reference was also made to EIA reports dealing with similar projects from other parts of the world.

Where possible, the ESIA team has provided annexes such as site maps, plans and applications to local authorities to support our findings or show the depth of our investigations. The ESIA team has also provided photos of the proposed site.

The ESIA team found out that the proponent of the proposed project has proposed to follow the laid down regulations, standards, laws and structural drawings as put out and proposed by the relevant authorities and professionals respectively. Our conclusion is that the project is important for economic development of Nairobi City County and has balanced environmental considerations and benefits. The ESIA team has given adequate measures to mitigate the negative impacts and a management plan proposed which the proponent should adhere to. The notable potential negative environmental impacts that were identified include among others:

i. Air pollution due to noise, vibration and dust;

ii. Ecological damage from the clearance of areas for site location and storage of materials (construction materials, fuel, lubricants and machinery);

iii. Material sourcing and supply for the construction and maintenance works;

iv. Social disturbance caused by the construction and future maintenance, and

v. Any effects from uncontrolled storm-water run-off

These have to be mitigated sufficiently for the project to progress. The mitigation measures to manage these impacts are as identified in the EMMP in the report. Moreover, this project’s potential benefits and positive impacts far outweigh the negative impacts.
Scope of environmental assessment

This Environmental Impact Assessment (EIA) Report considers the following aspects and others that may prove of significance during the study.

1. Assess the project’s impacts on ecology. This will in essence cover:-
   i. Impacts due to loss of vegetation cover
   ii. Surface run-off water, containment and flood control.

2. Assess social implications of the development within the locality, region and nationally will include: -
   i. Economic implications of the development.
   ii. Security-threats, risk and enhancement.
   iii. Employment.
   iv. Livelihoods.
   v. Public health implications.
   vi. Demand and development of infrastructure and social amenities.

3. Assess the impacts of development on landscape and land use such as: -
   (a) Determine the impact on change on civic shape, scenery, aesthetic modifications.
   (b) Examine the compatibility and complementarity of the development with the surrounding land uses.

4. Assess the impacts of the development on power demands, water demands, and access road congestion as well as possible impacts on surface run-off and ground water qualities and quantities, if any.

5. Develop an Environmental Management and Monitoring Plan (EMMP) that would mitigate the possible impacts on the environment.
CHAPTER ONE: INTRODUCTION

1.1. Background
The construction works are located in Embakasi Constituency in Nairobi City County in the Nairobi City of Kenya. The roads covered include:-

   a) Tegla Lorupe Road
   b) Cosmas Ndeti Road
   c) Catherine Ndereba Road (Section between Cosmas Ndeti junction to AA of Kenya)
   d) NMT within the railway reserve.
   e) Access to Embakasi Girls Secondary School
   f) Access to Mukuru Community centre.

A footbridge over the railway line erected from Mombasa Road is also part of the project as a Non Motorized Transport facility to enable accessibility to the railway station by pedestrians going to the railway station from the Mombasa Road side.

1.2 Need for the project
The broad aim of the project is to enhance mobility, accessibility and transport within the Imara Daima area. The project has laid emphasis on the provision of Non Motorized Transport facilities so as to encourage people living within the area to either walk or cycle to the Railway Station. The project is also aimed at providing and improving access to:-

   a) Embakasi Girls Secondary School
   b) Mukuru Community Centre
   c) Mukuru Kwa Njenga Slums
   d) Imara Daima and Villa Franca estates

The project is also good news in terms of job creation. There are so many town dwellers that lack employment and they are going to benefit from this project. Many people are going to be employed during the planning stage of the project, the construction stage and when the project will be operational. The need therefore exists for providing flexible, modern and cost effective transport facilities to and from Imara Daima Railway Station.

1.3 Scope and content of project
The works shall include but not limited to: -

   a) Site clearance and earthworks as necessary
b) Excavation to remove unsuitable materials
c) Filling with approved materials as specified and directed.
d) Hand packing with approved stone as specified and directed
e) Base repairs as specified and directed
f) Repairs to existing drainage structures as specified and directed
g) Improvement/construction to the drainage facilities as directed
h) Sectional improvement/construction of sections of roads as directed
i) Repairs and widening /or improvement/construction to footpaths and shoulders as directed
j) Laying of Asphaltic concrete layer(s) to a consolidated thickness directed
k) Laying and/or replacement of kerbs and channel as specified and directed
l) Grading and/or improvement/construction of unpaved roads as directed
m) Construction of road junctions abutting to these roads
n) Provision of public transport facilities
o) Relocation and/or protection of other services including but not limited to water pipes, sewer pipes, Street lighting, Power and Telephone
p) Installation of Streetlights

The project assessment investigates and analyses the anticipated environmental and social impacts of the proposed development in line with the Environmental (Impact Assessment and Audit) 2003 regulations. Consequently, the report provides the following:

- The location of the project including the physical environment that may be affected by the project’s activities.
- The activities that shall be undertaken during the project construction, operation and design of the project
- The materials to be used, products and by-products including waste to be generated by the project and the methods of disposal.
- The potential environmental and social impacts of the project and mitigation measures to be taken during and after the implementation of the project.
- An action plan for prevention and management of possible accidents during the project cycle
- A plan to ensure the health and safety of the workers and the neighboring communities
- The economic and social cultural impacts to local community.
The project budget
Any other information that the proponent may be requested to provide by NEMA

This report also seeks to ensure that all the potential environmental and social impacts are identified and that workable mitigation measures are adopted. The report also seeks to ensure compliance with the provisions of the EMCA 1999, and Environmental (Impact Assessment and Audit) Regulations 2003 as well as other regulations. The report emphasizes the duties of the proponent and contractor during the construction phase as well as the operation phase of this project.

1.4 Duties of the Proponent
It will be the duty of the proponent to ensure that all legal requirements as pertaining to the development are met as specified by the law, including World Bank Safeguards and specifically OP4.01 (Environmental Assessment).

- The proponent shall hand over the site to the Contractor for implementation of the project
- The proponent is also the one to fund the project
- The proponent is also the one who has initiated the project and will also ensure its satisfactory implementation

1.5 Duties of the Contractor
- Prepare and maintain an approved Time and Progress chart, showing clearly the period allowed for each section of the work
- The contractor is to comply with all regulations and by-laws of the local Authority including serving of notices and paying of the fees.
- During the night, public holidays and any other time when no work is being carried out onsite, the contractor shall accommodate only security personnel and never should a labor camp be allowed onsite.
- The contractor shall make good at his own expense any damage he may cause to public and private roads, drainages and pavements in the course of carrying out his work.
- The proponent shall define the area of the site, which may be occupied by the contractor for use as storage, on the site
- The contractor shall include all recommendations from ESIA into the contract.
- The contractor shall provide at his own risk, and cost all water required for use in connection with the works including the work of subcontractors, and shall provide temporary storage tanks, if required.
- The contractor shall make his own arrangements for sanitary conveniences for his workmen. Any arrangements so made shall be in conformity with the public health requirements for such facilities and the contractor shall be solely liable for any infringement of the requirements.
- The contractor shall be responsible for all the actions of the subcontractor in the first instance.
- The contractor shall take all possible precautions to prevent nuisance, inconvenience or injury to the neighboring properties and to the public generally, and shall use proper precaution to ensure the safety of wheeled traffic and pedestrian.
- All work operations which may generate noise, dust, vibrations, or any other discomfort to the workers and/or guest of the client and the neighbors must be undertaken with care, with all necessary safety precautions taken.
- The contractor shall take all effort to muffle the noises from his tools, equipment and workmen to not more than 80dBA.
- The contractor shall upon completion of working, remove and clear away all plant, rubbish and unused materials and shall leave the whole site in a clean and tidy state to the satisfaction of the Proponent. He shall also remove from the site all rubbish and dirt as it is produced to maintain the tidiness of the premises and its immediate environs.
- No shrubs, trees, bushes or underground thicket shall be removed except with the express approval of the Proponent.
- No blasting shall be permitted without the prior approval of the Proponent and the local authorities.
- Borrow pits will only be allowed to be opened up on receipt of permission from the Proponent.
- The standard of workmanship shall not be inferior to the current British codes of practice and/or the Kenya Bureau of Standards where existing. No materials for use in the permanent incorporation into the works shall be used for any temporary works or purpose.
other than that for which it is provided. Similarly, no material for temporary support may be used for permanent incorporation into the works.

All the materials and workmanship used in the execution of the work shall be of the best quality and description. Any materials condemned by the Proponent shall be immediately removed from the site at the contractors cost.

The premises should also be planned to be landscaped and with adequate drainage facilities. Environmental concerns need to be part of the planning and development process and not an afterthought, it is therefore advisable to avoid land use conflicts with the surrounding area. To avoid unnecessary conflicts that retard development in the project area, the proponent undertook this ESIA and incorporated environmental concerns as advised by the Authority. Finally, a comprehensive Environmental Management and Monitoring Plan (EMMP) is mandatory for a project of this magnitude and nature because large quantities of solid wastes are likely to be generated with temporary interference to the general public and services during project execution.
CHAPTER TWO: LEGAL, INSTITUTIONAL AND LEGISLATIVE FRAMEWORK

2.1 Environmental Management and Coordination Act No 8 of 1999
This project report has been undertaken in accordance with the Environment (Impact Assessment and Audit) regulation 2003, which operationalize the environment management and coordination act 1999. The report is prepared in conformity with the requirements stipulated in the environmental management and coordination act no 8 of 1999(EMCA) and the Environmental Impact Assessment and audit regulations 2003 regulation7 (1) and the second schedule. Part II of the said act states that every person is entitled to a clean and healthy environment and has the duty to safeguard the same. In order to achieve the goal of a clean environment for all, new projects listed under the second schedule of Section 58 of EMCA No 8 of 1999 shall undergo an Environmental Impact Assessment. This includes development activities such as this new project. In addition to the legal compliance above, the following legal aspects have also have been taken into consideration or will be taken into consideration before commencement of construction:

2.2 Occupational Health and Safety, 2007
The said Act requires that before any premises are occupied or used a certificate of registration should be obtained from the chief inspector. The occupier must keep a general register with provision for health, safety and welfare of workers on site. For safety, fencing of the premise and dangerous parts must be done. There should be provision for clean and sanitary working conditions. More so there must be also provision of quality and quantity wholesome drinking water.

2.3 Public Health Act Cap 242
Part IX section 115 of the Act states that no person or 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 reasonable practicable measures to maintain their jurisdiction clean and sanitary to prevent occurrence of nuisance or condition liable to injuries or dangerous to human health.

2.4 Physical Planning Act, 1999
The said Act section 29 empowers the Local Authorities to reserve and maintain all land planned for open spaces, parks, urban forests and green belts. The same section allows for prohibition or control of the use and development of an area. Section 30 states that any person who carries out development without development permission will be required to restore the land to its original condition. It also states that no other licensing
authority shall grant license for commercial or industrial use or occupation of any building without a development permission granted by the respective local Authority.

2.5 Land Planning Act Cap 303
Section 9 of the subsidiary legislation (the development and use of land Regulations 1961) under which it requires that before the Local Authority submits any plans to the minister for approval, steps should be taken as may be necessary to acquire the owners of any land affected by such plans. Particulars of comments and objections made by the landowners should be submitted, which intends to reduce conflict of interest with other socio economic activities.

2.6 Building Code 2000
Section 194 requires that where sewer exists, the occupants of the nearby premises shall apply to the Local Authority for permit to connect to the sewer line and all the wastewater must be discharged in to sewers. The code also prohibits construction of structures or building on sewer lines.

2.7 Other Relevant Laws
2.7.1 EMCA (Waste Management) Regulations, 2006
These Regulations guides on the appropriate waste handling procedures and practices. It is anticipated that, the proposed project will generate large quantity of solid waste during construction which will need to be managed through reuse, recycling or appropriate disposal. It is therefore anticipated that, the amount of materials to be discarded as waste during the project implementation will be minimum. It is recommended that the proponent should 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 including those excavated from existing road. Purchasing and using recovered construction materials will lead to financial savings and reduction of the amount of construction debris disposed of as waste. To comply with the requirements of the regulations the proponent should undertake the following in addition to the above-mentioned recommendations;

i. Should not dispose any waste on the highway, street road, recreational area and public places;
ii. Segregate waste and group them according to their similarity for example plastics, toxic, organic etc;

iii. Ensure all waste is deposited in a designated dumping are approved by the local authority;

iv. All waste handlers engaged by the proponent should be licensed by NEMA and posses all relevant waste handling documents such as waste transport license, tracking documents, license to operate a waste yard, insurance cover, vehicle inspection documents among others;

v. Implement cleaner production principles of waste management strategy namely reduce, reuse and recycle;

vi. Label all hazardous wastes as specified in section 24 (1-3) of the regulation.

vii. The fourth schedule lists wastes considered as hazardous and solvents, emulsifiers/emulsion, waste oil/water and hydrocarbon/water mixtures. Road projects involve use of inputs which are likely to generate the mentioned wastes and thus will need to be handled as required by the regulations.

2.7.2 EMCA (Noise and Vibrations Control) Regulations, 2009

These Regulations provides guidelines for acceptable levels of noise and vibration for different environments during the construction and operation phase. Section 5 of the regulation warns on operating beyond the permissible noise levels while section 6 gives guidelines on the control measures for managing excessive noises and copy of the first schedule indicating the permissible noise levels for different noise sources and zones. The project team should observe the noise regimes for the different zones especially when working in areas termed as silent zones which are areas with institutions and worship places. These areas are permitted exposure to sound level limits of not exceeding 40 dB (A) during the day and 35 dB (A) at night. The regulation states that a day starts from 6.01 a.m. to 8.00 p.m. while night starts from 8.01 p.m. – 6.00 a.m. Construction sites near the silent zones are allowed maximum noise level of 60 dB (A) during the day and night levels are maintained at 35 dB (A). The time frame for construction sites are adjusted and the day is considered to start at 6.01 a.m. and ends at 6.00 pm while night duration from 6.01 p.m. to 6.00 a.m.
Part III of the regulation gives guidelines on noise and vibration management from different sources. Sections 11, 12 and 13 of the stated part give guidelines on noise and vibration management from machines, motor vehicles and night time construction respectively. Section 15 requires owners of activities likely to generate excessive noise to conduct an ESIA to be reviewed and approved by NEMA.

It is anticipated that the proposed project will generate excessive noise and/or vibration due to demolition of the existing road; this noise will originate from the construction equipments, vehicles and the workers since the road neighbors homesteads and institutions in some sections and it is therefore recommended that the construction team develops mitigations to reduce noise propagation in the project area.

2.7.3 Way Leave Act Cap 292
Section 3 of the Act states that the Government may carry any works through, over or under any land whatsoever, provided it shall not interfere with any existing building or structure of an ongoing activity. Notice, however, should be given one month before carrying out any such works (section 4) with full description of the intended works and targeted place for inspection. Any damages caused by the works would then be compensated to the owner as per Section 8 of the Act that states that any person whom without consent causes any building to be newly erected on a way leave, or cause hindrance along the way leave shall be guilty of an offence and any alterations will be done at his/her costs.

2.7.4 Public Roads and Roads of Access Act (Cap 399)
Sections 8 and 9 of the Act provides for the dedication, conservation or alignment of public travel lines including construction of access roads adjacent to lands from the nearest part of a public road. Sections 10 and 11 allows for notices to be served on the adjacent land owners seeking permission to construct the respective roads.

2.7.5 Traffic Act Chapter 403
This Act consolidates the law relating to traffic on all public roads. The Act also prohibits encroachment on and damage of roads including land reserved for roads. This Imara Daima project is under the provisions of the Act.
2.7.6 The National Environment Management Authority

The responsibility of the National Environmental Management Authority (NEMA) is to exercise general supervision and, co-ordination of all matters relating to the environment and to be the principal instrument of government in the implementation of all policies relating to the environment. The Authority shall review the project report for the proposed project, visit the project site to verify information provided in the report and issue an ESIA license if it considers that all the issues relevant to the project have been identified and mitigation measures to manage them proposed.

2.8 World Bank Environmental and Social Safeguard Policies

Like in any project financed by, or with financial participation of, the World Bank, the environmental and social safeguards as defined in the Bank’s Operational Procedures (OPs) will be respected for the purposes of this project implementation.

WB classifies its projects into four Environmental Assessment categories according to the likely impacts on the environment they will have. This classification is as follows (only main conditions mentioned):

(a) Category A: A proposed project is classified as Category A if it is likely to have significant adverse environmental impacts.

(b) Category B: A proposed project is classified as Category B if its potential adverse environmental impacts on human populations or environmentally important areas—including wetlands, forests, grasslands, and other natural habitats—are less adverse than those of Category A projects. These impacts are site-specific; few if any of them are irreversible; and in most cases mitigatory measures can be designed more readily than for Category A projects. This particular NaMSIP subproject has been categorized as B.

(c) Category C: A proposed project is classified as Category C if it is likely to have minimal or no adverse environmental impacts. Beyond screening, no further EA action is required for a Category C project.
(d) Category FI: A proposed project is classified as Category FI if it involves investment of Bank funds through a financial intermediary, in subprojects that may result in adverse environmental impacts; this case, in any way, is not applicable to the NaMSIP project.

Most of the proposed specific projects are in the areas of water supply, storm water drainage and sewerage, with road upgrading and floodlighting in some of the settlements. All of them will have significant positive effects on the environment and on the living conditions of the residents in these settlements. Adverse effects, if any, will be limited (some minor and temporally limited noise and dust during construction). Only where drainage and sewage is concerned, measures will have to be taken to prevent indirect adverse effects; such effects could be outside of the project sites, i.e. the selected settlements, in the downstream area, to which drainage water and sewage will flow. Such effects can clearly be identified during the screening process and mitigated as described in EMMP.

The table below shows the applicability of World Bank Operational Safeguards as it applies to this construction of access road and footbridge to Imara Daima Railway Station in Nairobi City County.

<table>
<thead>
<tr>
<th>OP</th>
<th>Title</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.01</td>
<td>Environmental Assessment</td>
<td>Applicable. As a result of environmental and social screening, the project was identified as a Category B project due to its road rehabilitation and other activities, as described</td>
</tr>
<tr>
<td>4.04</td>
<td>Natural Habitats</td>
<td>Not applicable.</td>
</tr>
<tr>
<td>4.09</td>
<td>Pest Management</td>
<td>Not applicable.</td>
</tr>
<tr>
<td>4.10</td>
<td>Indigenous Peoples</td>
<td>Not applicable.</td>
</tr>
<tr>
<td>4.11</td>
<td>Physical Cultural Resources</td>
<td>Not applicable. Site visits and inventories have not indicated the presence of any cultural (historical, archaeological) sites in the sample settlements. However, to manage “chance finds” an appropriate procedure is included in this ESIA. Such procedure to be followed by contractors during the construction phase.</td>
</tr>
<tr>
<td>4.12</td>
<td>Involuntary Resettlement</td>
<td>Not applicable</td>
</tr>
<tr>
<td>4.36</td>
<td>Forests</td>
<td>Not applicable.</td>
</tr>
<tr>
<td>4.37</td>
<td>Safety of Dams</td>
<td>Not applicable.</td>
</tr>
<tr>
<td>7.50</td>
<td>Projects on</td>
<td>Not applicable.</td>
</tr>
<tr>
<td>International Waterways</td>
<td></td>
<td></td>
</tr>
<tr>
<td>------------------------</td>
<td>--</td>
<td></td>
</tr>
<tr>
<td>Projects in Disputed Areas</td>
<td>Not applicable.</td>
<td></td>
</tr>
</tbody>
</table>
CHAPTER THREE: DESCRIPTION OF THE PROJECT

3.1 Introduction and Project Objectives
Rapid urbanization has left Kenyan cities with huge unmet demand for critical infrastructure and basic services. This has constrained the productivity of businesses and negatively impacted the quality of life of residents. This uncoordinated urbanization has led to massive expansion of overcrowded and impoverished informal settlements; waste of many man hours in daily traffic jams due to lack of mass transport; uncollected solid waste, which end up blocking drainage systems, and contributing to periodic flooding; and sewage seeps into ground water, contaminating rivers and streams. Further, most major cities are financially fragile or insolvent, and have weak management structures, while key institutions lack adequate capacity.

Nairobi Metropolitan Service Improvement Project (NaMSIP) is part of a wide municipal development initiative by the Government and the development partners to address these problems. NaMSIP is an initiative of the Kenya Government with the support of the World Bank under the Country Partnership Strategy (CPS). The CPS emphasizes the themes of growth, equity, and environment, with a special emphasis on governance. NaMSIP contributes to the governance, growth, and improved environmental management agendas. It seeks to strengthen structures of governance in the metropolitan area, including the county administration and the new metropolitan authorities. NaMSIP contributes to the CPS’s growth objective by supporting design and implementation of critical urban services—including transport, sanitation, and solid waste management—that will allow the metropolitan area to meet the needs of businesses and residents. Investment in infrastructure also contributes to the growth agenda by improving the competitiveness of Kenya’s cities as places to live and invest.

NaMSIP is intended to improve services in the metropolitan area which are critical for economic development that include solid waste management, transport systems, storm water management, water supply and sanitation, disaster management and security/street lighting among many others. In addition, the implementation of the project will give the Ministry an opportunity to build its human resource and technical capacity in carrying out metropolitan-wide activities. NaMSIP is in line with the Government’s national development priorities and policies as well as ongoing public sector reform agenda. The project also supports strengthening of public sector management and accountability.
3.2 Project Description and design

The works are located in Embakasi Constituency in Nairobi City County.

The roads covered include:-

- Tegla Loroupe Road
- Cosmas Ndeti Road
- Catherine Ndereba Road (Section between Cosmas Ndeti junction to AA of Kenya)
- NMT within the railway reserve.
- Access to Embakasi Girls Secondary School
- Access to Mukuru Community centre.

3.3 Project Justification

The broad aim of the project is to enhance mobility, accessibility and transport within the Imara Daima area. The project has laid emphasis on the provision of Non Motorized Transport facilities so as to encourage people living within the area to either walk or cycle to the proposed Railway station. The project is also aimed at providing and improving access to:-

- Embakasi Girls Secondary School
- Mukuru Community Centre
- Mukuru Kwa Njenga Slums
- Imara Daima and Villa Franca estates

3.4 Scope of Works

The works shall include but not limited to: -

- Site clearance and earthworks as necessary
- Excavation to remove unsuitable materials
- Filling with approved materials as specified and directed.
- Hand packing with approved stone as specified and directed
- Base repairs as specified and directed
- Repairs to existing drainage structures as specified and directed
- Improvement/construction to the drainage facilities as directed
- Sectional improvement/construction of sections of roads as directed
- Repairs and widening /or improvement/construction to footpaths and shoulders as directed
- Laying of Asphaltic concrete layer(s) to a consolidated thickness directed
Environmental Impact Assessment Report for the Construction of Access Road and Footbridge to Imara Daima Railway Station in Nairobi City County

- Laying and/or replacement of kerbs and channel as specified and directed
- Grading and/or improvement/construction of unpaved roads as directed
- Construction of road junctions abutting to these roads
- Provision of public transport facilities
- Relocation and/or protection of other services including but not limited to water pipes, sewer pipes, Street lighting, Power and Telephone
- Installation of Streetlights

A further scoping report is as shown in the table below.

<table>
<thead>
<tr>
<th>ROAD</th>
<th>STATUS OF THE ROAD</th>
<th>RECOMMENDATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tegla Loroupe Road (346m)</td>
<td>Carriageway in good condition</td>
<td>Walkway to be widened to 2.5m with up-stand kerbs on the edge of the carriageway to prevent vehicular traffic from climbing and driving on the walkway.</td>
</tr>
<tr>
<td></td>
<td>1.5m walkway on one side which is worn out in a number of areas</td>
<td>Cleaning and de-silting of the open drain</td>
</tr>
<tr>
<td></td>
<td>Open drain on sections of the road which is heavily silted.</td>
<td>Introduce a 2.0m walkway on the RHS from the junction with Mombasa Road up to Cosmas Ndeti Road junction</td>
</tr>
<tr>
<td></td>
<td>Shallow open drain from the junction of Mombasa road to the access to Villa Franca Estate which has been covered with silt.</td>
<td>Provide an overlay of 35mm on the carriageway to fill the small cracks.</td>
</tr>
<tr>
<td></td>
<td>Street lighting existing and is in a good working condition.</td>
<td>Replace or repair any street lighting poles that may not be in working condition.</td>
</tr>
<tr>
<td></td>
<td>There are no bus areas for dropping and picking passengers.</td>
<td>Provision of two bus areas for inbound and outbound traffic from Mombasa road is not required in accordance with Design Manual and this is adequately served by the ones at the junction of Tegla Loroupe and Cosmas Ndeti Roads.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Provision of acceleration and deceleration lanes at the junction of Tegla Loroupe and Mombasa Road has been provided for in the design and is in the scope of</td>
</tr>
</tbody>
</table>
works. This will assist in the management of entry and exit from the busy Mombasa Road to reduce knock-down accidents to pedestrians, as has been reported in the extensive public participation and consultation exercise that has been carried out for the purposes of this ESIA.

- The design has provided for 4 bus lay byes.

<table>
<thead>
<tr>
<th>Location</th>
<th>Conditions</th>
<th>Improvement Measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cosmas Ndeti Road Section between Tegla Loroupe Junction and Moses Tanui Road</td>
<td>Carriageway in good condition, Open drain on both sides of the road, 2.0m walkway on the Left Hand Side, Street lighting existing and is in a good working condition.</td>
<td>Walkway to be widened to 3.0m, Cleaning and de-silting of the open drain, Introduce a 2.5m walkway on the RHS after the open drain to act as a deterrent for motorists not to drive on it, Provide an overlay of 35mm on the carriageway to fill the small cracks.</td>
</tr>
<tr>
<td>Cosmas Ndeti Road Section between Moses Tanui road and Catherine Ndereba Road</td>
<td>Undeveloped earth road with No drainage, No walkway and No street lighting</td>
<td>Construction of the section to provide for the 7.0m Carriageway, Lined open drain on both sides with access culverts, Provide for street lighting, Provide 3.0m walkway on both sides of the carriageway.</td>
</tr>
<tr>
<td>Cosmas Ndeti Road Section between Tegla Loroupe road and Catherine Ndereba Road (820m)</td>
<td>The section between Tegla Loroupe Road and the Entrance to Riara Academy is a gravel earth road with no drainage, no walkways and no street lighting. The Catherine Ndereba Road terminates at the gate of Riara School.</td>
<td>Construction of the section to provide for the Carriageway, drainage, walkways and street lighting up to the gate of Riara Academy where Catherine Ndereba road terminates, Provide 3.5m walkway on LHS and 2.0m walkway on the RHS.</td>
</tr>
<tr>
<td>Access to Imara Daima Railway Station (320m)</td>
<td>Undeveloped earth road with No drainage, No walkway and No street lighting</td>
<td>Construction of the section to provide for the 7.0m Carriageway, Lined open drain on both sides with access culverts.</td>
</tr>
</tbody>
</table>
### Description of the Project's Construction Activities

#### 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.
3.5.2 Demolition works
Any wastes or debris arising from any demolitions will be transported to licensed site for disposal.

3.5.3 Sourcing and transportation of construction materials
Construction materials will be transported to the project site from their extraction, manufacture, or storage sites using transport trucks. The materials to be used in construction of the project will be sourced from neighboring areas. Greater emphasis will be laid on procurement of construction 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.

3.5.4 Storage of materials
Construction 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 contractor should order bulky materials such as sand, gravel and stones in batches.

3.5.5 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, human effort and appropriate equipment.

3.5.6 Landscaping
To improve the aesthetic value or visual quality of the site once construction ceases, the contractor will carry out landscaping.

3.6 Description of the Project’s Operational Activities

3.6.1 General repairs and maintenance
The access roads and footbridge will be repaired and maintained by Nairobi City County during their operational phases.

3.7 Description of the Project’s decommissioning activities

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

3.7.2 Site restoration
Once all the waste resulting from demolition and dismantling works is removed from the site, the site will be restored through replenishment of the topsoil.

3.8 Public Participation and Consultation
Interviews were carried out in the neighborhood in May 2014 by the use of questionnaires, to find out all the views from the neighbors’ towards the proposed project. Most of the neighbors had no objection, with most commending the development as per the attached questionnaires.

Our questionnaire was initially giving introduction and making awareness to the residents of the proposed project. Afterwards, the ESIA team enquired on acceptance of the project and whether the project will cause any negative impacts on the following:

a) Local residents and their businesses; b) Ecology of the area; c) Human environment;
d) Recreational and leisure facilities; e) Public health and safety; f) Effect on water resources and quality; g) Effect on the soils; h) Effect on road transport and; i) Waste disposal. The said parameters were directly mentioned to foresee which could have intense negative impact. Average results show impact to be moderate with most of the impacts being mitigatable.

However, from previous projects of same magnitude, some impacts even without concern of the residents are expected and their effects are discussed below. A public meeting (baraza) was also organized with the residents of the surrounding estates on Sunday July 13, 2014 where the project was discussed and further views sought. The residents including all the officials of the residents associations all support the project and are awaiting eagerly for its commencement.

3.8.1 Noise and Vibration
Little concern is over the possibility of high noise and vibration levels in the project site as a result of construction works. The sources of noise pollution will include transport vehicles, construction machinery and metal grinding and cutting equipment. However, the proponent will take appropriate steps to minimize noise impacts including provision of appropriate protective equipment to construction workers, planning and minimizing the frequency of materials transport, and ensuring that all equipment are well maintained. The construction works will also be carried out exclusively during the day.
3.8.2 Infrastructure and Natural Resources
The respondents feared that the rapid increase in population in the area will demand more services such as electricity, water and sewerage supply. The traffic along the highway would increase as well. There was need for the proponent to ensure that the authorities concerned are informed to provide more resources and expand on infrastructure. Acceleration and deceleration lanes will be provided where required to manage traffic in the area.

3.8.3 Dust generation
There is possibility of generation of large amounts of dust within the project site and surrounding areas as a result of transportation of building materials, especially if the construction is done in dry weather. The proponent will ensure that dust levels at the site are minimized through sprinkling water in areas being excavated and along the tracks used by the transport trucks within the site. Additional mitigation measures presented in the EMMP will be fully implemented to minimize the impacts of dust generation.

3.8.4 Transport trucks
The heavy transport trucks that will be turning around the project site while delivering construction materials may cause traffic file-up. In addition to contribution of noise and emission of exhaust fumes around the premises, such trucks may slow down traffic flow. The contractor will put in place measures to address such concerns by ensuring that delivery trucks are well driven and managed. In addition, the mitigation measures outlined in the EMMP will be fully implemented to address environmental issues relating to construction trucks.

3.8.5 Aesthetics
Some of the respondents feared that the project will affect the area aesthetically through dumping. It was suggested that the proponent should ensure high hygiene standards within the premises and surrounding areas during construction and during the operation stages of the project. More so via the prescribed EMMP, the proponent shall put in place several measures aimed at ensuring high standards of hygiene and housekeeping within the premises and surrounding areas.
CHAPTER FOUR: BASELINE INFORMATION OF THE STUDY AREA

4.1 Introduction
Nairobi lies at an altitude of 1680m above sea level, but this height ranges from 1500m (to the east) to 2300m (to the West). It is located at longitude 36° 50’ East and latitude 1° 18’ South about 140 km South of the Equator placing its high affect for the cooler air to keep its temperatures moderate. Nairobi City has experienced rapid growth both in terms of population and physical expansion. The physical area of Nairobi has been expanding tremendously from 3.84 Km$^2$ in 1900 to 684 Km$^2$ in 1963 which is the current official size of the City.

Nairobi City lies in the Athi River Drainage Basin. The major rivers that cross the City include Nairobi, Ruaraka, Ngong, Athi and Mathare River. All these drain from the West and flow towards the Eastern direction as dictated by the topographical features. As the rivers pass through the City, industrial effluents, municipal waste and siltation heavily pollute them.

4.2 Climate
The average daily temperature throughout the year varies slightly from month to month with average temperatures of around 17 degrees Celsius during the months of July and August to about 20 degrees Celsius 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, southeast 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.

Because of Nairobi’s location just south of the equator in combination with humid air pumped in from the Indian Ocean, the humidity values for each day are generally on the higher end. This is not to say that values are always high, since the easterly winds coming off the Indian Ocean tend to keep the temperatures standard throughout the country; therefore the “warm sticky” feeling
Environmental Impact Assessment Report for the Construction of Access Road and Footbridge to Imara Daima Railway Station in Nairobi City County

is usually not associated with Nairobi as much as one would think. In the summer to autumn months of January to April, relative humidity values have been known to plummet to anywhere from 10% to 20%. The typical day, humidity-wise, starts off with nearly saturated in the morning hours, and steadily decreases throughout the remainder of the day. 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, a person may think there is only one rainy season when looking at the annual rainfall amounts.

4.3 Infrastructure

Due to such rapid urban growth, provision of basic infrastructure for all has become an important concern of development planners in Nairobi. Basic infrastructural services that have deteriorated due to such rapid increase in population include: Solid Waste Management (SWM) system; water and sewage systems; drainage and flood protection; roads; mass transportation; electric installations; and telecommunications. Greater environmental pollution, congestion and other problems have been the result of under-provision of such basic services.

The city is well served, with good communication and transport network such as air, road, and railway. It is centrally located to serve the Eastern African countries. Bus and train stations are within an easy walk of the City Centre. The main railway line runs from Mombasa to Malaba though Nairobi City. This network facilitates transportation of agricultural products from western Kenya to the coast. The city is a hub of road transport connecting other major towns in the country. On air transport Jomo Kenyatta International Airport (JKIA) is used to transport goods and persons from all over the world into the country and vice versa. Mombasa Road, a major highway to
Mombasa Port on the Kenyan coastline and the airport pass next to Imara Daima Estate and the area of envisaged construction.

4.4 Population
The cosmopolitan capital of Kenya, currently houses over 3.5 million people with a growth rate estimated at 7% which represents 51% of the country’s urban population. Nairobi City has one of the highest urban population densities in the country of up to 3,079 persons per square kilometer, bringing with it the associated needs for transportation facilities. Such needs can be catered for by establishment of adequate transportation facilities such as accessible railway networks that provide reliable transportation for the ever-increasing population.

The project area in Imara Daima Estate and adjacent estates consists of residential areas with several households enclosed in residential courts. Other residents are in high rise flats and apartments. In the vicinity on the lower side further away from Mombasa Highway are informal settlements where those of low income live and who will benefit immensely from improved accessibility to Imara Daima railway station as envisaged in this sub-project. Several small businesses are also in the project area mainly domiciled in rented buildings that includes hair salons, butcheries, shops selling basic household goods and small supermarkets. The area is also well served with schools – Embakasi Girls Secondary School and Riara Academy are two key schools in the area.

4.5 Economic Activities
Nairobi city is the centre of commercial, manufacturing and industrial development in East Africa. The major economic activities in Nairobi City include trade. Like most modern cities, Nairobi has crowded markets and trading areas, middle class suburbs, and spacious mansions for the rich and powerful. It also has vast overcrowded tenements and slums, exploitation, and high unemployment.

4.6 Waste Management
Solid waste must be disposed of in accordance with Nairobi City County by laws and good environmental practice. The anticipated waste management related activities of the project area include solid waste deposition into receptacles in the area and later collected by registered solid waste handlers (registered with NEMA) whilst wastewater is channeled in Nairobi City County sewer line for onward treatment at Ruai sewerage works.
5.1 Introduction

This chapter outlines the potential negative and positive impacts that will be associated with the project. The impacts will be related to activities to be carried out during construction of the project and the operation stage of the project. The operational phase impacts of the project will be associated with the activities carried out within the premises. In addition, closure and decommissioning phase impacts of the project are also highlighted.

The impacts of the project during each of its life cycle stages (construction, operation and decommissioning) can be categorized into: impacts on the biophysical environment; health and safety impacts and socio-economic impacts. It is also important to note that all the project activities will not require land acquisition or loss of economic activities or structures for those living in the area.

5.2 Negative environmental impacts of construction activities

5.2.1 Extraction and use of construction materials

Construction materials such as rough stone, ballast and bitumen required for construction of the roads project will be obtained from quarries and bitumen dealers and the structural steel for the bridge from steel dealers. Since substantial quantities of these materials will be required for construction of the roads, 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 animals and vegetation, poor visual quality and opening of depressions on the surface leading to several human and animal health impacts.

5.2.2 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 residents, which will be accentuated during dry weather conditions.

5.2.3 Exhaust emissions
The trucks used to transport various building materials from their sources to the project site will contribute to increases in emissions of CO$_2$, NO$_2$ 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 running of vehicle engines, frequent vehicle turning and slow vehicle movement in the loading and offloading areas.

5.2.4 Noise and vibration
The construction works, delivery of construction materials by heavy trucks and the use of machinery/equipment including bulldozers, generators, tippers 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 within the vicinity of the project site.

5.2.5 Risks of accidents and injuries to workers
Because of the intensive engineering and construction activities including erection and fastening of structural steel sections for the bridge, 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 risk of vehicular accidents.

5.2.6 Increased soil erosion
Excavation works associated with this project may lead to increased soil erosion at the project site and release of sediments into the drainage systems. Uncontrolled soil erosion can have adverse effects on any local water bodies.

5.2.7 Solid waste generation
Large quantities of solid waste will be generated as a result of demolitions and excavations in the existing roads. In addition, additional solid waste will be generated at the site during construction of
the bridge and related infrastructure. Such waste will consist of metal cuttings, rejected materials, surplus materials, surplus soil, 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 bitumen, while some of the waste materials including plastic containers are not biodegradable and can have long-term and cumulative effects on the environment.

5.2.8 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 may 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.

5.2.9 Water use
The construction activities will require large quantities of water that is supplied by Nairobi Water and Sewerage Company. Water will mainly be used for concrete mixing, dust suppression and sanitary and washing purposes. Excessive water use may negatively impact on the water source and its sustainability.

5.2.10 Social disturbance
The construction works may cause disturbance to the local population with interactions of non-local workers with residential communities. The movement of trucks and other equipment in the project area during the works implementation will cause noise and dust if the works will be in dry weather. This noise and dust may also affect the schools in the vicinity of the construction works.
5.3 Positive environmental impacts of construction activities

5.3.1 Creation of temporary employment opportunities
Several employment opportunities will be created for construction workers during the construction phase of the project. This will be a significant impact since unemployment is currently quite high in Nairobi and the surrounding areas.

5.3.2 Provision of market for supply of construction materials
The project will require supply of large quantities of construction materials most of which will be sourced locally in Nairobi City and the surrounding areas. This provides ready market for construction material suppliers such as quarrying companies, hardware shops and individuals with such materials.

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

5.4 Negative environmental impacts of operational activities

5.4.1 Increased storm water flow
The pavements will lead to increased volume and velocity of storm water or run-off flowing across the area covered by the roads. 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 if not adequately mitigated.

5.5 Positive environmental impacts of operational activities

5.5.1 Revenue to national and local governments
Through payment of relevant taxes, rates and fees to the government and the local authority, the roads project will contribute towards the national and local revenue earnings from those using the improved facilities.

5.6 Positive social impacts of operational activities

5.6.1 The operational activities after this project is commissioned will have several positive long-term social impacts that include the following:
(a) Improved access to lower income people (from informal settlements in the vicinity of the sub-project) to ride public transport
(b) Improved pathways (NMT) for cycling and walking for pedestrians
(c) Easier accessibility for all for the commuter rail station
(d) Reduced pedestrian accidents from optimal use of the acceleration and deceleration lanes at the entry and exit of Imara Daima from Mombasa highway
(e) Improved ease of use of public transport to passengers through use of the bus lay-byes
(f) Improved drainage will reduce the flood damage and improve accessibility especially for pedestrian traffic and residents
(g) Improved accessibility will spur physical development in the area leading to increased jobs for the urban poor living in Mukuru Kwa Reuben informal settlement. There is a net increase in their wages as there will be no transport costs for them due to close proximity of work sites to where they live.
(h) Improved lighting will increase trading hours for the businesses
(i) Reduced journey time to the commuter rail station
(j) Cleaner and orderly environment
(k) Improved safety and security for all

In a nutshell, all roads being improved or rehabilitated will be installed with street lights. This will lead to improved security in the area as well as increased time for doing business and hence increased income to inhabitants of the area. All the roads will have NMT facilities thus reducing conflict between vehicles and pedestrians hence accidents.

5.7 Negative environmental impacts of decommissioning activities

5.7.1 Solid waste
Demolition of the roads, bridge and related infrastructure will result in large quantities of solid waste. The waste will contain the materials used in construction including concrete, metal, kerbs, bitumen, stones and ballast. 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.
5.7.2 Dust
Large quantities of dust will be generated during demolition works. This will affect demolition staff as well as the neighboring residents.

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

5.8 Positive environmental impacts of decommissioning activities

5.8.1 Rehabilitation
Upon decommissioning 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 that will lead to improved visual quality of the area.

5.8.2 Employment Opportunities
Several employment opportunities will be created for demolition staff.
CHAPTER SIX: ANALYSIS OF PROJECT ALTERNATIVES

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

6.1 Relocation Option
Relocation option to a different site is not an option available for the project implementation as this project is to improve accessibility to an already established railway station, Imara Daima station.

6.2 Zero or 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 county and the community as a whole. Imara Daima railway station will continue to remain inaccessible and this will not help maximize usage and utilization of this station. 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.
- The railway station would remain under utilized.
- No employment opportunities will be created for thousands of Kenyans who will work in the project area.
- Increased urban poverty and crime in Kenya.
- Discouragement for investors and loaners
- Development of infrastructural facilities (roads, bridge and associated infrastructure) will not be undertaken.

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.

6.3 Analysis of Alternative Construction Materials and Technology
The proposed project will be constructed 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 road-works and bridge will be made using locally sourced stones, cement, sand (washed and clean), structural steel and fittings that meet the Kenya Bureau of Standards requirements.

The alternative technologies available include the conventional concrete roads, prefabricated concrete panels, or even temporary structures. These may not be desirable from a cost and durability perspective. The technology to be adopted will be the most economical and one sensitive to the environment.

6.4 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 in the management and the staff. Recycling and reuse options of the waste will be the second alternative in priority. This will call for a source separation programme to be put in place. The third priority in the hierarchy of options is combustion of the waste that is not recyclable. Finally, the proponent will need to establish agreement with the Nairobi City Council to ensure regular waste removal and disposal in an environmentally-friendly manner. In this regard, a NEMA registered solid waste handler would have to be engaged. This is the most practical and feasible option for solid waste management considering the delineated options.
CHAPTER SEVEN: IMPACTS MITIGATION AND MONITORING

7.1 Introduction
This chapter highlights the necessary mitigation measures that will be adopted to prevent or minimize significant negative environmental, health and safety impacts associated with the project during its construction, operation and decommissioning phases. Allocation of responsibilities, time frame and estimated costs for implementation of these measures are presented in the Environmental Management and Monitoring Plan (EMMP).

7.2 Mitigation of construction phase impacts

7.2.1 Efficient sourcing and use of raw materials
The contractor will source construction materials such as sand, ballast and hard core from registered quarry and sand mining firms, whose projects have undergone satisfactory environmental impact assessment/audit and received NEMA approval. 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 contractor 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 contractor shall consider reuse of construction materials and use of recycled 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.

7.2.2 Demolitions
The existing roads will have to be demolished to make for new roads and associated facilities and the removed materials will be taken to licensed sites or reused.
7.2.3 Minimization of run-off and soil erosion
The contractor 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 silt traps, barriers, vegetation planting, 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. This is especially relevant to the area close to the parking lot at the station, which is located in the low lying area with standing water during the rainy season.

7.2.4 Minimization of construction waste
It is recommended that demolition and construction waste is properly collected, stored, recycled or reused to ensure that materials that would otherwise be disposed off 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 off. 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.

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

- 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.
- Provision of facilities for proper handling and storage of construction materials to reduce the amount of waste caused by damage or exposure to weather elements
- Purchase of perishable construction materials such as paints incrementally to ensure reduced spoilage of unused materials
- Use of building materials that have minimal packaging to avoid the generation of excessive packaging waste
- Use of construction materials containing recycled content when possible and in accordance with accepted standards.
7.2.5 Reduction of dust generation and emission
Dust emission during construction will be minimized through strict enforcement of on-site speed controls as well as limiting unnecessary traffic within the project site. Traffic routes on site have to be sprinkled with water regularly to reduce amount of dust generated by the construction trucks.

7.2.6 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 vehicle engines at these points.

7.2.7 Minimization of noise and vibration
Noise and vibration will be minimized in the project site and surrounding areas with strict adherence to designated working hours; and through sensitization of construction truck drivers to switch off vehicle engines while offloading materials. In addition, they will be instructed to avoid running of vehicle engines or hooting especially when passing through sensitive areas such as residential areas and schools. In addition, construction machinery shall be kept in good condition to reduce noise generation. It is recommended that all generators and heavy duty equipment be insulated or placed in enclosures to minimize ambient noise levels.

7.2.8 Reduction of risks of accidents and injuries to workers
The contractor will have to be committed to adherence to the occupational health and safety rules and regulations stipulated in Occupational Health and Safety Act, OSHA. In this regard, the contractor is committed to provision of appropriate personal protective equipment, as well as ensuring a safe and healthy environment for construction workers as outlined in the EMMP.

7.2.9 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.
7.2.10 Minimization of water use
The contractor shall ensure that water is used efficiently at the site by sensitizing construction staff to avoid irresponsible water usage.

7.3 Mitigation of operation phase impacts

7.3.1 Management of storm-water runoff
The contractor will ensure that proper drainage is provided and regularly maintained for storm-water runoff management.

7.4 Mitigation of decommissioning phase impacts

7.4.1 Efficient solid waste management
Solid waste resulting from demolition or dismantling works will be managed as described above.

7.4.2 Reduction of dust concentration
High levels of dust concentration resulting from demolition or dismantling works will be minimized as described earlier.

7.4.3 Minimization of noise and vibration
Significant impacts on the acoustic environment will be mitigated as described.
CHAPTER EIGHT: ENVIRONMENTAL MANAGEMENT AND MONITORING PLAN

8.1 Significance of an EMMP
An Environmental Management and Monitoring Plan (EMMP) for developing projects is used to provide a logical framework within which identified negative environmental impacts can be avoided, mitigated and monitored. In addition the EMMP assigns responsibilities of actions to various actors and provides a timeframe within which mitigation measures and monitoring can be done. The EMMP is a vital output of an Environmental and Social Impact Assessment as it provides a checklist for project monitoring and evaluation. The EMMP outlined below will address the identified potential negative impacts and mitigation measures of the Project based on the chapters on Environmental Impacts and Mitigation Measures of the Negative Impacts.

8.1.1 Pre-Construction & Construction Phases EMMP
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 of the project are as outlined below:
Table 3: The EMMP for the Construction Phase of Imara Daima Roads and Bridge Project

<table>
<thead>
<tr>
<th>Objective/Plan</th>
<th>Recommended Mitigation Measures</th>
<th>Responsible Party</th>
<th>Monitoring Mechanism</th>
<th>Approximate Cost (Kshs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) Increased exploitation of raw materials</td>
<td>▪ Maximize sourcing of construction materials from suppliers who use environmentally friendly processes in their operations.</td>
<td>Contractor</td>
<td>Throughout construction period</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>▪ Ensure accurate budgeting and estimation of actual construction material requirements to ensure that the least amount of material necessary is ordered.</td>
<td>Contractor</td>
<td>Throughout construction period</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>▪ Ensure that damage or loss of materials at the construction site are kept minimal through proper storage.</td>
<td>Contractor</td>
<td>Throughout construction period</td>
<td>-</td>
</tr>
<tr>
<td>2) Run off and soil erosion</td>
<td>▪ 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, e.g. silt traps, barriers, tree planting.</td>
<td>Contractor</td>
<td>Throughout construction period</td>
<td>10,000</td>
</tr>
<tr>
<td></td>
<td>▪ Ensure that construction vehicles are restricted to existing graded roads to avoid soil compaction within the project site.</td>
<td>Contractor</td>
<td>Throughout construction period</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>▪ Ensure that any compacted areas are ripped to reduce run-off.</td>
<td>Contractor</td>
<td>6 months</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>▪ 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.</td>
<td>Contractor</td>
<td>Throughout construction period</td>
<td>-</td>
</tr>
<tr>
<td>3) Solid waste generation</td>
<td>▪ Ensure that construction materials left over at the end of construction will be used in other projects rather than being disposed of.</td>
<td>Contractor</td>
<td>One-off</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>▪ Ensure that damaged or wasted construction materials will be recovered for refurbishing and use in other projects.</td>
<td>Contractor</td>
<td>One-off</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>▪ Utilize opportunities for donating recyclable/reusable or residual materials to local community groups, institutions and individual local residents or homeowners.</td>
<td>Contractor</td>
<td>One-off</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>▪ 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.</td>
<td>Contractor</td>
<td>Throughout construction period</td>
<td>-</td>
</tr>
</tbody>
</table>
### Objective/Plan

<table>
<thead>
<tr>
<th>Recommended Mitigation Measures</th>
<th>Responsible Party</th>
<th>Monitoring Mechanism</th>
<th>Approximate Cost (Kshs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Provide facilities for proper handling and storage of construction materials to reduce the amount of waste caused by damage or exposure to the elements</td>
<td>Contractor</td>
<td>One-off</td>
<td>20,000</td>
</tr>
<tr>
<td>Purchase of perishable construction materials such as paints should be done incrementally to ensure reduced spoilage of unused materials</td>
<td>Contractor</td>
<td>Throughout construction period</td>
<td>-</td>
</tr>
<tr>
<td>Use construction materials that have minimal or no packaging to avoid the generation of excessive packaging waste</td>
<td>Contractor</td>
<td>Throughout construction period</td>
<td>-</td>
</tr>
<tr>
<td>Reuse packaging materials such as cartons, cement bags, empty metal and plastic containers to reduce waste at the site</td>
<td>Contractor</td>
<td>Throughout construction period</td>
<td>-</td>
</tr>
<tr>
<td>Dispose waste more responsibly by dumping at designated dumping sites or engaging the use of a registered waste disposal company or Nairobi City Council</td>
<td>Contractor &amp; Nairobi City Council</td>
<td>Throughout construction period</td>
<td>10,000/month</td>
</tr>
<tr>
<td>Sprinkle water on graded access routes each day to reduce dust generation by construction vehicles</td>
<td>Contractor</td>
<td>Throughout construction period</td>
<td>10,000/month</td>
</tr>
<tr>
<td>Sensitize truck drivers to avoid unnecessary racing of vehicle engines at loading/offloading points and parking areas. Switch off or keep vehicle engines at these points</td>
<td>Contractor</td>
<td>Throughout construction period</td>
<td>-</td>
</tr>
<tr>
<td>Ensure proper planning of transportation of materials to ensure that vehicle fills are increased in order to reduce the number of trips done per vehicle or the number of vehicles on the road</td>
<td>Contractor</td>
<td>Throughout construction period</td>
<td>-</td>
</tr>
<tr>
<td>Sensitize construction vehicle drivers and machinery operators to switch off engines of vehicles or machinery not being used.</td>
<td>Contractor</td>
<td>Throughout construction period</td>
<td>-</td>
</tr>
<tr>
<td>Sensitize construction drivers to avoid gunning of vehicle engines or hooting especially when passing through sensitive areas such as residential areas and schools</td>
<td>Contractor</td>
<td>Throughout construction period</td>
<td>-</td>
</tr>
</tbody>
</table>

### 4) Air/ Dust pollution

- Sprinkle water on graded access routes each day to reduce dust generation by construction vehicles
- Sensitize truck drivers to avoid unnecessary racing of vehicle engines at loading/offloading points and parking areas. Switch off or keep vehicle engines at these points

### 5) Air pollution

- Ensure proper planning of transportation of materials to ensure that vehicle fills are increased in order to reduce the number of trips done per vehicle or the number of vehicles on the road
- Sensitize construction vehicle drivers and machinery operators to switch off engines of vehicles or machinery not being used.

### 6) Noise Pollution

- Sensitize construction drivers to avoid gunning of vehicle engines or hooting especially when passing through sensitive areas such as residential areas and schools
<table>
<thead>
<tr>
<th>Objective/Plan</th>
<th>Recommended Mitigation Measures</th>
<th>Responsible Party</th>
<th>Monitoring Mechanism</th>
<th>Approximate Cost (Kshs)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Ensure that construction machinery are kept in good condition to reduce noise generation.</td>
<td>Contractor</td>
<td>Throughout construction period</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Ensure that all generators and heavy duty equipment are insulated or placed in enclosures to minimize ambient noise levels.</td>
<td>Contractor</td>
<td>Throughout construction period</td>
<td>-</td>
</tr>
<tr>
<td>7) Depletion of energy resources</td>
<td>Ensure planning of transportation of materials to ensure that fossil fuels (diesel, petrol) are not consumed in excessive amounts.</td>
<td>Contractor</td>
<td>Throughout construction period</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Monitor energy use during construction and set targets for reduction of energy use.</td>
<td>Contractor</td>
<td>Throughout construction period</td>
<td>-</td>
</tr>
<tr>
<td>8) Exploitation of water resources</td>
<td>Promote recycling and reuse of water as much as possible.</td>
<td>Contractor</td>
<td>Throughout construction period</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Organize collection of rainwater on site.</td>
<td>Contractor</td>
<td>Throughout construction period</td>
<td>-</td>
</tr>
<tr>
<td>9) Accidents</td>
<td>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.</td>
<td>Contractor</td>
<td>Continuous</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Ensure that the premises are insured as per statutory requirements (third party and workman’s compensation).</td>
<td>Proponent</td>
<td>Annually</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Develop, document and display prominently an appropriate SHE policy for construction works.</td>
<td>Contractor</td>
<td>One-off</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Provisions must be put in place for the formation of a Health and Safety Committee, in which the employer and the workers are represented.</td>
<td>Contractor</td>
<td>One-off</td>
<td>-</td>
</tr>
<tr>
<td>10) Hygiene</td>
<td>Suitable, efficient, clean, well-lit and adequate gender specific sanitary conveniences should be provided for construction workers.</td>
<td>Contractor</td>
<td>One-off</td>
<td>-</td>
</tr>
<tr>
<td>11) Medical Examinations</td>
<td>Arrangements must be in place for the medical examination of all construction employees before, during and after termination of employment.</td>
<td>Contractor</td>
<td>Continuous</td>
<td>-</td>
</tr>
<tr>
<td>12) Machinery Safety</td>
<td>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.</td>
<td>Contractor</td>
<td>One-off</td>
<td>-</td>
</tr>
<tr>
<td>13) Injuries caused by machineries and equipments.</td>
<td>Ensure that equipment and work tasks are adapted to fit workers and their ability including protection against mental strain.</td>
<td>Contractor</td>
<td>Continuous</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>All machines and other moving parts of equipment must be enclosed or guarded to protect all workers from injury.</td>
<td>Contractor</td>
<td>One-off</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Arrangements must be in place to train and supervise inexperienced workers regarding construction machinery use and other procedures/operations.</td>
<td>Contractor</td>
<td>Continuous</td>
<td>5,000 per training</td>
</tr>
<tr>
<td>Objective/Plan</td>
<td>Recommended Mitigation Measures</td>
<td>Responsible Party</td>
<td>Monitoring Mechanism</td>
<td>Approximate Cost (Kshs)</td>
</tr>
<tr>
<td>---------------</td>
<td>---------------------------------</td>
<td>-------------------</td>
<td>---------------------</td>
<td>-----------------------</td>
</tr>
<tr>
<td>14) Poor storage of materials</td>
<td>▪ Ensure that items are not stored/stacked against weak walls and partitions</td>
<td>Contractor</td>
<td>Continuous</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>▪ All floors, steps, stairs and passages of the premises must be of sound construction and properly maintained</td>
<td>Contractor</td>
<td>Continuous</td>
<td>-</td>
</tr>
<tr>
<td>15) Emergencies.</td>
<td>▪ Design suitable documented emergency preparedness and evacuation procedures to be used during any emergency. Such procedures must be tested at regular intervals</td>
<td>Contractor</td>
<td>Every 3 months</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>▪ 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</td>
<td>Contractor</td>
<td>One-off</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>▪ Ensure that the most current emergency telephone numbers posters are prominently and strategically displayed within the construction site</td>
<td>Contractor</td>
<td>One-off</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>▪ Provide measures to deal with emergencies and accidents including adequate first aid arrangements</td>
<td>Contractor</td>
<td>Continuous</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>▪ Sensitize the public on potential emergency situations</td>
<td>Contractor</td>
<td>Twice (before construction begins) and a repeated after 1 month.</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>▪ Provision must be made for persons to be trained in first aid, with a certificate issued by a recognized body.</td>
<td>Contractor</td>
<td>One-off</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>▪ Fire-fighting equipment such as fire extinguishers should be provided at strategic locations such as stores and construction areas.</td>
<td>Contractor</td>
<td>One-off</td>
<td>50,000</td>
</tr>
<tr>
<td>Objective/Plan</td>
<td>Recommended Mitigation Measures</td>
<td>Responsible Party</td>
<td>Monitoring Mechanism</td>
<td>Approximate Cost (Kshs)</td>
</tr>
<tr>
<td>---------------</td>
<td>---------------------------------</td>
<td>-------------------</td>
<td>---------------------</td>
<td>-----------------------</td>
</tr>
<tr>
<td></td>
<td>Regular inspection and servicing of the equipment must be undertaken by a reputable service provider and records of such inspections maintained</td>
<td>Contractor</td>
<td>Every 3 months</td>
<td>5,000</td>
</tr>
<tr>
<td></td>
<td>Signs such as “NO SMOKING” must be prominently displayed within the premises, especially in parts where inflammable materials are stored</td>
<td>Contractor</td>
<td>One-off</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Enough space must be provided within the premises to allow for adequate natural ventilation through circulation of fresh air</td>
<td>Contractor</td>
<td>One-off</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Well stocked first aid box which is easily available and accessible should be provided within the premises</td>
<td>Contractor</td>
<td>One-off</td>
<td>-</td>
</tr>
<tr>
<td>16) Food and toxins.</td>
<td>Ensure that all chemicals used in construction are appropriately labeled or marked and that material safety data sheets containing essential information regarding their identity, suppliers classification of hazards, safety precautions and emergency procedures are provided and are made available to employees and their representatives</td>
<td>Contractor</td>
<td>One-off</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Keep a record of all hazardous chemicals used at the premises, cross-referenced to the appropriate chemical safety data sheets</td>
<td>Contractor</td>
<td>Continuous</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>There should be no eating or drinking in areas where chemicals are stored or used</td>
<td>Contractor</td>
<td>Continuous</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Ensure that workers at the excavation sites and other dusty sites are adequately protected from inhalation of substantial quantities of dust through provision of suitable protective gear (e.g. nose masks)</td>
<td>Contractor</td>
<td>One-off</td>
<td>-</td>
</tr>
<tr>
<td>17) Provisions of PPE to Workers.</td>
<td>Provide workers in areas with elevated noise and vibration levels, with suitable ear protection equipment such as ear muffs</td>
<td>Contractor</td>
<td>One-off</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Suitable overalls, safety footwear, dust masks, gas masks, respirators, gloves, ear protection equipment etc should be made available and construction personnel must be trained to use the equipment</td>
<td>Contractor</td>
<td>Once off</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Ensure that construction workers are provided with an adequate supply of wholesome drinking water which should be maintained at suitable and accessible points.</td>
<td>Contractor</td>
<td>One-off</td>
<td>5,000/month</td>
</tr>
<tr>
<td></td>
<td>Provide and maintain adequate and suitable accommodation for clothing not worn during working hours for construction employees</td>
<td>Contractor</td>
<td>One-off</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Provide and maintain, for the use of all workers whose work is done standing, suitable facilities for sitting sufficient to enable them to take advantage of any opportunities for resting which may occur in the course of their employment</td>
<td>Contractor</td>
<td>One-off</td>
<td>-</td>
</tr>
</tbody>
</table>
### Objective/Plan

<table>
<thead>
<tr>
<th>Objective/Plan</th>
<th>Recommended Mitigation Measures</th>
<th>Responsible Party</th>
<th>Monitoring Mechanism</th>
<th>Approximate Cost (Kshs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>18) Sanitary</td>
<td>▪ Ensure that conveniently accessible, clean, orderly, adequate and suitable washing facilities are provided and maintained in within the site</td>
<td>Contractor</td>
<td>One-off</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>▪ All work places must be kept in a clean state, and free from effluvia arising from any drain, sanitary convenience or nuisance</td>
<td>Contractor</td>
<td>Continuous</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>▪ Accumulations of dirt and refuse should be cleaned daily from the floors, benches, staircases and passages</td>
<td>Contractor</td>
<td>Daily</td>
<td>-</td>
</tr>
<tr>
<td>26) Insecurity</td>
<td>▪ 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.</td>
<td>Contractor</td>
<td>Continuous</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>▪ Conduct sensitization campaign for the public on risks related to construction sites.</td>
<td>Contractor</td>
<td>Twice (before construction begins) and a repeated after 1 month.</td>
<td>-</td>
</tr>
</tbody>
</table>

The key responsibilities regarding compliance to the above EMMP rest on the Contractor. However, it is important that the project proponent ensures adequate monitoring and evaluation for the Contractor for no non-conformances.

#### 8.1.2 Operational Phase EMMP

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 the project are outlined below.
Table 4: EMMP for the Operational Phase of the Project

<table>
<thead>
<tr>
<th>Objective/Plan</th>
<th>Recommended Mitigation Measures (Key Performance Indicators)</th>
<th>Responsible Party</th>
<th>Monitoring Mechanism</th>
<th>Cost (Kshs)</th>
</tr>
</thead>
</table>
| 1) Storm Water Run-off Management | * Provide proper storm water drainage from the paved roads.  
  * Provide regular inspection and maintenance of the drains.                                                                                                                                                                                                 | Contractor         | One-off               | Part of project costs    |
| 2) Health and Safety Risks.     | * Implement all necessary measures to ensure health and safety of workers and the general public during operation of the project as stipulated in OSHA 2007                                                                                                               | County             | Continuous            | -                        |
| 3) Social Monitoring            | * Assess if there is increased usage of railway transport by the residents and those from the informal settlements in the vicinity of the project  
  * Assess satisfaction index or satisfaction levels of concerned residents and business persons after project completion and commissioning  
  * Assess increased costs of rent or property in the project area following the works  
  * Assess if there is increased population of residents or business persons in the project area following improved services – roads, drainage, lighting etc.                                                                 | County             | Continuous            | -                        |

8.1.3 Decommissioning Phase

In addition to the mitigation measures provided 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 project are outlined in below.
Table 5: EMMP for the Decommissioning Phase

<table>
<thead>
<tr>
<th>Environmental Impact</th>
<th>Recommended Mitigation Measures</th>
<th>Responsible Party</th>
<th>Time Frame</th>
<th>Cost (Kshs)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sold Waste Generation.</strong></td>
<td>• All removed materials that will not be used for other purposes must be removed and recycled/reused as far as possible</td>
<td>Contractor</td>
<td>One-off</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>• Where recycling/reuse of the removed materials and other demolition waste is not possible, the materials should be taken to a licensed waste disposal site or arrangements made with NCC</td>
<td>Contractor</td>
<td>One-off</td>
<td>10,000</td>
</tr>
<tr>
<td></td>
<td>• Donate reusable demolition waste to charitable organizations, individuals and institutions</td>
<td>Contractor</td>
<td>One-off</td>
<td>-</td>
</tr>
<tr>
<td><strong>Degeneration of vegetation at the construction site</strong></td>
<td>• Implement an appropriate re-vegetation programme to restore the site to better status</td>
<td>Contractor</td>
<td>One-off</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>• Consider use of indigenous plant species in re-vegetation</td>
<td>Contractor</td>
<td>One-off</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>• Trees should be planted at suitable locations so as to interrupt slight lines (screen planting), between the adjacent residential area and the development.</td>
<td>Contractor</td>
<td>Once-off</td>
<td>-</td>
</tr>
</tbody>
</table>
9.1 Budget
The summary of the certified Bills of Quantities that form the budget of the project is as attached in the Annexes. The total project budget is $4,669,565 (contract sum amount for the road-works) and $1,296,736 (estimate for the construction of footbridge).

9.2 Monitoring Guidelines
Continuous observations and assessment is essential so that if unforeseen safety dangers are noticed, alternatives must be sought for. Risk assessment of accidents, and other adverse impacts should not be ignored in the construction plan. Waste management in the construction should be strictly followed. Mitigation measures of storm water management are essential. Safety standards should constantly be maintained, with indicators like condition of equipment, contractor compliance with the set regulations, and tracking of accidents on-site logged regularly.

9.3 Reporting
Constant reporting by the site contractor to the contractor and proponent is necessary to ensure the project is executed as per the plans and drawings. The safety officer should always remain on site to report any safety concerns for urgent mitigation. The officer should also at all times enforce safety requirements as per the relevant legislation. The contractor must consult the proponent to maintain a clear understanding of all the aspects of the project. Nairobi City County Government should be involved where necessary in early stages of the project to increase acceptance and ensure necessary partnership is in place (e.g. waste removal requirements).
CHAPTER TEN: CONCLUSION AND RECOMMENDATIONS

During the preparation of this report for the development of the proposed development, it is observed and established that most of the negative impacts on the environment can be mitigated and have potentially short term low significant effect. The positive impacts are highly rated and will benefit all stakeholders and the Imara Daima and Villa Franca residents at large. The project proponents have proposed to adhere to prudent implementation of the environmental management and monitoring plan. The contractor is committed to obtaining all necessary permits and licenses from the relevant authorities and have qualified and adequate personnel to do the project as proposed. The proponent has proposed adequate safety and health mitigation measures as part of the relevant statutory requirements.

It is the duty of NEMA to consider licensing the project subject to annual environmental audits once it has been commissioned. This will be in compliance with the Environmental Management and Coordination Act, EMCA of 1999 and the Environmental Impact Assessment and Audit Regulations, Legal Notice No. 101 of 2003.
REFERENCES


Kenya gazette supplement Acts Building Code 2000 by government printer, Nairobi

Kenya gazette supplement Acts Land Planning Act (Cap. 303) government printer, Nairobi

Kenya gazette supplement Acts Local Authority Act (Cap. 265) government printer, Nairobi

Kenya gazette supplement Acts Penal Code Act (Cap.63) government printer, Nairobi

Kenya gazette supplement Acts Physical Planning Act, 1999 government printer, Nairobi

Kenya gazette supplement Acts Public Health Act (Cap. 242) government printer, Nairobi


The Environmental Management & Coordination Act 1999 (EMCA 1999).
Annexure

- Plate of Photographs – includes Public Participation & Consultation Meeting Photograph – meeting held on Sunday, July 13, 2014
- Site Layout Plan
- Sample Chance Find Procedures
- Minutes of Public Participation & Consultation meeting held on Sunday, July 13, 2014
- Site Drawings (Certified by Local Authority – Municipal Council Engineer)
- Public Participation & Consultation Questionnaires of Surrounding Community
Plate of Photographs

Plate 1: Cosmas Ndeti Road to be upgraded to bituminous standards

Plate 2: Tegla Lourupe Road to be upgraded to bituminous standards with improvements on the drainage
Plate 3: Road through newly developed residential estate towards Imara Daima Railway Station to be developed to bituminous standards

Plate 4: Portion of land between Mombasa Road and Imara Daima Railway Station boundary wall where the footbridge will be erected
Plate 5: Imara Daima Railway Station

Plate 6: Sections of bad roads in the area that will be rehabilitated and constructed for accessibility of Imara Daima Railway Station – Moses Tanui Road
Plate 7: Access to Embakasi Girls Secondary School that will be upgraded up to this gate of the school

Plate 8: Public Participation & Consultation Meeting (Baraza) held in Imara Daima Estate Grounds on Sunday July 13, 2014 that discussed the sub-project among other salient matters.
Site Layout Works Plan
Sample Chance Find Procedures

Chance find procedures are an integral part of the project EMMP and civil works contracts. The following is proposed in this regard:

If the Contractor discovers archeological sites, historical sites, remains and objects, including graveyards and/or individual graves during excavation or construction, the Contractor shall:

- Stop the construction activities in the area of the chance find;
- Delineate the discovered site or area;
- Secure the site to prevent any damage or loss of removable objects. In cases of removable antiquities or sensitive remains, a night guard shall be arranged until the responsible local authorities or the Ministry of State for National Heritage and Culture take over;
- Notify the supervisor, Project Environmental Officer and Project Engineer who in turn will notify the responsible local authorities and the Ministry of State for National Heritage and Culture immediately (within 24 hours or less);

Responsible local authorities and the Ministry of State for National Heritage and Culture would then be in charge of protecting and preserving the site before deciding on subsequent appropriate procedures. This would require a preliminary evaluation of the findings to be performed by the archaeologists of the National Museums of Kenya. The significance and importance of the findings should be assessed according to the various criteria relevant to cultural heritage, namely the aesthetic, historic, scientific or research, social and economic values.

Decisions on how to handle the find shall be taken by the responsible authorities and the Ministry of State for National Heritage and Culture. This could include changes in the layout (such as when finding irremovable remains of cultural or archeological importance) conservation, preservation, restoration and salvage.

Implementation for the authority decision concerning the management of the finding shall be communicated in writing by relevant local authorities.

Construction work may resume only after permission is given from the responsible local authorities or the Ministry of State for National Heritage and Culture concerning safeguard of the heritage.
MINUTES OF “BARAZA” HELD ON 13TH JULY 2014 @ IMARA DAIMA GROUNDS TO DISCUSS CONSTRUCTION OF ACCESS ROAD AND FOOT-BRIDGE TO IMARA DAIMA RAILWAY STATION

PRESENT:
Government Representatives:
1. Mr. Anthony Mwangi - Assistant Area Chief
2. Inspector Kinyua – Villa Police Post
3. Mr. Halifax Mutua – Manager – Hon. Sumra’s (Area Member of Parliament) Office
4. Mr. Julius Kamande – Nyumba Kumi Co-ordinator
5. Eng. Stephen Mwaura – World Bank (NaMSIP),
6. Eng. Kinyua Wamugunda – Nairobi City County

Residents Representatives (Totaling about 70 persons)
1. MUIMARA
2. VILLA FRANCA
3. IMARA GREEN
4. IMARA ESTATE
5. MAZIWA

AGENDA:
1. Nyumba Kumi;
2. Footbridge and Roads Construction – Main Agenda;
3. A.O.B;
   - Security;
   - Development of Imara Grounds;
   - National Youth Service Induction;
   - Animals/poultry keeping;
   - Drugs peddling;

1. **NYUMBA KUMI:**

   Please refer to mail under separate cover;

2. **FOOTBRIDGE & ROADS:**

   The Ministry of Land, Housing & Urban Development, Directorate of Nairobi Metropolitan Development has received financing from the World Bank towards the cost of the Nairobi Metropolitan Service Improvement Project (NaMSIP) and intends to apply part of the proceeds toward payments under the contract for CONSTRUCTION OF THE ACCESS ROAD TO IMARA DAIMA RAILWAY STATION and CONSTRUCTION OF IMARA DAIMA FOOTBRIDGE. The project as detailed below has already been approved and a contractor identified, and it was only awaiting the public participation through the questionnaire attached herein which is a NEMA requirement as well as a World Bank requirement whereby
the public must be involved in such projects by law and by the Bank requirements. The questionnaire was duly filled in by those present in the “Baraza” and passed on to Eng. Stephen Mwaura for further action. Eng. Kinyua Wamugunda of the City County explained the project in detail and Eng. Stephen Mwaura explained NEMA and Bank’s requirements. The project involves:

- REHABILITATION OF THE ACCESS ROAD TO IMARADA DAIMA RAILWAY STATION (dilapidated to be repaired to bitumen) – 1.2km;
- CONSTRUCTION OF THE ACCESS ROAD TO IMARADA DAIMA RAILWAY STATION (Currently earth road to be upgraded to bitumen). – 1.5km;
- CONSTRUCTION OF THE NON-MOTORISED (NMT) ACCESS TO IMARADA DAIMA RAILWAY STATION (currently earth path to be upgraded to paved) – 3.5km
- CONSTRUCTION OF FOOTBRIDGE TO IMARADA DAIMA RAILWAY STATION ACROSS FROM MOMBASA HIGHWAY.

The project is estimated to take 15 months to complete and the scope involves street lighting, walkways and drainage. There was an observation made pertaining to the entry and exit junction from the Mombasa Highway that appropriate lanes need to be allowed for to eliminate or reduce the pedestrian accidents happening at this junction. It was reported that acceleration and deceleration lanes will be provided for at this junction to reduce these pedestrian accidents. It was also reported that landscaping to improve greenery will also be undertaken. The lighting that will be provided will improve security of the estates.

3. **A.O.B.**

   a. **Security:**

   Mr. Julius Kamande - Nyumba Kumi Co-ordinator challenged Imara Daima’s Security procedures which he termed wanting.

   - Vehicles coming in the estate must go through a security check;
   - Visitors coming inside the estate must be vetted and they must produce their identification documents;
   - All persons not submitting the mandatory security fees as per their courts will be forced to pay through the involvement of the respective government officials;
   - Civilian arrests should start taking effect;
   - All unlicensed bars to be closed down – case in point – Kariuki’s bar which has become a nuisance and a threat to the residents; there were claims of death threats by the said Mr. Kariuki to the security personnel and an official report should be made to the relevant authorities for action to be taken;
   - Churches in the Imara area are making so much noise to the chagrin of the residents. The pastors present were requested to be observant of their timings and be sensitive on the noise pollution;
b. **Development of the Imara grounds:**

Mr. Mutua - General Manager (Hon. Sumra’s office) was taken to task on the development of the Imara grounds. He was requested to have their office put into consideration the following:

- Construction of toilet/bathrooms on the field;
- Construction of a social hall;
- Upgrading of the grounds capturing the various sports/activities that take place;

c. **National Youth Service induction:**

The above is in the pipeline and the same is deemed to take off at Embakasi Girls. Request was made for the residents to sensitize our youth on the same for skilled and unskilled basics;

d. **Animals/poultry keeping:**

Unknown to many the city council bylaws forbid rearing of animals or poultry that are a nuisance to other residents within the neighbourhood. Owners should acquire the licenses and necessary certificates from the relevant offices.

The menace continues with dogs, cats, chicken and geese all over the estates. A notice had been given to the residents of Imara Daima Estate on the same, but it seems that wasn’t taken seriously.

The Nairobi Ward Administrator had been taken to task on making sure the bylaws are effected with immediate effect.

e. **Drugs peddling:**

This remains a thorny issue amongst us and people have been sensitized on the importance of reporting such incidences to the relevant personnel;

f. **Important contact details:**

- Mr. Anthony Mwangi - Assistant Area Chief - 0720687454, email – kanyiriam@gmail.com;
- Inspector Kinyua – Villa Police Post – 0721297214;
- Hon. Sumra – 0722513663, email – lionsumra@yahoo.com;
- Mr. Halifax Mutua – Manager – Hon. Sumra’s Office – 0725927677 – email – mutuahalifax@yahoo.com;
- Mr. Julius Kamande – Nyumba Kumi Co-ordinator – 0721135669;
Mr. Joe Kimanga
Chairman – Imara Daima Residents Association