

REPUBLIC OF KENYA



ENVIRONMENTAL & SOCIAL IMPACT ASSESSMENT PROJECT REPORT FOR THE PROPOSED CONSTRUCTION OF OFF-STATION ACCESS ROAD TO KITENGELA RAILWAY STATION IN KAJIADO COUNTY OF NAIROBI METROPOLITAN REGION

GPS COORDINATES Latitude 1° 28' 51.63S Longitude 36° 57' 26.46"E Altitude 1563M



August 22, 2018
NAIROBI

PROPONENT

The Senior Principal Superintending Engineer
Ministry of Transport, Infrastructure, Housing and
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LEAD EXPERT

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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

Eng. Benjamin Njenga - The Project Coordinator

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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. 7284), confirms that the contents of this report are a true representation of the Environmental & Social Impact Assessment of the proposed Construction of Access Road to Kitengela Railway Station in Kitengela Town of Kajiado County in the Nairobi Metropolitan Region. This report is issued without prejudice.

Lead Expert – Eng. Stephen Mwaura - (NEMA License No. 7284 Copy in this report)

Signature _____ Date _____

ACRONYMS & ABBREVIATIONS

EA	Environmental Audit
ESIA	Environmental & Social Impact Assessment
EHS	Environment, Occupational Health and Safety
EMCA	Environmental Management & Coordination Act, 1999
ESMMP	Environmental & Social Management and Monitoring Plan
EMS	Environmental Management System
ISO	International Standards Organizations
MoTIH&UD	Ministry of Transport, Infrastructure, Housing & Urban Development
NaMSIP	Nairobi Metropolitan Services Improvement Project
NEMA	National Environment Management Authority
NMT	Non-Motorized Transport
OHS	Occupational Health & Safety
OSHA	Occupational Safety & Health Act
PPC	Public Participation& Consultation
PSP	Private Sector Participation
ToR	Terms of Reference

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EXECUTIVE SUMMARY

1. Introduction

This Environmental & Social Impact Assessment (ESIA) report was prepared as per the provisions of the Environmental Management and Coordination Act No. 8 of 2015, and the Environmental Impact Assessment Regulations 2003. It is also in line with the World Bank Safeguards Policies, 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. This project report gives the findings of the Environmental and Social Impact Assessment Study undertaken as an integral part of the design and construction process. The project highlights salient social, economic and environmental issues associated with the design, construction and operational aspects of the proposed rehabilitation and construction of Kitengela off-station access road to Kitengela railway station in Kajiado County of Nairobi Metropolitan Region. The current project will also involve construction of a new bridge in place of the existing box culvert bridge. A railway station is proposed to be constructed in future to result in a modern standard railway station.

2. Scope of the Project Report

This Environmental & Social Impact Assessment (ESIA) project report was prepared as per the provisions of the Environmental Management and Coordination Act No. 8, 2015 and more specifically to Environmental Impact Assessment Regulations 2003. It is also in line with the World Bank Safeguard 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.

The study process leading to this project report was further designed to address client expectations as stipulated in the Terms of Reference.

3. Objectives of the Project Report Study

The main objective of the study was to identify environmental and social impacts associated with the proposed rehabilitation and construction of Kitengela access road to the railway station and to recommend an appropriate environmental and social management strategy for the project. Thus, a core outcome of the study is an Environmental and Social Management and Monitoring Plan (ESMMP) for the project.

4. Study Approach and Methodology

The systematic investigative and reporting methodology specified for conduct of project report studies (Legal Notice 101 of EMCA) was adopted in this study. Baseline data on project design was

generated through discussion with the client and review of project documentation. Opinions formed were revalidated through field work entailing site investigations and interviews with potentially affected people and secondary stakeholders.

To identify, predict, analyze and evaluate potential impacts that may emanate from the project, diverse study methods and tools including use of checklists, matrices, expert opinions and observations were employed. An Environmental and Social Management and Monitoring Plan comprising of an impact mitigation plan and modalities for monitoring and evaluation were then developed to guide environmental management during all phases of project development.

Once approved by the Ministry of Transport, Infrastructure, Housing and Urban Development and NEMA, the project report will be disclosed as required from where accruing comments will be used to finalize the report.

5. Policy, Legal and Regulatory Framework

This project report has been developed to ensure that the proposed rehabilitation and construction of Kitengela off-station access road to the railway station is in conformity with national policy aspirations towards securing sustainable development. Specifically, this report has been developed to ensure compliance with requirements of the Environmental Management and Coordination Act (EMCA) 2015-Kenya's supreme environmental law and the National Constitution. Section 58 of EMCA requires that all proposed development in Kenya to be subjected to environmental impact assessment and to be conducted in line with the Second Schedule (of EMCA) and the Legal Notice 101 (Regulations for Environmental Assessment and Audit) of June 2003. The entire study process has been designed to conform to the regulatory framework stipulated by the National Environment Management Authority (NEMA) - the body that will review this report and make decisions to grant an ESIA license to the development.

6. Project Justification

The broad aim of the project is to improve accessibility to the railway station to optimize and maximize utility of the railway station. This will also enhance ease of mobility for persons wishing to use railway transport.

7. Scope and Content of Proposed Project

The works shall include but not limited to: -

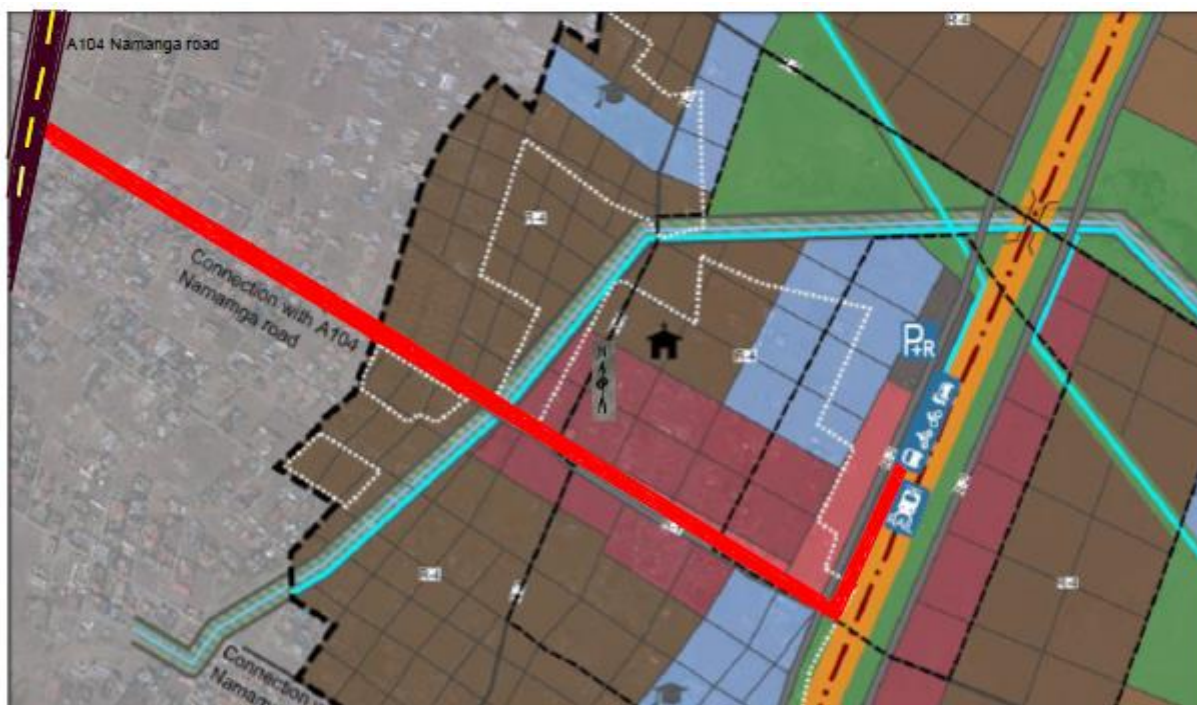
- (a) Site clearance and earthworks as necessary
- (b) Excavation to remove unsuitable materials
- (c) Filling with approved materials as specified and directed.
- (d) Hand packing base with approved stone as specified and directed
- (e) Construction of drainage structures as specified and directed including constructing a new bridge in place of the box culvert
- (f) Construction to footpaths and shoulders as directed
- (g) Laying of asphaltic concrete after preparation of base
- (h) Maintenance of the works during the construction and maintenance periods specified

- (i) Traffic management through the works and from the works
- (j) Relocation and/or protection of other services including but not limited to water pipes, sewer pipes, street lighting, power and telephone lines
- (k) Installation of streetlights
- (l) Provision of Non-Motorized Transport (NMT) facilities
- (m) Any other works as instructed by the Engineer and/or as specified in this document

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.

8. Project Description

The proponent aims to construct an off-station access road to the railway station in Kitengela Town of Kajiado County of the Nairobi Metropolitan Region. The design for the construction works will include upgrading the road paving to bitumen standards for use by motorists and pedestrians as well as constructing a new culvert bridge. The works are located in Kitengela Township in Kajiado County. A location map of this project is as shown below showing the access road to be upgraded of a distance of 2.129 kilometers.



Key: — Proposed Kitengela Railway off station road from A104 (Namanga Road) 2.129km

9. Scope of environmental and social assessment

This Environmental & Social Impact Assessment (ESIA) 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, if any
 - ii. Surface run-off water and its containment

2. Assess social implications of the development within the locality, region and nationally to include: -
 - i. Economic implications of the development.
 - ii. Employment.
 - iii. Demand and development of infrastructure and social amenities.

3. Assess the impacts of development on landscape and land use such as: -
 - i. Determine the impact on change on civic shape, scenery, aesthetic modifications.
 - ii. 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 congestion

5. Impacts of safety during construction to passers-by - this is mainly because of increased traffic during construction requiring better traffic management plan during construction for the safety of workers, general public, safety of motorists and other road users during construction.

6. Develop an Environmental and Social Management and Monitoring Plan (ESMMP) that would mitigate the possible impacts on the environment

7. Ensuring commitment to the ESMMP by the Contractor - the Contractor will commit to adhere to a Contractor Environmental and Social Management Plan, CESMP, and a Code of Conduct regarding various aspects of the ESMMP.

10. Public Participation Process

Public participation and consultative forums were held at the site that included the local community, business community, boda-boda operators, political leaders and the county government. The aim of the consultative meetings was to obtain data related to the past and present operations of the access road to the railway station that are significant to the future environmental status of the area, the management of the project both during and after implementation. The stakeholders responded positively to the development as long as mitigation and mending up measures, waste management, and noise and dust issues among others are developed and implemented simultaneously with the project. The record of the consultations is presented in this report in the form of questionnaires, attendance sheets and minutes of meetings held that had been administered to the stakeholders seeking their views on the project and especially as regards environmental and social management during project implementation. The key issues raised included seeking to know when the project would start as it was perceived as very beneficial, how dust will be mitigated and whether the locals would be considered for gainful engagement during project execution. The attendees during the

meetings were assured the project would commence as soon as the necessary clearances were received, dust would be managed through sprinkling mainly and that locals would be considered for gainful employment during project execution.

11. Findings from the Study

(i) Potential positive impacts anticipated:

The core observation of this study is that the proposed access road to the railway station construction project is aimed at improving rail commuter services and the broad transport sector. As such, the project in itself is already an activity in mitigation of an existing concern and this is the prime justification of the proposed investment. Other positive implications of the project will accrue from its potential to create short-term business and employment opportunities to both professional staff and workers during the design phase while, at construction phase, traders will benefit from opportunities to supply construction materials while locals will be employed in works. Upon commissioning, the project will improve accessibility to the railway station and its utilization.

(ii) Potential adverse impacts:

Construction activities will introduce nuisances such as dust, noise, vibrations and fumes which however can be effectively managed through shortening the construction period. Social vices associated with influx of job seekers can disturb the social order and even lay the ground for escalation of HIV/AIDS cases whose impacts are likely to be prolonged in prevalence. The notable potential negative environmental impacts that were identified include among others:

- i. Air pollution due to noise, vibration and dust;
- ii. Material sourcing and supply for the construction and maintenance works;
- iii. Any effects from uncontrolled storm-water run-off, and
- iv. Management of any wastes generated.

These have to be mitigated sufficiently for the project to progress. Mitigation measures include dust abatement, traffic management, and material sourcing from licensed sources. The mitigation measures to manage these impacts are as identified in the Environmental and Social Management and Monitoring Plan (ESMMP) in the report.

(iii) Residual and cumulative impacts:

The project has no residual or cumulative impacts as all can be effectively mitigated. Access to the businesses along the access road will be improved and this will cumulatively upgrade the value of these businesses and the adjacent properties.

A summary of the key negative environmental and social impacts and their proposed mitigation measures is as shown in the table below;

Objective/Plan	Recommended Mitigation Measures
1) Efficient sourcing and use of raw materials	<ul style="list-style-type: none"> ▪ Maximize sourcing of construction materials from suppliers who use environmentally friendly processes in their operations and storage to minimize losses.
2) Excavations – these should be done in manageable sections that should have adequate barricading and warning signs	<ul style="list-style-type: none"> ▪ Excavated material to be reused or disposed off ▪ Deep excavations to be barricaded sufficiently and warning signs erected ▪ Excavations in manageable sections and well barricaded with warning signs
3) Minimization of run-off and soil erosion	<ul style="list-style-type: none"> ▪ 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. drainage structures, silt traps, barriers, tree planting.
4) Minimization of construction wastes	<ul style="list-style-type: none"> ▪ Ensure that construction materials left over at the end of construction will be used in other projects rather than being disposed of. ▪ Dispose waste more responsibly by dumping at designated dumping sites or engaging the use of a registered waste disposal company or Kajiado County Government
5) Reduction of dust generation and exhaust emissions	<ul style="list-style-type: none"> ▪ Sprinkle water on graded access routes and site each day to reduce dust generation by construction vehicles ▪ Sensitize construction and truck drivers and machine operators to avoid unnecessary racing of vehicle engines at loading/offloading points and parking areas. Switch off or keep vehicle engines at these points not being used

Objective/Plan	Recommended Mitigation Measures
6) Minimization of noise and vibrations	<ul style="list-style-type: none"> ▪ Sensitize construction drivers to avoid gunning of vehicle engines or hooting especially when passing through sensitive areas such as residential areas, Deliverance Church and Doxa Academy
7) Reduction of risks of accidents and injuries	<ul style="list-style-type: none"> ▪ Ensure that provisions for reporting incidents, accidents and dangerous occurrences during construction using accidents/incidents logs.
	<ul style="list-style-type: none"> ▪ Provision and mandatory enforcement on use of PPE
	<ul style="list-style-type: none"> ▪ Ensure that the premises are insured as per statutory requirements (third party and workman's compensation)
8) Reduction of energy consumption	<ul style="list-style-type: none"> ▪ Ensure planning of transportation of materials to ensure that fossil fuels (diesel, petrol) are not consumed in excessive amounts
9) Minimization of water use	<ul style="list-style-type: none"> ▪ Ensure that water is used efficiently at the site
10) HIV-AIDS Management	<ul style="list-style-type: none"> ▪ HIV-AIDS awareness methods used in campaign to increase understanding about the disease; ▪ Distribute condoms to construction workers
11) Grievance redress mechanisms	<ul style="list-style-type: none"> ▪ Employ a robust grievance redress mechanism incorporating a negotiation and/or mediation team or party
12) Gender mainstreaming	<ul style="list-style-type: none"> ▪ Consider both men and women for the works
13) Crime Management, Child Protection, Gender Equity and Sexual Harassment	<ul style="list-style-type: none"> ▪ Improved security ▪ No child employment ▪ The client and the Contractor shall adopt and enforce a 'Child Protection Code of Conduct' and a Gender Action Plan ▪ Provision of gender disaggregated bathing, changing, sanitation facilities

Objective/Plan	Recommended Mitigation Measures
14) Labour Influx – Complaints and Grievances / Social Conflict	<ul style="list-style-type: none"> ▪ Provide grievance redress mechanism for the public and workers; ▪ Consider prioritizing the local manpower for both skilled and unskilled labour

12. The ESMMP

An ESMMP has been developed whose pursuit can greatly improve the overall net effect of the project. This report observes that the bulk of adverse impacts will manifest at the construction stage in which case, the core effort in mitigation will be concentrated in the contract for construction. This report therefore requires that the ESMMP be integrated into the design report with appropriate allocation of funds in the Bills of Quantities. The contract for construction should bear clauses binding the contractor to implement impact mitigation as part of the civil works. The NaMSIP's PCT will mount own internal monitoring to ascertain environmental and social sensitivity at all stages of project development. During project development, a grievance redress mechanism will also be in place to handle all complaints and there will be creation of awareness and sensitization on HIV-AIDS. The ESMMP budget is estimated at about **Kshs. 2,970,000**. Moreover, this project's potential benefits and positive impacts far outweigh the negative impacts.

NaMSIP safeguards team will ensure adequate monitoring during project implementation with generation of monthly progress reports that will include safeguards status. Key monitoring parameters will include recording numbers of complaints or grievances, number of accidents or incidents and safeguards non-conformances.

12. Total Cost of the Project

The total cost of the project is approximated to be **Kshs. 209,489,882/11**. The total ESMMP cost is approximated to be **Kshs. 2,970,000**.

13. Recommendations and Conclusions of this Project Report

In the view of this study, the project as currently proposed is environmentally sound. An ESMMP has been outlined to guide resolution of potential adverse impacts while enhancing the positive ones. Further, all negative impacts need to be mitigated and it is recommended that this project is granted NEMA licensing and other clearances to pave way for implementation.

Our conclusion is that the project is important for economic development of Kitengela Town of Kajiado 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.

CHAPTER ONE: INTRODUCTION

1.1 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 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.

1.2 Study Approach and Methodology

The systematic investigative and reporting methodology specified for conduct of Project Report Studies (Legal Notice 101 of EMCA) was adopted in this Study. Baseline data on project design was generated through discussion with the client and review of project documentation. Opinions formed

were revalidated through field work entailing site investigations and interviews with potentially affected people and secondary stakeholders.

To identify, predict, analyze and evaluate potential impacts that may emanate from the project, diverse study methods and tools including use of checklists, matrices, expert opinions and observations were employed. An Environmental and Social Management and Monitoring Plan comprising of an impact mitigation plan and modalities for monitoring and evaluation were then developed to guide environmental management during all phases of project development.

Once approved by the Ministry of Transport, Infrastructure, Housing and Urban Development and NEMA, the Project Report will be disclosed as required from where accruing comments will be used to finalize the report.

Consequently, this 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 design, construction, operation and 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 access road to the railway station 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 estimated project cost is **Kshs. 209,489,882/11** and a breakdown of this is in the annexure. The total ESMMP cost is approximated to be **Kshs. 2,970,000.**
- 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 2015, Environmental (Impact Assessment and Audit) Regulations 2003 as well as other regulations and World Bank OP4.01.

The report emphasizes the duties of the proponent and contractor during the construction phase as well as the operation phase of this project.

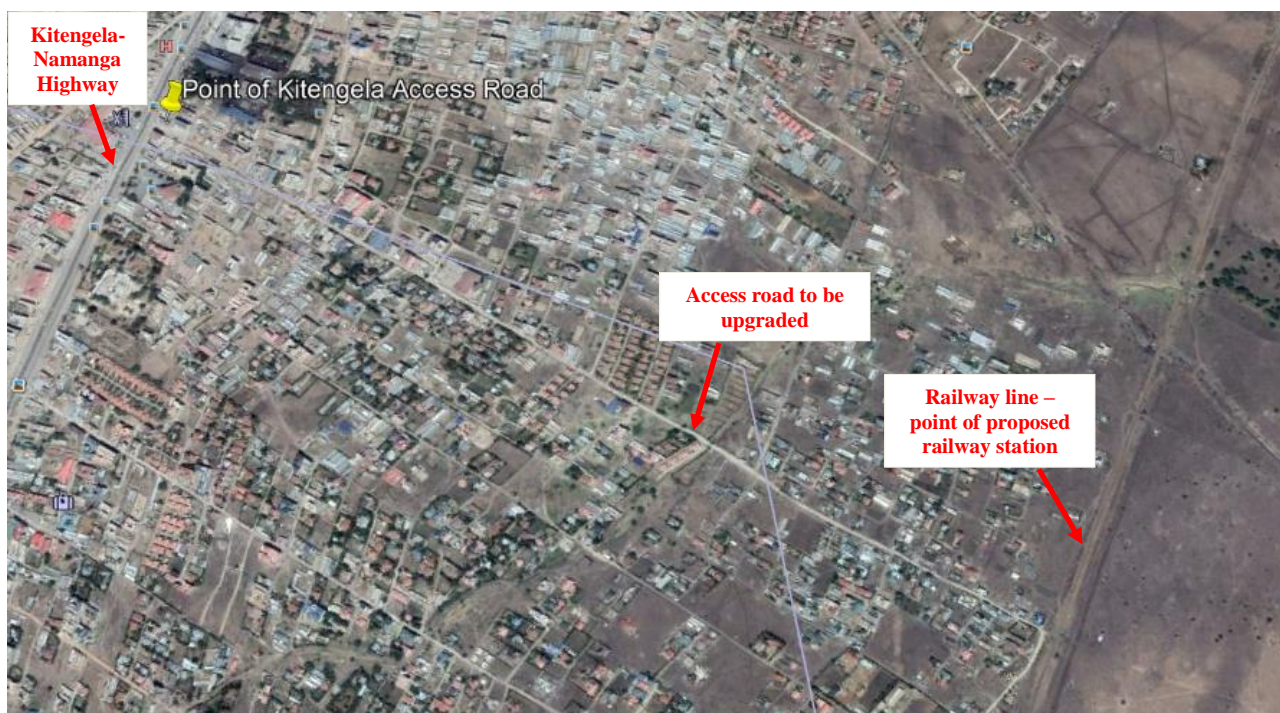
All the materials and workmanship used in the execution of the work shall be of the best quality and description. Any materials condemned by the Proponent shall be immediately removed from the site at the contractor's cost.

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 (ESMMP) 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.

1.3 Project Description and Justification

The works are located in Kitengela Township in Kajiado County. The project covers the total length of the access road to the railway station that is approximately 2.129 kilometers. The broad aim of the project is to maximize utilization of the railway station transport system. This will enhance mobility to those persons wishing to use the rail transport. The following is a Google map of the area of the proposed project.



Source: Google Earth (Google chrome short-cut), 2016

1.4 Scope and content of project

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 base with approved stone as specified and directed
- ✓ Construction of drainage structures as specified and directed including constructing a new bridge in place of the box culvert
- ✓ Construction to footpaths and shoulders as directed
- ✓ Laying of asphaltic concrete after preparation of base
- ✓ Maintenance of the works during the construction and maintenance periods specified
- ✓ Traffic management through the works and from the works

Environmental & Social Impact Assessment Project Report for the Proposed Construction of Off-station Access Road to Kitengela Railway Station in Kajiado County of Nairobi Metropolitan Region

- ✓ Relocation and/or protection of other services including but not limited to water pipes, sewer pipes, street lighting, power and telephone lines
- ✓ Installation of streetlights
- ✓ Provision of Non-Motorized Transport (NMT) facilities
- ✓ Any other works as instructed by the Engineer and/or as specified in this document

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.

General GPS Coordinates

Construction of off-station access road to the railway station in Kitengela Town of Kajiado County	<i>Latitude</i> 1° 28' 51.63" S -1.481130	<i>Longitude</i> 36° 57' 26.46"E 36.957362	<i>Altitude</i> 1563 masl
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Photo of current site showing access road to be upgraded

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

ITEM	STATUS OF THE ACCESS ROAD	RECOMMENDATION
Kitengela Off-station Access Road to the Railway Station	<ul style="list-style-type: none"> ○ The works shall be carried out on the proposed access road. This has earth drains, no clearly marked walk ways and a culvert bridge that will be upgraded. The surface is virgin soil and belongs to the County Government of Kajiado. 	<ul style="list-style-type: none"> ○ Upgrading to bitumen standards the existing earth sections; ○ Provision of NMT facilities; ○ Provision of street/security lighting works; ○ Construction / improvement of drainage structures; and ○ Any others as directed by the Engineer.

1.5 Description of the Project's Construction Activities

1.5.1 Pre-construction investigations

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

1.5.2 Demolition works

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

1.5.3 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 of Kitengela Town. 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.

1.5.4 Storage of materials

Construction materials will be stored on site, only if need be. Bulky materials such as rough stones, ballast, sand and suchlike will be brought to site only when needed owing to space constraints. To avoid piling large quantities of materials on site, the contractor should order bulky materials such as sand, gravel and stones in batches.

1.5.5 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.

1.5.6 Construction

This involves putting the different layers – sub-base, base and final finish – in aggregates and a final finish in blocks as well as compaction as required of different levels.

1.5.7 Landscaping

To improve the aesthetic value or visual quality of the site once construction ceases, the contractor will carry out landscaping and tree planting where possible.

1.6 Description of the Project's Operational Activities

1.6.1 General repairs and maintenance

The access road to the railway station will be repaired and maintained by Kajiado County during its operational phases.

1.7 Description of the Project's decommissioning activities

1.7.1 Demolition works

Upon decommissioning (unlikely), the project components including pavements and drainage systems 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.

1.7.2 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.

1.7.3 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.

1.7.4 Dust generation

There is possibility of generation 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 ESMMP will be fully implemented to minimize the impacts of dust generation.

1.7.5 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 ESMMP will be fully implemented to address environmental issues relating to construction trucks.

1.7.6 Aesthetics

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 ESMMP, the proponent shall put in place several measures aimed at ensuring high standards of hygiene and housekeeping within the premises and surrounding areas.

CHAPTER TWO: LEGAL, INSTITUTIONAL AND LEGISLATIVE FRAMEWORK

2.1 National, Legal and Institutional Framework

Kenya has approximately 77 statutes that guides on environmental management and conservation. Most of these statutes are sector specific, covering issues such as public health, soil conservation, protected areas conservation and management, endangered species, public participation, water rights, water quality, air quality, excessive noise control, vibration control, land use among other issues.

The National Environment Management Authority (NEMA) in conjunction with the various lead agencies studies proposed projects to ensure all aspects of the proposed project adheres to all Institutional Frameworks requirements. The institutional framework directly governing road development projects are: Environmental Management and coordination Act (EMCA) of 1999 and its subsequent supplements the Environmental (Impact Assessment and Audit) Regulation, 2003; EMCA (Waste Management) Regulations, 2006 and EMCA (Water Quality) Regulations, 2006; EMCA (Controlled Substance) Regulations, 2007; EMCA (Noise and Vibration Control) Regulations,2009; EMCA (Emissions Control) Regulations,2006; EMCA (Wetlands, River Banks, Lake Shores and Sea Shore Management) Regulations, 2009; EMC (Conservation of Biological Diversity and Resources, Access To Genetic Resources and Benefit Sharing) Regulations,2006, Land Acquisition Act (Cap.295), Land Act Way Leaves Act (Cap. 292), Public Roads and Roads Access Act (Cap. 399), Forest Act, Physical Planning Act (CAP 286), Local Government Act (CAP 265), Traffic Act Chapter 295, Water Act 2002, Public Health Ac (Cap. 242), Lakes and River Act Chapter 409, Wildlife Conservation and Management Act, Cap 376 and the Penal Code (CAP 63) 514

Relevance to this project

This project will adhere and comply with the relevant local and international laws and statutes.

2.2 Environmental Management and Coordination Act of 2015

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 additional 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.

Relevance to this project

This project report is been done consistent with this EMCA 2015.

2.3 Occupational Health and Safety, OSHA 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.

Relevance to this project

All these apply to this project. These issues are also addressed by the World Bank EHS guidelines. The contractor will also be required to submit and adhere to Contractor Environmental & Social Management Plans (CESMP), Environmental & Social Health and Safety Plan (ESHS) and a Code of Conduct.

2.4 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.

Relevance to this project

The contractor will need to keep the site area clean and sanitary and ensure provision of separate sanitary conveniences for the workers and provision of clean drinking water on site.

2.5 Physical Planning Act, 1999

The said Act section 29 empowers the local authorities to reserve and maintain all land planned for open spaces, roads, 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.

Relevance to this project

It has been confirmed that the land of the proposed project belongs to the county government of Kajiado and has no encumbrances or encroachments.

2.6 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.

Relevance to this project

It has been confirmed that the land of the proposed project belongs to the county government of Kajiado and has no encumbrances or encroachments.

2.7 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.

Relevance to this project

It has been confirmed that the road proposed will have adequate drains

2.8 Other Relevant Laws

2.8.1 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.

- 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 and access road to the railway stations 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.

To comply with the requirements of the regulations the proponent and contractor should undertake the above for this project and ensure that solid wastes will be collected and disposed in an environmentally friendly manner by a NEMA registered waste handler and transporter.

2.8.2 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 is 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 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 and also ensure that the project works are only conducted during the day.

Comparison between WHO and NEMA Noise Guidelines

Specific Environment	Critical Health Effects	L _{Aeq} dB(A) WHO	Time base (hours)	L _{Aeq} dB(A) NEMA	Time base (hours)
Outdoor living area	Serious annoyance	55	16	45	14
	Moderate annoyance	50	16	35	14
Indoor dwelling Inside bedroom	Speech interference	35	16	-	-
	Sleep disturbance	30	8		

Outdoor bedroom	Sleep disturbance	45	8	35	-
School classroom Indoor	Speech and communication	35	During class time	Day 60 Night 35	14 14
School playground outdoor	Annoyance External	55	During play	45	Day
Hospital, treatment room indoor	night time daytime	30 30	8 16	-	-
Industrial, Commercial and traffic areas	Hearing impairment	70	24	60	12
Ceremonies, festivals entertainment events	Hearing impairment	100	4	-	-

Relevance to the project

Noise emanating from construction machineries, equipment and workers is anticipated during construction phase of the project. Compliance to the regulation will be required throughout the project by the contractor. No work is to be done at night and working hours are from 6am up to 6pm.

2.8.3 EMCA (Air Regulations), 2014

This Act is meant to ensure that all activities at least maintain ambient quality standards of air and any pollution to air (in particulate matter, dust or obnoxious and poisonous gases) needs to be sufficiently mitigated.

Relevance to the project

There will be abatement of dust and vehicles on site will be well maintained for minimization of unwanted exhaust fumes.

2.8.4 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.

Relevance to this project

It has been confirmed that the land of the proposed project belongs to the county government of Kajiado and has no encumbrances or encroachments.

2.8.5 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.

Relevance to this project

It has been confirmed that the land of the proposed project belongs to the county government of Kajiado and has no encumbrances or encroachments.

2.8.6 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.

Relevance to this project

It has been confirmed that the land of the proposed project belongs to the county government of Kajiado and has no encumbrances or encroachments. During works, there will be adequate traffic management that includes use of flagmen, traffic cones, barricading, use of warning signs and worker PPE for visibility.

2.8.7 County Governments Act, 2012

This Act delineates the roles and responsibilities of county governments with their administrations as well as the role of county citizens in public participation and consultations regarding projects at the county level. CPP is part of this access road to the railway station project involving the county government and other stakeholders.

Relevance to this project

It has been confirmed that the land of the proposed project belongs to the county government of Kajiado and has no encumbrances or encroachments. Adequate public participation and consultations will be carried out for this project during design, execution and operational phases.

2.8.8 HIV Aids Prevention and Control (Cap 246A)

This Act is to promote public awareness about the causes, modes of transmission, consequences, means of prevention and control of HIV and AIDS. It also seeks to positively address and seek to address conditions that aggravate the spread of HIV infection.

Relevance to this project

In the Kitengela access road to the railway station project, there will be awareness creation and sensitization on the workers and other persons on the risks of infections and fostering prevention and control. It is also recommended that condoms for use by workers will be availed at site to prevent infections.

2.8.9 The Water Act, 2002

The Act vests the water in the State and gives the provisions for the water management, including irrigation water, pollution, drainage, flood control and abstraction. It is the main legislation governing the use of water.

The proposed project shall require some quantities of water during the construction phase and generation of equally large volumes of surface run-off during operations. The water supplied by the local water provider and local rivers might be the sources of water for construction. Any water body near the project will be receiving bodies for the surfaces run-off, as all the drainage systems shall be designed to discharge into them.

Relevance to this project

The contractor shall ensure that there will be no pollution to the nearby drainage system, and will seek the necessary permits to abstract the water from the rivers, or any other sources, and shall abide by the conditions attached to the permit(s).

2.8.10 The Water Resources Management Rules (2007)

These Rules are described in Legal Notice Number 171 of the Kenya Gazette Supplementary Number 52 of 2007. They apply to all water resources and water bodies in Kenya, including all lakes, water courses, streams and rivers, whether perennial or seasonal, aquifers, and shall include coastal channels leading to territorial waters.

The Water Resources Management Rules empower Water Resources Management Authority (WRMA) to impose management controls on land use falling under riparian land. It also enables any person with a complaint related to any matter covered by these rules to the appropriate office in WRMA as per the Tenth Schedule which provides a format for report on complaints. WRMA is to reply to the complainant with “copies to all other relevant parties within twenty one days of receiving the complaint, starting with what action is being taken, the position of the Authority on the matter and any recommendation to the complainant.”

Relevance to this project

The contractor shall seek the necessary permits to abstract the water from the rivers, or any other sources, and shall abide by the conditions attached to the permit(s). The contractor/proponent will adhere to the provision of this regulation by obtaining relevant water permit from WRMA or consult with the relevant Water and Sewerage Company for its water sources.

2.8.11 Environmental Management and Coordination Act (Water Quality) Regulations, 2006

These are described in Legal Notice No. 120 of the Kenya Gazette Supplement No. 68 of September 2006. They apply to drinking water, water used for agricultural purposes, water used for recreational purposes, water used for fisheries and wildlife and water used for any other purposes. They include the following: Protection of sources of water for domestic use; Water for industrial use and effluent discharge; Water for agricultural use. These Regulations outline:

- Quality standards for sources of domestic water;
- Quality monitoring for sources of domestic water;
- Standards for effluent discharge into the environment as indicated in table 3-2 Monitoring guide for discharge into the environment;
- Standards for effluent discharge into public sewers;
- Monitoring for discharge of treated effluent into the environment.

Kenya Discharge Guidelines for Waste water

Parameter	Discharge in public sewers (mg/l)	Discharge into water bodies (mg/l)
PH	6.0 – 9.0	6.0 – 9.0
BOD5 (20oC)	500	20
COD	1000	50
Suspended Solids	500	30
Detergents	30	Nil
Heavy metals (combined)	1	0.1
Oils/Grease	50	Nil
Nitrates (TN)	20	10
Phosphates (TP)	30	5
Conductivity	-	1500 uS/cm
4hr PV Value	No limits	20
Faecal Coliforms	No limits	1000/100ml for large water bodies, otherwise <10/ml)

Sulphates	-	500
Dissolved Oxygen	No limits	2
Phenols	-	2
Cyanides	-	0.1
Chlorides	-	1000
PCB	-	0.003
Colour	No limits	5 Hazen Units
Odour	No limits	Not objectionable

Sources: Department of Water Development

Relevance to this project

Discharge of effluent from construction machineries is anticipated during implementation phase of the project, Compliance to the regulation will be required throughout the project by both the contractor. The proposed project should abide to the provisions of the regulations in respect to management of waste water and water resources in the entire project cycle.

2.8.12 The Work Injury Benefits Act, 2007

The Work Injury Benefits Act (WIBA) provides for compensation to employees for work related injuries and diseases contracted in the course of their employment and for connected purposes.

Section 7(a) of the Act, on the obligations of the employer, requires an employer to obtain and maintain an insurance policy with an insurer approved by the State in respect of any liability that the employer may incur under this Act to any of his employees.

Section 10(1) States that an employee who is involved in an accident resulting in the employee's disablement or death is subject to the provision of this Act, and entitled to the benefits provided for under this Act. It also states expressly that an employer is liable to pay compensation in accordance with the provisions of this Act to an employee injured while at work.

On First Aid covered in section 45(1), an employer is supposed to provide and maintain such appliances and services for the rendering of first aid to his employees in-case of any accident as may be prescribed in any other written law in respect of the trade or business in which the employer is engaged.

Relevance to this project

This Act is triggered by the proposed project and it is thus recommended that all workers contracted during the project implementation phase have the required insurance covers so that they can be compensated in case of injuries while working.

2.9 National Policy Framework

Several policies have been developed over the years to guide the development and management of proposed projects to ensure both economic and social sustainability these policies are discussed below.

2.9.1 The National Poverty Eradication Plan (NPEP)

The objective of the NPEP is to reduce the incidences of poverty in both rural and urban areas by 50 percent by the year 2015, as well as to strengthen the capabilities of the poor and vulnerable groups to earn income. It also aims to narrow gender and geographical disparities and create a healthy, better-educated and more productive population. This plan has been prepared in line with the goals and commitments of the World Summit for Social Development (WSSD) of 1995.

The plan focuses on the four WSSD themes of poverty eradication; reduction of unemployment; social integration of the disadvantage people and creation of an enabling economic, political, and cultural environment which can be achieved through developing the transport and communication sector. The plan will be implemented by the Poverty Eradication Commission (PEC) formed in collaboration with Government ministries, Community Based Organization (CBO), private sector, Non-Governmental Organization (NGO), bilateral and multilateral donors.

2.9.2 The Poverty Reduction Strategy Paper (PRSP)

The PRSP has the twin objectives of poverty reduction and enhancing economic growth. The paper articulates Kenya's commitment and approach to fighting poverty; with the basic rationale that the war against poverty cannot be won without the participation of the poor themselves. The proposed project through improving transport in the area will, contribute towards economic growth, as well as relieve the daily pressure of poverty for sustainable number of people by enabling them reach the markets and suppliers on time.

2.9.3 National Environmental Action Plan (NEAP)

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

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

The application of this plan is widening as the government through NEMA does not approve a development project unless the impacts of the proposed project are evaluated and mitigation measures proposed for incorporation in the project's development plan which is in line with the requirements of the NEAP.

Relevance to this project

It is expected that the development of this road will improve accessibility and mobility of the boda boda riders and traders in the area to improve their livelihoods and access to the railway station.

2.9.4 Environmental and Development Policy (Session Paper No.6 1999)

As a follow-up to the foregoing, the goal of this policy is to harmonize environmental and developmental goals so as to ensure sustainability. The paper provides comprehensive guidelines and strategies for government action regarding environment and development. It is recommended that the requirements of this policy are observed, as much by:

- i. Taking measures to enhance the water catchment by replanting trees, using clean energy to reduce deforestation;
- ii. Undertaking environment friendly practices during project implementation;
- iii. Take measures to reduce pollutants leading to eutrophication of water bodies both above- and underground water bodies; and
- iv. Rehabilitate project affected areas and public infrastructure among other

2.9.5 International Policy Framework

Kenya is a signatory as well as a party to various international conventions, treaties and protocols relating to the environment which aims at achieving sustainable development. According to the Registrar of International Treaties and other Agreements in Environment (UNEP 1999), there are 216 treaties, 29 of which are of interest to Kenya. The country is a signatory to 16 such agreements, which range from use of oil, protection of natural resources and protection of the atmosphere. The agreements are both regional and international and became legally binding on Kenya upon ratification thereof by the rightfully designated Kenyan Authority. The agreements of interest to Kenya can be categorized as those for protecting natural resources, atmosphere and social wellbeing of man.

2.9.6 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.

2.10 World Bank EHS Guidelines

These guidelines require that World bank supported projects comply with guidelines regarding environmental, occupational health and safety in areas of noise management, air quality management, adoption of personal protective equipment for workers, emergency response and disaster preparedness and fire, mechanical, machinery and general plant safety. These guidelines also require that contractors commit to an environmental and social health and safety (ESHS) plan and a code of conduct on environmental and social impacts mitigation and management.

Relevance to this project

The contractor will be made to commit to an ESHS plan and a code of conduct regarding environmental, occupational health and safety management.

2.11 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 Category 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 ESMMP. The table below shows the applicability of World Bank Operational Safeguards as it applies to this Construction of Kitengela Off-station Access Road to Kitengela Railway Station in Kitengela Town of Kajiado County of Nairobi Metropolitan Region.

Table 1: Applicability of WB Ops

Environmental & Social Impact Assessment Project Report for the Proposed Construction of Off-station Access Road to Kitengela Railway Station in Kajiado County of Nairobi Metropolitan Region

OP	Title	Comments
4.01	Environmental Assessment	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
4.04	Natural Habitats	Not applicable.
4.09	Pest Management	Not applicable.
4.10	Indigenous Peoples	Not applicable.
4.11	Physical Cultural Resources	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.
4.12	Involuntary Resettlement	Not applicable. The earth road corridor area has no encroachments neither are there any relocation of assets or displacement of persons.
4.36	Forests	Not applicable.
4.37	Safety of Dams	Not applicable.
7.50	Projects on International Waterways	Not applicable.
7.60	Projects in Disputed Areas	Not applicable.

CHAPTER THREE: BASELINE INFORMATION OF THE STUDY AREA

3.1 Physical Environment

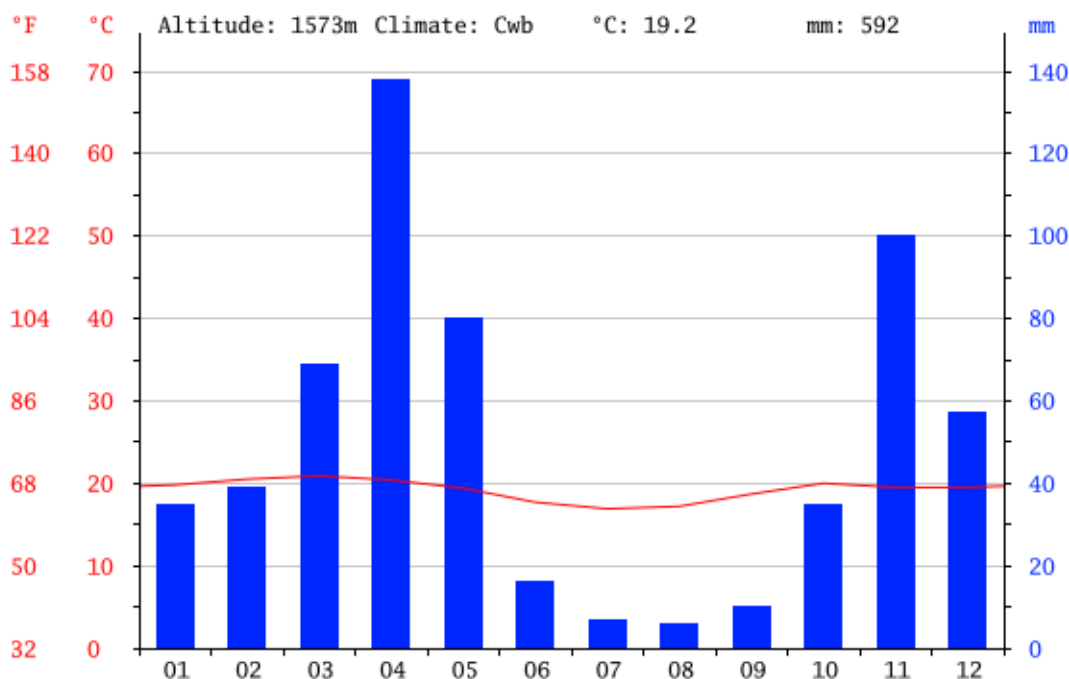
Kitengela is a town located in Kajiado County in the former Rift valley province just 30 kilometers south of Nairobi. The town is part of the Nairobi Metropolitan Area and is one of the 13 urban centres. The proposed location of the proposed access road to the railway station is of gentle slope topography and winds down between commercial and residential buildings towards the railway line and railway station starting from the main tarmac road in Kitengela Town that starts from Nairobi City passing through Kitengela towards Namanga. The aim is to upgrade the existing earth access road to the railway station. The area for the proposed access road to the railway station is currently a clear earth road belonging to the County Government of Kajiado.

3.1.1 Climate

Data from nearest weather station: Nairobi, Kenya (30.2 KM) from Kitengela indicates that the climate of the area is warm and temperate according to the Köppen-Geiger climate classification. The temperature here averages 16.7 °C. In a year, the average rainfall is 865 mm. Most rainfall (rainy season) is seen in April, May, November and December. Kitengela has dry periods is the coolest month is August. April is the wettest month and July is the driest month. The figures below present summary of climate data for Kitengela area.

Figure 3-1: Mean Monthly Rainfall

Source: weather-and-climate.com 2016-Kitengela



The driest month is August, with 6 mm of rain. In April, the precipitation reaches its peak, with an average of 138 mm.

Temperature

The monthly mean minimum and maximum daily temperatures indicate that March is the warmest month of the year. The temperature in March averages 20.9 °C. At 16.9 °C on average, July is the coldest month of the year.

Figure 3-2: Mean Monthly Temperature

Source: *weather-and-climate.com 2016-Kitengela*

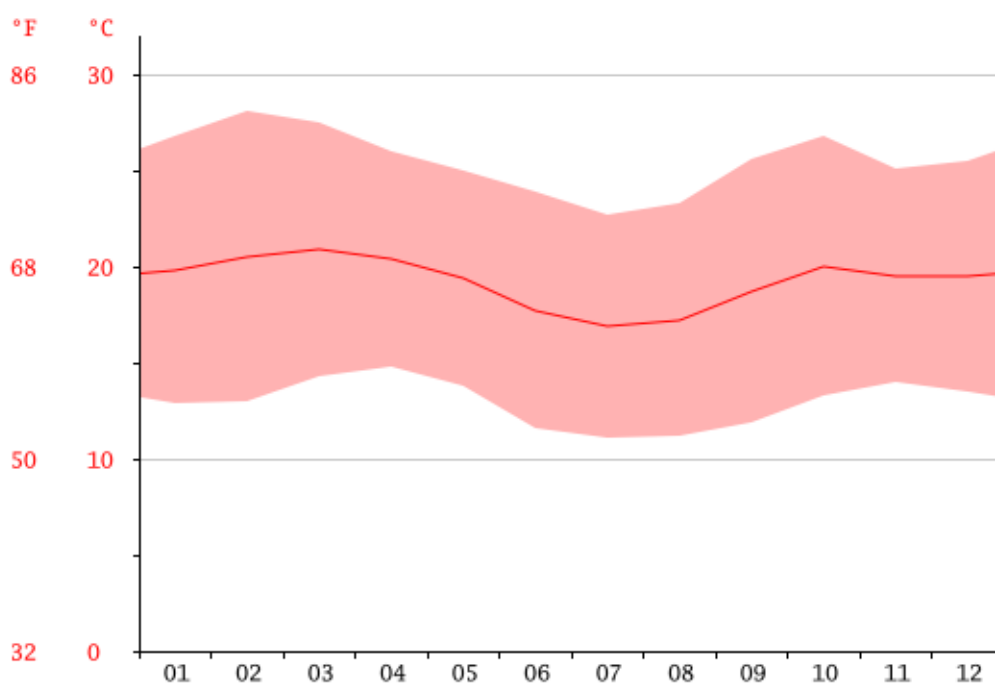
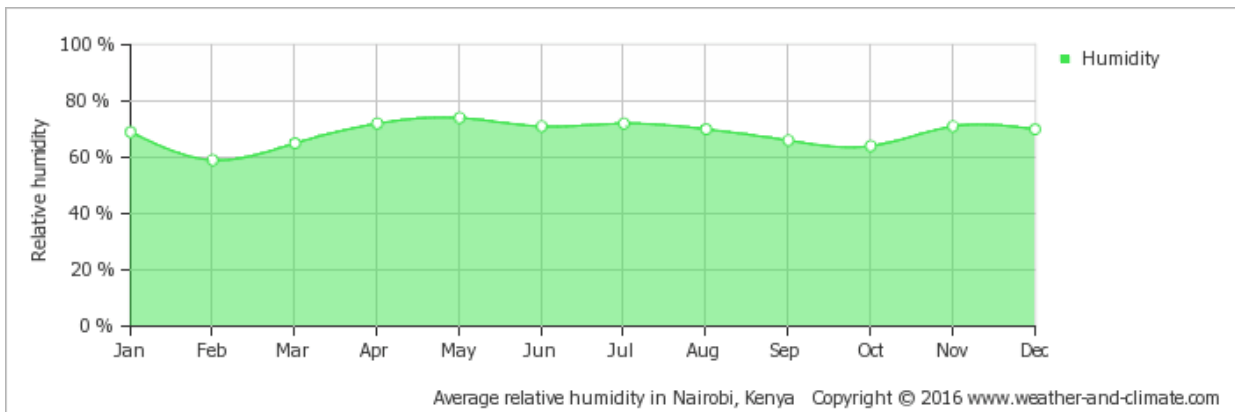


Figure 3-3: Average humidity over the year

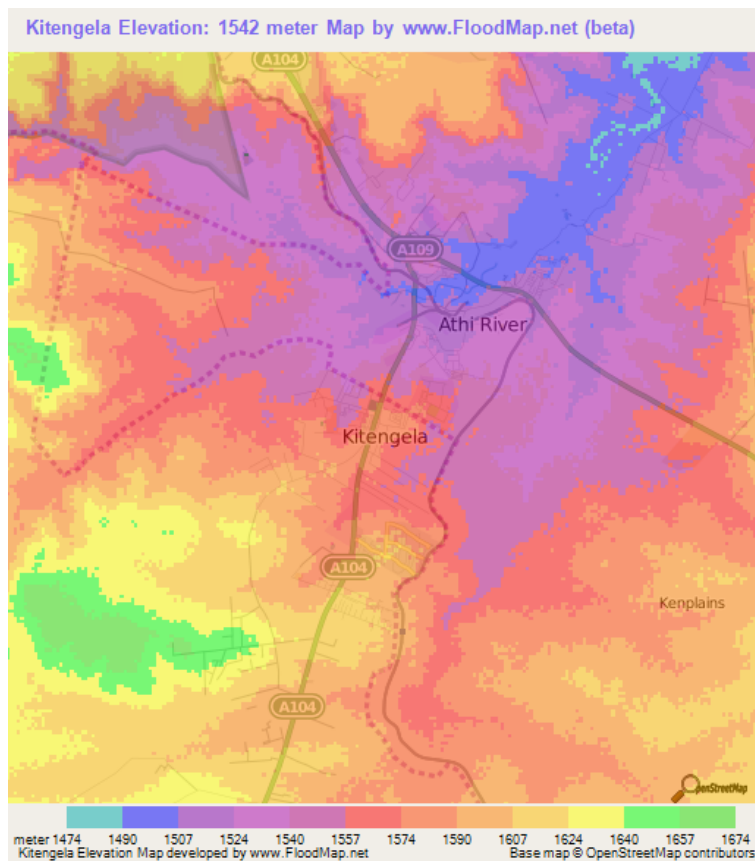
Source: *weather-and-climate.com 2016-Kitengela*



3.1.2 Topography and Physiographic Features

There are no major physical features in the project area and is generally flat with a slight slope towards the railway line. The altitude of the area is about 1740m above sea level.

The figure below presents the Elevation map of Kitengela town generated using elevation data from NASA's 90m resolution SRTM data.



3.1.3 Hydrology

Water is scarce as there are no perennial rivers. Water can be obtained from the river bed of the Kajiado River, but much of the population in this area depends on boreholes. The most accessed horizons are the biotite gneisses, or the contact between the metamorphic rocks and the volcanics.

3.1.4 Geology and Soils

The area of the project is mainly of volcanic soils and rocks represented by Upper Athi Series consisting of sediments and lake beds, Athi Tuffs and Kapiti phonolite. The rocks mainly consist of gneisses and schists that are shallow seated and have been encountered by several of the numerous boreholes drilled in the vicinity of the area. The rock outcrops are not extensive in the project area and are confined mainly to the valley of Athi River, Stony Athi and along Kitengela River.

3.2 Biological Environment

The area proposed for the construction has little or no flora as it has long been cleared to pave way for the earth road that heads to the railway station and other developments. The town also has a lot of roaming cows and goats and most of the animal husbandry is a pastoralist or semi-pastoralist activity. Dairying, which may involve paddock systems and zero grazing, is also practised around Kitengela.

3.3 Social Environment

3.3.1 Demographics

The human population within Kitengela area has more than doubled in the last 10 years, from 6548 in 1889 to 17,347 in 1999 to 58,167 in 2009. The actual and projected population of Kitengela Town is as shown in the following table.

Urban Centres	2009			2015			2017 (Projected)		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
Kitengela	30088	28079	58167	39325	36699	76024	43778	40855	84633

Kitengela town holds more of the urban population than any other town in the county with 41 percent of the total. The other towns are Kitengela with 23 percent, Ongata Rongai with 16 percent and Kajiado with 6 percent. The male urban population (50.4 percent) is more compared to Female urban population (49.6 percent).

3.3.2 Land use

Land is mainly used for livestock rearing and crop growing. There is a significant change in land use in Kitengela where industrial and commercial use is gaining momentum. There is growing level of land speculation in the urban areas of the county, leading to excessive subdivision of land to small and sometimes uneconomical plots.

3.3.3 Infrastructure

The project site is located in Kitengela Town in Kajiado County South of Nairobi. The area is growing constantly with rapid developments of large estates, industries, intensive farming and institutions. Kitengela town and its environs have business premises developing rapidly. These include shopping malls such as Eastmatt, Tusksys, Naivas and banks (National, Equity, KCB, DTB, Family bank among others). There are also numerous cybers cafes boutiques, and petrol stations, Due to such rapid urban growth, provision of basic infrastructure for all has become an important concern of development planners in Kitengela. 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 from Kitengela Hills; roads and vehicles parking; transportation; and telecommunications. Greater environmental pollution, congestion and other problems have been the result of under-provision of such basic services. Currently under construction is Kitengela Bus Park in the neighborhood that is also under NaMSIP.

A key landmark is the Kobil Petrol Station whose annex houses the popular pizza place and Standard Chartered Bank. These are not far from the project site.

3.3.4 Livelihood

The larger Kitengela area is a semi-urban area with a range of households which on average, family sizes have been shrinking, more children are going to school and for longer, and land and herd sizes are smaller than before. One half of the cattle are owned by the 20% of households with the highest income earning more than US\$ 4,842/year/household, or US\$13/day/household. The lowest income households on the other hand, own 11% of the cattle and earn less than US\$ 1,917/year/household, or US\$ 5/day/household. Despite the fact that cattle ownership is not equally distributed livestock-related earnings (including the value of the meat and milk they consume) still account for over 50% of incomes across all income categories. Poorer households actually have more income sources than the wealthier ones, although non-livestock earnings are considerably lower and from less reliable sources. Higher income- earning households have a larger proportion of their income coming from wages and business, for example, while those in the lower ones depend more on petty trading and other informal sector activities to help them diversify their incomes. Such trading and commercial activities are conducted in Kitengela town – butcheries, hardware shops, clothes shops and Kitengela Market where groceries, fruits, second-hand clothes, kitchen utensils, shoes are sold. Other personnel are engaged in the petrol stations, eateries, shopping malls and banks in the town to earn their livelihoods.

3.3.5 General

The earth access road proposed for upgrading passes in between commercial shops that thin out towards the railway line. The road did not have much traffic and during the initial visits, for a period of one hour, about eleven vehicles had used the road. During initial visits, dust was an issue and dust abatement measures will need to be applied during construction. Little or no dust was encountered during later visits as the area had rained and dust was not an issue of concern. The road is also very

much used by motorcycle riders ferrying passengers towards and from the railway line area. It was not possible to obtain data on how many will use the railway station once operational but it is expected that there will be increased use of the road once it is upgraded. The commercial shops along the road especially near the main Namanga Highway are built next to each other with little room for passing in between them and have high human traffic. In addition, Kitengela having a population of about 85,000 persons, the station with an improved access road will have a high level of utilization. Kitengela is also reputed to be one of the fastest growing urban areas in Kenya.

CHAPTER FOUR: PUBLIC PARTICIPATION AND CONSULTATION

4.1 Introduction

Legal Notice 101 of EMCA 2015 (The Environmental Regulations, 2003) requires that all environmental assessment processes in Kenya incorporate Consultations and Public Participation (CPP). The aim is to ensure that all stakeholder interests are identified and incorporated in project development, implementation and operation. Of necessity, stakeholder consultations should take place alongside project design and implementation to ensure that the project puts in place measures to cater for stakeholder concerns in all project phases.

4.2 Approach to Public Participation and Consultations

In the case of the proposed Kitengela off-station access road to the railway station project, CPP followed these steps:

1) Identification of Stakeholders

Like in all civil works projects, the core stakeholders comprise people to be directly served by the access road to the railway station and include traders, businessmen, train passengers, pedestrians along the upgraded access road and the general surrounding community. This is the group that is likely to benefit or be affected by the proposed development hence the primary stakeholders. This study also identified a second category of stakeholders comprised of County Government of Kajiado officers, county government heads and institutions in charge of diverse sectors (Ministry of Transport, among others), which are likely to be impacted by the access road to the railway station construction project. This category was also consulted as key informants on sectoral policy and to advise this ESIA study on mitigation measures to be put in place so as to minimize adverse impacts in respective sectors. Each category of stakeholders called for a different approach to consultation.

2) Modalities for stakeholder consultation

The following techniques and instruments were used for public participation and consultation;

➤ Photography and direct observation

Photography was particularly useful as it captured the real situation on the ground that was relevant to the study. Direct observation involved site viewing of the proposed project location to see the extent of development on it and the condition of the existing railway station as shown on the plates below.

Photograph of Stakeholders CPP – October 18, 2017



Public Participation & Consultation with local (business and political) leaders and boda-boda operators that also included county government officials – disclosure of project design and status conducted

➤ **Interviews**

Interviews and stakeholder engagements were carried out in the form of a public meeting where attendance sheets were filled in and minutes of meeting taken. It also included filling in of questionnaires to solicit views regarding this project from these persons. The status of the project as well as its design was disclosed to the stakeholders at this point. The questionnaire initially gave introduction and created awareness to these stakeholders of the proposed project. Afterwards, the ESIA team enquired on the acceptance of the project and whether the project would 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.

In total, about 40 persons attended the meetings and were consulted. These were mainly traders in the area along the road to be upgraded, political leaders and boda boda riders. Interviewed also were members of the local matatu group, members of Deliverance Church along the road to be upgraded, ward administrators and representatives of the county government of Kajiado.

4.3 Issues Raised

The issues raised in the public meeting held on October 18, 2017 are as represented in the table below;

Mr. Danson Mwangi requested that once the road is complete speed bumps should be constructed along the road.	Eng. Malika said that that was well noted.
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<p>Mr. Calvin Otieno asked whether the youth shall be given employment once the project commences.</p> <p>Mr. Alex Kimani asked when the project was likely to start and end.</p>	<p>Eng. Mwaura assured them that the contractor is usually advised to recruit casual labor from the local community so that they can directly benefit from the project.</p> <p>Hon. Matuya added that a project management team shall be set up headed by himself.</p> <p>Eng Mwaura told the stakeholders that the project is still under procurement process so it is expected that it will start earliest January 2018 and it will take a period of 6 months to be completed.</p>
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Further issues are as reflected in the minutes of meetings in the Annexure.

The attendance sheets, questionnaires and minutes of meeting for CPP will be attached to this report.

CHAPTER FIVE: ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT

5.1 Introduction

This chapter outlines the potential negative and positive impacts that will be associated with the access road to the railway station 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 access road to the railway station 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.

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 access road to the railway station project will be obtained from quarries and bitumen dealers. These are not renewable in the short term.

5.2.2 Dust emissions

During construction, the project will generate substantial quantities of dust at the construction site and its surrounding especially during excavations particularly in dry and dusty weather. 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, the local residents and the businesses along the access road. This would be accentuated during dry weather conditions. Key receptors of this dust are the commercial businesses along the access road, Deliverance Church during worship times and Doxa Academy during school times.

5.2.3 Exhaust emissions

The trucks used to transport various building materials from their sources to the access road to the railway station project site will contribute to increases in emissions owing to frequent running of vehicle engines, frequent vehicle turning and slow vehicle movement in the loading and offloading areas. Such emissions can lead to several environmental impacts including global warming and health impacts.

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 to 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. The movement of trucks and other equipment in the project area during the works implementation will cause noise and this noise may adversely affect key receptors – Deliverance Church during worship times and Doxa Academy during school times.

5.2.5 Risks of accidents and injuries to workers and third parties

Because of the intensive engineering and construction activities including concrete work, construction workers and third parties will be exposed to risks of accidents and injuries. Such injuries can result from accidental falls, injuries from hand tools and construction equipment 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

Solid wastes - used iron sheets and timber for barricading, unwanted soil, empty cartons, wrappers, plastic containers, organic foods wastes - will be generated as a result of demolitions and excavations in the existing earth road. 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 access road 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 mainly to be used for dust suppression, concrete mixing and sanitary and washing purposes. Excessive water use may negatively impact on the water source and its sustainability. The water for use in Kitengela area used to be supplied by the Export Processing Zone Authority but this service is now being transferred to Olkejuado Water and Sewerage Company (OWSC) under the supervision of Tanathi Water Services Board (TAWSB).

5.2.10 Increased Traffic

The construction phase will be characterized by increased traffic that may cause traffic jams and inconvenience to transporters and commuters.

5.2.11 Inconvenience of the local residents during construction

The construction phase will inconvenience the local persons adjacent to the proposed road.

5.2.12 Community Health and Safety from Deep Excavations

The local community could be affected by deep excavations that will be dug to remove the black cotton soils for construction of the road.

5.3 Positive 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 Kitengela 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 Kajiado County 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 Social Impacts

5.4.1 HIV-AIDS Infections

There is risk of infections to workers and other persons to sexually transmitted diseases and HIV-AIDS during project implementation following increased incomes of workers as well as some of the contractor workers being away from their homes.

5.4.2 Gender Mainstreaming

It is important that both men and women are considered for the works. A situation whereby there is preponderance of men even for tasks that women can do is a negative impact on gender. All need to have equitable opportunities.

5.4.3 Grievances

The surrounding community and workers will have grievances or complaints during project execution.

5.4.4 Crime Management, Child Protection, Gender Equity and Sexual Harassment

The laws of Kenya prohibit Contractors from “employing children in a manner that is economically exploitative, hazardous, and detrimental to the child’s education, harmful to the child’s health or physical, mental, spiritual, moral, or social development. It is also important to be vigilant towards potential sexual exploitation of children, especially young girls. The Contractor should adopt a ‘Child Protection Code of Conduct’; that all staff of the Contractor must sign, committing themselves towards protecting children, which clearly defines what is and is not acceptable behavior. Crimes might occur in the project area during the construction and operation such as stealing of construction materials or individual property, fighting, petty crimes such as pick pocketing, drug abuse and alcoholism among others.

There is also potential that gender inequality might occur during project construction through unequal distribution of work, discrimination against women, and unequal pay for women, lack of provision of separate facilities for women, among others. Sexual harassment against women might also happen because of mixing of women and men at the construction site.

5.4.5 Labour Influx – Complaints and Grievances / Social Conflict

During construction, the neighbouring community and residents may have complaints and grievances regarding the ongoing activities. There is also potential for social unrest among the local population if they are not considered for employment and especially if they perceive that external labourers are being engaged for works that they can do. This can bring negative publicity and social conflict during construction including stoppage of work and can delay the projects progress.

Against the background of this knowledge and expectation, there is a risk of dissatisfaction if procedures of work allocation do not consider locals or if they are seen to be applied in an inequitable manner.

5.5 Negative impacts of operational activities

5.5.1 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 access road to the railway station. 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.

5.5.2 Increased crime

From a more motorable road, there could be increase in crime in the area

5.5.3 Risks of accidents

Because of a smoother more motorable road, accidents to passengers, pedestrians and children could increase.

5.6 Positive impacts of operational activities

5.6.1 Revenue to national and local governments

Through payment of relevant taxes, rates and fees to the government and the local authority, the access road to the railway station project will contribute towards the national and local revenue earnings from those using the improved facilities.

5.6.2 Other positive impacts

Other positive impacts include reduction of dust emissions, reduction of traffic jams, enhanced emergency preparedness and response access and vehicle maintenance reduction.

5.7 Positive social impacts of operational activities

The operational activities after this project is commissioned will have several positive long-term social impacts that include the following;

- Easier accessibility for commuters to the railway station
- Improved convenience, mobility and movement of persons, goods and services in an upgraded access road
- Improved drainage will reduce the flood damage and improve accessibility especially for pedestrian traffic and residents
- Improved accessibility will spur physical development in the area leading to increased jobs for Kitengela Town residents
- Cleaner and orderly environment
- Improved safety and security for all.

5.8 Negative environmental impacts of decommissioning activities

5.8.1 Solid waste

Demolition of the access road and related road 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.

5.8.2 Dust

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

5.8.3 Noise and vibration

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

5.9 Positive environmental impacts of decommissioning activities

5.9.1 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.

5.9.2 Employment Opportunities

Several employment opportunities will be created for demolition staff.

5.10 Sensitive Receptors

Sensitive receptors constitute aspects of the environment likely to be affected by the proposed development in the course of its life cycle. The proposed project area is the earth access road to the railway station and the adjacent structures. The table below lists various sensitive receptors that were noted for this proposed project.

Receptor	Description of susceptible feature	Suggested Way Forward / Mitigations	Responsible Party	Estimated Cost Kshs
General commercial and residential buildings along the access road	Noise and air quality	Construction works only during the day Sprinkling water for dust abatement Barricade construction site to shut off third parties Avoid unnecessary hooting Use of quiet and modern equipment and minimize idling time and shut off vehicle engines when not in use. Need to have inspection and monitoring program for equipment	Contractor during construction	220,000

Environmental & Social Impact Assessment Project Report for the Proposed Construction of Off-station Access Road to Kitengela Railway Station in Kajiado County of Nairobi Metropolitan Region

Receptor	Description of susceptible feature	Suggested Way Forward / Mitigations	Responsible Party	Estimated Cost Kshs
		Use suppressors / dampers on construction equipment to manage noise Materials hauling trucks to be covered so as not to affect the receptors		
Deliverance Church	Noise and air quality	Minimum or reduced work during church worship times Sprinkling water for dust abatement Barricade construction site to shut off church Avoid unnecessary hooting Use of quiet and modern equipment and minimize idling time and shut off vehicle engines when not in use. Need to have inspection and monitoring program for equipment Use suppressors / dampers on construction equipment to manage noise Materials hauling trucks to be covered so as not to affect the post	Contractor during construction	Applied above
Doxa Academy	Noise and air quality	Minimum or reduced work during school times and maximized work during weekends or when school is not open Construction works only during the day Sprinkling water for dust abatement	Contractor during construction	Applied above

Environmental & Social Impact Assessment Project Report for the Proposed Construction of Off-station Access Road to Kitengela Railway Station in Kajiado County of Nairobi Metropolitan Region

Receptor	Description of susceptible feature	Suggested Way Forward / Mitigations	Responsible Party	Estimated Cost Kshs
		<p>Barricade construction site to shut off Academy's students and staff</p> <p>Avoid unnecessary hooting</p> <p>Use of quiet and modern equipment and minimize idling time and shut off vehicle engines when not in use.</p> <p>Need to have inspection and monitoring program for equipment</p> <p>Use suppressors / dampers on construction equipment to manage noise</p> <p>Materials hauling trucks to be covered so as not to affect the Academy</p>		

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 access road to the railway station in Kitengela.

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. The access road to the railway station will not be improved under this option and the improved accessibility and utilization of the railway station will not be realized. 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 access road to the railway station and the proposed railway station would remain under utilized.
- No employment opportunities will be created for thousands of Kenyans who will work in the project area.
- Discouragement for investors and loaners
- Development of infrastructural facilities 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 access road to the railway station will be made using locally sourced stones, cement, sand (washed and clean) and other materials that meet the Kenya Bureau of Standards requirements. The alternative technologies available include the conventional concrete, 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 program 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 program 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 Kajiado County 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. Alternatively, the contractor could develop a solid waste management plan which could be approved by the client. 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 and Social Management and Monitoring Plan (ESMMP).

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 Management of Dust Generation

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. The construction site will need to be barricaded especially to shut off the sensitive receptors identified from dust and other emissions. Materials hauling trucks need to be covered to reduce dust especially to the sensitive receptors identified in section 5.10.

7.2.3 Minimization of Exhaust Emissions

Minimization of exhaust emissions 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.

7.2.4 Minimization of Noise and Vibrations

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 unnecessarily especially when passing through sensitive areas such as residential areas, Deliverance Church and Doxa Academy. 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. The construction works are also to be carried out during the day. Use of quiet and modern equipment should be ensured with minimization of idling time and shutting off of vehicle engines when not in use. The equipment also needs to be inspected and monitored with suppression or damping of noise applied.

7.2.5 Reduction of Risks of Accidents and Injuries

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 and the World Bank EHS guidelines. 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 and third parties as outlined in the ESMMP. This will also include development and use of a traffic management plan.

7.2.6 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 drainage structures, 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.

7.2.7 Minimization of Construction Wastes

It is recommended that 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. The existing area will have to be excavated to make for new access road and associated facilities and the removed materials will be taken to licensed sites or reused. 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.

7.2.8 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.

7.2.9 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. Recycling of water where possible needs to be applied. If possible also, water harvesting from rain water should also be adopted.

7.2.10 Traffic Management

Traffic flagmen and use of warning signs and bumps where necessary should be applied to manage and control traffic employed in the construction works.

7.2.11 Convenience to Local Residents

The contractor should ensure there is a good working relationship with the surrounding community including provision of proper barricading to remove access of locals from active sites, use of diversions and adequate warning signs. Inconvenience to locals should be as little as practically possible.

7.2.12 Community Health and Safety from Deep Excavations

The contractor should ensure that excavation is done in manageable sections and phases with adequate warning signs and barricading for no falls of community members.

7.3 Mitigation of Social Impacts

7.3.1 HIV-AIDS Management

It is recommended that there is sensitization and awareness creation to safeguard workers and other persons against infections from sexually transmitted diseases including HIV-AIDS. Other mitigation measures include;

- HIV-AIDS awareness methods used in campaign to increase understanding about the disease;
- Raising awareness about HIV/AIDS;
- Promote the benefits of abstinence / avoidance;
- Distribute condoms to construction workers;
- Encourage workers to go for HIV voluntary counseling, testing and referral services;
- Monitoring of outcomes, in collaboration with National HIV/AIDS Authorities.

7.3.2 Gender Mainstreaming

It is important that both men and women are considered for the works. A situation whereby there is preponderance of men even for tasks that women can do is a negative impact on gender. All need to have equitable opportunities.

7.3.3 Grievance Redress Mechanisms

Grievance redress mechanisms will be employed for this project to handle and manage any complaints or grievances received from concerned persons. Documentation for this that will be applied is attached to this report. It is expected that a standard form is applied to receive complaints / grievances and a grievance log is kept on site by the Resident Engineer.

7.3.4 Crime Management, Child Protection, Gender Equity and Sexual Harassment

The following are some mitigation measures;

- Proper design incorporating lighting to enhance security along the access road
- Ensure no children are employed on site in accordance with national labor laws
- Ensure that any child sexual relations offenses among Contractors' workers are promptly reported to the police
- The client and the Contractor shall adopt a 'Child Protection Code of Conduct' which sets stringent standards for personal behavior to avoid child exploitation and abuse.
- The Contractor shall require his employees, sub-Contractors, sub-Consultants, and any personnel thereof engaged in construction works to individually sign and comply with this Code of Conduct.
- Removing any employee who persists in any misconduct or lack of care, carries out duties incompetently or negligently, fails to conform to any provisions of the contract, or persists in any conduct which is prejudicial to safety, health, or the protection of the environment.
- Taking all reasonable precautions to prevent unlawful, riotous or disorderly conduct by or amongst the Contractor's personnel, and to preserve peace and protection of persons and property on and near the site.
- Prohibiting alcohol, drugs, arms, and ammunition on the worksite among personnel.
- The Contractor and Supervision Consultant should register in a log all events of a criminal nature that occur at the worksite or are associated with the works activities.

- The Contractor and Supervision Consultant should report all activities of a criminal nature on the worksite or by the Contractor's employees (whether on or off the worksite) to the police and undertake the necessary follow-up. Crime reports should include nature of the offense, location, date, time, and all other pertinent details
- Sensitize the construction workers, locals, and security to be on the lookout on suspicious activities near the site.

The Contractor's responsibility for workers' conduct within the worksite should include but not limited to:

- Contractor to prepare and enforce a "No Sexual Harassment Policy" in accordance with national laws where applicable
- Contractor and implementing agency to prepare and implement a Gender Action plan to include at minimum, in conformance with local laws and customs, equal opportunity employment, gender sensitization
- Provision of gender disaggregated bathing, changing, sanitation facilities at the campsite
- Liaise with the administration units (County and sub County governments, Police, DO, chiefs, etc.) to provide regular surveillance and patrols to protect workers and access road users during operation

7.3.5 Labour Influx – Complaints and Grievances / Social Conflict

The mitigation measures include;

- Provide grievance redress mechanism for the workers and surrounding community;
- Advise the public and workers on where to report grievances;
- Consider prioritizing the local manpower for both skilled and unskilled labour.
- Implement proposed grievance resolution mechanism

7.4 Mitigation of Operation Phase Impacts

7.4.1 Management of Storm-water Runoff

The contractor will ensure that proper drainage is provided and regularly maintained for storm-water runoff management. The maintenance and repairs fall under the jurisdiction of the county government.

7.4.2 Management of Crime

Crime management during operations falls under the jurisdiction of the county government. Lighting will be installed along this road by the contractor to improve security.

7.4.3 Management of Accidents

Accidents prevention during operations falls under the jurisdiction of the county government. The contractor will also ensure adequate warning signs are mounted and bumps erected.

7.4.4 Solid Waste Management

Implement measures to ensure adequate solid waste management along the access road including putting wastes receptacles and proper disposal

7.4.5 HIV-AIDS Management

It is recommended that there is sensitization and awareness creation to safeguard the access road users and workers against infections from sexually transmitted diseases including HIV-AIDS.

7.5 Mitigation of Decommissioning Phase Impacts

7.5.1 Efficient Solid Waste Management

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

7.5.2 Reduction of Dust Concentration

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

7.5.3 Minimization of Noise and Vibrations

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

CHAPTER EIGHT: ENVIRONMENTAL AND SOCIAL MANAGEMENT AND MONITORING PLAN (ESMMP)

8.1 Significance of an ESMMP

An Environmental and Social Management and Monitoring Plan (ESMMP) 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 ESMMP assigns responsibilities of actions to various actors and provides a timeframe within which mitigation measures and monitoring can be done. The ESMMP is a vital output of an Environmental and Social Impact Assessment as it provides a checklist for project monitoring and evaluation. The ESMMP 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 ESMMP

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.

8.2 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 will fund the project
- The proponent will acquire the NEMA license
- The proponent will supervise the project and will also ensure its satisfactory implementation
- The proponent shall ensure that there is a functional stakeholder engagement plan and grievance redress mechanism

8.3 Duties of the Contractor

- Prepare and maintain an approved time and progress work-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 on-site, 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 the public and private roads, drainages and pavements in the course of carrying out construction of the access road to the railway station.

- 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 and workwomen. 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 of the Public Health Act.
- 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 guests 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 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 Kenya Bureau of Standards and/or current British codes of practice 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.
- The contractor shall maintain good working relationship with the community and implement a robust stakeholder engagement plan and grievance redress mechanism.
- The contractor shall also be required to submit a Contractor Environmental and Social Health and Safety (CESMP) plan that contains an Environmental and Social Health and Safety (ESHS) plan and a Code of Conduct, the former aligned to this project's ESMMP.

Table 3: ESMMP for the Construction Phase of the Off-Station Access Road to the Proposed Kitengela Railway Station in Kitengela Town of Kajiado County

Objective/Plan	Recommended Mitigation Measures	Responsible Party*	Monitoring Mechanism	Approximate Cost (Kshs)
1) Efficient sourcing and use of raw materials	<ul style="list-style-type: none"> ▪ Maximize sourcing of construction materials from suppliers who use environmentally friendly processes in their operations. 	Contractor	Amount of raw material lost -	No additional cost
	<ul style="list-style-type: none"> ▪ Ensure accurate budgeting and estimation of actual construction material requirements to ensure that the least amount of material necessary is ordered 	Contractor	Minimum loss of materials	No additional cost
	<ul style="list-style-type: none"> ▪ Ensure that damage or loss of materials at the construction site are kept minimal through proper storage 	Contractor		No additional cost
2) Management of Dust Generation	<ul style="list-style-type: none"> ▪ Sprinkle water on graded access routes and site each day to reduce dust generation by construction vehicles 	Contractor	Number of complaints	10,000/month
	<ul style="list-style-type: none"> ▪ 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 	Contractor		No additional cost
3) Minimization of Exhaust Emissions	<ul style="list-style-type: none"> ▪ Sensitize construction and truck drivers and machine operators to avoid unnecessary racing of vehicle engines at loading/offloading points and parking areas. Switch off or keep vehicle engines at these points not being used 	Contractor	Number of complaints	No additional cost
	<ul style="list-style-type: none"> ▪ 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 	Contractor		No additional cost
	<ul style="list-style-type: none"> ▪ Sensitize construction vehicle drivers and machinery operators to switch off engines of vehicles or machinery not being used. 	Contractor		No additional cost

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Objective/Plan	Recommended Mitigation Measures	Responsible Party*	Monitoring Mechanism	Approximate Cost (Kshs)
4) Minimization of noise and vibrations	<ul style="list-style-type: none"> ▪ Sensitize construction drivers to avoid gunning of vehicle engines or hooting especially when passing through sensitive areas such as residential areas, Deliverance Church and Doxa Academy 	Contractor	Number of complaints / Incidences of hearing impairment	No additional cost
	<ul style="list-style-type: none"> ▪ Ensure that construction machinery are kept in good condition to reduce noise generation 	Contractor		No additional cost
	<ul style="list-style-type: none"> ▪ Ensure that all generators and heavy duty equipment are insulated or placed in enclosures to minimize ambient noise levels and are equipped with suppressors or dampers of noise 	Contractor		No additional cost
	<ul style="list-style-type: none"> ▪ Ensure workers in high noise areas use ear muffs 	Contractor		No additional cost
5) Reduction of risks of accidents and injuries	<ul style="list-style-type: none"> ▪ 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 or use of accidents/incidents logs. 	Contractor	Number of accidents / injuries	No additional cost
	<ul style="list-style-type: none"> ▪ Provision and mandatory enforcement on use of PPE 	Contractor		
	<ul style="list-style-type: none"> ▪ Ensure that the premises are insured as per statutory requirements (third party and workman's compensation) 	Proponent		250,000
	<ul style="list-style-type: none"> ▪ Develop, document and display prominently an appropriate SHE policy for construction works 	Contractor		No additional cost
	<ul style="list-style-type: none"> ▪ Provisions must be put in place for the formation of a Health and Safety Committee, in which the employer and the workers are represented 	Contractor		No additional cost

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Objective/Plan	Recommended Mitigation Measures	Responsible Party*	Monitoring Mechanism	Approximate Cost (Kshs)
	<ul style="list-style-type: none"> ▪ Ensure that equipment and work tasks are adapted to fit workers and their ability including protection against mental strain 	Contractor		No additional cost
	<ul style="list-style-type: none"> ▪ All machines and other moving parts of equipment must be enclosed or guarded to protect all workers from injury 	Contractor		No additional cost
	<ul style="list-style-type: none"> ▪ Arrangements must be in place to train and supervise inexperienced workers regarding construction machinery use and other procedures/operations 	Contractor		5,000 per training
	<ul style="list-style-type: none"> ▪ Equipment such as fire extinguishers must be examined by a government authorized person. The equipment may only be used if a certificate of examination has been issued 	Contractor		30,000
	<ul style="list-style-type: none"> ▪ Reports of such examinations must be presented in prescribed forms, signed by the examiner and attached to the general register 	Contractor		No additional cost
	<ul style="list-style-type: none"> ▪ Ensure that materials (cement bags, aggregates, bitumen drums) are stored or stacked in such manner as to ensure their stability and prevent any fall or collapse 	Contractor		No additional cost
	<ul style="list-style-type: none"> ▪ Ensure that materials (cement bags, aggregates, bitumen drums) are stored or stacked in such manner as to ensure their stability and prevent any fall or collapse 	Contractor		No additional cost
	<ul style="list-style-type: none"> ▪ Conduct sensitization campaign for the public on risks related to construction sites. 	Contractor		30,000
6) Minimization of run-off and soil erosion	<ul style="list-style-type: none"> ▪ 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. drainage structures, silt traps, barriers, tree planting. 	Contractor	Inspections to ensure no soil erosion	50,000

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Objective/Plan	Recommended Mitigation Measures	Responsible Party*	Monitoring Mechanism	Approximate Cost (Kshs)
	<ul style="list-style-type: none"> ▪ Ensure that construction vehicles are restricted to existing graded roads to avoid soil compaction within the project site. 	Contractor		No additional cost
	<ul style="list-style-type: none"> ▪ Ensure that any compacted areas are ripped to reduce run-off 	Contractor		No additional cost
7) Minimization of construction wastes	<ul style="list-style-type: none"> ▪ Ensure that construction materials left over at the end of construction will be used in other projects rather than being disposed of. 	Contractor	Amount of wastes	No additional cost
	<ul style="list-style-type: none"> ▪ Ensure that damaged or wasted construction materials will be recovered for refurbishing and use in other projects 	Contractor		No additional cost
	<ul style="list-style-type: none"> ▪ Utilize opportunities for donating recyclable/reusable or residual materials to local community groups, institutions and individual local residents or home owners. 	Contractor		No additional cost
	<ul style="list-style-type: none"> ▪ 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 	Contractor		No additional cost
	<ul style="list-style-type: none"> ▪ Provide facilities for proper handling and storage of construction materials to reduce the amount of waste caused by damage or exposure to the elements ▪ 	Contractor		20,000
	<ul style="list-style-type: none"> ▪ Purchase of perishable construction materials such as paints should be done incrementally to ensure reduced spoilage of unused materials 	Contractor		No additional cost
	<ul style="list-style-type: none"> ▪ Use construction materials that have minimal or no packaging to avoid the generation of excessive packaging waste 	Contractor		No additional cost

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Objective/Plan	Recommended Mitigation Measures	Responsible Party*	Monitoring Mechanism	Approximate Cost (Kshs)
	<ul style="list-style-type: none"> ▪ Reuse packaging materials such as cartons, cement bags, empty metal and plastic containers to reduce waste at the site 	Contractor		No additional cost
	<ul style="list-style-type: none"> ▪ Dispose waste more responsibly by dumping at designated dumping sites or engaging the use of a registered waste disposal company or Kajiado County Government 	Contractor & Kajiado County		10,000/month
8) Reduction of energy consumption	<ul style="list-style-type: none"> ▪ Ensure planning of transportation of materials to ensure that fossil fuels (diesel, petrol) are not consumed in excessive amounts 	Contractor	Throughout construction period	No additional cost
9) Minimization of water use	<ul style="list-style-type: none"> ▪ Ensure that water is used efficiently at the site 	Contractor	Continuous	No additional cost
10) Traffic Management	<ul style="list-style-type: none"> ▪ Use traffic flagmen 	Contractor	Number of traffic incidents / accidents	No additional cost
	<ul style="list-style-type: none"> ▪ Adequate warning signs 			
	<ul style="list-style-type: none"> ▪ Use of bumps 			
11) Convenience to residents	<ul style="list-style-type: none"> ▪ Good working relationship between contractor and surrounding community 	Contractor	Number of complaints	No additional cost
	<ul style="list-style-type: none"> ▪ Proper barricading 			
	<ul style="list-style-type: none"> ▪ Provide walkways and diversions 			
12) Community Health and Safety From Deep Excavations	<ul style="list-style-type: none"> ▪ Construction in manageable sections for no hazardous deep excavations that pose as fall hazards 	Contractor	Number of incident / accidents	No additional cost
	<ul style="list-style-type: none"> ▪ Adequate barricading 			
	<ul style="list-style-type: none"> ▪ Use of warning signs 			

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Objective/Plan	Recommended Mitigation Measures	Responsible Party*	Monitoring Mechanism	Approximate Cost (Kshs)
13) HIV-AIDS Management	<ul style="list-style-type: none"> ▪ HIV-AIDS awareness methods used in campaign to increase understanding about the disease; ▪ Raising awareness about HIV/AIDS; ▪ Promote the benefits of abstinence / avoidance; ▪ Distribute condoms to construction workers; ▪ Encourage workers to go for HIV voluntary counseling, testing and referral services; ▪ Monitoring of outcomes, in collaboration with National HIV/AIDS Authorities. 	Contractor	Number of incidences	Kshs. 1,755,000
14) Gender mainstreaming	<ul style="list-style-type: none"> ▪ Consider both men and women for the works 	Contractor	Proportion of men and women at work – 1/3 gender rule	No additional cost
15) Grievance redress mechanisms	<ul style="list-style-type: none"> ▪ Employ a grievance redress mechanism incorporating a negotiation and/or mediation team or party 	Grievance Chairman / Committee (Stewarded by Resident Engineer)	Number of grievances	Kshs. 100,000

<p>16) Crime Management, Child Protection, Gender Equity and Sexual Harassment</p>	<ul style="list-style-type: none"> ▪ Proper design incorporating lighting to enhance security ▪ Ensure no children are employed on site in accordance with national labor laws ▪ Ensure that any child sexual relations offenses among Contractors’ workers are promptly reported to the police ▪ The client and the Contractor shall adopt a ‘Child Protection Code of Conduct’ which sets stringent standards for personal behavior to avoid child exploitation and abuse. ▪ The Contractor shall require his employees, sub-Contractors, sub-Consultants, and any personnel thereof engaged in construction works to individually sign and comply with this Code of Conduct. ▪ Taking all reasonable precautions to prevent unlawful, riotous or disorderly conduct by or amongst the Contractor’s personnel, and to preserve peace and protection of persons and property on and near the site. ▪ Prohibiting alcohol, drugs, arms, and ammunition on the worksite among personnel. ▪ The Contractor and Supervision Consultant should register in a log all events of a criminal nature that occur at the worksite or are associated with the civil works activities. ▪ Sensitize the construction workers, locals, and security to be on the lookout on suspicious activities near the site ▪ Contractor to prepare and enforce a “No Sexual Harassment Policy” in accordance with national law where applicable ▪ Contractor and implementing agency to prepare and implement a Gender Action plan to include at minimum, in conformance with local laws and customs, equal opportunity employment, gender sensitization 	<p>Contractor</p>	<p>Number of occurrences</p>	<p>300,000</p>
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Objective/Plan	Recommended Mitigation Measures	Responsible Party*	Monitoring Mechanism	Approximate Cost (Kshs)
	<ul style="list-style-type: none"> • Provision of gender disaggregated bathing, changing, sanitation facilities • Liaise with the administration units (County and sub County governments, Police, DO, chiefs, etc.) to provide regular surveillance and patrols to protect workers and shoppers during operation ▪ ▪ The road should hire a security firm to manage security within the park ▪ ▪ ▪ ▪ ▪ 			

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Objective/Plan	Recommended Mitigation Measures	Responsible Party*	Monitoring Mechanism	Approximate Cost (Kshs)
	<ul style="list-style-type: none"> ▪ Contractor and implementing agency to prepare and implement a Gender Action plan to include at minimum, in conformance with local laws and customs, equal opportunity employment, gender sensitization ▪ Provision of gender disaggregated changing and sanitation facilities ▪ Liaise with the administration units (County and sub County governments, Police, DO, chiefs, etc.) to provide regular surveillance and patrols to protect workers and surrounding community during operation 			
17) Labour Influx – Complaints and Grievances / Social Conflict	<ul style="list-style-type: none"> ▪ Provide grievance redress mechanism for the public and workers; ▪ Advise the public and workers on where to report grievances; ▪ Consider prioritizing the local manpower for both skilled and unskilled labour. ▪ Implement proposed grievance resolution mechanism 	Contractor	Number of complaints	100,000
TOTAL ESMMP BUDGET				Kshs. 2,970,000

Responsible Party*

Of importance, NaMSIP Safeguards team of Environmental and Social Experts will monitor this project to ensure compliance to safeguards ESHS and Code of Conduct requirements as per this ESMMP and as per the CESMP as submitted and agreed with the Contractor

This ESMMP cost will be allowed in the Bills of Quantities. The key responsibilities regarding compliance to the above ESMMP rest on the Contractor. However, it is important that the project proponent ensures adequate monitoring and evaluation for the Contractor for no non-conformances.

8.3.1 Operational Phase ESMMP

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: ESMMP for the Operational Phase of the Project

Objective/Plan	Recommended Mitigation Measures	Responsible Party	Monitoring Mechanism	Cost (Kshs)
1) Storm Water Run-off Management	▪ Provide proper storm water drainage from the paved roads.	Contractor	Number of blocked drains	Part of project costs
	▪ Provide regular inspection and maintenance of the drains.	County		-
2) Management of Crime	▪ Improved lighting to improve security	Contractor / County	Number of criminal activities	-
3) Management of Accidents	▪ Adequate warning signs and bumps	Contractor / County	Number of accidents	-
4) Solid waste management	▪ Implement measures to ensure adequate solid waste management along the access road including putting wastes receptacles and disposal	County	Inspections to check cleanliness	-
5) HIV-AIDS Management	▪ Awareness creation and sensitization to workers and other persons post- project to reduce or eliminate chances of infections of HIV-AIDS and other sexually transmitted diseases	County	Number of new infections	-

8.3.2 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: ESMMP for the Decommissioning Phase

Environmental Impact	Recommended Mitigation Measures	Responsible Party	Time Frame	Cost (Kshs)
Solid Waste Generation.	<ul style="list-style-type: none"> ▪ All removed materials that will not be used for other purposes must be removed and recycled/reused as far as possible 	Contractor	One-off	-
	<ul style="list-style-type: none"> ▪ 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 dumpsite or arrangements made with Kajiado County 	Contractor	One-off	10,000
	<ul style="list-style-type: none"> ▪ Donate reusable demolition waste to charitable organizations, individuals and institutions 	Contractor	One-off	-
Degeneration of vegetation at the construction site	<ul style="list-style-type: none"> ▪ Implement an appropriate re-vegetation program to restore the site to better status 	Contractor	One-off	-
	<ul style="list-style-type: none"> ▪ Consider use of indigenous plant species in re-vegetation 	Contractor	One-off	-
	<ul style="list-style-type: none"> ▪ Trees should be planted at suitable locations so as to interrupt slight lines (screen planting), 	Contractor	Once-off	-

	between the adjacent commercial premises area and the access road.			
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CHAPTER NINE: AUXILLIARY INFORMATION

9.1 Budget

The summary of the certified Bills of Quantities that form the cost of the project is as attached in the Annexes. The total project cost is **Kshs. 209,489,882/11**.

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 and environmental concerns for urgent mitigation. A documented log should be maintained of all grievances and all accidents and incidents must be reported to the proponent within 24 hours. The officer should also at all times enforce safety and environmental requirements as per the relevant legislation. The contractor must consult the proponent to maintain a clear understanding of all the aspects of the project. Kajiado 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

10.1 Conclusion

During the preparation of this report for the construction of off-station access road to the proposed Kitengela Railway Station, it is observed and established that most of the negative environmental and social impacts on the environment can be mitigated and have potentially short term low significant effects. The positive impacts are highly rated and will benefit all stakeholders and Kitengela residents at large.

Positive impacts associated with the proposed project include;

- Creation of temporary employment opportunities
- Provision of market for supply of construction materials
- Increased business opportunities
- Revenue to national and local governments
- Easier accessibility for rail commuters
- Improved mobility to improve railway transport
- Improved drainage
- Improved convenience and mobility for movement of persons, goods and services in the project area
- Cleaner and orderly environment
- Improved safety and security for all

The key negative impacts that are all mitigatable as explored in this report include the following;

- Sourcing of materials
- Excavations
- Run-off and soil erosion
- Generation of wastes
- Dust generation and exhaust emissions
- Noise and vibrations
- Risk of accidents and injuries
- Energy and water use
- HIV-AIDS risk
- Grievances and complaints from workers and general public
- Crime, child exploitation, gender and sexual harassment issues and
- Labour influx leading to social conflicts issues

10.2 Recommendation

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

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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 2015 and the Environmental Impact Assessment and Audit Regulations, Legal Notice No. 101 of 2003. The World Bank also is to clear the project consistent with the Bank's safeguards requirements.

REFERENCES

Kenya gazette supplement Acts 2000, Environmental Management and Coordination Act Number 8 of 2015. *Government printer, Nairobi*

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

Kenya gazette supplement number 56. Environmental Impact Assessment & Audit Regulations 2003. *Government Printer, Nairobi*

Resettlement Policy Framework

The Environmental Management & Coordination Act 1999 (EMCA 2015).

World Bank Safeguards Documents

- Environmental Assessment (OP 4.01) Safeguard
- Involuntary Resettlement (OP 4.12) Safeguard
- Physical Cultural Resources (OP 4.11) Safeguard

Annexes

- i. Sample Chance Find Procedures
- ii. Consultations and Public Participation
 - a. Minutes of Stakeholder Meeting
 - b. Signed-in Attendance Sheets
- iii. Grievance Redress Mechanisms Documents
- iv. Summarized Bills of Quantities
- v. Plate of Photographs
- vi. (Design) Drawings

Sample Chance Find Procedures

Chance find procedures are an integral part of the project ESMMP 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.

Consultations and Public Participation

PROPOSED CONSTRUCTION OF KITENGELA ACCESS ROAD
MINUTES OF MEETING HELD ON 18TH OCTOBER, 2017 WITH STAKEHOLDERS
ON ESIA AT THE SITE AT 12.30 PM

In Attendance

- | | |
|---------------------------------|---------------------------------|
| 1. Hon. Paul Matuya | MCA Kitengela Ward |
| 2. Hon. Francis Kaesha | MCA Oloosirkon/ Sholinke Ward |
| 3. Eng. Stephen Mwaura | NaMSIP |
| 4. Eng. Malika Badiribu Wachira | PIT, Kajiado County |
| 5. Purity Wanjiku | Kajiado County |
| 6. Michael Shukare | Kajiado County |
| 7. Francis Pere | Ward Admin, Kitengela |
| 8. Washington Sekut | Ward Admin, Oloosirkon/Sholinke |

Stakeholders in Attendance

As per the attached attendance list.

Agenda

1. Introduction
2. Project Briefing
3. Plenary
4. A.O.B

Minute No.	Details	Response/ Action
1.00	<p><u>Introduction</u></p> <p>The area MCA Hon. Paul Matuya welcomed all stakeholders present to the meeting.</p> <p>The meeting started with a word of prayer from Ms. Purity Wanjiku from Kajiado County.</p> <p>Eng. Malika thanked all the stakeholders for turning up for the meeting and keeping time</p>	
2.0	<p><u>Project Briefing</u></p>	
2.01	<p>Eng. Malika expressed her gratitude to all those who attended the meeting. She said that the access road starts from Junction Namanga Road to the Railway line, which is 2.1Km in length.</p>	
2.02	<p>Eng. Stephen Mwaura from NaMSIP told members that NaMSIP is a World Bank sponsored program that covers 5 counties that border the Nairobi Metro region. These are Kiambu, Machakos, Murang'a, Kajiado and Nairobi City Counties. It was reported that the access road</p>	

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	<p>would be constructed and upgraded to bitumen standards.</p> <p>Eng. Stephen Mwaura from NaMSIP added that, as a World Bank requirement, it is important to carry out ESIA (Environmental and Social Impacts Assessment) for any project before its commencement. This is to ensure that all stakeholders that are directly and indirectly affected by the project are safe of any environmental hazards that they feel the project could bring about. He also noted that the Kenyan Constitution 2010 greatly emphasizes on Public Participation. He added that each person's views will be captured and all questions pertaining to the project shall be answered accordingly. He continued saying that he had a set of questionnaires which, through his guidance be filled by each person in attendance and the report shall be submitted to National Environmental Management Authority (NEMA) for approval and subsequent issuance of certificate.</p>	
3.0	<u>Plenary</u>	
3.01	Mr. Danson Mwangi requested that once the road is complete speed bumps should be constructed along the road.	Eng. Malika said that that was well noted.
3.02	Mr. Calvin Otieno asked whether the youth shall be given employment once the project commences.	<p>Eng. Mwaura assured them that the contractor is usually advised to recruit casual labor from the local community so that they can directly benefit from the project.</p> <p>Hon. Matuya added that a project management team shall be set up headed by himself.</p>
3.03	Mr. Alex Kimani asked when the project was likely to start and end.	Eng Mwaura told the stakeholders that the project is still under procurement process so it is expected that it will start earliest January 2017 and it will take a

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		period of 6 months to be completed.
4.0	<p><u>A.O.B</u></p> <p>There being no other business, all stakeholders were given copies of questionnaires and with assistance of Eng. Mwaura they filled and handed them back to him.</p> <p>The meeting ended at 11.00am</p>	Francis Pere

Signed:

Secretary.....

Date.....

Chairman.....

Date.....








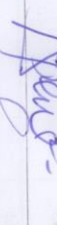
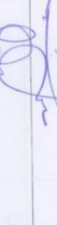

Attendance Sheets

**Attendance List for Public Participation & Consultation Meeting in
Kitengela for the Proposed Rehabilitation and Improvement of
Kitengela Off-Station Access Roads in Kajiado County**

Date: Wednesday October 18, 2017

Venue: Old Stage Opposite Kobil

Time: 10am

#	Name of Participant	Organization	Signature
1	Eng. Stephen Mwaura	NAMSIP	
2	George RSTIA	Dalweraa Group Kajiado	
3	Langston SAMILA	KITE MUSLIMS	
4	DAVIDSON MURRAY	KITE BUSINESSMEN	
5	JAMES Sabetia	BUSINESSMEN	
6	Moses M. Karaiwe	Asst-chief	
7	David Mwangi Mwangi	Boda Boda	
8	Francis Ruse	Ward Admin	
9	Julius Wanjiku	Kite Res Valley	
10	John Otiens	Res Valley (elder)	

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11	Michael Shukwa	KC County Eng	Jukas
12	Purity Rinz Kiding'ika	Kajiado	Kajiado
13	Salimath Othman	Kajiado	Kajiado
14	ALEX MIBOGA	KAJIADO	Kajiado
15	Gooding	Kite	Kite
16			
17			
28			
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26	FRANCES MUYOKA	Deliverance church Kitengela	
27	Alfred K. Angulu	Deliverance church ^{near} Kitengela	
28	Jubus LEI	Deliverance Church	
29	Evans change	Residence	
30	Washington Seled	W/Admin	
31	John KAMAU	Deliverance RA	
32	MCA PAUL MATUTHIA	KITENGELA	
33	KELVIN ATIANXI	KITENGELA	
34	WETUNBU KOINANGRE	KITENGELA	
35	Joseph MESHIMI	KITENGELA	
36	PAUL NIWANGI	KITENGELA	
37	ROBERT N'YAZINDI	KITENGELA	
38	DEHS M. OHSONGO	KITENGELA	
39	JONATHAN KUBAI	KITENGELA	
40	Maitika Wachira	Kajiado County	

Grievance Resolution Mechanism

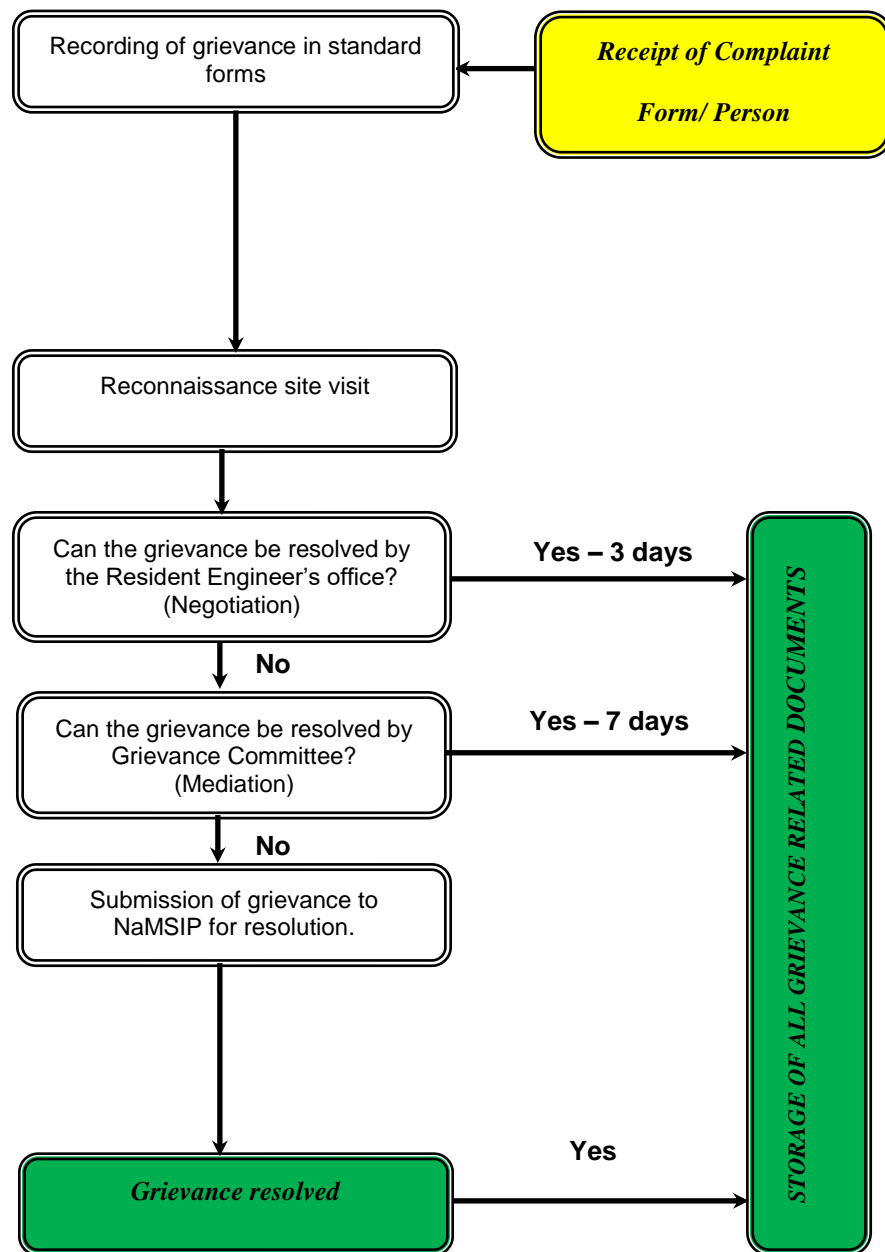
1. Steps in dealing with grievances

- 1.1. Complaint received in writing from affected person
- 1.2. Recording of grievance in standard form
- 1.3. Reconnaissance site visit with the complainant.
- 1.4. Submission of detailed complaint to Resident Engineer for resolution by negotiation.
- 1.5. Submission of detailed complaint to the Grievance Committee for resolution by mediation.
- 1.6. Submission of complaint to NaMSIP for resolution.

2. Composition of grievance committee

	Name	Designation	Organization	Position
1		Resident Engineer	Nairobi City County	Committee Secretary
2		County Ward Administrator	Kajiado County	Committee Assistant Secretary
3		Site Administrator / Agent	Contractor	Member
4		Commercial Businesses / Boda-boda Representative		Member
5		Community Representative	Area Chief	Member

Grievance Resolution Procedure



NB:

- All complaints should be received in the standard form to authenticate them
- All resolved grievances need to be stored in the form of a retrievable grievance log
- All complaints need to be resolved within 7 days from receipt of complaint.
- All relevant persons need to be made aware of the existence and utility of this grievance redress mechanism.

Summarized Bills of Quantities - Estimate

SUMMARY BILLS OF QUANTITIES - KITENGELA RAILWAY STATION ACCESS ROAD		
BILL No.	DESCRIPTION	AMOUNT KSHS
1	Preliminary and General Items	12,280,000.00
4	Site Clearance and top Soil Stripping	395,220.00
5	Earthworks	31,443,532.50
7	Excavation and Filling for Structures	4,229,150.00
8	Culverts and Drainage works	27,979,188.00
9	Passage of Traffic	500,000.00
12	Natural material base and sub base	15,974,525.70
14	Cement Stabilizer	5,775,020.01
15	Bituminous Surface Treatment	4,131,111.60
16	Bituminous Mixes	33,187,583.25
17	Concrete Works	9,223,712.05
20	Road Furniture	9,223,712.05
21	Miscellaneous Bridge works	3,067,000.00
22	Day Works	502,500.00
24	Street Lighting	8,327,838.75
25	HIWAIDS Awareness	1,755,000.00
I	Sub-Total 1	167,995,093.91
II	Add 7.5% of Sub-Total 1 of Bills as Provisional sum for Contingencies to be expended in whole or	12,599,632.04
III	Sub-Total 2	180,594,725.96
IV	Add 16% of Sub-Total 2 for Value Added Tax	28,895,156.15
	BID PRICE CARRIED FORWARD TO FORM OF BID	209,489,882.11

Plate of Site Photographs



Part of the access road to the railway station that will be upgraded



Culvert bridge to be replaced/constructed anew

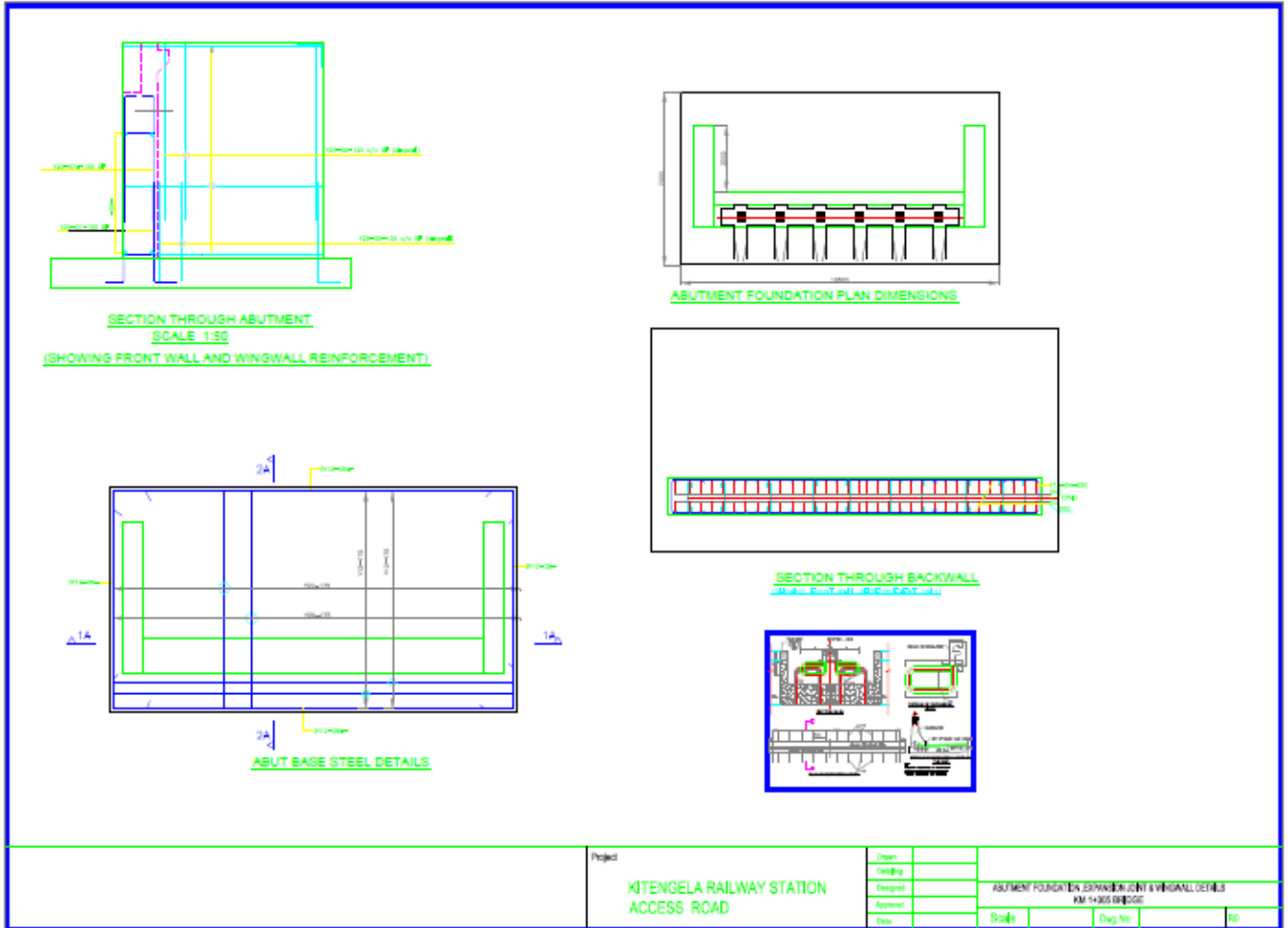


Approach from access road to railway line and proposed location of railway station to be built



Academy along access road – a sensitive receptor

Drawing No. 1 – Bridge Details



Drawing No. 2 – Access Road Profile Details

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