ENVIRONMENTAL IMPACT ASSESSMENT STUDY REPORT

FOR

THE PROPOSED COMMERCIAL HOTEL ON LAND REFERENCE NUMBER MACHAKOS MUNICIPALITY BLOCK 11/521 NEXT TO GARDEN HOTEL, MACHAKOS CENTRAL SUB COUNTY, MACHAKOS TOWN

PROPONENT

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CERTIFICATION

This environmental impact assessment study report for **Maanzoni Capitol Hotel Limited** was conducted and prepared by Nduhiu Nyoike who is a registered expert by NEMA. The registration details are as follows

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NDUHIU NYOIKE SIGNATURE …….. DATE ……October /2019	LEAD EXPERT	5006

PROPONENT

MAANZONI CAPITOL HOTEL LIMITED EVELYNE MWINZI – PA CHAIRMAN SIGNATURE ……. DATE ……October /2019 RUBBER STAMP

EXECUTIVE SUMMARY

This EIA Study Report is for a proposed commercial hotel in the town of Machakos. The hotel will comprise of the following major salient features: 300 guest rooms, parking for at least 125 vehicles, gate house and perimeter fence, swimming pool., several meeting rooms totaling to 1500 square metres, laundry & housekeeping area, bar & restaurant area, offices for the hotel, electrical & mechanical areas, kitchen, food preparation areas & stores, employees facilities and gardens and recreation area for large events.

Maanzoni Capitol Hotel Limited is the proponent of the proposed project.

This study report was cognizant that Environmental Impact Assessment (EIA) is a systematic process of identifying, predicting and evaluating the environmental effects of proposed actions and projects. It also noted that special emphasis in EIA is given to the practice of preventing, mitigating and offsetting adverse effects of proposed undertakings. Therefore, the purpose of environmental impact assessment is to provide information for decision-making on the environmental consequences of proposed actions; to promote environmentally sound, sustainable development and mitigation measures.

However, the immediate objectives of EIA is to improve the environmental design of the proposed proposal; to ensure that resources are used appropriately and efficiently; to identify appropriate measures for mitigating the potential impacts of the proposal; to facilitate informed decision making including setting the environmental terms and conditions for implementing the proposal.

The proponent engaged a team of experts in order to articulate and prepare the project to its completion. Construction & Project Management Consultants Ltd are the project manager, Inkubate Ltd are the hotel consultants, Design Life Ltd are the project architects, Fanisi Consultants are the quantity surveyors, Metrix Integrated Consultancy are the civil & structural engineer, Gill Consult is the mechanical and electrical engineers, Mercy Omondi is the social expert and Nduhiu Nyoike is the NEMA Lead expert.

This study report has followed the guidelines contained in the approved Terms of Reference and covers but is not limited to the following considerations:

1. A detailed description of the proposed project and location.
2. A detailed description of the project site and surrounding area.
3. A general description and explanation of the process to be used in implementing the proposed project in its diverse phases.
4. The objectives of the project.
5. The design of the project.
6. The materials to be used in the construction and implementation of the project.
7. The products, by-products and waste generated project.
8. Predicted and anticipated environmental impacts and the proposed mitigation measures for the negative impacts.
9. Project alternatives.
10. Environmental Management Plan for the construction, operation, decommission phases together with the legal framework.
11. An action plan for the prevention and management of foreseeable accidents and hazardous activities.
12. A safety and Health plan for employees and general public.
13. An economic and social analysis of the project.
14. The project cost.

The scope of the study report covers the following expected works to be undertaken in the implementation of the projects.

Construction of the Substructure

The structure shall comprise of a basement floor constructed in reinforced concrete raft foundation, floor slabs, retaining walls, columns, beams, ramps and floor slabs. Penetron cementitious based capillary waterproofing is provided at the bottom of the raft and to the sides of retaining walls and secured with masonry skin wall. Utility spaces in the basements are fitted with metal louvred doors and finished with plaster and paint to walls and ceilings. Ramps are finished with non-slip ribbed concrete.

Back of house area to be finished in ceramic floor tiles and plastered and painted ceiling; Guest Rooms, Common Areas and Meeting Rooms will have suspended ceilings

Construction of the Superstructure

The superstructure comprises of reinforced concrete beams, columns, walls and floor slabs in a framed building structure. Masonry stone walls form external infills. Internally masonry stone walls are used in permanent partitions.

Construction of the Roofing works

The roof is made of stone coated aluminium tiles with shingle profile on timber trusses at the topmost floor. The flat roof covering is finished in penetron water-proofing and covered with mazeras stone paving.

Construction works of Openings

The opening shall mainly comprise of frameless glass doors, powder coated aluminium doors, and solid core flush doors with frame, ironmongery and painting. Windows will be powder coated aluminium with coloured sheet glass.

Works involving finishes

Externally the walls will be plastered and painted with 'ruff n tuff' weather-resistant paint. Internally the walls will be plastered and painted. Ceramic tiles will be provided to floors and walls in wet areas. Floors are to be finished in cement and sand screed in offices; and marble, porcelain tiles and ceramic tiles in other areas. Ceilings are finished in gypsum board in lift and entrance lobbies, kitchen and toilets and plaster and paint to offices and parking areas.

Works involving fittings

Joinery fittings comprise pelmet boxes, window boards, cupboards, duct doors and storage shelving, mainly in MDF boarding.

In preparing this report, the following legal framework was considered and perused:

1. The Building Code – The Local Government (Adoptive By-laws) (Buildings) Order 1968 and The local Government (Adoptive By-Laws) (Grade II Building) Order 1968
2. The Constitution of Kenya.
3. The County Governments Act No. 17 of 2012
4. The Persons with Disability Act
5. The Machakos Persons with Disability Act
6. The Employment Act 2007
7. The Environment and Land Court Act, 2011 29
8. The Environmental Management and Co-ordination (Amended) Act of 2015
9. The Water Quality Regulations, 2006 - Legal Notice No. 120

10. The Waste Management Regulations, 2006
11. The Environmental (Impact, Assessment and Audit) Regulation, 2009
12. The Noise And Excessive Vibration Pollution) (Control) Regulations, 2009
13. Legal Notice 31 - EMCA - Amendment to the Second Schedule
14. The Factories Act Cap 514
15. The Food, Drugs and Chemical Substances Act Chapter 254
16. The Hotels and Restaurants Act Chapter 494
17. The Land Registration Act, 2012
18. The National Construction Authority Act NO. 41 OF 2011
19. The National Construction Authority Regulations, 2014
20. The Occupational Health and Safety Act 2007
21. The Physical Planning Act Chapter 286 of 1996
22. The Public Health Act Chapter 242 4.17
23. The Public Roads And Roads Of Access Act Chapter 399
24. The Tourism Act, 2011 - No. 28 of 2011
25. Workmen's Compensation (Compulsory Insurance) Order No. 13 OF 2007

The study report was able to extract the following as the expected positive impacts of the proposed project:

IMPACTS	**DESCRIPTION OF IMPACTS**
Employment opportunities.	The proposed project is expected to provide employment opportunities for both skilled and unskilled personnel, in all its three project phases.
Improved business opportunities.	The proposed project will open up a lot of business opportunities to Kenyans from all the major sectors of the economy: industries (supply of construction materials), energy (supply of fuel and electricity), tourism and agriculture (bed occupancy and food ingredients supplies to the hotel) among others
A new hotel.	The proposed project will usher in a new hotel in the area which will greatly boost the hotel industry in the area.
Improved land use.	The proposed project will change the land use of the proposed site from being idle to being income generating.
Improved revenue to government.	The proposed project will attract revenue to the county and central government through the payment of various levies, taxes and rates.

The study report was also able to inform the proponent and NEMA on the expected negative impacts and their proposed mitigation measures which include the following:

IMPACTS	**MITIGATION MEASURES**
Loss of trees and vegetation.	Demarcation of project site and contractor's site yard. Restrict movement of vehicles to the project site and not beyond. Adherence to work programme.

Noise management.	Apply of a Noise license. Restrict construction activities to the hours of 8.00 to 5.00 pm. No supplies at night. No hooting and gunning of engines. Service programme for equipment and machinery. Switch off engines on site when not in use. Encourage the use of PPE for ear protection.
Dust control procedures.	The contractor will develop a standard approach to handling all air emission throughout all the different activities in the site. Follow work programme to the letter. Ensure the construction site is watered when necessary. Ensure all supply trucks carry loose materials are covered. Encourage the use of electrical equipment and machinery instead of diesel powered engines. Buckets being carried by crane and machine hoist should be enclosed to avoid spill over. Ensure hoarding of 2.4 metres is erected around the site boundary. All workers in areas where air pollution is expected to have adequate dust and other PPE.
Exhaust fumes control measures	Ensure all diesel powered machinery and equipment together with supply trucks to have their engines switch off when not in use. Discourage gunning of engines on site. Encourage engine service and maintenance to the manufactures specification.
Construction material control, ordering and recycling.	The ordering of the construction material to be timed to the work programme to avoid having idle material on site. The contractor is encouraged to purchase high value and high quality construction material which will be able to last long and avoid wastages. To encourage recycling of construction materials to avoid wastages. To encourage the refurbishing of damaged construction materials including doors for sale or use in other construction sites. Ensure adequate toilet facilities on site. Transport waste materials to NEMA certified dumpsites using NEMA certified transporters.
Controlling soil erosion, water runoff and preserving flora.	In order to reduce run-off velocity – terracing and leveling of the compact areas on site. Dig trenches and cut off drains to channel the runoff to the drainages. Begin with one construction sector at a time and complete before moving to the next site. Restrict movement of vehicles and trucks to existing roads and not to compact areas that are not due for construction.
Conservation of water.	Purchase holding tanks for construction works. Contractor to purchase a 5,000.00 litre tank for fresh drinking water. Signage for water sensitization. Install water-conserving automatic taps and toilets. All workers and guests shall be sentised on how to use water efficiently. Have the water from the borehole tested.

Security issues and control measures.	The contractor to cordon off the construction place and to have one gate for access. The contractor shall have a register of all construction workers on site and shall ensure only those on the register are allowed on site. The contractor shall capture the details of all visitors and supply trucks into the site. The contractor shall hire security guards to ensure no unauthorized people are in the site 24 hrs. a day. Contractor to employ personnel with good conduct certificates.
Safety designs in Drawings.	Design of steps, stairs, passages and gangways to be of good quality, have the necessary dimension and to be properly constructed. Each floor to have a safe means of access through staircase and lifts.
Safety, health and occupational concerns.	Implement the relevant sections of the OSHA. Employ a Safety and Health Officer on site. All workplace procedures and activities that pose a risk to workers during construction should have adequate warning signs. Contractor to set aside a place for storing home clothes and personal effects. Ensure personal protective equipment for all construction workers. Ensure all new workers are trained on work procedures and are under a supervisor at all times.
Occupational Safety and Health Act.	Contractor will register the site as a workplace. Proponent and Contractor will maintain a general register where all matters pertaining to OSHA will be stored.
First Aid concerns.	Ensure adequate provision of first aid boxes at the construction site and ensure they are properly labelled "First Aid'. Ensure an adequate number of persons are trained in first aid procedures.
Fire Fighting procedures and requirements.	Ensure the construction site has adequate fire fighting equipment. Ensure fire fighting equipment is serviced every six months and certificate is issued. Regularly inspect workplace for potential fire risks and recommend remedial measures. Ensure a sufficient number of people are trained in fire fighting procedures. Identify fire assembly points and have signage showing directions thereto.
Service of equipment, machines and vehicles.	Ensure all machines, equipment, vehicles, trucks and cranes are serviced as per manufacturer's specification. The weighbridge station to be serviced once a year and certificate to be issued. Hoists and lifts to be kept in good mechanical condition and to obtain a certificate of compliance every six months. Cranes are too be kept in good mechanical condition and the proponent/contractor to obtain a certificate of compliance every 14 months.
Choking of water bodies.	Engage WRMA to undertake pegging for the two water bodies.
Traffic management	Have proper signage showing directions and speed limits. Ensure supply trucks bring materials during the day and preferably at

	off peak time. Traffic marshal to monitor the traffic and to assist where needs be.
Minimized Energy consumption	Staff shall be sensitized to switch off machinery, equipment and lights when not being used. Install energy saving bulbs and fluorescent lights.
HOTEL OPERATIONS	
Ensuring efficient solid waste management	All persons in the hotel will be sentised on solid wastes disposal procedures through the use of sign boards and information notices posted within the hotel. Separation or sorting of wastes shall be undertaken at source through the provision of multiple skips and bins. This shall be placed in all offices and rooms in each floor. Kitchen foods wastes shall be separated from other wastes and shall be used as animal feeds. All department of the hotel will have a daily cleaning routine with some department such as the bar and restaurants being swept and mopped more than once a day Cleaning crew will direct the wastes to the holding bay where a further sorting and segregation will take place. Plastic bottles will be collected separately and sold to waste collectors as an income generating project. The county government of Machakos will organize collection of garbage at least twice a week.
Managing storm water drainage	The proponent will ensure the design of the building will capture all the storm water and direct the same to the River Iine. The proponent will ensure that gulley traps are laid to capture the large particles so as not to pollute the river.
Liquid waste generation	All the effluent and waste water will be directed through piping to the county government public sewer. The maintenance crew will ensure that the piping is in good condition and will repair immediately a breakage occurs.
Reducing air emission	Ensure the kitchen hood and the fans in the laundry are serviced and in working condition.
Safety and Health concerns	Register the Hotel as a Workplace under OSHA. The hotel management will constitute a safety and health committee and will empower the committee to undertake its mandate. The hotel management will provide personal protective equipment to all its workers. The hotel management will ensure the industrial gas cylinder is serviced every 5 years and a certificate to be issued on the same. Provide lockers. Hotel lifts to be kept in good mechanical condition and to obtain a certificate of compliance every six months.
Reducing the risk of fire outbreak.	Identifying and training a fire fighting team of at least five persons and ensure equal distribution in all department and all shifts. Ensuring that the hotel has adequate and appropriate firefighting equipment together with ensuring the regular service of the same.

	Ensuring that fire drills are undertaken once a year and identifying a fire assembly point Ensuring that all fire accidents are properly investigated and recommend corrective measures are undertaken. Develop and implement a fire fighting response and evacuation procedures.
Intervention measures for injuries and accidents	Ensuring an adequate supply of fully stocked First Aid Boxes in every department which is easily assessable. Ensuring the First Aid Boxes are properly labelled "First Aid' Ensuring the identification and training of first aid team according to department and to shifts at the hotel.
Security concerns and control measures.	The management to ensure that all its vehicles and trucks are locked when in parking. The management to have signage encouraging all owners of vehicles to lock their cars when in parking The management to have security guards patrolling the premises and on the lookout for security concerns. The management to capture details of guests at the reception. Guest arriving by car to be checked at the gate for terrorism explosives and details of the car to be captured. On entering the hotel, all people are to go through frisking by security guards. The hotel to install CCTV camera and to have the information backed up off site. The security team to undergo security training at least once a year from a qualified security expert. At the gate house and reception, contacts of the OCS, Fire department and ambulance to be displayed so that a quick respond can done by those on the ground. Install a siren for alerting the general public on security emergency.

Recommendation

The proponent has followed the correct procedure in regard to this project;

1. Sourced and purchased the property in CBD of Machakos Town and processed the title in the company name.
2. Engaged project consultants who have designed a hotel and have processed the approval with the county government.
3. Engaged a NEMA Lead Expert who has prepared an EIA project report.

The proponent is also aware that the project will generate negative environmental impacts and owners of the company are ready to implement the recommendations contained in the EMP to the letter.

We therefore recommend the project for **licensing s**ubject to the adherence to the EMP.

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ABBREVIATIONS AND MEANINGS

CCTV	Closed Circuit Television
EA	Environmental Audit
EIA	Environmental impact assessment
HR	Human resource
Km	Kilometre
K P & L Co Ltd	Kenya Power & Lighting Company Limited
OSHA	Occupation Safety and Health Act
Sm	Square meter

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Figure 4 Globe ATG Spring Valley Church on proposed church

CHAPTER ONE

INTRODUCTION

1.1 Background and rationale for an Environmental Impact Assessment (EIA)

Maanzoni Capitol Hotel Limited intends to construct and run a 3 Star Hotel in the CBD of Machakos Town which is within Machakos County. Specifically, the proposed Hotel will be located off Mwatu Wa Ngoma Street and near the famous Garden Hotel. The proposed development will comprise a hotel with a bed capacity of 300, parking area, swimming facilities and other hotel services. The proposed project will be located on Plot Number Machakos Municipality Block 11/521.

Under the legal framework operating in Kenya, all new projects and undertakings are required to undergo environmental impact assessment studies to ensure the protection and preservation of the environment both for the current generation and the future ones. Section 58(1) of The Environmental Management and Co-ordination (Amended) Act of 2015, requires all new projects to undergo EIA before financing and commencement while section II and III of the Environmental (Impact, Assessment and Audit) Regulations of 2003 also requires environmental impact assessment studies on new projects or undertakings. Once the studies are undertaken, they are to be submitted to NEMA for review, appraisal and licensing.

1.2 Terms of Reference (TOR)

The Terms of Reference (TOR) for conducting this EIA Study are based on the General Guidelines for Conducting EIAs in Kenya as per Environment (Impact Assessment and Audit) Regulations, 2009, which operationalizes The Environmental Management and Coordination (Amended) Act of 2015. The TOR was prepared and approved by NEMA on 12 September 2019 and the expected output of the study will be the EIA Study Report which will contain on the minimum the following information as per the requirement in The Environmental (Impact, Assessment and Audit) Regulations of 2009:

1. A detailed description of the proposed project and location.
2. A detailed description of the project site and surrounding area.
3. A general description and explanation of the process to be used in implementing the proposed project in its diverse phases.
4. The objectives of the project.
5. The design of the project.
6. The materials to be used in the construction and implementation of the project.
7. The products, by-products and waste generated project.
8. Predicted and anticipated environmental impacts and the proposed mitigation measures for the negative impacts.
9. Project alternatives.
10. Environmental Management Plan for the construction, operation, decommission phases together with the legal framework.
11. An action plan for the prevention and management of foreseeable accidents and hazardous activities.
12. A safety and Health plan for employees and general public.
13. An economic and social analysis of the project.
14. The project cost.

1.3 Objectives of the project

The objectives of the project are as follow:

1. To obtain a NEMA License for the proposed project.
2. To obtain the best design of the project.

1.4 Scope of the proposed project

The scope of this EIA Study report will cover the following areas:

1. A description of the project.
2. An adequate description of the baseline conditions of the area
3. A detailed and adequate description of the relevant and significant legal framework which will affect the proposed project.
4. A summary of project alternatives
5. A summary of expected environment impacts and their effects on the environment.
6. A comprehensive EMP to cover all phases of the project together with legal framework.

1.5 Process used in preparing this EIA Study Report

1.5.1 Information gathering procedures

The consultant has undertaken the following procedures and activities:

1. A site visit to determine the status of the land, site characteristic and developments therein.
2. A visit and study of the surrounding area to understand the affected area, provision of public infrastructure, status of public waste disposal systems, existence of rivers and water bodies, provision of water and electricity, roads conditions, other hotels in the area and economic activities in the area.
3. A prediction of anticipated environmental impacts.

1.5.2 Consultative meetings

1. The local administrative chief was consulted and interviewed.
2. Neigbours, government officials in the County offices next to the site, county government officials in the physical planning department, WRMA officials and others stakeholders were invited for a public baraza to get their comments and views.
3. Preparation and distribution of questionnaires during public participation.
4. Consultative meetings with the project consultants in order to describe and understand the project.
5. Interviews of various stakeholders including the proponent.
6. Use of checklists, observations and photography.

1.5.3 Desktop study

This included documentary review on the nature of the proposed activities, project documents, designs policy and legislative frameworks as well as the environmental setting of the area among others.

1.5.4 Reporting

In addition to constantly briefing of the client, this environmental impact assessment study report was prepared and presented for submission to NEMA as required by law.

1.5.5 Format of EIA Study Report

This report has followed the following format:

Chapter one Introduction

Chapter two	Project description and design
Chapter three	Baseline information of the study area
Chapter four	Relevant legislative and regulatory framework
Chapter five	Stakeholder and Public participation
Chapter six	Analysis of project alternatives
Chapter seven	Potential impacts to the environment
Chapter eight	Proposed mitigation measures and monitoring
Chapter nine	Environmental management plan
Chapter ten	Recommendation and Conclusion
	References
	Annexes

CHAPTER TWO

2.0 PROJECT DESCRIPTION AND DESIGN

Maanzoni Capitol Hotel Limited is envisioned to be a 300 Room Three Star Hotel to be located in Machakos County. The facility hopes to offer adequate space and facilities for Meetings, Incentives, Conventions, & Exhibitions (MICE) not only for Machakos County but all the adjacent Counties including Nairobi.

The Facility is designed to be about 15,000 Square Metres that will sit on a 6.5 Acre Site within the City limits of Machakos town. The proposed facility will utilize local materials for construction and is designed to be sustainable in the use of natural light and ventilation for most of the facilities provided. The hotel will also provide adequate parking and use solar for water heating and lighting.

The hotel will also utilize efficient plumbing fixtures and equipment to help manage waste systems while having minimum damage to the environment. The building will take advantage of the existing nice views and has considered the location of the Sun and wind to reduce energy expenses from the use of Heating, Ventilation, & Air Conditioning Equipment.

The hotel design concept will be a traditional classical design with modern interiors. The building will be symmetrical and about eight stories with the design taking advantage of the existing sloping site conditions. This will enable the building to blend within the existing building environment.

The development will provide its own security that is designed to be non-intrusive that is cost efficient. It will also have ICT connectivity encompassed in the design enhancing the connectivity desired by guests and locals. Other facilities provided that will not only benefit the Guests and the locals include Bar, Restaurants, Coffee shops etc.

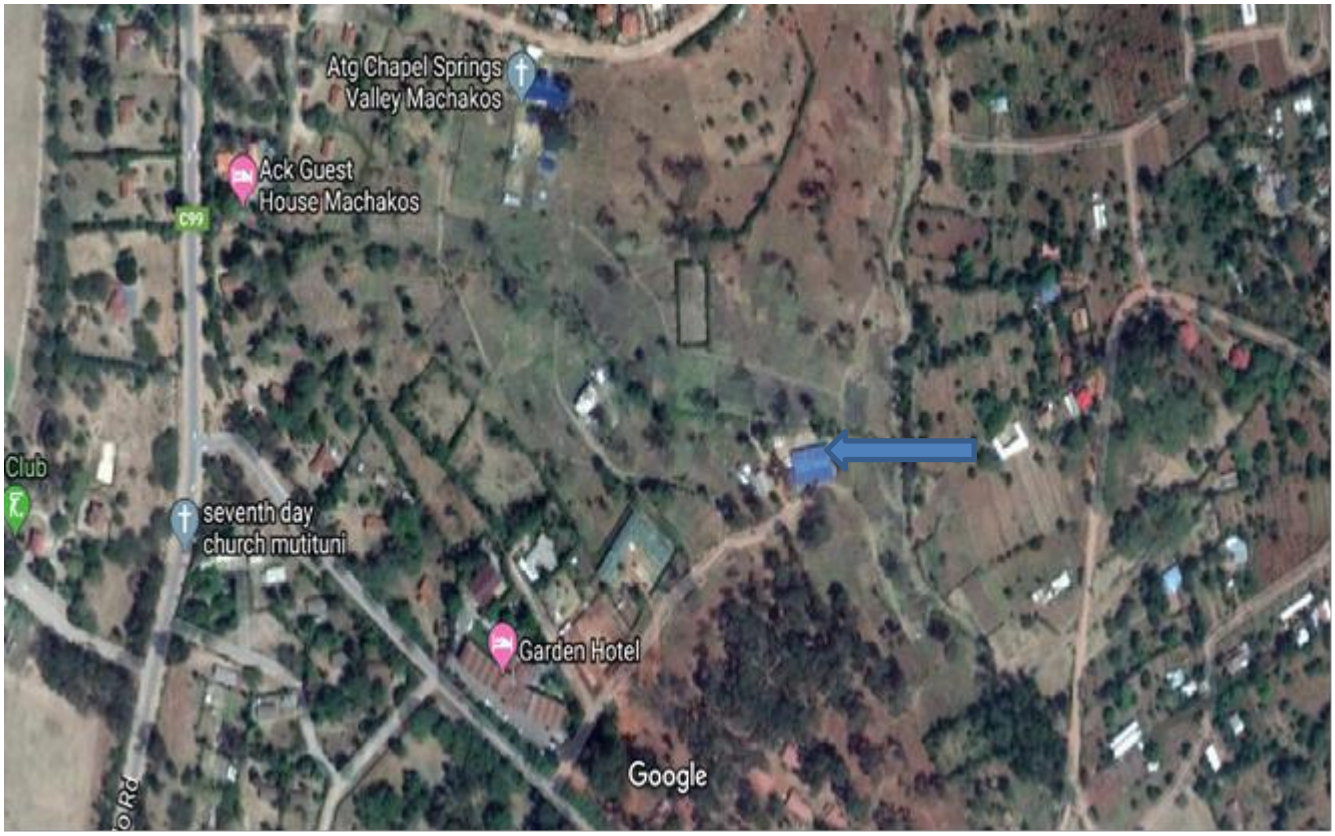
The development shall have the following facilities;

1. 300 Guest Rooms.
2. Parking for at least 125 Vehicles.
3. Gate house.
4. Swimming Pool.
5. Several meeting Rooms totaling to 1500 Square Metres.
6. Laundry & Housekeeping Area.
7. Bar & Restaurant Area.
8. Offices for the Hotel.
9. Electrical & Mechanical Areas.
10. Kitchen, Food Preparation Areas & Stores.
11. Employees Facilities.
12. Gardens and recreation area for large events

2.1 Site location and particulars

The location of the proposed project site is off Mwatu Wa Ngoma Street and next to Garden Hotel (278m) in the North East direction. The plot is 2.607 Ha or 6.44 acres in size and is registered in the name of Maanzoni Lodge Limited which is the parent company of the

proponent. The geographical co-ordinates of the plot are as follows: Latitude 1.511994 and Longitude 37.269661.



Map 1 Proposed location of project site

2.2. Project details

The project will be summarised in three ways: overview, actual hotel plan and the major concern issues.

2.2.1 Overview

Proponent	- Maanzoni Capitol Hotel Limited
Project Description	- Proposed Commercial Hotel
Features of hotel	- 300 Guest Rooms, Offices and Administration, Bar & Restaurant areas, Kitchen and Food Preparations areas, conference and meeting rooms, Laundry & Housekeeping, recreation and swimming pool and parking areas, Electrical and Mechanical Areas
Plot No.	- Machakos Municipality Block 11/521
Plot Size	- 2.607 Ha or 6.44 acres.
Access Road	- Mwatu Wa Ngoma Street
GPS Co – ordinates	- Latitude 1.511994 and Longitude 37.269661.
Neighbours	- Garden Hotel and DC's Office.
Land use	- Cow, sheep shed and Church.
Vegetation on site	- Cypress and other forest trees, shrubs and grass.

2.2.2 Hotel Plan

The following is the description of what will be present in each floor when the building is completed:

Basement level 1&2

This floor contains a separate gents room, housekeeping room with its store, staff uniform store, interview room, staff training room, maintenance room, general storage room, gazebo, gas storage room, laundry area with two rooms, genset room, fire escape & elevator lobby, garbage sorting room, separate toilets for men and women in one unit, separate locker rooms for gents and women, metering room, transformer room, bar area with ladies toilets at the back, a pool area and a second fire escape area with stairs.

Sauna / Steam room

This will contain two units: each unit will have a relaxing room, a sauna and a steam room. One will be for ladies and another for men.

Ground floor

Wing A will have fire escape / staircase, elevator lobby and SVC elev together with unit with separate toilets for men and women.

Wing B will have 4 meeting rooms with a unit for toilets which are separated for men and women. Two rooms which are designated for shops, a large lounge, garage storage room, and two other general rooms.

Lobby area will have three elevators, a raised lounge area with stairs and ducts area.

Main gate together with the pedestrian access is located on the eastern side with its own toilet.

First floor

Wing A will have one large meeting room, one meeting room with a pre-function storage room, two smaller meeting rooms, secretarial office, a banquet room, ballroom with a break-cut area on the outside, a small meeting room and a fire escape / staircase, elevator lobby and SVC elev. The section also has a unit with separate toilets for men and women.

Wing B will have 21 guest rooms each with toilet and shower and a fire escape / staircase.

Lobby area with three elevators and sections which has ducts for electrical and other uses.

Second floor

Wing A will have 20 guest rooms each with toilet and shower and a fire escape / staircase, elevator lobby and SVC elev.

Wing B will have 22 guest rooms each with toilet and shower and a fire escape / staircase; chairman's office, board room and a break-cut area serviced by a unit with toilets.

Lobby area with three elevators and sections which has ducts for electrical and other uses.

Third to fifth Typical floors

Wing A will have 21 guest rooms each with toilet and shower and a fire escape / staircase, elevator lobby and SVC elev.

Wing B will have 22 guest rooms each with toilet and shower and a fire escape / staircase.

Lobby area with three elevators and sections which has ducts for electrical and other uses.

Sixth floor

Wing A will have 17 guest rooms each with toilet and shower and a fire escape / staircase, elevator lobby and SVC elev.

Wing B will have 18 guest rooms each with toilet and shower and a fire escape / staircase.

Lobby area with three elevators and sections which has ducts for electrical and other uses.

Seventh floor

Wing A will have 15 guest rooms each with toilet and shower and a fire escape / staircase, elevator lobby and SVC elev.

Wing B will have 16 guest rooms each with toilet and shower and a fire escape / staircase.

Lobby area with three elevators and sections which has ducts for electrical and other uses.

Eighth floor

Wing A will have 13 guest rooms each with toilet and shower and a fire escape / staircase, elevator lobby and SVC elev.

Wing B will have 14 guest rooms each with toilet and shower and a fire escape / staircase.

Lobby area with three elevators and sections which has ducts for electrical and other uses.

Ninth floor

Wing A will have a fire escape / staircase, elevator lobby and SVC elev as one unit and another unit having a lounge, one bedroom, one bath room and toilet.

Wing B will have a unit with a bedroom, bath room and cloak room and another unit with a fire escape / staircase.

2.2.3 Other major components

1. Construction materials - The proponent intends to use local materials for construction including sanitary ware.
2. Solar Water – the project is design to use solar for water heating and external lighting.
3. The design allows for maximum utilization of sunshine through provision of windows and has considered the location of the Sun and wind to reduce

energy expenses from the use of Heating, Ventilation, & Air Conditioning Equipment.

4. Storm Water drainage – The project site is located at the bottom of a slop and it is expected to receiver a lot of storm water during the rainy season. The project design will enable all storm water drainage to be directed to internal and external drains which will empty into the two streams adjacent to the plot.
5. Water supply – The proponent has drilled a very productive borehole ($20m^3$ per day) which serve the needs of both construction and operations phases of the project. The design includes the use of pumps to ensure the supply of water to all floors and also adequate holding tanks.
6. Security concerns – the design requires the building of a perimeter wall during construction with a gate in order to prevent the public from entering the site.
7. The design also includes the use of security lights both in construction and in operations. The security personnel will be engaged during construction and operation in order to augment the security at the project site. Other measures for capturing details of people and vehicles / trucks coming into and out of the project site will be put in place. The design also includes the use of closed circuit television system.
8. Electrical System - the project site is already connected to Kenya Power & Lighting Company. The transformer will be upgraded to 3 phase and two back-up generators of 600kva to be installed. A fire safety plan to be put in action to ensure safety in the construction and operations phases.
9. Safety and health concerns - the design of the building will include the staircase which will provide an emergency escape route in the event of fire or earthquake. The staircase will be fitted with balustrade and will have strategic signage placed strategically. All major doors will open outwards and other safety measures will include the use of firefighting equipment and procedures during all phases of project cycle. Training of construction crew and hotel staff will be ongoing.
10. Sewerage and waste water disposal – all wastes will be directed to the county government sewer line.
11. Access and parking area – the main access road from Mwatu Wa Ngoma Street to the project site is 278 metres and is not developed. It is an earth road which has been compacted by use of vehicles. This access road to the site will be cleared and constructed to bitumen standards and within the hotel the parking road will be made from cabro blocks. Total parking will be for 125 vehicles. The driveways will be made of concrete screen and will be wide enough for two cars. The driveways will have adequate signage.

2.3 General description of the works

The work comprises a 11-storey hotel and gate house complete with external works including ICT, electrical and mechanical engineering installations. The hotel has two (2) basements, a ground floor, 2 above-ground floors, 4 typical hotel room floors, seventh floor, and eighth floor housing two suites. The building is fully serviced with modern mechanical and electrical engineering services installations.

2.3.1 Substructure

Shall comprise a basement floor constructed in reinforced concrete raft foundation, floor slabs, retaining walls, columns, beams, ramps and floor slabs. Penetron cementitious based capillary waterproofing is provided at the bottom of the raft and to

the sides of retaining walls and secured with masonry skin wall. Utility spaces in the basements are fitted with metal louvred doors and finished with plaster and paint to walls and ceilings. Ramps are finished with non-slip ribbed concrete.

Back of house area to be finished in ceramic floor tiles and and plastered and painted ceiling; Guest Rooms, Common Areas and Meeting Rooms will have suspended ceilings

2.3.2 Superstructure

The superstructure comprises reinforced concrete beams, columns, walls and floor slabs in a framed building structure. Masonry stone walls form external infills. Internally masonry stone walls are used in permanent partitions.

2.3.3 Roofing

The roof is made of stone coated aluminium tiles with shingle profile on timber trusses at the topmost floor. The flat roof covering is finished in penetron water-proofing and covered with mazeras stone paving.

2.3.4 Openings

Shall mainly comprise, frameless glass doors, powder coated aluminium doors, and solid core flush doors with frame, ironmongery and painting. Windows will be powder coated aluminium with coloured sheet glass.

2.3.5 Finishes

Externally the walls will be plastered and painted with 'ruff n tuff' weather-resistant paint. Internally the walls will be plastered and painted. Ceramic tiles will be provided to floors and walls in wet areas. Floors are to be finished in cement and sand screed in offices; and marble, porcelain tiles and ceramic tiles in other areas. Ceilings are finished in gypsum board in lift and entrance lobbies, kitchen and toilets and plaster and paint to offices and parking areas.

2.3.6 Fittings

Joinery fittings comprise pelmet boxes, window boards, cupboards, duct doors and storage shelving, mainly in MDF boarding.

2.3.7 Floor Areas

The approximate total floor area (measured over external walls) is:

1. Basements	
Basement 1	3,131 sm
Basement 2	2,140 sm
2. Lower Floors	
Ground Floor	2,341 sm
First Floor	2,143 sm
Second Floor	2,633 sm
3. Typical Floors 4No. @ 1,692 sm	6,768 sm
4. Penthouse Floors	
Seventh Floor	1,068 sm

Eighth Floor	365 sm
Total Plinth Area	20,589 sm

(Note – Estimates from the Bill of Quantities – working figures for the contractors use)

2.4 Works to be undertaken during construction phase

2.4.1 Site investigations

The consultants will investigate to determine the past land users and their activities on the land in order to uncover all environmental issues which can affect the proposed project and help improve the design of the project. This investigation will cover but not be limited to the following:

The consultants and especially the civil engineer will undertake investigation to determine depth of the base rock where construction will begin.

Also the nature of fauna and flora on site will be determined and an assessment made on what needs to be preserved and what needs to be removed especially the presence of the forest trees on site.

The elevation and contours of the project site and area will need to be investigated to help inform on storm water and sewerage disposal system.

The access road to the project site is not the official road and road survey will need to be undertaken to determine the specification of the road.

The Machakos Water and Sewerage Company Limited has provided the main water distribution line to the site but on the lower side. Investigation on how the water can be utilized will be undertaken.

2.4.2 Site occupation by contractor

The activities will involve the clearing of the site to enable the setting up of the contractor's site office and work area. Other activities will involve the fencing of the project site and construction of gate.

2.4.3 Preparation of project site for construction

Existing trees

The site has numerous fully grown forest trees and the identification by the architect of the trees to be removed shall be made to enable the cutting and uprooting of the trees to pave way for construction works. However, the necessary legal approvals from the relevant authorities must be obtained before cutting down the trees.

The project site houses the ATG Church together with a livestock housing structure which will need to be demolished.

The presence of other vegetation will also be cleared but restricted to the actual construction site as directed by the architect.

The generated solid wastes will need to be properly disposed off.

2.4.4 White ant - Insecticide Treatment

The Contractor must destroy any white ants' nests found within the perimeter of the proposed building site and within a distance of 20 metres externally; take out and

destroy the queen ants, impregnate holes and tunnels with approved insecticide and back-fill with hard material well rammed and consolidated.

2.4.5 Substructure works

Excavation

This refers to the works undertaken to prepare the foundation of the building to be built. The building site will need to be marked and delineated. Then excavations will be undertaken until the ground level is reached. This will involve the removal of top soil, the removal of underlying loose murram and stones until the hard rock surface are reached. The surface will need to be leveled and smoothed to prepare for construction.

This process will involve the use of wedges, tippers, excavators, traxcavator, air compressor and wagon drill and use of human personnel.

Blasting

No blasting will be allowed at the construction site and all rocks requiring blasting shall be broken down using wedges, picks and air compressor drills driven by wagon drill.

Hardcore filling

This will involve the identification of good hard stone, ballast or quarry waste which will be used to back fill the excavation together with compacting and application of a concrete layer on top.

Protection of pipes, cables etc.

A determination of all existing underground cabling and piping from the Post Office, K P & L Co Ltd, Kenya Pipeline Company Ltd, Engineer's Department (Water and Sewers section) and all other public bodies together with companies shall be made before works are undertaken.

2.4.6 Construction of foundations and structural works

This section will involve an array of activities from:

1. The ordering and importation of construction materials to the work area.
2. The marking and laying out of the foundation lines and columns.
3. The concrete and full construction of the foundations, the retaining walls and drainage systems.
4. The concrete mixing, plastering, slab construction, construction of the building, walling and curing of concrete mixes.
5. All manner of general masonry and the usage of tower hoists, pavers and concrete vibrators.
6. All concrete works will be reinforced with steel and the steel works will involve steel cutting, welding and erection on site.
7. Piping for electrical, mechanical and other services will be installed before concreting.

2.4.7 Electrical works

All electrical installation including all electrical gadgets, transformers, generators, meters, electrical cables, lighting apparatus and sockets shall be fitted.

2.4.8 Mechanical works

The plumbing works will include installation pipes for the water supply system and distribution, the piping for sewerage and waste water system and the storm water drainage capturing and disposal system.

2.4.9 Other general works

The other general works will including flooring with tiles and other finishes, plastering, painting and other finishes. Installation of internet, CCTV cabling and other finishes.

2.4.10 Drainage works

1. All drainage works shall be done by a registered plumber and drain layer.
2. The materials which will be used shall include precast concrete pipes, flexible spigots, rubber gaskets, cast iron pipes, precast concreter invert and side blocks together with precast concrete gullies.
3. Trench excavation shall be undertaken to the required depth and the bed shall be refilled and compacted with suitable material.
4. Before laying of pipes, scrutiny will take place to insure quality of pipes and the defects pipes are removed from the site.

2.2.11 Road works

The official access road to the premises is not developed and the following activities are expected to be undertaken by the contractor:

1. Reestablishing the boundaries of the road and marking out the same.
2. The excavation of the top soil shall then take place to the required depth.
3. The excavated soil shall be stored outside the limits of the proposed road.
4. Murram shall be imported to the site and applied to the road together with compacting to for both the sub- base and the base construction.
5. Compaction shall be done with a smooth faced three wheel.
6. After construction of base is completed, bitumen shall be applied to the road.

2.4.12 Landscaping

This will involve the planting of trees, loan grasses and flower gardens in order to improve the visual quality of the site.

2.4.13 Contractor existing site

This will involve the dismantling of all temporary building structures and the removal of all construction materials both used and unused from the site. All excavated materials and other solid wastes will also be cleared from the site. All machinery and equipment will be removed from site.

2.5 Activities to be undertaken during operations phase

2.5.1 Hotel activities

The main business of the hotel is accommodation and the facility will provide 300 guest rooms. Other activities will be running of restaurants and bar to provide both food and drinks to the guests in the hotel. Conference and meeting rooms will also be provided. The hotel will also offer parking space for its clients. Health activities such as swimming will also be provided.

2.5.2 General repairs and maintenance

The building will requires general maintenance including repairs during the activities of the operational phase.

Electrical gadgets and equipment will need to be repaired and maintained on regular basis. The building will require fresh coat of paint every two years and general repairs on building walls and floors will require to be undertaken regularly. The water and sewerage piping system will require periodic inspection and repair. The garden will need planting, weeding and general upkeep.

2.5.3 Housekeeping

Regular cleaning (sweeping, mopping, vacuuming, polishing etc) of the buildings floors, carpets, staircases, pavements and general compound is expected to be carried out during the operational phase of the project.

2.5.4 Staff improvement

The hotel will need to constantly improve its service by taking their staff through continuous trainings.

2.5.5 Procurement

The hotel will be involved in daily purchase of food stuff for its restaurants, drinks to its bar and general supplies for housekeeping and offices.

2.6 Description of the project's decommissioning activities

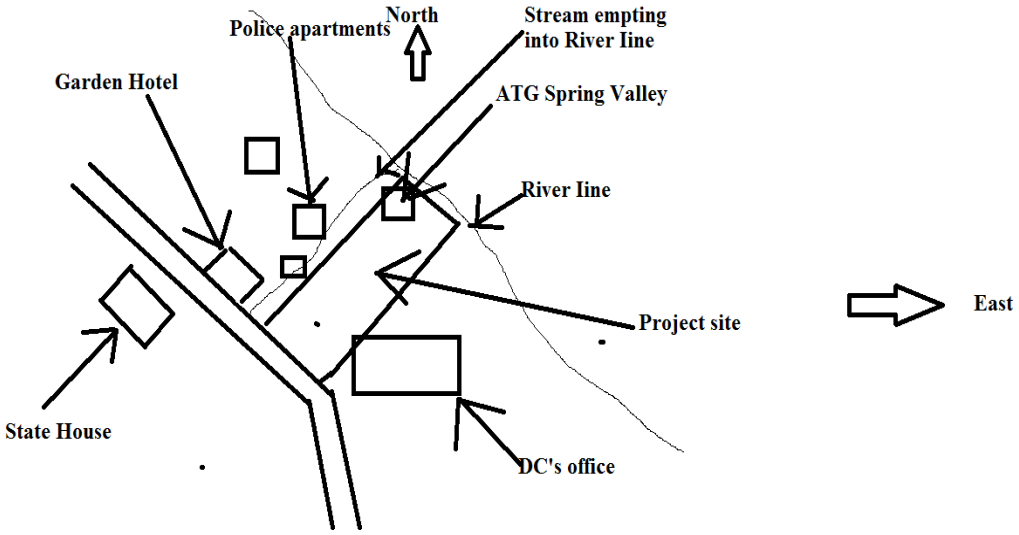
2.6.1 Demolition works

All structures in the proposed site will be demolished and removed from the premise including the perimeter fence, parking areas, drainage system and the building.

2.6.2 Site rehabilitation

All demolitions wastes and materials will be sorted and separated in different categories: degradable from no degradable. Electrical installations, underground piping will be sorted out to usable and non- usable materials. All usable wastes and materials will be moved to different sites while non-usable wastes and materials will be carted away to disposable wastes site.

2.7 Description of the potentially affected environment



Map 2 location of proposed site

The project site is located in the northern part of the central business district of Machakos Town. The section of the town is not densely populated and its infrastructure development is not densely constructed.

2.7.1 North of the proposed site

The land is mainly being used for peasant farming. Several different residential buildings are located therein including bungalows, maisonettes and stored building.

2.7.2 North – north eastern- east of proposed site

River Iine runs across the area from the North to South / South Eastern direction and the river is seasonal. Across the river to a distance of up to 500 metres is a presence of many small holdings farms with bungalows and mixed farming is being practiced. A section of the land has been used as an illegal material dumping site but this has stopped.

2.7.3 South of the Project site

Huge tract of undeveloped land with the buildings housing the District Commissioner's office (Old name is still retained) and the NIS offices.

2.7.4 South – Western of the project site

Government offices including the IEBC offices are located in this area. However the buildings are mainly single storied.

2.7.5 Western – North of the project site

This area has the statehouse Lodge and the Garden Hotel. The area has single dwelling houses in ¼ acres plots.

2.7.6 Water main line

The Machakos Water & Sewerage Company water main line runs adjunct with the River Iine.

2.7.7 Current land use of the proposed site

The bulk of the land is idle with huge cypress trees and other forest trees. On the lower side towards and abutting the River Iine, the proponent has leased the land to a Church who have built a sanctuary and also have a livestock shed with cows and goats.

Figure 5 Land use across the River Iine = view showing the Iveti Hills in background

Figure 6 Farming activities - land across the stream abutting the project site

Figure 7 Neigbours to the site - NIS office, private development and police lines

Figure 8 River line = effects of soil erosion damage the riparian

Figure 9 Stream abutting the site = effects of storm water damage on riparian

CHAPTER THREE

3.0 BASELINE INFORMATION OF THE STUDY AREA

3.1 Machakos Town

The capital city of Machakos County is Machakos Town which is located about 63km from Nairobi Town. The National Census of 2009 listed the population of the town as 150,041 with the majority being Akamba.

3.1.1 Economics activities

Machakos Town has always been the door to Ukambani in terms of trade and economic activities. The open market for vegatables is open Monday and Friday and is the key distribution market in the region.

All major banks and financial institutions have branches in the town including Barclays, Equity, National Bank, NIC Bank, Credit Bank, Commercial Bank of Africa (CBA), Standard Chartered, K-rep, Co-operative and Kenya Commercial in the CBD and the Universal traders sacco.

Machakos Town has traditionally been known for its strong and effective town 'askaris' who have tamed the transport sector and the town also has a very well planned bus terminal. The terminal connects the town to Nairobi, Kitui and all other places in the county and beyond.

3.1.2 Tourism

The town and its environs have several tourism sites including the Machakos Peoples Park which is adjacent to the Maruba Dam and the famous point in Kituluni Hill where water flows uphil against gravity.

3.1.3 Sports facilities

Kenyatta Stadium is located in the city and is major location for sports in the town. It is used to host many Kenya Premier League competitions and matches. The stadium is also used for political rallies and for national and county government events. The Town also houses the Machakos Golf Club which has 9-hole golf course.

3.1.4 Hotels and restaurants

The town being the hub of the county, hosts several large hotels and eating places. Among the top hotels is Gelian Hotel, Lysak Haven Park, Shanbad House, Kyaka Hotel and T-Tot among others.

3.1.5 Education

The town is domicile to many primary schools both private and public including Machakos Primary, St. Mary's Boys and Girls, Muthini Primary, Township Muslim Primary School, St. Teresas Primary, Machakos Academy, ABC Girls Academy, One Hill Academy Premese Academy, Lukenya Academy, Makutano Academy, Mumbuni Primary, Baptist Primary, Highrise School Mks, and Katoloni.

Several High Schools are found in the town both private and public including Pope Paul VI Junior Seminary (Popase), Kyanguli Secondary School, Machakos Girls, Machakos School, St. Monica, St. Valentine Girls, Mumbuni High School and Katoloni.

The town also has Universities and other tertiary education institution. The following is list of some of them; Machakos University, Machakos Teachers Training College, Machakos Institute of Technology, Copperbelt College, Century Park College, African Training Center for Research and Technology, Scott Christian University and Computers for School Kenya.

3.1.6 Hills and forest surrounding the town

Kituluni Hills and also known as Kyamwilu Hill is about 10.26km in the northern direction, Iveti Hills which begin at the foot of the town and the Mua Hills which are located to the west of the town. Katunga Forest is 6.4km from the town in the north – northeast direction.

3.2 Machakos County

The study area is located in Machakos County, which is an administrative county in the former Eastern Province. The climate is semi-arid; the terrain is hilly from 1000m to 1600m above sea level. Akamba people are the dominant tribe. The county boarders Embu County to the north, Kitui to the east, Makueni to the south, Kajiado to the south west, Nairobi and Kiambu to the west and Kirinyanga to the North West. It stretches from latitudes $0^0$45 to$1^0$31 south and longitudes $36^0$45 east to$37^0$45. Administratively the county is divided into twelve divisions, sixty two locations and two hundred and twenty five sub-locations. It lies past the Namanga Road junction along Mombasa road towards Makutano.

3.2.1 Average temperatures

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

3.2.2 Average humidity values

The humidity values for each day are generally on the higher end. This is not to say that values are always high, since the easterly winds coming off the Indian Ocean tend to keep the temperatures standard throughout the country; therefore the ‘warm sticky’ feeling is usually not associated with the area as much as one would think. In the summer to autumn months of January to April, relative humidity values have been known to plummet to anywhere from 10 % to 20%. The Typical day, humidity-wise, starts off with nearly saturated in the morning hours, and steadily decreases throughout the remainder of the day.

3.2.3 Average rain amounts

The rainy seasons are two: the March to May is the long rains while the short rains run from October to December. The rains range from 500 to 1500mm with the average being 900mm.

3.2.4 Averages winds

Winds along the surface are predominating easterly throughout the entire year. They are shifted to northeast between October and April, and they are shifted southeast between May and September. Right before the Long rains, the strongest winds occur, reaching speeds of 20 to 25 miles per hour. During the rest of the year, winds are usually at speeds of 10 to 15 miles per hour.

3.3 Geology

The geology of the project area is dominated by Achaean gneisses of the Basement System.

3.3.1 The Archean Eon

The **Archean** Eon (/ɑːrˈkiːən/, also spelled Archaean or Archæan) is one of the four geologic eons of Earth history, occurring 4,000 to 2,500 million years ago (4 to 2.5 billion years ago). During the **Archean**, the Earth's crust had cooled enough to allow the formation of continents and life started to form (https://en.wikipedia.org/wiki/Archean).

3.3.2 Gneiss

Gneiss (/ˈnaɪs/) is a common and widely distributed type of high-grade metamorphic rock. Gneiss is formed by high-temperature and high-pressure metamorphic processes acting on formations composed of igneous or sedimentary rocks (https://en.wikipedia.org/wiki/Gneiss).

Gneiss (pronounced "nice") is a **metamorphic rock** consisting mostly of **quartz** and **feldspar** and showing distinct layering or banding. The layering of a gneiss may be weak or well-developed and consists of varying concentrations of biotite, garnet, hornblende, mica, and other **minerals**. These structures do not record a layered deposition process but arise from preferential recrystallization along flow or stress lines during metamorphosis of the parent **rock** (protolith). The gneisses are a very varied group, including both **igneous rocks** and metamorphosed **sedimentary rocks**, and may be categorized as quartzofeldspathic, pelitic, calcarous, or hornblende gneiss (https://www.encyclopedia.com/earth-and-environment/geology-and-oceanography/geology-and-oceanography/gneiss).

The Basement rocks throughout the area are covered in the higher parts by sandy alluvium and red-sandy soils, while in the lower parts clayey sandy soils predominate.

3.3.3 Alluvial deposit

Alluvial deposit - Material deposited by rivers. It consists of silt, sand, clay, and gravel, as well as much organic matter. Alluvial deposits are usually most extensive in the lower part of a river’s course, forming floodplains and deltas, but they may form at any point where the river overflows its banks or where the flow of a river is checked. They yield very fertile soils, such as those of the deltas of the Mississippi, Nile, Ganges and Brahmaputra, and Huang (Yellow) rivers (https://www.britannica.com/science/alluvial-deposit).

3.3.4 Soil Colour (Generic name is Red)

Red Soil - The color of red soil ranges from red to brown, chocolate, yellow, gray, or sometimes even black. Red soil contains a high percentage of iron content, which is responsible for its color. This soil is deficient in nitrogen, humus, phosphoric acid, magnesium, and lime but fairly rich in potash, with its pH ranging from neutral to acidic. It is formed by the weathering of ancient crystalline and metamorphic rocks, particularly acid granites and gneisses, quartzitic rocks, and felspathic rocks. Chemically, red soil is siliceous and aluminous, with free quartz as sand, but is rich in potassium, ranging from sand to clay with the majority being loamy. The lowermost area of red soil is dark in color and very fertile, while the upper layer is sandy and porous (https://www.sciencedirect.com/topics/agricultural-and-biological-sciences/red-soil).

Basement system rocks are the oldest rocks in the area and they underlie the Machakos Town and even the surrounding hills in general. The Basement rock in the area comprises quartzo-felspathic gneisses and the Biotite and Granitoid gneisses hidden beneath a layer of recent soils.

3.4 Soils of Machakos

County reflect the largely metamorphic parent material and the rainfall regimes that contribute to their formation. In Machakos, the dominant soil groups are alfisols, ultisols, oxisols, and lithic soils. These soils are all generally of low fertility, and many are highly erodible. The ultisols and alfisols are also susceptible to sealing (capping), which increases runoff and makes the clay soils hard to plough by the end of the dry season. A rough estimate of the agricultural quality of the region's soils indicates that less than 20% of Machakos has well-drained, deep, friable red and brown clays of good fertility; more than 60% of the region has very erodible, relatively shallow, sticky, red, black, and brown clays of variable fertility, on steep slopes; 20% has poorly drained, shallow, Stoney soils of low fertility.

https://www.nema.go.ke/images/Docs/EIA_1450-1459/ESIA_1453%20MACHAKOS%20WATER%20SUPPLY%20PROJECT.pdf

3.4.1 Alfisols

Alfisols are a soil order in USDA soil taxonomy. Alfisols form in semiarid to humid areas, typically under a hardwood forest cover. They have a clay-enriched subsoil and relatively high native fertility. "Alf" refers to aluminium (Al) and iron (Fe). Because of their productivity and abundance, the Alfisols represent one of the more important soil orders for food and fiber production (https://en.wikipedia.org/wiki/Alfisol).

3.4.2 Ultisols

Ultisols - commonly known as red clay soils, are one of twelve soil orders in the United States Department of Agriculture soil taxonomy. The word "ultisol" is derived from "ultimate", because ultisols were seen as the ultimate product of continuous weathering of minerals in a humid, temperate climate without new soil formation via glaciation. They are defined as mineral soils which contain no calcareous (calcium carbonate containing) material anywhere within the soil, have less than 10% weatherable minerals in the extreme top layer of soil, and have less than 35% base saturation throughout the soil (https://en.wikipedia.org/wiki/Ultisol).

3.4.3 Oxisols

Oxisols are an order in USDA soil taxonomy, best known for their occurrence in tropical rain forest, 15–25 degrees north and south of the Equator. They are classified as ferralsols in the World Reference Base for Soil Resources; [1] some oxisols have been previously classified as laterite soils (https://en.wikipedia.org/wiki/Oxisol).
Lithic – pertaining to clastic rocks, either sedimentary or volcanic, containing a large proportion of debris from previously formed rocks.

3.4.4 Black Cotton Soil

The area in Machakos town and project site is covered with black cotton soil. The black cotton soil or vertisol has a high content of expansive clay (60%) known as montmorillonite that forms deep cracks in drier seasons or years. Alternate shrinking and swelling causes self-mulching, where the soil material consistently mixes itself, causing vertisols to have an extremely deep A horizon and no B horizon. In our case it was 60 to 120cms thick. Vertisols typically form from highly basic rocks such as basalt and phonolites in climates that are seasonally humid or subject to erratic droughts and floods, or to impeded drainage. Depending on the parent material and the climate, they can range from grey or red to the more familiar deep black. The natural vegetation of vertisols is grassland, savanna, or grassy woodland. The heavy texture and unstable behaviour of the soil makes it difficult for many tree species to grow, and forest is uncommon. The shrinking and swelling of vertisols can damage buildings and roads, leading to extensive subsidence.

3.5 Hydrogeology

Hydrogeology deals with how water gets into the ground (recharge), how it flows in the subsurface (through aquifers) and how groundwater interacts with the surrounding soil and rock (the geology).

One of the three major sources of water for the town is boreholes and the town has 35 active boreholes according to Machakos Water and Sanitation 'Design-and Build' Project:
(http://www.nema.go.ke/images/Docs/EIA_1450-1459/ESIA_1453%20MACHAKOS%20WATER%20SUPPLY%20PROJECT.pdf).

3.6 Rivers and Streams

Major rivers cross the Machakos County on their way to the Indian Ocean such as the Athi River which begins in the Gatamiyo Forest in Nairobi and the Nairobi River which is fed by numerous streams originating in the Nairobi Water Basin empty into the Athi River. Thika River has been used as a source to provide water to the Yatta area and the Yatta Canal has now been upgraded and is serving a huge population. Central government intends to build a Yatta Dam which is expected to permanently solve the water problem in the region. River Maruba is another major river in the region and is the source of water for the Maruba Dam which supplies water to the Machakos Town. River Iine flows right through the Machakos Town and touches the proposed project site. The county and the town have numerous streams which provide surface water to the area.

3.61 Other sources of water

Nol-Turesh water supply provides clean water by piping from the foot of Mount Kilimanjaro to Machakos Town at a supply rate of 5,800m3/d.

CHAPTER FOUR

4.0 RELEVANT LEGISLATIVE AND REGULATORY FRAMEWORK

4.1 Introduction

In Kenya, the country has a legal framework which governs and regulates all aspect of life, activities and enterprises. This legal framework anticipates the existence and impacts of those activities and enterprises on the lives of the people and also on the environment. In this section, we shall seek to peruse and review the legal framework that touches on the proposed project.

4.2 Environmental Policy Framework

"environmental impact assessment" means a systematic examination conducted to determine whether or not a programme, activity or project will have any adverse impacts on the environment (EMCA – Chapter 387). This study should cover all aspects of the project cycle from planning, implementation, operating and decommissioning phases for public as well as private enterprises. The aim is to protect the environment and to ensure sustainability for future generations.

The relevant regulations (EIA) provide the format and processes for undertaking the studies and also allows the licensing authority to approve those projects which are environmentally sustainable.

4.3 Institutional Framework

Environmental matters and issues are dealt with by different departments and institutions in Kenya such as the Public Administration, the Police, County Government departments like Physical Planning and Health, the Public Works departments that approve government projects, Kenya Wildlife Services (KWS) and the Forest Departments. Other interested parties and institution such as NGO and political interest also have a say and influence on how the environmental interest are taken care of. Ministry of Environment has National Environmental Council (NEC) and the National Environmental Management Authority (NEMA) which deals primarily with environmental matters. The role of NEMA is to exercise general supervision and co-ordination over all matters relating to the environment and to be the principal instrument of Government in the implementation of all policies relating to the environment while the role of NEC for policy formation, setting national goals and objectives among others.

4.4 The Constitution of Kenya

The constitution guarantees under section 42 the right of every person to have a clean and healthy environment and also to have that environment protected for the benefit of the present and future generations.

The constitution shall encourage the use of public participation in the management and protection of the environment as required in section 69 (d). The state is also mandated to establish systems of EIA and EA together with eliminating process and activities that are likely to endanger the environment as required under section 69(d, f and g).

Relevance

The project design and methodology of construction together with operations of the hotel must be geared to not only protect the environment but to promote the same. The Lead Agencies have a duty to ensure protection of the environment through systems.

4.5 The Building Code – The Local Government (Adoptive By-laws) (Buildings) Order 1968 and The local Government (Adoptive By-Laws) (Grade II Building) Order 1968

Under section 1-4

Section 1-4 of the First Schedule spells out how drawing will be produced, who will sign them for submission, number of copies to be produced and the duty of the municipal to retain copies whether approved or not.

Section 15 requires that all construction sites to have sufficient temporary latrine accommodation.

Section 16 requires the contractor/proponent to provide a detailed work plan and to deposit the same with the council. The work plan shall show who is supervising the construction, frequency and evidence of material testing if required, date of intended completion and other matters that may be required.

Section 20 requires all building to have a secondary means of access while 34 gives the power to the council to request for testing of materials and to cause the removal of any materials that do not meet the required standards.

Section 42 mandates all constructors to ensure that they identify the beacons or boundaries of the land before commencement of works.

Under section 124;

This section specifies that only a qualified architect and structural engineer will be engaged and they shall prepare the required drawings in the prescribed manner.

Under section 126;

This section requires the qualification of those persons who are qualified to supervise construction activities on site.

Section 137 provides the requirement for installing lifts and requires mandatory testing every six months under section 138.

Section 139 requires every building to be provided with approved means of refuse disposal.

Section 148 requires the design for buildings to have storage tanks for the purposes of fire-fighting purposes.

158. All common stairs and common passages shall be adequately cross ventilated, and for common stairs sufficient natural and artificial lighting shall be provided.

Under section 170;

This section specifies how the harvesting of rainwater from the roof tops will be carried out and the materials to be used.

Section 199/200 requires proponent to apply and obtain approval to construct and to connect to public sewer.

Section 214 list the following firefighting equipment to be incorporated in whole or in part when designing and constructing a building:

(a) hydrants, hose, hose reels and fire appliance external connexions;

(b) portable fire appliance;

(c) sprinkler, drencher and water spray projector system;

(d) water storage tanks; and

(e) dry risers.

The general construction activities from building of foundations, walling, plumbing roofing and all other steps in construction shall be carried out in accordance with the First to Twelfth Schedule of the building code.

Relevance

The consultants will be required to incorporate the above requirement in the design of the project while the contractor is mandated to implement the same during construction.

4.6 The County Governments Act No. 17 of 2012

Under section 134 of the act, The Local Government Act was repealed and this ushered in the authority of the County Government over all matters within its jurisdiction.

Relevance

This act enables the County Governments to enforce the other acts of parliament that have now been repealed but are still being used as the reference laws.

4.7 The Persons with Disability Act 2003

Public buildings

22.(1) A proprietor of a public building shall adapt it to suit persons with disabilities in such manner as may be specified by the Council. (2) All proprietors of public buildings shall comply with subsection (1) within five years after this section comes into operation.

Compliance

The architect shall ensure that the design of the building has either a ramp or lift.

4.8 The Machakos County Acts, 2016

Right to Accessibility and Mobility

12. (l) Persons with disabilities are entitled to a barrier-free and disability-friendly environment to enable them to have access to buildings, roads and other social amenities, assistive devices and other equipment to promote their mobility.

(2) A proprietor of a public building or public service vehicle shall adapt it to suit persons with disabilities in such manner as may be specified by the Board.

(3) The Executive Committee Member shall prescribe the period within which proprietors of public amenities shall comply with this section.

Compliance

The architect shall ensure that the design of the building has either a ramp or lift.

4.9 The Employment Act 2007

The proponent shall give equal employment opportunities to both sexes, shall not discriminate or deny employment, nor employ children and shall pay equal remuneration for work done under section 4, 5 and 5(3) of the act.

Relevance

The proponent is required to ensure that the staff and worker in the hotel and construction site are engaged within the parameters of this law.

4.10 The Environment and Land Court Act, 2011

This Act is in place to give effect to Article 162(2) (b) of the Constitution; to establish a superior court to hear and determine disputes relating to the environment and the use and occupation of, and title to, land, and to make provision for its jurisdiction functions and powers, and for connected purposes.

Relevance

In the event of a need for judicial assistance in adjudicating matters that may arise from environmental issues, this court is available.

4.11 The Environmental Management and Co-ordination (Amended) Act of 2015

Section 58 of the Act requires all proponents to undertake an environmental impact assessment study before implementation or financing of any project and also to have the same studies submitted to the relevant authority for approval.

The second schedule provides a list of the projects that are required to undergo an environmental impact assessment and specifically in no. 1 it specifies that any activity that is out of character with its surrounding or any structure of a scale not in keeping with its surrounding and finally any major changes in land use will be subjected to an EIA process. The proposed hotel will change the nature of the project site permanently and qualifies for an EIA under item I of the Second Schedule.

Third Schedule - List the relevant representatives of Government Ministries that should be consulted when dealing with environmental matters. The Public Administration shall be consulted when undertaking the public participation and stakeholder's consultative meetings and WRMA shall be consulted when undertaking the pegging for the riparian land.

Compliance

The proponent is required to undertake and submit an EIA and the Lead agency is to approve, amend or reject the project.

4.11.1 The Water Quality Regulations, 2006 - Legal Notice No. 120

Regulation 4(1) prohibits all persons from undertaking any activity that can cause any pollution to a water body whether directly or indirectly.

Regulation 4(2) prohibits all persons from throwing or causing to be thrown any pollution or substance into a water body.

Regulation 6 (b) requires a person to have an environmental impact assessment license for abstracting ground water.

Regulation 6 (c) sets the minimum and maximum area of riparian on rivers and streams where construction works cannot be undertaken.

The Fifth Schedule specifies the standards that must be met for sewer to be emptied into public sewer.

Compliance

The design of the Hotel should take into account the treatment of waste water and effluent which will be generated at the site before disposal. WRMA are to peg the riparian before commencement of works.

4.11.2 The Waste Management Regulations, 2006

4. Responsibility of Waste Generator

(1) No person shall dispose of any waste on a public highway, street, road, recreational area or in any public place except in a designated waste receptacle.

(2) Any person whose activities generate waste shall collect, segregate and dispose or cause to be disposed off such waste in the manner provided for under these Regulations.

(3) Without prejudice to the foregoing, any person whose activities generates waste has an obligation to ensure that such waste is transferred to a person who is licensed to transport and dispose off such waste in a designated waste disposal facility.

5. (1) Any person whose activities generate waste, shall segregate such waste by separating hazardous waste from non-hazardous waste and shall dispose of such wastes in such facility as is provided for by the relevant Local Authority.

Compliance

The proponent shall ensure that all wastes generated within the proposed site shall be properly disposed off.

4.11.3 The Environmental (Impact, Assessment and Audit) Regulation, 2009

Section 4 requires all projects that are likely to have a negative environmental impact to undertake an EIA before commencement of works.

The proponent shall apply and obtain a Terms of Reference approval for undertaking an EIA full study before commence of the project as required under section 11 (5).

Section 31 requires all ongoing projects and new undertakings that to undertake annual environmental audits and to submit the same to the authority for perusal and action.

Compliance

The proponent will undertake EIA before commencement of the project and shall undertake annual audits every year therein.

4.11.4 Noise And Excessive Vibration Pollution) (Control) Regulations, 2009

“action plan” means a plan designed for the purpose of managing noise or excessive vibrations and their effects, including reduction of noise or excessive vibrations;

Section 2 list the factors that are used in determining whether noise is loud, unreasonable, unnecessary or unusual including time of day and proximity to residential area.

Section 4 specifically prohibits noise from vibration beyond stated amounts.

Section 11 prohibits the use of Machinery activity which is to emit noise or excessive vibrations that shall exceed the noise levels listed in the First Schedule.

Section 13 prohibits construction noise at night if the activity shall exceed the noise levels listed in the Second Schedule of these regulations.

The following table 1 shows the noise levels permissible under these regulations:

MAXIMUM PERMISSIBLE NOISE LEVELS					
Zone		**Sound Level Limits dB(A) (Leq,14 h)**		**Noise Rating Level (NR)**	
		Day	Night	Day	Night
A	Silent Zone	40	35	30	25
B	Places of worship	40	35	30	25
C	Residential : Indoor Outdoor	45 50	35 25	35 40	25
D	Mixed residential (with some commercial and places of entertainment)	55	35	50	25
E	Commercial	65	35	55	25

4.11.5 Legal Notice 31 - EMCA - Amendment to the Second Schedule

Hotels with bed capacity of over 150 are now listed as high risks project and are subject to full EIA study report (3 High Risk Projects – 3 Urban Developments – part (f)).

Relevance

The proposed project has a bed capacity of 300 and qualifies for a full EIA study report.

4.12 The Factories Act Cap 514

Section 29 requires all employers to provide training and supervision to inexperienced and new workers.

Section 30 requires all hoists and lifts to be in good mechanical condition before work and also requires them to be examined and certified in writing every six months by a person approved to undertake such a task.

Section 32 requires all cranes and other lifting machines to be of good mechanical condition and to be serviced and examined by a qualified person every 14 months.

Section 62 requires all proponent to keep a registered where all pertinent information required under the act will be contained.

Compliance

The contractor shall ensure all machinery, hoists, lifts and lifting machines in the site are in good working condition and shall have certificate as evidence of the same.

4.12.1 The Factories (First-Aid) Rules, 1977 Legal Notice No. 160

Section 2 and 3 requires not only the provision of a first aid box in the premises but also what should be contained in it.

Section 4 requires the name ‘First Aid’ to be clearly marked on the container and to be displayed where it can be easily seen.

Section 5 list three categories of factory by number of employees: 1-49, 50-99 and 100-above. The section then defines the number of persons who shall be trained in First Aid procedures.

Section 7 requires that no person can handle the first aid box that has not been trained and has a certificate of competence from the required authorities.

Compliance

The contractor during the construction phase and the proponent during the operation phase shall comply to the above requirement.

4.12.2 The Fire Risk Reduction Rules, 2007

20. (1) Every occupier shall establish a fire fighting team that shall consist of–

(a) At least two persons, where the number of workers is not more than ten;

(b) At least three persons, where the number of workers is between eleven and twenty five;

(c) At least five persons, where the number of workers is more than twenty five.

22. A fire fighting team shall carry out the following functions–

(a) ensure that all fire fighting appliances, fire detection systems, fire alarm and any other facility for fire safety are in place and are regularly serviced;

(b) Conduct fire drills at the workplace;

(c) Investigate fire incidences at the workplace and recommend corrective measures;

(d) Regularly inspect the workplace for purposes of identifying potential fire risks and recommend remedial measures;

(e) Train other workers in the safe use of fire fighting appliances;

(f) Co-ordinate the evacuation of other workers in the event of a fire; and

(g) Undertake any other functions as may be directed by the occupier.

23. (1) Every occupier shall ensure that fire-drills are conducted at least once in every period of twelve months and a record of such drills kept available for inspection.

24. (1) Every occupier shall identify a location in the workplace where every worker shall assemble in the event of a fire.

26. (1) Every occupier shall provide suitable means of alerting persons in the workplace, in the event of a fire, and such means shall be made known to all workers.

29. (1) Every occupier shall provide means of extinguishing fire at the work place.

(2) Every occupier shall ensure that the position of the means in subsection (1) shall be distinctively and conspicuously marked.

(3) Every occupier shall ensure that any portable fire extinguisher is mounted at an easily accessible height of not less than 60 cm from the floor.

(4) Where fire hose reels are provided, every occupier shall ensure that there is at least one fire hose reel within a radius of 30 metres.

30. (1) Every occupier shall ensure that all means of extinguishing fire are properly maintained.

(2) The occupier shall-

(a) Causing inspection and testing of all fire fighting appliances in the work place to be carried out by a competent person at least once every twelve months;

(b) Keep a record indicating the date of inspection and tests including the name of persons carrying out the inspection and test; and

(c) Ensure that all cylinders for fire fighting appliances are examined and tested at least once every five years and such tests shall include hydraulic pressure test.

Compliance

The contractor during construction and the proponent during operation shall develop a fire fighting plan which shall cover all aspects of fire fighting procedures and equipment together with their implementation.

4.13 The Food, Drugs and Chemical Substances Act Chapter 254

Section 3 requires all premises which are to be used for the purposes of selling, preparing, packaging, storing or displaying food to be licensed.

Section 15 requires all workers who handle food to have a medical examination carried out by a government medical institution periodically.

Section 11(B and C) requires all employers to provide adequate sanitary conveniences for all their workers and also to have running water at all points where processing of food and cleaning is taking place.

Second Schedule Part B

The following requirement shall be complied with as regards the cleanliness of all persons working in direct contact with food

A They shall wear clean outer garments and conform to hygienic practises while on duty

B They shall wash their hands thoroughly, remove all jewellery, and take any necessary precaution to prevent contamination of food with micro- organisms or foreign substances

E as is necessary for the work, on which the employee is engaged, he shall wear effective head – dress, such as hair net, head – band or cap and

F all employee shall refrain from storing their clothing or any other personal belonging or from eating or drinking beverages in areas where food is or food ingredient are exposed or areas used for washing equipment or utensils.

Compliance

The proposed hotel must ensure that the restaurants and canteens will be fully licensed, the sanitary conveniences to be enough for all guest and workers, that the food handlers have all undergone medical examination, that all employees have the appropriate PPE and the facilities has adequate lockers for storing personal effects while at work.

4.14 The Hotels and Restaurants Act Chapter 494

4. (1) After the appointed day

a) no premises shall be used or kept as a hotel unless there is in force a valid hotel licence in respect of such hotel;

b) no person shall exercise overall control over the day-to-day operation of a hotel, whether he is the owner or the manager of such hotel, unless he is the holder of a hotel manager's licence;

Part VI- Catering Training And Tourism Development Levy

16. (1) The Minister may, by order, require payment by the owners of hotels and restaurants of a Catering Training and Tourism Development Levy.

Compliance

The proponent will ensure that all the restaurants and the Hotel itself will be licensed before operations begin.

The proponent will ensure that the Hotel is registered under the Catering Levy fund and that remittance to the fund will be made on regular and timely basis.

4.15 The Land Registration Act, 2012

This act specifies how the land will be registered and the title deed produced.

Compliance

The proponent is to ensure that the proposed site land has a title deed in the name of the hotel.

4.16 The National Construction Authority Act NO. 41 OF 2011

Requirement for registration

15. (1) A person shall not carry on the business of a contractor unless the person is registered by the Board under this Act.

(2) A person seeking registration under subsection (1) shall, in the case of a firm, be eligible for registration if at least one of the partners or directors of the firm possesses such technical qualifications, skills or experience as the Board may from time to time prescribe.

Meaning of "Contractor".

16. (1) For the purposes of this Act, a person carries on business as a contractor where such person, for reward or other valuable consideration, undertakes the construction, installation or erection, for any other person, of any structure situated below, on or above the ground, or other work connected therewith, or the execution, for any other person, of any alteration or otherwise to any structure or other work connected therewith, and undertakes to supply—

(a) the materials necessary for the work, or is authorized to exercise control over the type, quality or use of the materials supplied by any other person;

(b) the labour necessary for the work, or is authorized on behalf of the person for whom the work is undertaken or any other person, to employ or select workmen for employment for the purposes of the execution of the work, whether under a contract of service or otherwise:

17. (1) A person or firm may apply to the Board for registration as a contractor for purposes of this Act.

Relevance

The proponent is required contract persons, firms or company to be contractors of the proposed project who are registered under this act.

4.16.1 The National Construction Authority Regulations, 2014

The owners of all construction works are required to register construction works and the BQ with the authority as soon as possible as required under section 17 (1) and (2).

The owner of the all constructions works must provide a contact person and details to the Authority for ease of communication as required under section 18 (1) and (2).

The Authority shall accredit and certify all construction workers and site supervisors in accordance with this act as specified under sections 19, 20 and 21.

Compliance

The contractor will register the tender contract with the authority and the proponent will provide the name of the contact person.

4.17 The Occupational Health and Safety Act 2007

6. (1) Every occupier shall ensure the safety, health and welfare at work of all persons working in his workplace.

(6) It is the duty of every occupier to register his workplace unless such workplace is exempted from registration under this Act.

Part vii— Machinery Safety

70 provides the guidelines for gas cylinders.

77. (1) All floors, steps, stairs, passages and gangways in a workplace shall be of sound construction and be properly maintained.

(3)There shall, so far as is practicable, be provided and maintained safe means of access to every place at which any person, has at any time, to work.

(4) Necessary precautions including warning signs, shall be taken to prevent injury to employees and other persons at a workplace from mobile plants falling objects and objects ejected from machines and work processes.

89.(1)In every workplace in which, in connexion with any process carried on, there is given off any dust or fume or other impurity of such a character and to such extent as to be likely to be injurious or offensive to the persons employed, or any substantial quantity of dust of any kind, all practicable measures shall be taken to protect the persons employed against inhalation of the dust or fume or other impurity and to prevent its accumulating in any workroom, and in particular, where the nature of the process makes it practicable, exhaust appliances shall be provided and maintained, as near as possible to the point of origin of the dust or fume or other impurity, so as to prevent it entering the air of any workroom and the dust, fumes or impurity shall not be allowed to enter into the atmosphere without undergoing appropriate treatment to prevent air pollution or other ill-effect to life and property.

Part X Welfare – General Provision

91 (1) Every Occupier shall provide and maintain an adequate supply of wholesome drinking water at suitable points conveniently accessible to all persons employed.

93 Every occupier shall provide and maintain for use of a person employed, adequate and suitable accommodation for clothing not worn during working hours.

Part XI Health, Safety and Welfare- Special Provisions

101 1 Every employer shall provide and maintain for the use of employees in any workplace where employees are employed in any process involving exposure to wet or to any injurious or offensive substance, adequate, effective and suitable protective clothing and appliances, including ,where necessary, suitable gloves, footwear, goggles and head coverings.

Compliance

The proponent and contractor are required to put measures into place to ensure that the safety health and welfare all workers and public is secured.

Both the contractor and the proponent are required to register the construction site and hotel as a workplace.

The proponent is to ensure that all service and safety procedures are undertaken for the gas cylinders at the hotel.

The proponent, constructor and the consultants are to ensure safety and health concerns are incorporated into the design of the project.

4.18 The Physical Planning Act Chapter 286 of 1996

Under section 32 part 4 and 5, the County Government of Machakos shall ensure that the status of the land being developed has acquired the necessary change of user**.**

Under section 29/30 part 1 to 3, the proponent is required to seek developmental permission from the County Government and if not the section defines the penalty which is too be metered out.

Compliance

The proponent is to apply and obtain a change of user together with architectural approval.

4.19 The Public Health Act Chapter 242

115. Nuisances prohibited

No person shall cause a nuisance or shall suffer to exist on any land or premises owned or occupied by him or of which he is in charge any nuisance or other condition liable to be injurious or dangerous to health.

116. Local authorities to maintain cleanliness and prevent nuisances

It shall be the duty of every local authority to take all lawful, necessary and reasonably practicable measures for maintaining its district at all times in clean and sanitary condition, and for preventing the occurrence therein of, or for remedying or causing to be remedied, any nuisance or condition liable to be injurious or dangerous to health, and to take proceedings at law against any person causing or responsible for the continuance of any such nuisance or condition.

117. Health authorities to prevent or remedy danger to health from unsuitable dwellings

It shall be the duty of every health authority to take all lawful, necessary and reasonably practicable measures for preventing or causing to be prevented or remedied all conditions liable to be injurious or dangerous to health arising from the erection or occupation of unhealthy dwellings or premises, or the erection of dwellings or premises on unhealthy sites or on sites of insufficient extent, or from overcrowding, or from the construction, condition or manner of use of any factory or trade premises, and to take proceedings against.

Compliance

The Proponent and the Contractor will take measures to ensure that all sewer, waste and storm water together with solid wastes generated at the site are discharged correctly, safety and promptly to ensure safety, health and welfare of all persons on site.

4.20 The Public Roads And Roads Of Access Act Chapter 399

Section 9 allows for all people who wish to apply or develop a public road to apply and obtain permission to undertake the required works.

Compliance

The contractor and proponent will apply for permission to develop the access road to the property.

4.21 The Tourism Act, 2011 - No. 28 of 2011

A. Licensing

Requirement for licence

98. (1) A person shall not undertake any of the tourism activities and services specified in the Ninth Schedule, unless that person has a licence issued by the Authority.

Tourism levy

105. (1) The Minister may, by order, require the payment by persons engaged in tourism activities and services of a tourism levy.

(2) The tourism levy order may make different provisions in relation to different tourism activities and services.

(3) A tourism levy may contain provisions as to the evidence by which a person's liability to the tourism levy, or his discharge of that, may be established, and as to the time at which any amount payable by any person by any of tourism activity and service shall become due.

(4) All monies received in respect of the tourism levy shall be paid into the Fund established under section 67 of this Act.

Compliance

The proponent will apply for registration under this act and shall remit the necessary levy on monthly basis.

4.22 Workmen's Compensation (Compulsory Insurance) Order No. 13 OF 2007

2. Application

This Order shall apply to any employer in any undertaking or part of any undertaking which consists in the carrying on, for gain or reward, of one or more of the following activities, that is to say—

(a) the construction, structural alteration, maintenance or repair of any building the demolition of any building and the preparation for, and laying the foundation of, any intended building;

(b) the construction of any railway line or siding, and the construction, structural alteration or repair or the demolition of any airfield, dock, harbour, wharf, quay, pier, in-land navigation works, road tunnel, bridge, viaduct, waterworks, dam, reservoir, pipeline, aqueduct, sewer, sewage works or latticework structure designed solely for the support of electric lines;

(c) the carriage of passengers and goods, or either of them, by any motor vehicle whether or not required to be licensed as a public service vehicle under theTraffic Act (Cap. 403) or a road service licence, or public carriers licence or a limited carriers licence, under the Transport Licensing Act (Cap. 404):

Provided that this Order shall not apply to—

(i) the Government of Kenya;

(ii) any employer who provides and maintains in force a security consisting of an undertaking by a surety, approved by the Minister, to make good, subject to any conditions specified in such undertaking and up to an amount approved by the Minister, any failure by the employer to discharge any liability which he may incur under the Act to any workmen employed by him.

Compliance

The contractor shall undertake liability insurance for all construction workers and visitors on site.

The proponent will also take liability insurance for all the hotel workers during operations.

CHAPTER FIVE

5.0 STAKEHOLDER AND PUBLIC PARTICIPATION

5.1 Introduction

Public consultation and participation process is a policy requirement by the Government of Kenya and a mandatory procedure as stipulated by EMCA CAP 387 section 58, on Environmental Impact Assessment for the purpose of achieving the fundamental principles of sustainable development. Therefore, this section describes the process of the public consultation and public participation followed to identify the key issues and impacts of the proposed commercial hotel on Machakos Municipality Block 11/521 Machakos Town held at the Globe Deliverance Chapel Spring Valley Machakos on 26th September 2019. The objective of the consultation and public participation was to:

- Disseminate and inform the stakeholders about the project with Special reference to its key components and location.
- Gather comments, suggestions and concerns of the interested and affected parties about the project.
- Incorporate the information collected in the EIA study

In addition, the process enabled:

1) The establishment of a communication channel between the general public and the team of consultants, the project proponents and the Government.

2) The concerns of the stakeholders be known to the decision-making bodies at an early phase of project development

5.2 Methodology used in Public consultation

The exercise was conducted by a team of experienced registered environmental experts and social expert. The following process in carrying out the entire process involved:

- Key informant interviews and discussions
- Field surveys, photography and observations
- Completion of the pre-designed questionnaires which captured all the phases of the proposed development

The purpose for such interviews was to identify the positive and negative impacts and subsequently promote proposals on the best practices to be adopted and mitigate the negative impacts respectively. It also helped in identifying any other miscellaneous issues, which may bring conflicts in case project implementation proceeds as planned. The information gathered enabled the identification of the specific issues from the stakeholders' response, which provided the basis upon which the aspects of the Environmental Impact Assessment was undertaken.

5.3 Sources of information

The exercise of public consultation was conducted on 26th September 2019. The exercise was conducted via a public baraza and interviews under the guidance of questionnaires developed to capture the concerns, comments and issues that the stakeholders, neighbours and business people around the project site have regarding the proposed commercial hotel. The completion of such questionnaires allowed for the synthesis and analysis of issues that arose.

From the field work, and the public meeting it was apparent that the proposed development was received with mixed reactions by the interviewed people as they anticipated numerous impacts both negative and positive alike. The local community people, neighbours, and major stakeholders independently gave their views, opinions, and suggestions as in the best of their interest and in the interest of the factors that affected the circumstances, influences, and conditions under which their organizations exist.(see attached questionnaires and minutes of the meeting).

5.4 Recommendations from the barasar

1. General construction & related works

It was agreed that;

- The developer /contractor should ensure that the structure is built professionally to ensure the building does not collapse leading to deaths, injuries and loss of property.
- The contractor should ensure that 2/3 of the population of his labour force are from within Machakos town.
- The contractor should follow the bill of quantities to the letter and avoid taking shortcuts to save on costs.
- The contractor/developer should ensure that they leave access roads to the hotel so that it can be accessible in case of emergencies such as fire.
- The proposed connection to the sewer line should be done well in such a way that raw sewer does not leak into river Iine polluting it.
- The developer should construct gabions along the river to conserve and protect it.
- The design of the hotel should incorporate persons with disability for easy movement within the facility.
- Construction works should be done around 8am-5pm to minimise disturbance to the residents.

2. Hotel operations

It was agreed that;

- During operation of the hotel, local women to be considered in the supply of farm produce for use in the hotel.
- Locals should be given equal employment opportunities.
- The elderly should also be considered for non-technical jobs.
- The developer should place a job advert at the chief's office.
- The waste water from the hotel should be recycled and used to water gardens and the lawns.
- Rain water should be harvested and surplus supplied to the local as opposed to channelling it into the river.
- food waste should be composted and used as manure in the lawns /gardens

3. Security

It was agreed that;

- That the project site should be fenced from the onset of construction.
- The premises should have CCTV cameras during construction and operation phases.
- Trained security guards should be stationed at the facility.

Figure 10 Public showing approval for the proposed project

CHAPTER SIX

6.0 ANALYSIS OF PROJECT ALTERNATIVES

6.1 Introduction

The proponent purchased the property in Machakos for the purpose of extending his business to Machakos Town by building a level 3 hotel.

Under the environmental framework and regulation whose interest is to safe guard the environment today so that future generations shall have a suitable environment in which they can generate both a livelihood and a habitant in which to live; alternatives to the project in alternative plot, no project alternative, proposed development alternative, alternatives to disposal of effluent and waste water together with alternatives in solid waste management will be considered.

6.2 Alternative plot

Under this alternative, the proposed project would be relocated from the proposed site to another site. This would involve several factors that would need to be considered:

a) Sourcing for the alternate plot -The proposed concept is for a 3 star hotel and requires a location with a sufficient customer base to be able to make the project viable. The proposed new site would also have to have the necessary infrastructure and also the land would have to be in a place that allows a change of user. This two options are a tall order for the proponent.
b) Extra costs involved in a new site involve purchasing a new plot and the proponent is not in a position to undertake such expenditure. The current land was purchased at an great sum of money and to be able to put the same in the market in order to get a buyer would take an indefinite amount of time and the money realised would be no guarantee that it would be enough for the new site. The proponent has already expended a lot of money on consultation fees to the team of consultants who have designed the concept and a change of the location would be a loss of the concept already designed and a further cost of designing a new concept based on the new site.

This alternative is not attractive or cost friendly and the proponent is not financially able to undertake this option.

6.3 No Project – alternative

This alternative envisages that the current status quo remains and the proposed development does not take place. In practical terms, this would involve the following:

1. The bulk of the land would continue to remain idle.
2. The church would continue renting their space and continue keeping livestock.
3. The proponent would continue paying land rent to the Ministry of Lands and land rate to the county government of Machakos without adequate income.
4. The economic status of the local community which would have benefitted with employment would remain the same.
5. The business opportunity to supplies of construction materials and consulting services would not be realised.
6. The proponent would suffer a big blow due to his dreams not being realised and also other investors would be discouraged to know that their projects would be disapproved under similar circumstances.

From the above analysis, it becomes apparent that the no-project alternative is a **no alternative** to the local people, proponent, Kenyans and the Governments of the Machakos County and Kenya.

6.4 The proposed Development Alternative

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

Under the proposed Development Alternative Option in respect to the proposed project, implies that the project achievements will proceed as discussed before hence the local people, Kenyans, and the government of Kenya will all benefit immensely.

6.5 Alternatives to disposal of effluent and waste water

During the occupation of the hotel, a lot of waste water and effluent will be generated and will need to be properly disposed off.

6.5.1 Current option

The proponent has applied and obtained for permission to connect the sewer to the county government sewer line which is located 893 metres downstream by gravity. Under this option, all the waste water and effluent will be properly disposed off and the only concerns would be to check for leaks and burst pipes along the line.

6.5.2 Use of septic tanks

This option would involve the construction of a sufficient number of septic tanks which would be spread strategically around the hotel in order to capture the waste by gravity and to store the same until extraction. However, it would also involve the use of soak pits to absorb the waste water as the volume is expected to be large due to the size of the hotel.

This option has only one challenge: the waste water discharged into the soak pit would lead to ground water contamination and would not be feasible.

6.5.3 Use of a waste treatment plant

Under this option, the proponent would design and install a waste treatment plant which would collect all waste water and effluent and treat the same before discharge into the environment. The result waste water would be used to water the grounds.

This option is viable as it would properly dispose of the wastes. However, the cost implications verse the option of connecting to the sewer is huge and makes the option unattractive.

6.5.4 Use of bio-digesters

Biodigestors work on the principle by which microorganisms break down organic materials without the use of oxygen. The facility is usually a closed system to allow the breakdown to occur naturally. The raw material used is any organic material and in this case will be the toilets wastes from the hotel together with the waste water generated therein. The end product of the process is recycled water which can be used

to water the ground or can be discharged back into the river. The process also produces fertilizers and biogas.

This is a viable option which can be used in the project.

Three of the four options are all viable except for the use of septic tanks which will result in ground water contamination. However, the option that is least expensive and will not require much further input to implement is the connection to the public sewer system.

6.6 Alternatives in solid waste management

During operation phase, a lot of solid wastes will be generated in the different departments of the hotel. The following measures can be used:

1. Plastic bottles can be collected and sold for recycling..
2. Kitchen food can be separated and recycled as animal feed.
3. Great care should be taken at ordering of materials to ensure only required amount are ordered which will minimize wastes.

CHAPTER SEVEN

7.0 POTENTIAL IMPACTS TO THE ENVIRONMENT

7.1 Introduction

The purpose of environmental impact assessment study is to identify and predict potential impact to the environment that the proposed project will generate and to propose mitigation measures to counteract the negative impacts.

In this chapter, we shall explore at greater length the direct and indirect impacts together with those that are cumulative and those that are irreversible. We shall also be sensitive to the short-term impacts against those that are long term.

7.2 Positive impacts from construction activities

7.2.1 Job creation

The cow shed and the existing church will be dismantled and the debris cleared from the site. The rest of the land will also be cleared of all debris and disposed off. The foundation area will be marked and excavated to allow construction to begin. All these processes will require general and specialized labour, electricians, plumbers, masons, specialist artisans and consultants.

The comments from public participation indicated that at least 2/3 of all workforce should be local people.

7.2.2 Procurement of building materials

The project will require sand, cement, aggregate, building stones, DRC, scaffolding, formwork among other materials for building; these materials will have to be sourced by the proponent from vendors and traders in the Machakos, Nairobi and its environs.

7.2.3 Creation of supporting businesses

The project will attract other secondary businesses which complement the main project activities.

7.3 Negative impacts arising from construction activities

7.3.1 Loss of vegetation and trees

The contractor shall identify and demarcate the area where the construction site shall be. Clearing of the site will involve cutting down affected trees, shrubs and vegetative life.

The contractor shall also identify and demarcate the area where the building will be constructed. Clearing of this site will also involve cutting the trees together with shrubs and other vegetative life.

Care will be taken to cut down only those trees that are affected.

7.3.2 Extraction and use of building materials

Among the materials which will be used are stones, hard core, cement and sand harvesting. These materials are obtained from quarries and factories which mine from the ground. These materials are of limited quantities and are not renewable. This causes permanent degradation of the environment. In the process of extraction, the landscape changes, displacement of animals and vegetation occurs.

7.3.3 Generation of noise and vibration

Construction noise is expected to be generated at the construction site. The activities that are earmarked to generate noise are loaders, excavators, cranes, concrete mixers trucks, concrete pumps, and concrete vibrators among others.

However, noise is only an issue depending on the context where it occurs. Factors such as:

1. Time of the day.
2. Distances to nearest neighbour to be affected.
3. Nature of the noise generated (continuous or intermittent).
4. Those closest to the source of the noise.

The effects of the noise include:

1. Loss or impairment of hearing.
2. Structural damage to foundation, walls and swimming pools.
3. Interference with learning in schools.

7.3.4 Generation of dust and exhaust fumes

The following activities in the construction site are expected to generate air pollutions:

Movement of trucks, vehicles and motorcycles will generate exhaust fumes from engines and dust from the ground.
The operation of machinery and construction equipment is also likely to generate fumes from engines.
Construction activities involving site clearance, excavations and general building will generate dust emission into the air.
Exhaust fumes from diesel and other engines generate:

1. Carbon monoxide can lead to severe tissue damage, dull headache, weakness, nausea, vomiting, confusion, dizziness and difficulty in breathing.
2. Metallic abrasion particles, sulfates and silicates all of which are harmful to health.

Dust emissions contain tiny solid and liquid particles that can float in the air. The large particles tend to be trapped in the nose and mouth when you in hale them but the smaller particles will penetrate to the lungs and others will be absorbed directly into the lungs.

Prolonged and or intensify exposure to dust and exhaust fumes can adversely affect one's health.

7.3.5 Solid waste generations

Solid wastes are those useless or unwanted products produced during the activities of the construction site. These wastes include rejected materials, packages from used materials, metal cuttings, paper bags, empty cartons, empty paint and solvent containers, broken glass, broken tiles, sand, concrete, gravel, stones, bricks, plastics, paper, wood and cleared biomass among others.

Effects of undisposed solid wastes include:

1. Undisposed solid wastes on site have been the source of insecurity in the area as thieves hide behind them when waylaying pedestrians as reported to us during the public participations.

2. Rubbish heaps can easily become a breeding ground of rodent and flies which will become vectors of disease to the community.
3. Uncollected materials can easily find their way to the stream adjacent to the site together with the River Iine causing choking and pollution.
4. Some wastes materials such as plastic are not biodegradable and will permanently ground contamination if not properly disposed off.
5. Undisposed human excreta will cause health problems and illness.

7.3.6 Water logging and soil erosion

The proposed project site slopes quite steeply towards the River Iine and once the cutting of trees and shrubs occurs due to clearing of the site and excavation of the building site, the site is expected to suffer from soil erosion when the rainy season occurs. The exposed excavated sites are also expected to be filled with water during the same rainy season.

7.3.7 Increase water demand

Water is a key component of most of the building activities from concreting, cementing, walling and plastering. Other activities such as cleaning and water for construction workers (drinking and washing) will lead to an increase on the demand of water.

7.3.8 Increase insecurity

Construction materials will be brought to the construction site and will become a target of persons who may wish to benefit from stealing the same.

The presence of large number of people at the site is both a blessing and a curse:

Some of the people will be looking for employment opportunities while others will be part of the construction crew.
Some of the people will come to scout for information on the type and location of construction materials so that they can plan on how to steal the same.
Some of the people are terrorists who come to survey how they can unleash terror to Kenyans.

7.3.9 Increased traffic

The scale of the project will require the movement of a lot of supply trucks and vehicles to and from the site and it is expected that the flow of traffic will greatly increase causing congestion.

7.3.10 Risks of accidents and injuries

Several of the construction phase activities can pose serious threat of accidents and injuries to the construction crew and general public:

Deep excavations can lead to accidental falls resulting in injuries and also damage to equipment and machinery.
Constant movement of trucks, vehicles, cranes and other equipment in the site poses a risk of accidents and injuries through collisions.
Construction materials falling from above can cause injuries and accidents to those below while general handling of equipment poses a risk of injuries to the handlers.

7.3.11 Risk of choking the stream and River Iine.

The project site is located next to the two water bodies and the activities of the construction site can lead to soils and other construction material finding their way into water bodies causing choking and pollution.

Both the stream and the River Iine are showing signs erosion from the effects of storm water drainage. It is expected that as construction begins, the volume of storm water will also increase and the water bodies are expected to suffer much greater impacts of storm water damage.

7.4 Positive impacts from operational activities

7.4.1 Availability of a new 3 star hotel in Machakos town

The project will provide a three star hotel to the residents of Machakos Town and its environs.

7.4.2 Optimization of land

The land is no longer idle and has become income generating.

7.4.3 Job creation

The proponent will employ personnel to run the hotel; we engage different consultants and service providers to augment the service delivery of the hotel.

The local community women indicate that they would like to supply food stuff.

The senior persons at the public participation indicated that they should be considered for employment opportunities such as opening the gate to visitors.

The local community indicated that tenders for the hotel should be displayed at the chief's office so that those who wish to supply can.

7.4.4 Increased revenue to government

Proponent shall pay income, withholding and VAT to the central government, land rent to Ministry of Land, rates and other relevant fees to the County Government.

7.5 Negative impacts arising from operational activities

7.5.1 Increased traffic

The number of vehicles, motorbikes and trucks that shall be bringing supplies to the hotel is expected to be quite high. The expected increase will be determined by the number of guest in the hotel, the occupancy of conferencing facilities and other meeting rooms in the hotel and the time of the year or season.

7.5.2 Increased Water use

The cleaning activities of the hotel, the operations of the kitchen and dining room will require large amounts of water and this will be a big drain on the underground reservoir. Use of unsafe drinking water can bring about illness to workers and guests. This usage will bring an additional drain on the limited water source in the area.

7.5.3 Increased Energy consumption

The hotel activities will require a lot of electricity for lighting, running office equipment and electrical gadgets, air conditioning, refrigeration systems, air compressors and pumping water from the borehole.

Electricity is generated using natural resources; excessive electricity consumption will have a big drain on the same and negatively impact the environment.

7.5.4 Increased storm water flow

The building roofs and pavements will lead to increased volume and velocity of storm water or runoff flowing across the area covered by the project. This water can be very destructive to existing structures including comprising foundation of buildings, soil erosion and destruction of walls.

7.5.5 Solid waste generation

The entire hotel operations will generate a lot of solid waste during its operation and this waste will pose a danger to the employees, public and guests if not properly disposed off.

7.5.6 Liquid waste generation

The liquid waste generated from the use of bathrooms, toilet and cleaning activities of the rooms/hotel and the same will need to be properly disposed or else it will pose a risk of ground contamination.

The local community suggests that waste water should be recycled and used to water the grounds instead of directing the same to the stream.

7.5.7 Increased air emission

The cooking process in the Kitchen and the cleaning activities in the laundry room will produce unclean and unwanted fumes into the environment which are harmful.

7.5.8 Safety and Health concerns

Some of the hotel activities are likely to cause a risk of injuries and accidents to employees, guests and the general public such as cleaning, food preparation in the kitchen and use of gas cylinders in cooking.

7.5.9 Risk of fire outbreak

The general activities of the hotel can lead to the risk of fire from electrical to human causes and this can bring about loss of life and damage to property.

7.5.10 Risk for injuries and accidents

The hotel activities including cleaning services, kitchen operation and housekeeping involve procedures and tasks that can pose a risk of injuries and accidents to the employees and the general public.

7.5.11 Security concerns

Security challenges in the hotel are multifaceted and can cause serious loss and threats of insecurity:

Loss of vehicles through theft in the parking lot is a real issue.
Loss of guests personal items either in rooms or in the common area is another concern.
Loss of life through terrorism threats is another concern.
Drunkard behaviour in bars can cause confusion and concern among guest.

7.6 Positive impacts from decommissioning activities

7.6.1 Rehabilitation

Upon decommissioning the project, the land will be restored to its original status. This will include replacement of topsoil and re-planting vegetation that will lead to improved virtual quality of the area.

7.6.2 Creation of employment opportunities

The demolition exercise will involve the use of electricians to dismantle electrical installations, plumbers, masons and general workers. Variety of equipment will be used. All this activities will provide opportunities for monetary engagement.

7.6.3 Creation of secondary business

Contractors may or may not sublet some demolitions works and other supportive business such as NEMA licensed transport to cart away solid wastes materials will be engaged.

Food business will mushroom to cater for eating needs of the staff at site.

7.7 Negative impacts of decommission activities

7.7.1 Solid waste generation

Demolition of the project buildings and related infrastructure will result in large quantities of solid waste. The waste will comprise of the materials used in construction including concrete, metal, wood, glass, paints, adhesives and fasteners.

Although demolition waste is generally considered as less harmful to the environment since they are composed of inert materials, there is growing evidence that large quantities of such waste may lead to release of certain hazardous chemicals into the environment. In addition, even the generally non-toxic chemicals such a chloride, sodium, sulphate and ammonia which may be released as a result of leaching of demolition waste, are known to lead to degradation of ground water quality.

7.7.2 Dust generation and exhaust fumes

The following activities in the demolition site are expected to generate air pollutions:

Movement of trucks, vehicles and motorcycles will generate exhaust fumes from engines and dust from the ground.
The operation of machinery and construction equipment is also likely to generate fumes from engines.
Exhaust fumes from diesel and other engines generate:

Carbon monoxide can lead to severe tissue damage, dull headache, weakness, nausea, vomiting, confusion, dizziness and difficulty in breathing.
Metallic abrasion particles, sulfates and silicates all of which are harmful to health.
Dust emissions contain tiny solid and liquid particles that can float in the air. The large particles tend to be trapped in the nose and mouth when you in hale them but the smaller particles will penetrate to the lungs and others will be absorbed directly into the lungs.

Prolonged and or intensify exposure to dust and exhaust fumes can adversely affect one’s health.

7.7.3 Generation of noise and vibration

A similar analysis will be undertaken like that for construction phase impacts. Construction noise is expected to be generated at the demolition site. The activities that are earmarked to generate noise are loaders, excavators and cranes among others.

However, noise is only an issue depending on the context where it occurs. Factors such as:

1. Time of the day.
2. Distances to nearest neighbour to be affected.
3. Nature of the noise generated (continuous or intermittent).
4. Those closest to the source of the noise.

The effects of the noise include:

1. Loss or impairment of hearing.
2. Structural damage to foundation, walls and swimming pools.
3. Interference with learning in schools.

7.7.4 Risks of injuries and accidents

Some of the expected demolition activities pose a risk of accidents on site and of injuries which can occur. The following are some of the expected activities which can results in injuries and accidents:

Demolitions will cause debris to fall down from upper floors and this poses a risk of injuries and accidents to those on the ground.
Constant movement of trucks, vehicles, cranes and other equipment in the site poses a risk of accidents and injuries through collisions.
General handling of equipment poses a risk of injuries to the handlers.

7.7.5 Licensing requirements

Various regulation exists that spell out procedures to be followed when carryout demolitions exercises as means of protecting the environment and the general public.

CHAPTER EIGHT

8.0 PROPOSED MITIGATION MEASURES AND MONITORING

8.1 Introduction

In the previous chapter we analyzed the positive and negative environmental impacts which are potentially significant that will arise from the activities of the construction, operation and decommission phase of the project.

In this chapter, we go to the next phase in EIA process which is Mitigation where we identify measures which will avoid, minimize or remedy impacts. This will then be incorporated in the impact management system in order to ensure that practical measures to protect the environment will be carried out during all phases of the project cycle.

8.2 Negative impacts arising from construction activities

8.2.1 Increasing employment opportunities

The contractor is to ensure that local people from the town and county of Machakos are given first priority and preference in employment.

8.2.2 Reduce the loss of trees and vegetation

In order to reduce the loss of trees and vegetation on site the contractor and proponent shall do the following:

The area for the contractor site office and holding together with the building site shall be demarcated with the architect and surveyor. The aim is to reduce unnecessary loss of trees and vegetation.
Movement of vehicles and trucks in the proposed site to be restricted so as not to disturb flora.
The landscaping programme of the project site to commence immediately and in tandem with the constructions works ensuring restoration of vegetation to completed areas.

8.2.3 Efficient sourcing and use of raw material

The proponent is recommended to source building materials such as sand, ballast and hard core from registered quarries 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 proponent has been advised to 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 excess quantities. Moreover, the proponent will ensure that wastages, damages or loss (through run-off, wind etc.) of materials at the site is kept minimal, as these would lead to additional demand for and purchase of materials. The proponent is recommended to ensure that bulk purchases are carried out in order to minimize the number of trips done thus saving on fuel and transport costs.

The proponent is to purchase supplies from vendors who are registered with VAT and to deal with quarries that are NEMA compliant in order to earn revenue for the government and to protect the environment.

8.2.4 Minimization of noise and vibration

The contractor and proponent will implement the relevant sections of the EMCA (Noise and Excessive Vibration Pollution) (Control) Regulations, 2009. In this regard they shall undertake as follows:

1. Shall apply for a license under this regulations for those operations which are expected to exceed recommended noise levels:
2. Restrict construction activities to the hours of 8.00 to 5.00 pm.
3. Avoid having supply trucks bringing supplies at night.
4. Encourage supply trucks drivers to avoid hooting and gunning engines on site in order to reduce the noise level.
5. Ensure all contractors machinery, equipment, vehicles and trucks are well serviced and maintained.
6. Encourage all trucks and machinery to switch off the engines when not in use.
7. Encourage the use of PPE for ear protection.

8.2.5 Minimization of dust generation and emission

The programme to reduce dust and exhaust fumes emission into the air will be dealt with in three approaches:

General procedures

The contractor will develop a standard approach to handling all air emission throughout all the different activities in the site.
The project manager, the contractor and the proponent are to be extremely strict in following the work program in order to minimize the amount of time air pollution can happen.

Dust control procedures

1. Ensure the construction site is watered when necessary.
2. Ensure all supply trucks carry loose materials are covered.
3. Encourage the use of electrical equipment and machinery instead of diesel powered engines.
4. Buckets being carried by crane and machine hoist should be enclosed to avoid spill over.
5. Ensure hoarding of 2.4 metres is erected around the site boundary.
6. During construction activities where scaffolding is used, ensure adequate netting, sheeting or dust screens.

Exhaust fumes control measures

1. Ensure all diesel powered machinery and equipment together with supply trucks to have their engines switch off when not in use.
2. Discourage gunning of engines on site.
3. Encourage engine service and maintenance to the manufactures specification.

8.2.6 Minimization of construction waste

In order to minimize construction waste, the following measures will need to be put in place:

1. The ordering of the construction material to be timed to the work programme to avoid having idle material on site.
2. The contractor is encouraged to purchase high value and high quality construction material which will be able to last long and avoid wastages.
3. To encourage recycling of construction materials to avoid wastages.
4. To encourage the refurbishing of damaged construction materials including doors for sale or use in other construction sites.
5. Promptly carting away to NEMA certified dumpsites using NEMA certified transporters.
6. Build toilets for the construction crew.

8.2.7 Controlling soil erosion, water logging

The following measures will be put in place to control possible soil erosion and water logging:

1. In order to reduce run-off velocity – terracing and leveling of the compact areas on site.
2. Dig trenches and cut off drains to channel the runoff to the drainages.
3. Begin with one construction sector at a time and complete before moving to the next site.
4. Restrict movement of vehicles and trucks to existing roads and not to compact areas that are not due for construction.

8.2.8 Minimization of water use

The contractor will purchase holding tanks for storing water for construction and shall be careful to minimize the use of water for only essential services. Signage for water controlling measures will be put in place to ensure no wastages are experience.

8.2.9 Minimization of insecurity

The following measures shall be put into place:

1. The contractor to cordon off the construction place and to have one gate for access.
2. The contractor shall have a register of all construction workers on site and shall ensure only those on the register are allowed on site.
3. The contractor shall capture the details of all visitors and supply trucks into the site.
4. The contractor shall hire security guards to ensure no unauthorized people are in the site 24 hrs a day.
5. The contractor to insist on back ground checks of employees.

8.2.10 Controlling of traffic

The scale of the project will require the movement of a lot of supply trucks and vehicles to and from the site and it is expected that the flow of traffic will greatly increase causing congestion.
Contractor will ensure the following:

1. Have proper signage showing directions and speed limits.
2. Ensure supply trucks bring materials during the day and preferably at off peak time.

8.2.11 Minimization of risks of accidents and injuries to workers

The proponent and contractor to:

1. Implement the relevant sections of the OSHA.
2. Contractor will register the site as a workplace.
3. Ensure personal protective equipment for all construction workers.

8.2.12 Reducing the risk of choking the stream and River Iine

In order to minimize the risk of choking the two water bodies from the activities in the construction site, the proponent undertakes to engage WRMA on river pegging to clearly show the riparian.
The contractor is to construct gabions along the stream and the River Iine inorder to prevent further damage to the water bodies.

8.3 Negative impacts arising from operational activities

8.3.1 Increase of income opportunities

1. Ensure the local community women have the chance to tender for supply of food stuff.
2. Give preference to the senior members of community in job employment.
3. Ensure tenders are displayed at the Chief's office to ensure local participation.

8.3.2 Traffic management

The hotel management will ensure the following measures are put in place:

1. Traffic signs to be displayed to direct vehicles to and from the building.
2. Traffic marshal to monitor the traffic and to assist where needs be.

8.3.3 Ensure efficient water use

The proponent will do the following:

1. Install water-conserving automatic taps and toilets.
2. All workers and guests shall be sentised on how to use water efficiently.
3. Have the water from the borehole tested.

8.3.4 Minimized Energy consumption

The proponent will install energy saving electrical devices in the hotel and will augment solar power which shall have a huge economic saving. Other measures will include:

1. Staff shall be sensitized to switch off machinery, equipment and lights when not being used.
2. Install energy saving bulbs and fluorescent lights.

8.3.5 Ensuring efficient solid waste management

The hotel management will undertake the following measures in order to handle solid wastes:

1. All persons in the hotel will be sentised on solid wastes disposal procedures through the use of sign boards and information notices posted within the hotel.

2. Separation or sorting of wastes shall be undertaken at source through the provision of multiple skips and bins. This shall be placed in all offices and rooms in each floor.
3. Kitchen foods wastes shall be separated from other wastes and shall be used as animal feeds or as manure for garden.
4. All department of the hotel will have a daily cleaning routine with some department such as the bar and restaurants being swept and mopped more than once a day.
5. Cleaning crew will direct the wastes to the holding bay where a further sorting and segregation will take place.
6. Plastic bottles will be collected separately and sold to waste collector as an income generating project.
7. The county government of Machakos will organize collection of garbage at least twice a week.

8.3.6 Managing storm water drainage

The proponent will ensure the design of the building will capture all the storm water and direct the same to the River Iine. The proponent will ensure that gulley traps are laid to capture the large particles so as not to pollute the river.

8.3.7 Liquid waste generation

All the effluent and waste water will be directed through piping to the county government public sewer. The maintenance crew will ensure that the piping is in good condition and will repair immediately a breakage occurs.

The cost benefit analyses of having a waste treatment so that the waste water can be used to beautify the gardens is to high as opposed to connecting to the sewer.

8.3.8 Reducing air emission

The design of the kitchen has a kitchen hood for capturing and directing the kitchen fumes to the air and the proponent will ensure the regular service and maintenance of the same. The design of the laundry allows for cross ventilation in the room to enable the presence of fresh air. The laundry will also have fans to extract bad air and to help in air circulation.

8.3.9 Safety and Health concerns

The hotel management has committed to implementing the OSHA regulations on all matters pertinent to the hotel operations.

The hotel management will constitute a safety and health committee and will empower the committee to undertake its mandate.

The hotel management will provide personal protective equipment to all its workers.

The hotel management will ensure the industrial gas cylinder is service every 5 years and a certificate to be issued on the same.

8.3.10 Reducing the risk of fire outbreak

The hotel management will implement the regulations contained in The Fire Risk Reduction Rules, 2007 including:

1. Identifying and training a fire fighting team of at least five persons and ensure equal distribution in all department and all shifts.

2. Ensuring that the hotel has adequate and appropriate firefighting equipment together with ensuring the regular service of the same.
3. Ensuring that fire drills are undertaken once a year and identifying a fire assembly point.
4. Ensuring that all fire accidents are properly investigated and recommend corrective measures are undertaken.
5. Develop and implement a fire fighting response and evacuation procedures.

8.3.11 Intervention measures for injuries and accidents

The hotel management will implement the regulations contained in The Factories (First-Aid) Rules, 1977 including:

1. Ensuring an adequate supply of fully stocked First Aid Boxes in every department which is easily assessable.
2. Ensuring the First Aid Boxes are properly labeled "First Aid'.
3. Ensuring the identification and training of first aid team according to department and to shifts at the hotel.

8.3.12 Reducing security concerns

The issue of security including the acts of terrorist is a major concern today and the hotel management undertakes to carry out the following actions:

1. The management to ensure that all its vehicles and trucks are locked when in parking.
2. The management to have signage encouraging all owners of vehicles to lock their cars when in parking.
3. The management to have security guards patrolling the premises and on the lookout for security concerns.
4. The management to capture details of guests at the reception. Guest arriving by car to be checked at the gate for terrorism explosives and details of the car to be captured. On entering the hotel, all people are to go through frisking by security guards.
5. The hotel to install CCTV camera and to have the information backed up off site.
6. The security team to undergo security training at least once a year from a qualified security expert.
7. At the gate house and reception, contacts of the OCS, Fire department and ambulance to be displayed so that a quick respond can done by those on the ground.
8. Install a siren for alerting the general public on security emergency.

8.4 Mitigation measures of decommission phase impacts

8.4.1 Rehabilitation

The structure shall be demolished and the foundation shall be undone. All underground cables, pipes and structures shall be dismantled and uprooted. The debris shall be removed from the site and the land shall be backfilled.

The appropriate topsoil shall be imported to the site and the suitable vegetative cover shall be planted.

8.4.2 Efficient waste management

In order to manage waste, the following measures will need to be put in place:

1. Ensure adequate provision of toilets in the site.
2. Cordon of the demolition site.
3. To encourage recycling of construction materials to avoid wastages.
4. To encourage the refurbishing of damaged construction materials including doors for sale or use in other construction sites.
5. Separation of wastes into biodegradable and non-biodegradable.
6. Use NEMA licensed transporters to cart away wastes to NEMA certified dumpsites.

8.4.3 Job creation

General and specialized workers will be employed and preference should be given to those from the immediate area.

8.4.4 Minimization of dust generation and emission

The programme to reduce dust and exhaust fumes emission will be similar to those in the construction phases:

General procedures

1. The contractor will develop a standard approach to handling all air emission throughout all the different activities in the site.
2. The contractor and the proponent to be extremely strict in following the work program in order to minimize the amount of time air pollution can happen.

Dust control procedures

1. Ensure all supply trucks carry loose materials are covered.
2. Ensure hoarding of 2.4 metres is erected around the site boundary.

Exhaust fumes control measures

1. Ensure all diesel powered machinery and equipment together with supply trucks to have their engines switch off when not in use.
2. Discourage gunning of engines on site.
3. Encourage engine service and maintenance to the manufactures specification.

8.4.5 Minimization of noise and machine vibration

The programme to reduce noise and machine vibration will be similar to those in the construction phases:

The contractor and proponent will implement the relevant sections of the EMCA (Noise and Excessive Vibration Pollution) (Control) Regulations, 2009. In this regard they shall undertake as follows:

1. Restrict construction activities to the hours of 8.00 to 5.00 pm.
2. Encourage supply trucks drivers to avoid hooting and gunning engines on site in order to reduce the noise level.
3. Ensure all contractors machinery, equipment, vehicles and trucks are well serviced and maintained.
4. Encourage all trucks and machinery to switch off the engines when not in use.
5. Encourage the use of PPE for ear protection for areas and activities where noise levels are expected to exceed the recommended levels.

8.4.6 Risk reduction at site of accidents and injuries

The demolition exercise is expected to be short but very vigorous and dangerous. The proponent and the contractor agreed to undertake the following:

1. Implement the relevant sections of the OSHA.
2. Ensure personal protective equipment for all construction workers.

8.4.7 Application for permits and disconnection licenses

The proponent is to apply for demolition permits and to apply for disconnection from the utilities company.

8.5 Anticipated impacts and mitigation measures in construction phase (table form)

NO.	ACTIVITY	IMPACTS	MITIGATION MEASURES	RESPONSIBLE	INDICATORS
1.	Employment.	Job creation.	Ensure local people are given priority or preference in employment opportunities. At least 2/3 of all local workforce should be local people.	Project manager and contractor.	Employment records.
2.	Clearing of construction and building site.	Loss of trees and vegetation	Demarcation of project site and contractor's site yard.	Architect, contractor and Project manager.	Survey pegs on the ground.
			Restrict movement of vehicles to the project site and not beyond.	Contractor and project manager.	Signage on ground.
			Adherence to work programme.	Contractor and project manager.	Work programme.
3.	Efficient sourcing and use of raw material	Accumulation of material on site.	Order as per the bill of quantities.	Contractor and project manager.	Records of purchases.
			Order from NEMA approved suppliers.	Contractor and project manager.	Bill of Quantities.
			Order from registered VAT vendors.	Contractor and project manager.	Check for VAT receipts.
			Recycle construction materials.	Contractor and project manager.	Bill of quantities.
4.	Construction activities.	Minimization of noise and vibration	Apply of a Noise license.	Contractor and proponent.	Application form and payment fees.
		Reduce working hours.	Restrict construction activities to the hours of 8.00 to 5.00 pm.	Project manager and contractor.	Work schedule.
		Night work.	No supplies at night.	Project manager and contractor.	Security book records.

		Noise at site.	No hooting and gunning of engines.	Project manager and contractor.	Visual inspections.
		Noise at site.	Service programme for equipment and machinery.	Project manager and contractor.	Service records.
		Noise at site.	Switch off engines on site when not in use.	Project manager and contractor.	Visual inspections and signage
		Noise at site	Encourage the use of PPE for ear protection.	Project manager and contractor	Workers uniform record book.
5.	Construction activities.	Minimization of dust generation and emission	The contractor will develop a standard approach to handling all air emission throughout all the different activities in the site.	Project manager and contractor.	Published programme.
		Reduce generation of emissions.	Follow work programme to the letter.	Project manager and contractor.	Work programme.
		Dust control procedures.	Ensure the construction site is watered when necessary.	Contractor.	Visual inspections.
			Ensure all supply trucks carry loose materials are covered.	Contractor, supplier and project manager.	Visual inspections.
			Encourage the use of electrical equipment and machinery instead of diesel powered engines.	Project manager and contractor.	Visual inspections.
			Buckets being carried by crane and machine hoist should be enclosed to avoid spill over.	Project manager and contractor.	Visual inspections.
			Ensure hoarding of 2.4 metres is erected around the site boundary.	Project manager and contractor.	Material purchase records.
			During construction activities where scaffolding is used, ensure adequate netting, sheeting or dust screens.	Project manager and contractor.	BQ quantities and purchase

					records.
		Exhaust fumes control measures	Ensure all diesel powered machinery and equipment together with supply trucks to have their engines switch off when not in use.	Project manager and contractor.	Visual inspections.
			Discourage gunning of engines on site.	Project manager and contractor.	Visual inspections.
			Encourage engine service and maintenance to the manufactures specification.	Project manager and contractor.	Service records.
6.	Material control procedures and process.	Minimization of construction waste.	The ordering of the construction material to be timed to the work programme to avoid having idle material on site.	Project manager and contractor.	Purchase records.
		Ordering of material.	The contractor is encouraged to purchase high value and high quality construction material which will be able to last long and avoid wastages.	Project manager and contractor.	Purchase records.
		Damaged and reject materials.	To encourage recycling of construction materials to avoid wastages.	Project manager and contractor.	Visual inspections.
		Damaged materials.	To encourage the refurbishing of damaged construction materials including doors for sale or use in other construction sites.	Project manager and contractor.	Sale estimates.
		Toilets.	Ensure adequate toilet facilities on site.	Project manager and contractor.	BQ estimates.
		Waste materials.	Transport waste materials to NEMA certified dumpsites using NEMA certified transporters.	Project manager and contractor.	Visual inspections.
7.	Storm water	Controlling soil erosion, water logging	In order to reduce run-off velocity – terracing and levelling of the compact areas on site.	Project manager and contractor.	Visual inspections.
		Water runoff.	Dig trenches and cut off drains to channel the runoff to the drainages.	Project manager and contractor.	Visual inspections.
		Water runoff.	Begin with one construction sector at a time and complete	Project manager	Work

	management.		before moving to the next site.	and contractor.	programme.
		Preservation of flora.	Restrict movement of vehicles and trucks to existing roads and not to compact areas that are not due for construction.	Project manager and contractor.	Signage on roads for directions.
8.	Water use in site.	Minimization of water use	Purchase holding tanks.	Project manager and contractor.	Purchase records.
			Signage for water sensitization.	Project manager and contractor.	Visual inspections.
9.	Construction activities.	Minimization of insecurity	The contractor to cordon off the construction place and to have one gate for access.	Project manager and contractor.	Design drawings.
		Workers attendance sheet.	The contractor shall have a register of all construction workers on site and shall ensure only those on the register are allowed on site.	Project manager and contractor.	Security records.
		Visitor's identification.	The contractor shall capture the details of all visitors and supply trucks into the site.	Project manager and contractor.	Security records.
		Security oversight.	The contractor shall hire security guards to ensure no unauthorized people are in the site 24 hrs. a day.	Project manager and contractor.	Engagement records.
			Contractor to employ personnel with good conduct certificates.	Contractor.	Employment records.
10.	Construction activities.	Controlling of traffic	Have proper signage showing directions and speed limits.	Project manager and contractor	Signage.
			Ensure supply trucks bring materials during the day and preferably at off peak time.	Project manager and contractor	Procurement records.
11.	Minimization of risks of accidents and injuries to workers	Safety and health concerns.	Implement the relevant sections of the OSHA.	Project manager and contractor.	Safety and health committee minutes.
		Safety concerns	Employ a Safety and Health Officer on site.	Project manager and contractor.	
		Registration of workplace.	Contractor will register the site as a workplace.	Project manager and contractor.	Application form and

	Safety and health concerns.				payment receipt.
		General register.	Proponent and Contractor will maintain a general register where all matters pertaining to OSHA will be stored.	Project manager and contractor.	Purchase book.
		Access ways to safe.	Design of steps, stairs, passages and gangways to be of good quality, have the necessary dimension and to be properly constructed.	Project manager and contractor.	Design drawings and BQ.
		Access ways to safe.	Each floor to have a safe means of access through staircase and lifts.	Project manager and contractor.	Design drawings and BQ.
		Warning and safety signs.	All workplace procedures and activities that pose a risk to workers during construction should have adequate warning signs.	Project manager and contractor.	Signage.
		Air pollution from construction activities.	All workers in areas where air pollution is expected to have adequate dust and other PPE.	Project manager and contractor.	Procurement records and employee uniform data records.
		Drinking water	Contractor to purchase a 5,000.00 litre tank for fresh drinking water.	Project manager and contractor.	Procurement records.
		Provide lockers.	Contractor to set aside a place for storing home clothes and personal effects.	Project manager and contractor.	Procurement records.
		Safety and health concerns.	Ensure personal protective equipment for all construction workers.	Project manager and contractor.	Procurement records.
	First aid procedures.	First aid box and display requirements.	Ensure adequate provision of first aid boxes at the construction site and ensure they are properly labelled “First Aid’.	Project manager and contractor.	Procurement record.
		First Aid training.	Ensure an adequate number of persons are trained in first aid procedures.	Project manager and contractor.	Safety and Health committee

					minutes.
	Fire fighting procedures.	Equipment provision.	Ensure the construction site has adequate fire fighting equipment.	Project manager and contractor.	Purchase receipts.
		Equipment provision.	Ensure fire fighting equipment is serviced every six months and certificate is issued.	Project manager, fire consultant and contractor.	Consultant quotation.
		Fire preparedness.	Regularly inspect workplace for potential fire risks and recommend remedial measures.	Safety officer and contractor.	Inspections.
		Training of fire fighters.	Ensure a sufficient number of people are trained in fire fighting procedures.	Safety officer and contractor.	Safety minutes.
		Fire assembly points.	Identify fire assembly points and have signage showing directions thereto.	Safety officer and contractor.	Safety minutes.
	Training procedures.	New workers.	Ensure all new workers are trained on work procedures and are under a supervisor at all times.	Project manager and contractor.	Training records.
12.	Machine maintenance.	Service of equipment, machines and vehicles.	Ensure all machines, equipment, vehicles, trucks and cranes are serviced as per manufacturer's specification.	Project manager and contractor.	Service records.
			The weighbridge station to be serviced once a year and certificate to be issued.	Project manager and contractor.	Certificate of compliance.
			Hoists and lifts to be kept in good mechanical condition and to obtain a certificate of compliance every six months.	Project manager, service engineer and contractor.	Certificate of compliance.
			Cranes are too be kept in good mechanical condition and the proponent/contractor to obtain a certificate of compliance every 14 months.	Project manager, service engineer and contractor.	Certificate of compliance.
13.	Pollution of river and stream	Choking of water bodies.	Engage WRMA to undertake pegging for the two water bodies.	Proponent.	Works completion certificate.
14.	Storm water damage.	Soil erosion.	Construct gabions along the stream and the River Iine in order to prevent further damage to the water bodies.	Project manager, structural engineer and contractor.	Visual inspections and cost estimates.

8.6 Anticipated impacts and mitigation measures in operation phase (table form)

NO.	ACTIVITY	IMPACTS	MITIGATION MEASURES	RESPONSIBLE	INDICATORS
1.	Operations.	Increase of income opportunities	Ensure the local community women have the chance to tender for supply of food stuff. Give preference to the senior members of community in job employment. Ensure tenders are displayed at the Chief's office to ensure local participation.	Hotel management.	Tender award. Employment records. Visual inspections.
2.	Operations	Traffic management	Traffic signs to be displayed to direct vehicles to and from the building.	HR.	Signage.
			Traffic marshal to monitor the traffic and to assist where needs be.	Security supervisor and traffic marshal.	Visual inspections.
3.	Provision of water during operations.	Ensure efficient water use	Install water-conserving automatic taps and toilets.	Proponent.	BQ for mechanical works.
			All workers and guests shall be sentised on how to use water efficiently.	Hotel management.	Signage.
			Have the water from the borehole tested.	Proponent.	Water quality parameters.
4.	Energy provision.	Minimized Energy consumption	Staff shall be sensitized to switch off machinery, equipment and lights when not being used.	Hotel management.	Signage.
			Install energy saving bulbs and fluorescent lights.	Hotel management.	Purchase records.
5.	Waste disposal	Ensuring efficient solid waste management.	All persons in the hotel will be sentised on solid wastes disposal procedures through the use of sign boards and information notices posted within the hotel.	Hotel management.	Signage.

			Separation or sorting of wastes shall be undertaken at source through the provision of multiple skips and bins. This shall be placed in all offices and rooms in each floor.	Maintenance manager.	Visual inspections.
			Kitchen foods wastes shall be separated from other wastes and shall be used as animal feeds or manure for the gardens.	Kitchen crew, marketing team and grounds keeping crew.	Separate bins.
			All department of the hotel will have a daily cleaning routine with some department such as the bar and restaurants being swept and mopped more than once a day	Cleaning crew.	Cleaning rooster.
			Cleaning crew will direct the wastes to the holding bay where a further sorting and segregation will take place.	Cleaning crew.	Yard inspections.
			Plastic bottles will be collected separately and sold to waste collector as an income generating project.	Cleaning crew.	Yard inspections.
			The county government of Machakos will organize collection of garbage at least twice a week.	Yard manager.	Visual inspections.
6.	Rain damage.	Managing storm water drainage	The proponent will ensure the design of the building will capture all the storm water and direct the same to the River Iine. The proponent will ensure that gulley traps are laid to capture the large particles so as not to pollute the river.	Proponent.	Design drawings for mechanical works.
7.	Effluent discharge.	Liquid waste generation.	All the effluent and waste water will be directed through piping to the county government public sewer.	Proponent.	Drainage system drawings and specification.
			The maintenance crew will ensure that the piping is in good condition and will repair immediately a breakage occurs.	Maintenance manager.	Visual inspections.

8.	Air pollution	Reducing air emission	Ensure the kitchen hood and the fans in the laundry are serviced and in working condition.	Maintenance manager.	Visual inspections and service maintenance program.
9.	Safety issues	Safety and Health concerns	Register the Hotel as a Workplace under OSHA.	Proponent.	Application form and payment receipts.
			The hotel management will constitute a safety and health committee and will empower the committee to undertake its mandate.	Proponent and HR.	Safety and health minutes.
			The hotel management will provide personal protective equipment to all its workers.	Hotel management.	Workers uniform records.
			The hotel management will ensure the industrial gas cylinder is serviced every 5 years and a certificate to be issued on the same.	Hotel management and service engineer.	Service records.
		Provide lockers.	Proponent to set aside a place for storing home clothes and personal effects.	Project manager and contractor.	Procurement records.
		Maintenance of lifts	Hotel lifts to be kept in good mechanical condition and to obtain a certificate of compliance every six months.	Project manager, service engineer and contractor.	Service records.
10.	Fire issues	Reducing the risk of fire outbreak	Identifying and training a fire fighting team of at least five persons and ensure equal distribution in all department and all shifts.	Safety and health committee.	Safety and health minutes.
			Ensuring that the hotel has adequate and appropriate fire fighting equipment together with ensuring the regular service of the same.	Hotel management.	Purchase records and visual inspections.
			Ensuring that fire drills are undertaken once a year and identifying a fire assembly point	Safety and health committee.	Safety and health minutes.
			Ensuring that all fire accidents are properly investigated and recommend corrective measures are undertaken.	Hotel management.	General register, medical reports.

			Develop and implement a fire fighting response and evacuation procedures.	Hotel management.	Safety and health minutes.
11.	Injuries and accidents.	Intervention measures for injuries and accidents	Ensuring an adequate supply of fully stocked First Aid Boxes in every department which is easily assessable.	HR.	Procurement records.
			Ensuring the First Aid Boxes are properly labelled "First Aid'	HR.	Signage.
			Ensuring the identification and training of first aid team according to department and to shifts at the hotel.	Safety and Health committee.	Safety and health minutes.
12.	Oversight of security concerns.	Reducing security concerns	The management to ensure that all its vehicles and trucks are locked when in parking.	Security and transport manager.	Visual inspections.
		Car theft prevention.	The management to have signage encouraging all owners of vehicles to lock their cars when in parking	Hotel management.	Signage.
		Security oversight.	The management to have security guards patrolling the premises and on the lookout for security concerns.	Security manager.	Duty rooster.
		Security information collection.	The management to capture details of guests at the reception.	Hotel management.	Guest check-in record book,
		Security checks.	Guest arriving by car to be checked at the gate for terrorism explosives and details of the car to be captured. On entering the hotel, all people are to go through frisking by security guards.	Security manager.	Barrier at gate and radar detection equipment at entrance.
		CCTV installation.	The hotel to install CCTV camera and to have the information backed up off site.	Hotel management.	Pro-forma invoice.
		Training.	The security team to undergo security training at least once a year from a qualified security expert.	Hotel management.	Training records.
		Alert provision.	At the gate house and reception, contacts of the OCS, Fire department and ambulance to be displayed so	Hotel management.	Signage.

			that a quick respond can done by those on the ground.		
		Siren.	Install a siren for alerting the general public on security emergency.	Hotel management.	Visual inspections.

8.5 Anticipated impacts and mitigation measures in decommission phase (table form)

NO.	ACTIVITY	IMPACTS	MITIGATION MEASURES	RESPONSIBLE	INDICATORS
1.	Demolition works.	Rehabilitation	The structure shall be demolished and the foundation shall be undone.	Contractor and proponent.	Contract tender.
			All underground cables, pipes and structures shall be dismantled and uprooted.	Mechanical and electrical engineer together with Contractor.	Underground designs and installation maps.
			The debris shall be removed from the site and the land shall be backfilled.	Contractor and NEMA approved transporter.	Visual inspections.
			The appropriate topsoil shall be imported to the site and the suitable vegetative cover shall be planted.	Botanist, geologist, contractor and proponent.	Quotations.
2.	Demolition activities.	Efficient waste management.	Ensure adequate provision of toilets in the site.	Proponent and Contractor.	BQ.
			Cordon of the demolition site.	Proponent and Contractor.	Visual inspection.
			To encourage recycling of construction materials to avoid wastages.	Proponent and Contractor.	Visual inspections.
			To encourage the refurbishing of damaged construction materials including doors for sale or use in other construction sites.	Proponent and Contractor.	Workshop charges.
			Separation of wastes into biodegradable and non-biodegradable.	Contractor.	Visual inspections.
			Use NEMA licensed transporters to cart away wastes to NEMA certified dumpsites.	Contractor and transporters.	Transport quotations.

3.	Employment opportunities.	Job creation	General and specialized workers will be employed and preference should be given to those from the immediate area.	Contractor and proponent.	Employment records.
4.	Air pollutions during demolitions.	Dust control	The contractor will develop a standard approach to handling all air emission throughout all the different activities in the site.	Contractor and proponent.	Dust control procedures guidelines.
			The contractor and the proponent to be extremely strict in following the work program in order to minimize the amount of time air pollution can happen.	Contractor and proponent.	Work programme.
			Ensure all supply trucks carry loose materials are covered	Contractor and proponent.	Purchase records.
			Ensure hoarding of 2.4 metres is erected around the site boundary.	Contractor and proponent.	BQ.
	Air pollutions during demolitions.	Exhaust emission.	Ensure all diesel powered machinery and equipment together with supply trucks to have their engines switch off when not in use.	Contractor and proponent.	Signage.
			Discourage gunning of engines on site.	Contractor and proponent.	Visual inspections.
			Encourage engine service and maintenance to the manufactures specification.	Contractor and proponent.	Service records.
5.	Noise at the demolition site.	Minimization of noise and machine vibration	Restrict construction activities to the hours of 8.00 to 5.00 pm.	Contractor and proponent.	Work programme.
			Encourage supply trucks drivers to avoid hooting and gunning engines on site in order to reduce the noise level.	Contractor and proponent.	Signage.
			Ensure all contractors machinery, equipment, vehicles and trucks are well serviced and maintained.	Contractor and proponent.	Service register.
			Encourage all trucks and machinery to switch off the engines when not in use.	Contractor and proponent.	Visual inspections.

			Encourage the use of PPE for ear protection for areas and activities where noise levels are expected to exceed the recommended levels.	Contractor and proponent.	Workers uniform record book.
6.	Demolition activities.	Risk reduction at site of accidents and injuries	Implement the relevant sections of the OSHA by appointing a safety and health officer on site.	Contractor and proponent.	Appointment letter.
			Ensure personal protective equipment for all construction workers.	Contractor and proponent.	Workers uniform record book.
			Purchase adequate First Aid Boxes. Ensure the first aid boxes are fully stocked.	Contractor and proponent.	Purchase records.
			Ensure First Aid Box is clearly labeled 'First Aid'.	Contractor and proponent.	Visual inspections.
			Identify and train first aid team.	Contractor and proponent.	Training records.
			Identify and provide signage for fire assembly points.	Contractor and proponent.	Visual inspection and signage.
			Provide fire fighting equipment.	Contractor and proponent.	Purchase records.
			Ensure fresh drinking water is on site.	Contractor and proponent.	Visual examinations.
7.	Public utility companies	Application for permits and disconnection licenses	Apply for demolition permits.	Contractor and proponent.	Application form and payment fees.
			Apply for disconnection from the utilities company.	Contractor and proponent.	Application form and payment fees.

CHAPTER NINE

9.0 ENVIRONMENTAL MANAGEMENT PLAN

9.1 Introduction

Environmental Impact Assessment (EIA) is a systematic process of identifying, predicting and evaluating the environmental effects of proposed actions and projects. Special emphasis in EIA is given to the practice of preventing, mitigating and offsetting adverse effects of proposed undertakings. In this section, an environmental management plan is developed which will translate recommended mitigation and monitoring measures into specific actions that will be carried out by the proponent.

The main components included in the EMP are;

- Summary of potential impacts of the proposal.
- Description of the recommended mitigation measures.
- Statement of compliance with relevant standards.
- Allocation of resources and responsibilities.

9.2 Table 1 Environmental Management Plan for construction phase.

9.3 Table 2 Environmental Management Plan for operation phase.

9.4 Table 3 Environmental Management Plan for decommission phase.

9.5 Table 3 Environmental Management Plan for compliance with environmental legislation and regulations.

9.2 EMP impact mitigation measures for construction phase

NO.	IMPACTS	MITIGATION MEASURES	TIME FRAME	RESPONSIBLE	COST ALLOCATION
1.	Job creation..	Ensure local people are given priority or preference in employment opportunities. At least 2/3 of all local workforce should be local people.	From onset until the end.	Project manager and contractor.	Wage bill.
2.	Loss of trees and vegetation	Demarcation of project site and contractor's site yard.	Onset of constructions.	Architect, contractor and Project manager.	BQ.
		Restrict movement of vehicles to the project site and not beyond.	Throughout construction cycle.	Contractor and project manager.	1,000.00 for signage.
		Adherence to work programme.	Throughout construction cycle.	Contractor and project manager.	Nil.
3.	Accumulation of material on site.	Order as per the bill of quantities.	Throughout construction cycle.	Contractor and project manager.	Nil.
		Order from NEMA approved suppliers.	Throughout construction cycle.	Contractor and project manager.	Nil.
		Order from registered VAT vendors.	Throughout construction cycle.	Contractor and project manager.	Nil.
		Recycle construction materials.	Throughout construction cycle.	Contractor and project manager.	Repair and restoration charges.
4.	Minimization of noise and	Apply of a Noise license.	At onset of building works.	Contractor and proponent.	Gazetted charges.

	vibration				
	Reduce working hours.	Restrict construction activities to the hours of 8.00 to 5.00 pm.	Throughout construction cycle.	Project manager and contractor.	Nil.
	Night work.	No supplies at night.	Throughout construction cycle.	Project manager and contractor.	Nil.
	Noise at site.	No hooting and gunning of engines.	Throughout construction cycle.	Project manager and contractor.	Nil.
	Noise at site.	Service programme for equipment and machinery.	When time is due.	Project manager and contractor.	50,000.00 every three months.
	Noise at site.	Switch off engines on site when not in use.	During delivery.	Project manager and contractor.	Nil.
	Noise at site	Encourage the use of PPE for ear protection.	Throughout construction cycle.	Project manager and contractor	1,500.00 for sensitization.
5.	Minimization of dust generation and emission	The contractor will develop a standard approach to handling all air emission throughout all the different activities in the site.	From onset.	Project manager and contractor.	3,000.00 to develop guidelines.
	Reduce generation of emissions.	Follow work programme to the letter.	Throughout construction cycle.	Project manager and contractor.	Nil.
	Dust control procedures.	Ensure the construction site is watered when necessary.	Throughout construction cycle.	Contractor.	Wage bill.
		Ensure all supply trucks carry loose materials are covered.	Throughout construction cycle.	Contractor, supplier and project manager.	4,200.00 for a canvass for each truck.
		Encourage the use of electrical equipment and machinery instead of diesel powered engines.	Throughout construction cycle.	Project manager and contractor.	Nil.
		Buckets being carried by crane and machine hoist	Throughout	Project manager	25,000.00 for

		should be enclosed to avoid spill over.	construction cycle.	and contractor.	renovation.
		Ensure hoarding of 2.4 metres is erected around the site boundary.	At beginning of construction.	Project manager and contractor.	BQ.
		During construction activities where scaffolding is used, ensure adequate netting, sheeting or dust screens.	Throughout construction cycle.	Project manager and contractor.	12,500.00 for a roll of netting.
	Exhaust fumes control measures	Ensure all diesel powered machinery and equipment together with supply trucks to have their engines switch off when not in use.	Throughout construction cycle.	Project manager and contractor.	1,000.00 for signage.
		Discourage gunning of engines on site.	Throughout construction cycle.	Project manager and contractor.	Nil.
		Encourage engine service and maintenance to the manufactures specification.	When the time comes.	Project manager and contractor.	Service charges.
6.	Minimization of construction waste.	The ordering of the construction material to be timed to the work programme to avoid having idle material on site.	Throughout construction cycle.	Project manager and contractor.	Nil.
	Ordering of material.	The contractor is encouraged to purchase high value and high quality construction material which will be able to last long and avoid wastages.	Throughout construction cycle.	Project manager and contractor.	Nil.
	Damaged and reject materials.	To encourage recycling of construction materials to avoid wastages.	Throughout construction cycle.	Project manager and contractor.	Nil.
	Damaged materials.	To encourage the refurbishing of damaged construction materials including doors for sale or use in other construction sites.	Throughout construction cycle.	Project manager and contractor.	Repair and refurnishing quotations.
	Toilets.	Ensure adequate toilet facilities on site.	From onset.	Project manager and contractor.	15,000.00
	Waste materials.	Transport waste materials to NEMA certified dumpsites using NEMA certified transporters.	On needs basis.	Project manager and contractor.	4,000.00-12,000.00 depending on distance.

7.	Controlling soil erosion, water logging	In order to reduce run-off velocity – terracing and levelling of the compact areas on site.	During rainy season.	Project manager and contractor.	30,000.00
	Water runoff.	Dig trenches and cut off drains to channel the runoff to the drainages.	During rainy season.	Project manager and contractor.	15,000.00
	Water runoff.	Begin with one construction sector at a time and complete before moving to the next site.	Throughout construction cycle.	Project manager and contractor.	Nil.
	Preservation of flora.	Restrict movement of vehicles and trucks to existing roads and not to compact areas that are not due for construction.	Throughout construction cycle.	Project manager and contractor.	1,000.00 for signage.
8.	Minimization of water use	Purchase holding tanks.	At onset of operations.	Project manager and contractor.	75,000.00 for 10,000litre tank.
		Signage for water sensitization.	Throughout construction cycle.	Project manager and contractor.	1,000.00
9.	Minimization of insecurity	The contractor to cordon off the construction place and to have one gate for access.	From onset and within one month.	Project manager and contractor.	BQ.
	Workers attendance sheet.	The contractor shall have a register of all construction workers on site and shall ensure only those on the register are allowed on site.	From onset.	Project manager and contractor.	1,000.00 for employment cards.
	Visitor's identification .	The contractor shall capture the details of all visitors and supply trucks into the site.	Throughout construction cycle.	Project manager and contractor.	500.00 for record books.
	Security oversight.	The contractor shall hire security guards to ensure no unauthorized people are in the site 24 hrs. a day.	Throughout construction cycle.	Project manager and contractor.	16,000.00 per guard.
		Contractor to employ personnel with good conduct certificates.	Throughout construction cycle.	Contractor.	Nil.
10.	Controlling of traffic	Have proper signage showing directions and speed limits.	Throughout construction cycle.	Project manager and contractor	1,500.00 for signage.
		Ensure supply trucks bring materials during the day and preferably at off peak time.	Throughout construction cycle.	Project manager and contractor	Nil.

11.	Safety and health concerns.	Implement the relevant sections of the OSHA.	Throughout construction cycle.	Project manager and contractor.	Wage bill.
	Safety concerns	Employ a Safety and Health Officer on site.	From onset.	Project manager and contractor.	
	Registration of workplace.	Contractor will register the site as a workplace.	Within one month.	Project manager and contractor.	20,000.00
	General register.	Proponent and Contractor will maintain a general register where all matters pertaining to OSHA will be stored.	Within one month.	Project manager and contractor.	1,000.00
	Access ways to safe.	Design of steps, stairs, passages and gangways to be of good quality, have the necessary dimension and to be properly constructed.	Planning stage.	Project manager and contractor.	Consultants charges for design and material quantifying.
	Access ways to safe.	Each floor to have a safe means of access through staircase and lifts.	Planning and construction stage.	Project manager and contractor.	Design costs in BQ.
	Warning and safety signs.	All workplace procedures and activities that pose a risk to workers during construction should have adequate warning signs.	Throughout construction cycle.	Project manager and contractor.	15,000.00 for all signage's for construction period.
	Air pollution from construction activities.	All workers in areas where air pollution is expected to have adequate dust and other PPE.	Throughout construction cycle.	Project manager and contractor.	75,000.00 for initial purchase and top up on reordering.
	Drinking water	Contractor to purchase a 5,000.00 litre tank for fresh drinking water.	Onset.	Project manager and contractor.	45,000.00
	Provide lockers.	Contractor to set aside a place for storing home clothes and personal effects.	Within two months.	Project manager and contractor.	15,000 for work benches
	Safety and health	Ensure personal protective equipment for all construction workers.	Throughout construction cycle.	Project manager and contractor.	75,000.00 for initial purchase

	concerns.				and top up on reordering.
	First aid box and display requirements.	Ensure adequate provision of first aid boxes at the construction site and ensure they are properly labelled "First Aid'.	First one month.	Project manager and contractor.	5,000.00 for each including stocking.
	First Aid training.	Ensure an adequate number of persons are trained in first aid procedures.	Within two months.	Project manager and contractor.	1,250.00 per person at St. John's Ambulance.
	Equipment provision.	Ensure the construction site has adequate fire fighting equipment.	Within two months.	Project manager and contractor.	150,000.00
	Equipment provision.	Ensure fire fighting equipment is serviced every six months and certificate is issued.	Every six months.	Project manager, fire consultant and contractor.	Fire marshal quotation.
	Fire preparedness.	Regularly inspect workplace for potential fire risks and recommend remedial measures.	Every two weeks.	Safety officer and contractor.	Wage bill.
	Training of fire fighters.	Ensure a sufficient number of people are trained in fire fighting procedures.	Within two months and every six months.	Safety officer and contractor.	2,500.00 per person.
	Fire assembly points.	Identify fire assembly points and have signage showing directions thereto.	Within two months.	Safety officer and contractor.	Nil.
	New workers.	Ensure all new workers are trained on work procedures and are under a supervisor at all times.	Throughout construction cycle.	Project manager and contractor.	Wage bill.
12.	Service of equipment, machines and vehicles.	Ensure all machines, equipment, vehicles, trucks and cranes are serviced as per manufacturer's specification.	Service time table.	Project manager and contractor.	50,000.00 every three months.
		The weighbridge station to be serviced once a year and certificate to be issued.	Every 12 months.	Project manager and contractor.	8,500.00 per year.
		Hoists and lifts to be kept in good mechanical condition and to obtain a certificate of compliance every six months.	Every 6 months.	Project manager, service engineer	25,000.00

				and contractor.	
		Cranes are too be kept in good mechanical condition and the proponent/contractor to obtain a certificate of compliance every 14 months.	Every 14 months.	Project manager, service engineer and contractor.	
13.	Choking of water bodies.	Engage WRMA to undertake pegging for the two water bodies.	Planning stage.	Proponent.	WRMA quotation.
	Soil erosion.	Construct gabions along the stream and the River Iine in order to prevent further damage to the water bodies.	Before rainy season and during construction.	Project manager, structural engineer and contractor.	Bill of quantities rates.

9.3 Environmental Management Plan for operation phase

NO.	IMPACTS	MITIGATION MEASURES	TIME FRAME	RESPONSIBLE	COST ALLOCATION
1.	Increase of income opportunities	Ensure the local community women have the chance to tender for supply of food stuff. Give preference to the senior members of community in job employment. Ensure tenders are displayed at the Chief's office to ensure local participation.	From onset.	Hotel management.	Tender awards and employment records.
2.	Traffic management	Traffic signs to be displayed to direct vehicles to and from the building.	From onset.	HR.	1,000.00 for signage.
		Traffic marshal to monitor the traffic and to assist where needs be.	From onset.	Security supervisor and traffic marshal.	Wage bill.
3.	Ensure efficient water use	Install water-conserving automatic taps and toilets.	From onset and on replacement.	Proponent.	Purchase quotations and BQ estimates.
		All workers and guests shall be sentised on how to use water efficiently.	Throughout cycle.	Hotel management.	Wage bill and 1,000.00 for written guidelines.
		Have the water from the borehole tested.	Planning stage.	Proponent.	8,000.00
4.	Minimized Energy consumption	Staff shall be sensitized to switch off machinery, equipment and lights when not being used.	Throughout cycle.	Hotel management.	1,000.00 for signage.
		Install energy saving bulbs and fluorescent lights.	From onset and on replacement.	Hotel management.	BQ.
5.	Ensuring efficient solid waste management	All persons in the hotel will be sentised on solid wastes disposal procedures through the use of sign boards and information notices posted within the hotel.	Throughout cycle.	Hotel management.	5,000.00 for signage.

		Separation or sorting of wastes shall be undertaken at source through the provision of multiple skips and bins. This shall be placed in all offices and rooms in each floor.	Throughout cycle.	Maintenance manager.	125,000.00
		Kitchen foods wastes shall be separated from other wastes and shall be used as animal feeds or manure for the gardens.	Throughout cycle.	Kitchen crew, marketing team and grounds keeping crew.	Wage bill.
		All department of the hotel will have a daily cleaning routine with some department such as the bar and restaurants being swept and mopped more than once a day	Throughout cycle.	Cleaning crew.	Wage bill.
		Cleaning crew will direct the wastes to the holding bay where a further sorting and segregation will take place.	Once per day.	Cleaning crew.	Wage bill.
		Plastic bottles will be collected separately and sold to waste collectors as an income generating project.	Collection daily and selling every two weeks when they have accumulated.	Cleaning crew and marketing team.	Wage bill.
		The county government of Machakos will organize collection of garbage at least twice a week.	Twice per week.	Yard manager.	Free or 50,000.00 per month for private collector.
6.	Managing storm water drainage	The proponent will ensure the design of the building will capture all the storm water and direct the same to the River Iine. The proponent will ensure that gulley traps are laid to capture the large particles so as not to pollute the river.	Planning stage.	Proponent and mechanical engineer.	BQ.
7.	Liquid waste generation	All the effluent and waste water will be directed through piping to the county government public sewer.	Throughout cycle.	Maintenance manager.	Wage bill.

		The maintenance crew will ensure that the piping is in good condition and will repair immediately a breakage occurs.	Weekly.	Maintenance manager.	Wage bill and repair cost estimates.
8.	Reducing air emission	Ensure the kitchen hood and the fans in the laundry are serviced and in working condition.	Weekly.	Maintenance manager.	30,000.00 per half year.
9.	Safety and Health concerns	Register the Hotel as a Workplace under OSHA.	From onset.	Proponent.	20,000.00
		The hotel management will constitute a safety and health committee and will empower the committee to undertake its mandate.	Two months.	Proponent and HR.	Wage bill.
		The hotel management will provide personal protective equipment to all its workers.	From onset.	Hotel management.	250,000.00 initial cost plus replacement costs as they occur.
		The hotel management will ensure the industrial gas cylinder is serviced every 5 years and a certificate to be issued on the same.	On installation and every 5 years.	Hotel management and service engineer.	Service quotation from engineer.
		Provide lockers.	Proponent to set aside a place for storing home clothes and personal effects.	Project manager and contractor.	125,000.00
		Hotel lifts to be kept in good mechanical condition and to obtain a certificate of compliance every six months.	Every 6 months.	Project manager, service engineer and contractor.	25,000.00
10.	Reducing the risk of fire outbreak	Identifying and training a fire fighting team of at least five persons and ensure equal distribution in all department and all shifts.	Three months and every six months.	Safety and health committee.	2,500.00 per person.
		Ensuring that the hotel has adequate and appropriate fire fighting equipment together with ensuring the regular service of the same.	Every six months.	Hotel management.	350,000.00 as a start-up cost estimate.

		Ensuring that fire drills are undertaken once a year and identifying a fire assembly point	After 6 months and 12 months thereafter.	Safety and health committee.	Wage bill.
		Ensuring that all fire accidents are properly investigated and recommend corrective measures are undertaken.	After every incident.	Hotel management and fire Marshalls.	Wage bill.
		Develop and implement a fire fighting response and evacuation procedures.	After 6 months.	Hotel management and safety and health committee.	50,000.00
11.	Intervention measures for injuries and accidents	Ensuring an adequate supply of fully stocked First Aid Boxes in every department which is easily assessable.	Throughout cycle.	HR. and safety and health committee.	5,000.00 for each.
		Ensuring the First Aid Boxes are properly labelled "First Aid'	On purchase of First Aid Box.	HR.	Nil.
		Ensuring the identification and training of first aid team according to department and to shifts at the hotel.	After two months and every six months thereafter.	Safety and Health committee.	1,250.00 per person.
12.	Reducing security concerns	The management to ensure that all its vehicles and trucks are locked when in parking.	Daily.	Security and transport manager.	Wage bill.
	Car theft prevention.	The management to have signage encouraging all owners of vehicles to lock their cars when in parking	After one week.	Hotel management.	1,000.00 for signage.
	Security oversight.	The management to have security guards patrolling the premises and on the lookout for security concerns.	Daily.	Security manager.	Wage bill.
	Security information collection.	The management to capture details of guests at the reception.	Daily.	Hotel management.	Nil. – details captured by the computer system.
	Security checks.	Guest arriving by car to be checked at the gate for terrorism explosives and details of the car to be captured. On entering the hotel, all people are to go	Throughout cycle.	Security manager.	Wage bill + 3,500 for each frisky gadget.

		through frisking by security guards.			
	CCTV installation.	The hotel to install CCTV camera and to have the information backed up off site.	From onset.	Hotel management.	2,500,000.00 for entire hotel.
	Training.	The security team to undergo security training at least once a year from a qualified security expert.	Two months and after every six months thereafter.	Hotel management.	20,000.00
	Alert provision.	At the gate house and reception, contacts of the OCS, Fire department and ambulance to be displayed so that a quick respond can done by those on the ground.	Immediately.	Hotel management.	500.00 for display signage.
	Siren.	Install a siren for alerting the general public on security emergency.	From onset.	Hotel management.	25,000.00 for industrial siren.

9.4 Environmental Management Plan for decommission phase

NO.	IMPACTS	MITIGATION MEASURES	TIME FRAME	RESPONSIBLE	COST ALLOCATION
1.	Rehabilitation.	The structure shall be demolished and the foundation shall be undone.	From onset.	Contractor and proponent.	BQ.
		All underground cables, pipes and structures shall be dismantled and uprooted.	After demolition and clearing of debris.	Mechanical and electrical engineer together with Contractor.	BQ.
		The debris shall be removed from the site and the land shall be backfilled.	After demolition.	Contractor and NEMA approved transporter.	BQ.
		The appropriate topsoil shall be imported to the site and the suitable vegetative cover shall be planted.	After clearing of site and backfilling.	Botanist, geologist, contractor and proponent.	BQ.
2.	Efficient waste management	Ensure adequate provision of toilets in the site.	From onset.	Proponent and Contractor.	15,000.00 per each.
		Cordon of the demolition site.	From onset.	Proponent and Contractor.	BQ.
		To encourage recycling of construction materials to avoid wastages.	During clearing and demolition.	Proponent and Contractor.	Nil.
		To encourage the refurbishing of damaged construction materials including doors for sale or use in other construction sites.	During clearing.	Proponent and Contractor.	Repair and refurbishing cost.
		Separation of wastes into biodegradable and non-biodegradable.	Throughout cycle.	Contractor.	Wage bill.
		Use NEMA licensed transporters to cart away wastes to NEMA certified dumpsites.	Throughout cycle.	Contractor and transporters.	4,000.00-12,000.00 per trip depending on distance.

3.	Job creation	General and specialized workers will be employed and preference should be given to those from the immediate area.	Throughout cycle.	Contractor and proponent.	Nil.
4.	Dust control	The contractor will develop a standard approach to handling all air emission throughout all the different activities in the site.	From onset.	Contractor and proponent.	3,000.00 to develop guidelines.
		The contractor and the proponent to be extremely strict in following the work program in order to minimize the amount of time air pollution can happen.	Throughout cycle.	Contractor and proponent.	Nil.
		Ensure all supply trucks carry loose materials are covered	Throughout cycle.	Contractor and proponent.	4,200.00 for a canvass for each truck.
		Ensure hoarding of 2.4 metres is erected around the site boundary.	First one month.	Contractor and proponent.	BQ.
	Exhaust emission.	Ensure all diesel powered machinery and equipment together with supply trucks to have their engines switch off when not in use.	Throughout cycle.	Contractor and proponent.	1,000.00 for signage.
		Discourage gunning of engines on site.	Throughout cycle.	Contractor and proponent.	Nil.
		Encourage engine service and maintenance to the manufactures specification.	On need basis.	Contractor and proponent.	Service charge.
5.	Minimization of noise and machine vibration	Restrict construction activities to the hours of 8.00 to 5.00 pm.	Throughout cycle.	Contractor and proponent.	Wage bill.
		No hooting and gunning of engines.	Throughout cycle.	Contractor and proponent.	Nil.
		Service programme for equipment and machinery.	Throughout cycle.	Contractor and proponent.	50,000.00 every three months.
		Switch off engines on site when not in use.	Throughout cycle.	Contractor and proponent.	Nil.
		Encourage the use of PPE for ear protection.	Throughout cycle.	Contractor and	1,500.00 for

				proponent.	sensitization.
6.	Risk reduction at site of accidents and injuries	Implement the relevant sections of the OSHA by appointing a safety and health officer on site.	From onset.	Contractor and proponent.	Wage bill.
		Ensure personal protective equipment for all construction workers.	Throughout cycle.	Contractor and proponent.	50,000.00
		Purchase adequate First Aid Boxes. Ensure the first aid boxes are fully stocked.	From onset.	Contractor and proponent.	5,000.00 for each.
		Ensure First Aid Box is clearly labeled 'First Aid'.	On purchase.	Contractor and proponent.	Nil.
		Identify and train first aid team.	30 days.	Contractor and proponent.	1,250.00 per person for St. John's Ambulance.
		Identify and provide signage for fire assembly points.	14 days.	Contractor and proponent.	1,000.00 for signs.
		Provide fire fighting equipment.	14 days.	Contractor and proponent.	25,000.00
		Ensure fresh drinking water is on site.	Immediately.	Contractor and proponent.	45,000.00 to purchase a 5,000 litre tank.
7.	Application for permits and disconnection licenses	Apply for demolition permits.	Before demolition.	Contractor and proponent.	Gazetted charges.
		Apply for disconnection from the utilities company.	Before demolition.	Contractor and proponent.	Gazetted charges.

9.5 EMP FOR COMPLIANCE WITH ENVIRONMENTAL LEGISLATION AND REGULATIONS

NO.	REGULATION/ACT	COMPLIANCE	TIME FRAME	RESPONSIBLE.	COST ALLOCATION
1.	**The Building Code 1968** Section 1-4 of the First Schedule spells out how drawing will be produced, who will sign them for submission, number of copies to be produced and the duty of the municipal to retain copies whether approved or not.	ISOE, D. M. have drawn, submitted and obtained approval for the architectural drawings.	Planning.	Proponent and project team.	Already done.
	Section 15 requires that all construction sites to have sufficient temporary latrine accommodation.	Contractor to build toilets at site.	Construction and decommission.	Proponent and contractor.	EMP construction and decommission.
	Section 16 requires the contractor/proponent to provide a detailed work plan and to deposit the same with the council. The work plan shall show who is supervising the construction, frequency and evidence of material testing if required, date of intended completion and other matters that may be required.	Contractor to prepare work plan.	Planning and start of construction.	Project manager and contractor.	BQ.
	Section 20 requires all building to have a secondary means of access while 34 gives the power to the council to request for testing of materials and to cause the removal of any materials that do not meet the required standards.	Design of building to have secondary means of access – staircase and lift.	Planning and construction.	Architect and contractor.	Architects drawing – architects fees. Testing of materials – lumpsum of 300,000.00 for full project.
	Section 42 mandates all constructors to ensure that they	Contractor and	Planning and	Proponent,	Nil.

	identify the beacons or boundaries of the land before commencement of works.	architect to conform boundary beacons.	start of construction.	architect and contractor.	
	Section 124 requires that only registered architect and structural engineer can supervise the erection of construction building. Architect and civil engineer to supervisor the compliance to the design.	Project manager will supervise all construction works.	Construction.	Project manager and team.	Consultant's fees.
	Section 137 provides the requirement for installing lifts and requires mandatory testing every six months under section 138.	Contractor to tests lifts on installation and proponent to maintain lifts.	Construction and operations.	Contractor and proponent.	BQ and 25,000.00 for service during operations.
	Section 139 requires every building to be provided with approved means of refuse disposal.	Design of the building.	Planning.	Architect and mechanical engineer.	BQ.
	Section 148 requires the design for buildings to have storage tanks for the purposes of fire-fighting purposes.	Design of the building. Underground tanks of 10,000 litres each.	Planning.	Architect and structural engineer.	BQ.
	158. All common stairs and common passages shall be adequately cross ventilated, and for common stairs sufficient natural and artificial lighting shall be provided.	Design of the building to ensure adequate ventilation and natural lighting.	Planning.	Architect and structural engineer.	BQ and consultants fees.
	Under section 170; This section specifies how the harvesting of rainwater from the roof tops will be carried out and the materials to be used.	Design of the building to incorporate storm water capture and disposal.	Planning.	Architect and mechanical engineer.	BQ and consultants fees.
	Section 199/200 requires proponent to apply and obtain approval to construct and to connect to public sewer.	Design of sewer line to connect to public sewer line.	Planning.	Architect and structural	BQ and consultants fees

				engineer.	
	Section 214 list the following firefighting equipment to be incorporated in whole or in part when designing and constructing a building: (a) hydrants, hose, hose reels and fire appliance external connexions; (b) portable fire appliance; (c) sprinkler, drencher and water spray projector system; (d) water storage tanks; and (e) dry risers.	Firefighting provision and requirement to be in the design.	Planning.	Electrical, structural engineers and architect.	BQ and consultants charges.
	First to Twelfth Schedule spells out how construction is to be carried out.	Proponent and contractor to use right quality of materials and to adhere to correct building practices.	Construction.	Project manager and contractor.	BQ.
2.	**The Constitution of Kenya** The constitution guarantees under section 42 the right of every person to have a clean and healthy environment and also to have that environment protected for the benefit of the present and future generations. The constitution shall encourage the use of public participation in the management and protection of the environment as required in section 69 (d). The state is also mandated to establish systems of EIA and EA together with eliminating process and activities that are likely to endanger the environment as required under section 69(d, f and g).	The EMP chapters will ensure that the proponent protects the environment. NEMA demands that every proponent undertakes EIA commencement and EA after operations have begun.	Planning. Planning.	Proponent. Proponent.	Consultant's charges. Consultant's charges.
3.	**The County Governments Act No. 17 of 2012** 134. Repeal of Cap. 265 (1) The Local Government Act is repealed upon the final	Proponent to obtain an occupational permit upon	At the end of construction.	Contractor.	Gazetted charges.

	announcement of all the results of the first elections held under the Constitution. (2) All issues that may arise as a consequence of the repeal under subsection (1) shall be dealt with and discharged by the body responsible for matters relating to transition.	completion of the hotel.			
4.	**Persons with Disability Act 2003** Public buildings 22.(1) A proprietor of a public building shall adapt it to suit persons with disabilities in such manner as may be specified by the Council. (2) All proprietors of public buildings shall comply with subsection (1) within five years after this section comes into operation.	The design of the building to have either a ramp or lifts.	Planning.	Architect.	Architects fees.
5.	**Machakos County Acts, 2016** Right to Accessibility and Mobility 12. (l) Persons with disabilities are entitled to a barrier-free and disability-friendly environment to enable them to have access to buildings, roads and other social amenities, assistive devices and other equipment to promote their mobility. (2) A proprietor of a public building or public service vehicle shall adapt it to suit persons with disabilities in such manner as may be specified by the Board. (3) The Executive Committee Member shall prescribe the period within which proprietors of public amenities shall comply with this section.	The design of the building to have either a ramp or lifts.	Planning.	Architect.	Architects fees.
7.	**The Employment Act 2007** Section 4 guarantees payment of wages should be commensurate with work done.	Proponent to pay market wages for work done and on	All phases.	Proponent and contractor.	BQ and wage bill.

		time.			
	Requires no discrimination in employment under section 5.	Contractor to give women an equal chance for employment.	All phases.	Proponent and contractor.	Nil.
	5 (3) discrimination of employment based on race tribe, gender or HIV status.	Employ qualified people	All phases.	Proponent and contractor.	Nil.
8.	**The Environment and Land Court Act, 2011** This court will arbitrate on environmental matters when a case arise.	Proponent to go to court if an issue arises.	On need basis.	Proponent.	Court and lawyer charges.
9.	**The Environmental Management and Co-ordination (Amended) Act of 2015** Requires proponents to prepare and submit EIA before commencement of projects under section 58, second schedule and the third schedule list persons who act as representative of the government.	Proponent has undertaken an EIA project report. Proponent to hold a baraza with the senior chief.	Planning. Planning.	Proponent. Consultant of NEMA.	Consultant charges. Budget for public participation.
10.	**The Water Quality Regulations, 2006 - Legal Notice No. 120** Regulation 4(1) prohibits all persons from undertaking any activity that can cause any pollution to a water body whether directly or indirectly.	Proponent to keep away from the river riparian.	Construction.	Contractor.	Nil.
	Regulation 4(2) prohibits all persons from throwing or causing to be thrown any pollution or substance into a water body.	Proponent to desist from choking the river.	Construction.	Contractor.	Nil.
	Regulation 6 (b) requires a person to have an environmental impact assessment license for abstracting ground water.	Proponent to apply for a borehole license.	Planning.	Proponent.	Already done.
	Regulation 6 (c) sets the minimum and maximum area of riparian on rivers and streams where construction works	Proponent to undertake pegging on	Planning.	Proponent.	WRMA pegging

	cannot be undertaken.	river bed.			quotation.
	The Fifth Schedule specifies the standards that must be met for sewer to be emptied into public sewer.	Proponent to apply for connection to the public sewer.	Planning.	Proponent and structural engineer.	Already done.
11.	**The Waste Management Regulations, 2006** 4. Responsibility of Waste Generator (1) No person shall dispose of any waste on a public highway, street, road, recreational area or in any public place except in a designated waste receptacle.	All solid wastes will be collected and stored in the yard awaiting collection.	Operation.	Proponent.	Nil.
	(2) Any person whose activities generate waste shall collect, segregate and dispose or cause to be disposed off such waste in the manner provided for under these Regulations.	Proponent shall engage the county government disposal trucks to collect all garbage.	Operation.	Proponent.	Free.
	(3) Without prejudice to the foregoing, any person whose activities generates waste has an obligation to ensure that such waste is transferred to a person who is licensed to transport and dispose off such waste in a designated waste disposal facility.	Proponent shall engage the county government disposal trucks to collect all garbage.	Operations.	Proponent.	Nil.
	5. (1) Any person whose activities generate waste, shall segregate such waste by separating hazardous waste from non-hazardous waste and shall dispose of such wastes in such facility as is provided for by the relevant Local Authority.	Non-biodegradable waste shall be separated from biodegradable wastes.	Operations.	Proponent	Nil.
12.	**The Environmental (Impact and Assessment) Regulations, 2009** Section 4 requires all projects that are likely to have a negative environmental impact to undertake an EIA before commencement of works. The proponent shall apply and obtain	Proponent shall undertake an EA after completion of project.	Planning.	Proponent.	Consultant charges.

	The proponent shall apply and obtain a Terms of Reference approval for undertaking an EIA full study before commence of the project as required under section 11 (5).	Proponent to apply for approval of TOR.	Planning.	Proponent.	Free.
	Section 31 requires all ongoing projects and new undertakings that to undertake annual environmental audits and to submit the same to the authority for perusal and action.	Proponent to undertake EA after completion of construction.	Operation.	Proponent.	Consultant charges.
13.	**The Noise And Excessive Vibration Pollution) (Control) Regulations, 2009** Section 2 lists the factors that are used in determining whether noise is loud, unreasonable, unnecessary or unusual including time of day and proximity to residential area.	Proponent to restrict construction to 8.00am to 5.00pm daily.	Construction.	Contractor.	Nil.
	Section 4 specifically prohibits noise from vibration beyond stated amounts.	Proponent to encourage the use of ear protection.	Construction.	Contractor.	300 per piece.
	Section 11 prohibits the use of Machinery activity which is to emit noise or excessive vibrations that shall exceed the noise levels listed in the First Schedule.	Proponent to service engines and trucks to ensure they are working at optimum levels hence producing little noise.	Construction.	Contractor.	Service charges.
	Section 13 prohibits construction noise at night if the activity shall exceed the noise levels listed in the Second Schedule of these regulations.	No work at night.	Construction.	Contractor.	Nil.
14.	**The Factories Act Cap 514** Section 29 requires all employers to provide training and supervision to inexperienced and new workers.	Proponent to train new workers and to place them under supervision.	All phases.	Proponent.	Wage bill.

	Section 30 requires all hoists and lifts to be in good mechanical condition before work and also requires them to be examined and certified in writing every six months by a person approved to undertake such a task.	Proponent and contractor to have all hoist and lifts serviced.	Construction.	Proponent and contractor.	25,000.00
	Section 32 requires all cranes and other lifting machines to be of good mechanical condition and to be serviced and examined by a qualified person every 14 months.	Proponent and contractor to have all cranes to be serviced every 14 months.	Construction.	Proponent and contractor.	50,000.00
	Section 62 requires all proponents to keep a registered where all pertinent information required under the act will be contained.	Proponent and contractor to maintain a general register.	All phases.	Proponent and contractor.	500.00
15..	**The Factories (First-Aid) Rules, 1977 Legal Notice No. 160** Section 2 requires not only the provision of a first aid box in the premises but also what should be contained in it.	Proponent to purchase First Aid for the necessary department.	All phases.	Proponent.	5,000.00 for each.
	Section 4 requires the name 'First Aid' to be clearly marked on the container and to be displayed where it can be easily seen.	Proponent to ensure first aid box are purchase which are already labeled.	All phases.	Proponent.	Nil.
	Section 5 requires the workplace to have at least 4 trained persons and at least 2 should be at the work place at all times.	Proponent to train First Aid workers.	All phases.	Proponent.	1,250.00 per person at St. John Ambulance.
	Section 7 requires that no person can handle the first aid box that has not been trained and has a certificate of competence from the required authorities.	Proponent to train First Aid workers.	All phases.	Proponent.	1,250.00 per person at St. John Ambulance.
16.	**The Fire Risk Reduction Rules, 2007**				

	Section 20 requires proponent to establish firefighting team and specifies the number.	Proponent will establish a firefighting team.	All phases.	Proponent.	Wage bill.
	Section 22 spells out the duties of a firefighting team.	Firefighting team will ensure fighting equipment are serviced, conduct fire drills, investigate fire accidents and train other workers on firefighting procedures.	All phases.	Safety and health committee.	Wage bill.
	23. (1) Every occupier shall ensure that fire-drills are conducted at least once in every period of twelve months and a record of such drills kept available for inspection.	Proponent to undertaken a fire drill once a year.	Construction and operations.	Safety and health committee.	Wage bill.
	24. (1) Every occupier shall identify a location in the workplace where every worker shall assemble in the event of a fire.	Proponent to identify fire-assembly points.	All phases.	Safety and health committee.	Wage bill.
	26. (1) Every occupier shall provide suitable means of alerting persons in the workplace, in the event of a fire, and such means shall be made known to all workers.	Proponent to have a siren at the place of work.	Operations.	Proponent.	25,000.00
	Section 29 requires the proponent to provide firefighting equipment.	Proponent to purchase fire extinguishers, fire blanket and horse reel.	All phases.	Proponent.	BQ and 350,000.00 as a start-up cost
	Section 30 requires all firefighting to be properly maintained and records kept.	Proponent will service all firefighting equipment every six months.	All phases.	Proponent.	Service charges.

17.	**The Food, Drugs and Chemical Substances Act Chapter 254** Section 3 requires all premises which are to be used for the purposes of selling, preparing, packaging, storing or displaying food to be licensed.	Proponent to apply for license to run a restaurant and canteen.	Operations.	Proponent.	Gazetted charges.
	Section 11(B and C) requires all employers to provide adequate sanitary conveniences for all their workers and also to have running water at all points where processing of food and cleaning is taking place.	Proponent and architect to ensure enough sanitary conveniences in the design of the hotel. Proponent has already drilled a borehole.	Planning.	Proponent and project manager.	BQ and borehole.
	Section 15 requires all workers who handle food to have a medical examination carried out by a government medical institution periodically.	All food handlers to undergo medical examination every six months.	Operations and every six months.	Proponent and HR.	1,000.00 per examination.
	Second Schedule Part B The following requirement shall be complied with as regards the cleanliness of all persons working in direct contact with food A They shall wear clean outer garments and conform to hygienic practises while on duty B They shall wash their hands thoroughly, remove all jewellery, and take any necessary precaution to prevent contamination of food with micro- organisms or foreign substances E as is necessary for the work, on which the	Proponent to purchase and ensure to staff PPE. Proponent to ensure reliable and clean water is available for all staff. Food handlers to	Operations. Operations. Operations.	HR and F&B Supervisor kitchen. Kitchen supervisor.	250,000.00 initial cost. Nil. Above A.

	employee is engaged, he shall wear effective head – dress, such as hair net, head – band or cap and F all employee shall refrain from storing their clothing or any other personal belonging or from eating or drinking beverages in areas where food is or food ingredient are exposed or areas used for washing equipment or utensils.	wear headdress. Proponent and architect to ensure availability of lockers for all workers.	Planning and operations.	Proponent.	Nil.
18.	**The Hotels and Restaurants Act Chapter 494** 4. (1) After the appointed day a) no premises shall be used or kept as a hotel unless there is in force a valid hotel license in respect of such hotel; b) no person shall exercise overall control over the day-to-day operation of a hotel, whether he is the owner or the manager of such hotel, unless he is the holder of a hotel manager's license;	Proponent to apply for a hotel license. Proponent to hire qualified personnel to run the hotel.	Operations. Operations.	Hotel management. Hotel management.	Gazetted charges. Nil.
	Part VI- Catering Training And Tourism Development Levy 16. (1) The Minister may, by order, require payment by the owners of hotels and restaurants of a Catering Training and Tourism Development Levy.	Proponent to register for paying Catering Training and Tourism Development Levy.	Operations.	Hotel management.	Monthly sales percentage.
19.	**The Land Registration Act** This act spells out how the title is produced, which registry it is registered in and the nature of the land.	The proponent will apply to the Ministry of Lands for a tittle deed.	Planning.	Proponent.	Already done.
20.	**The National Construction Authority Act NO. 41 OF 2011** 15. (1) A person shall not carry on the business of a contractor unless the person is registered by the Board	The proponent to identify and to contract a registered	Planning.	Contractor.	Nil.

	under this Act.	contractor.			
	17. (1) A person or firm may apply to the Board for registration as a contractor for purposes of this Act.	Contractor to undertake construction works.	Planning.	Contractor.	Nil.
21.	**The National Construction Authority Regulations, 2014** The owners of all construction works are required to register construction works and the BQ with the authority as soon as possible as required under section 17 (1) and (2).	Contractor to register construction works with the Authority.	Planning and construction.	Contractor and proponent.	Nil.
	The owner of the all constructions works must provide a contact person and details to the Authority for ease of communication as required under section 18 (1) and (2).	Contact name to be lodged with the Authority.	Planning.	Contractor and proponent.	Nil.
	The Authority shall accredit and certify all construction workers and site supervisors in accordance with this act as specified under sections 19, 20 and 21.	All workers and supervisors to register with authority.	Planning and construction.	Workers and supervisors .	Nil.
22.	**The Occupational Safety and Health Act** Under section 6 requires the proponent to safe guard the safety, health and welfare of all workers at this site and hotel.	Proponent to provide protective gear for all workers at the site and hotel.	All phases.	Contractor and proponent.	250,000.00 initial cost.
	(6) It is the duty of every occupier to register his workplace unless such workplace is excepted from registration under this Act.	Proponent to apply for registration as a workplace.	Construction and operations.	Contractor and proponent.	20,000.00
	70 provides the guidelines for gas cylinders.	Proponent to engage a service engineer to maintain the cylinders.	Operations.	Proponent.	Service quotation from engineer.
	Under section 77 the act requires warning signs to be put	Proponent to provide	All phases.	Proponent	EMP

	in order to prevent injuries from falling objects and work process.	warning signs at site.		and contractor.	construction and decommission.
	Section 89 requires adequate measures to be put in place to prevent dust, fumes, vibration and noise pollution.	Proponent to purchase ear mask, to water the site at least once a day and to limit work to between 8.00am and 5.00pm.	Construction and demolitions.	Proponent and contractor.	EMP construction and decommission.
	91 (1) Every Occupier shall provide and maintain an adequate supply of wholesome drinking water at suitable points conveniently accessible to all persons employed.	Proponent to test water from the borehole every three months.	All phases.	Proponent.	BQ and borehole.
	93 Every occupier shall provide and maintain for use of a person employed, adequate and suitable accommodation for clothing not worn during working hours.	Proponent to provide lockers for each employee.	Operations and planning.	Proponent.	125,000.00
	Part XI Health, Safety and Welfare- Special Provisions 101 1 Every employer shall provide and maintain for the use of employees in any workplace where employees are employed in any process involving exposure to wet or to any injurious or offensive substance, adequate, effective and suitable protective clothing and appliances, including ,where necessary, suitable gloves, footwear, goggles and head coverings.	Proponent to keep in working order the kitchen hoods. Proponent to ensure extraction fans are working in the laundry room.	Planning and operations. Operations and planning.	Proponent and engineers. Proponent and engineers.	BQ. BQ.
23.	**The Physical Planning Act** Under section 29/30, the act gives the county council power to approve all development and to take action against those who do not comply.	Proponent applied and obtained approval.	Planning.	Proponent and consultants.	Already done.

	Conditions of development approval by the physical planner: 1. Contractor to give the county government at least 30hrs notice for commencement of work. 2. To obtain separate permission for excavation and construction of building. 3. To renew approval of building works if not completed on time. 4. Erect a construction sign board. 5. Display the approval for development with drawings at sight at all times. 6. Apply for a certificate of occupation.	Contractor. Contractor to give notice. Contractor to apply for excavation permit. Proponent to apply for extension. Contractor to erect a sign board. Contractor to display PP2 approval on site. Proponent to apply for certificate of occupation on completion of works.	Planning. Construction. Construction. Construction. Construction. Construction.	Contractor. Contractor. Proponent. Proponent. Contractor. Contractor. Proponent.	Nil. Nil. 10,000.00 25,000.00 8,000.00 Nil. Gazetted charges.
	Under section 32, the act gives the council power to approve change of user from agricultural to commercial.	Land already has change of user from original allocation.	Planning.	Proponent.	Already done.
24.	**The Public Health Act** Section 115 and 116 prohibits nuisance in the building. The building must be kept in clean and sanitary conditions.	Contractor to ensure the site is cleared from all dangerous metal cuttings and	Construction.	Contractor.	BQ.

		other objects that can cause injuries to workers. Cleaning crew to keep the hotel clean.			
	Section 117 requires the proponent to ensure that no pests or rodents are found in the premises.	Proponent to maintain a rodent control measure.	Construction and operation.	Proponent.	35,000.00 rodent control measures every six months.
25.	**The Public Roads And Roads Of Access Act Chapter 399** Section 9 allows for all people who wish to apply or develop a public road to apply and obtain permission to undertake the required works.	Proponent to apply for permission to open and fix the access road.	Planning and construction.	Proponent.	Gazetted charges.
26.	**The Tourism Act, 2011 - No. 28 of 2011** A. Licensing Requirement for licence 98. (1) A person shall not undertake any of the tourism activities and services specified in the Ninth Schedule, unless that person has a licence issued by the Authority.	Proponent to apply for a license once construction is complete.	Operations.	Proponent.	Gazetted charges.
	Tourism levy 105. (1) The Minister may, by order, require the payment by persons engaged in tourism activities and services of a tourism levy. (2) The tourism levy order may make different provisions in relation to different tourism activities and services. (3) A tourism levy may contain provisions as to the evidence by which a person's liability to the tourism levy, or his discharge of that, may be established, and as	Proponent will calculate and remit monthly levy contribution to the fund.	Operations.	Proponent.	Amount depends on the monthly sales.

	to the time at which any amount payable by any person by any of tourism activity and service shall become due. (4) All monies received in respect of the tourism levy shall be paid into the Fund established under section 67 of this Act.				
27.	**Workmen's Compensation (Compulsory Insurance) Order No. 13 OF 2007** Section 2 of the regulation makes it compulsory for all employers who undertake the listed activities to contract an insurance company to provide liability insurance.	The contractor shall undertake liability insurance for all construction workers and visitors on site. The proponent will also take liability insurance for all the hotel workers during operations.	Contstruction. Operations.	Contractor. Proponent.	Insurance quote. Insurance quote.

CHAPTER TEN

10.0 RECOMMENDATION

The proponent is encouraged to pay close attention to the recommendation outlined in this document and summarized here below:

1. To urgently complete the process of riparian pegging by WRMA in order to safeguard the integrity of the stream and River Iine.
2. Due to the steep slope of the land, the soil erosion measures to be strictly implemented in order to reduce storm water damage during the rainy season.
3. The recommendation for solid and effluent waste disposal systems to be put in place as the expected volume is quite large.
4. The OSHA requirements on safety health and occupation should be implemented to the letter in order to ensure a safe environment for the workers and general public.
5. The land has a beautiful view of the surrounding Iveti Hills and the programme of landscaping should commence immediately with the construction in order to re-establish the beauty of the project site in tandem with the environment.
6. The entire EMP for construction, operation, decommission and legal framework should be implemented to the letter in order to safe guard the environment and to bring out the best hotel in Machakos Town.

10.1 Conclusion

The proposed project has numerous positive impacts including:

1. The proposed project is expected to provide employment opportunities for both skilled and unskilled personnel, in all its three project phases and will go along way in alleviating the employment shortage in Machakos County and Kenya in General.
2. The proposed project will open up a lot of business opportunities to Kenyans from all the major sectors of the economy: industries (supply of construction materials), energy (supply of fuel and electricity), tourism and agriculture (bed occupancy and food ingredients supplies to the hotel) among others.
3. The proposed project will usher in a new hotel in the area which will greatly boost the hotel industry in the area.
4. The proposed project will change the land use of the proposed site from being idle to being income generating.
5. The proposed project will attract revenue to the county and central government through the payment of various levies, taxes and rates.

   The proponent is also aware that the project will generate negative environmental impacts and owners of the company are ready to implement the recommendations contained in the EMP to the letter.

We therefore recommend the project for licensing subject to the adherence to the EMP.

References

1. The Constitution of Kenya
2. The County Governments Act No. 17 of 2012
3. The Disability Act
4. The Employment Act 2007
5. The Environment and Land Court Act, 2011 29
6. The Environmental Management and Co-ordination (Amended) Act of 2015
7. The Water Quality Regulations, 2006 - Legal Notice No. 120
8. The Waste Management Regulations, 2006
9. The Environmental (Impact, Assessment and Audit) Regulation, 2009 Noise And Excessive Vibration Pollution) (Control) Regulations, 2009
10. Legal Notice 31 - EMCA - Amendment to the Second Schedule
11. The Factories Act Cap 514
12. The Food, Drugs and Chemical Substances Act Chapter 254
13. The Hotels and Restaurants Act Chapter 494
14. The Land Registration Act, 2012
15. The National Construction Authority Act NO. 41 OF 2011
16. The National Construction Authority Regulations, 2014
17. The Occupational Health and Safety Act 2007
18. The Physical Planning Act Chapter 286 of 1996
19. The Public Health Act Chapter 242 4.17
20. The Public Roads And Roads Of Access Act Chapter 399
21. The Tourism Act, 2011 - No. 28 of 2011
22. The Building Code – The Local Government (Adoptive By-laws) (Buildings) Order 1968 and The local Government (Adoptive By-Laws) (Grade II Building) Order 1968

Annexes

Certificate of registration

Architectural drawings

Copy of Title Deed

Copy of PP2

Letter to the Chief

Chief's letter to the Elders

Copy of borehole license

Direction map

Expert license

Pictorial presentation of public meeting

Above are photographs showing the participants in the public baraza


USMC

Above are some of the participants' giving their comments during the plenary session.

The senior chief addressing the baraza

Stakeholders and the senior chief unanimously agreeing to the implementation of the project by show of hands