THE UNITED REPUBLIC OF TANZANIA

MINISTRY OF WATER

Dar es Salaam Water Supply and Sanitation Authority
DAWASA Building, Dunga/Malaga Street, Mwananyamala Area
P. O. Box 1573, Dar es Salaam. TANZANIA.
Tel. +25522276006/15; Fax: +255222762480; E-mail: dawasaceo@dawasa.co.tz

Provision of Consultancy Services for Preparation of Environmental and Social Impact Assessment (ESIA) and Resettlement Action Plan (RAP) Report for Construction of Off-Grid Sanitation Projects

Ref No: TZ-DAWASA-91652-CS-QCBS

Comprehensive Project Brief for the Proposed Simplified Sewerage System to be constructed at Kinyerezi NSSF housing Estate, Kinyerezi Ward, Ilala District in Dar es Salaam Region

Submitted to:
National Environment Management Council
Regent Estate, Mikocheni**, P. O. Box 63154, Dar es Salaam.**
Tel: +255 22 2774852/ 0713608930;Fax: +255 22 2774901E-mail: nemc@nemctz.org

Lead Consultant:
Prof. Rubhera RAM Mato (PhD), CEng. (T), Reg. EIA Expert
Mobile: +255754898592; E-Mail: rubheramato@gmail.com

ROYAL ASSOCIATE CONSULTING ENGINEERS
P.O.BOX 37705-00100, Nairobi

In Association with

G-PES LIMITED
P.O.BOX 35539
Dar es Salaam

Submission date: March 3, 2022

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

THE STUDY TEAM

NAME	POSITION	NEMC Reg. No.	SIGNATURE
Prof. Rubhera RAM Mato	Environmentalist and ESIA Team Leader	Registered NEMC/EIA/0092	
Mr. Robert Kishiki	Sociologist	Not Registered	
Mr. Emmanuel Rajab	Environmental Engineer	Not Registered	
Mr. Melkizedeck Stephano	Environmentalist	Not Registered	

ABBREVIATIONS

AAQ	Ambient Air Quality
AIDS	Acquired Immuno-Deficiency Syndrome
DAWASA	Dar es Salaam Water and Sanitation Authority
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
ESIA	Environmental and Social Impact Assessment
ESMP	Environmental and Social Monitoring Plan
GoT	Government of Tanzania
HIV	Human Infection Virus
IDA	International Development Association
LGA	Local Government Authority
NEMC	National Environment Management Council
NEP	National Environment Policy
OGSP	Off-Grid Sanitation Project
PPE	Personal Protective Equipment
PVC	Polyvinyl Chloride
RAP	Resettlement Action Plan
SSS	Simplified Sewerage System
STDS	Sexual Transmitted Diseases
TANESCO	Tanzania National Electric Supply Company
WSP	Wastewater Stabilization Ponds

EXECUTIVE SUMMARY

Comprehensive Project Brief for The Proposed Simplified sewerage system to be constructed at Kinyerezi NSSF housing estate, Kinyerezi Ward, Ilala District in Dar es Salaam Region

Proponent: DAWASA

Proponent's Contact : DAWASA House, **Dunga/Malanga**
Street/Mwananyamala
P.O Box 1573 DSM
Tel: +255222760006/15
Fax: +255222762480
Email Address: info@dawasa.go.tz

EIA Expert: **Prof. Rubhera RAM Mato**
(PhD), CEng. (T), Reg. EIA Expert
Mobile: +255754898592
E-Mail: rubheramato@gmail.com

INTRODUCTION

The Government of the United Republic of Tanzania (GoT) through the Dar es Salaam Water and Sewerage Authority (DAWASA) under the Ministry of Water intends to implement an Off-Grid Sanitation Project (OGSP) in Dar es Salaam City to serve peri-urban areas not connected to the central sewerage system. DAWASA has received financing from the International Development Association (IDA) in the form of a credit to implement the project. Before implementing the project, the law in Tanzania requires an Environmental Impact Assessment to be conducted and approved by the relevant authority. To comply with the law in Tanzania, the DAWASA intends to apply a portion of the proceeds of the credit to eligible payments for consulting services for Preparation of Environmental and Social Impact Assessment (ESIA) and Resettlement Action Plan (RAP) Report for the construction of off-grid sanitation projects.

Dar es Salaam is the largest and most important commercial and industrial center in Tanzania. The city has an estimated population of about 5.0 million and is projected to double at the end of the project horizon of 25 years. About 10% of the population is served by sewers and the rest almost depend on on-site sanitation systems. The sewer coverage is only limited to the area within the city center with a total length of 67.8km and the system is based on a separate system and discharges their effluent into oxidation ponds, and into the sea through a sea outfall of about 1.03km long. The onsite sanitation systems result in Faecal sludge of which handling and management throughout the sanitation chain (from domestic containment, transportation as well as disposal and treatment) is currently hygienically inadequate thus posing environmental and public health risks. The Off-Grid project is intended to address these challenges. The Off-Grid project is divided into several subprojects which will be implemented in the five municipalities of Dar es Salaam City. One of these is the Construction of Simplified Sewerage System at Kinyerezi NSSF housing estate, in Kinyerezi Ward, Ilala Municipality. The project is planned to connect 250 households with an estimated population of 1,365 people.

This study was conducted following the Environmental Management (Environmental Impact Assessment and Audit) (Amendment) Regulations, 2018 along with the Environmental Impact Assessment and Audit Regulations of 2005. These Regulations provide legal procedures for implementing the requirements of the Environmental Management Act Cap.191 of 2004. The Regulations give a mandate to NEMC to oversee the EIA process, which culminates with an award of the EIA Certificate by the Ministry responsible for Environment.

Following the EIA Regulations, NEMC is mandated to screen projects and make decisions of the level of EIA required as well as evaluating the adequacy of respective environmental statements. Considering the nature and size of the proposed “Simplified Sewerage System in Ilala Municipality”, the project falls under Category “B2” (Non-Mandatory) following Reg.4 (1)(c) and First Schedule of the amended 2018 Regulations which categorizes the *night soil*

collection and treatment being under the '*List of small-scale activities and enterprises that require registration but shall not require Environmental Impact Assessment. Further, the projects shall not require screening and scoping, rather, the Project Brief shall be examined and issued with an Environmental Impact Assessment Certificate*'. The regulations require developers to prepare and submit to the National Management Council (NEMC) filled EIA registration forms and "Project Briefs" for all B2 projects. The preparation and content of the "Project Briefs" are provided under Reg.6 (1). The same has been followed in preparing this "Project Brief". The study for preparing this project brief was conducted from July to October 2020.

This project brief for the Proposed Construction of Simplified Sewerage System in Ilala Municipality is being submitted to NEMC together with EIA Registration Forms for EIA Certificate decision.

PROJECT DESCRIPTION

Kinyerezi is an administrative ward situated 523367 Eastings and 9245977 Northings in Ilala Municipal of the Dar es Salaam Region of Tanzania. According to the 2002 census, the ward has a total population of 5,811. Most of the streets in Kinyerezi ward are unplanned settlements restricted access roads for feacal sludge emptying trucks.

Currently, this area is being served through on-site sanitation management that involves domestic containment and emptying trucks that are not satisfactorily managed.

The project area is accessible through Nkurumah street then Pugu road to Segerea junction finally unto Segerea junction along Segerea road to Mbuyuni junction 17.2 Kilometers.

The proposed project intends to use the existing alleys (*vichochoro)* for installing the simplified sewer pipelines. The local government in the project area has agreed with DAWASA through a formal meeting held on 08/07/2021

to use the alleys whether formal or non-formal for the construction of a simplified sewerage system and the associated appurtenances to improve the sanitation conditions

POLICIES, LEGISLATION AND INSTITUTIONAL ASPECT

Sector policies that were reviewed when executing the proposed development are;

- National Environment Policy 1997
- National Land Policy of 1997
- Construction Industry Policy (2003)
- National Health Policy (2003)
- National Gender Policy of 2000
- National Human Settlements Development Policy (2000)

Principal Acts, regulations and guidances that support and provide guidelines to implement the intended project are;

- Environmental Management Act (2004)
- The Environmental Management (Fees and Charges) Regulations, 2021
- The Environmental Management (Control of hazardous Waste) regulations, 2021
- The Environmental Management (Control of Noise and vibration) regulations, 2015
- The Environmental Management (Prohibition of Plastic Carrier bags) regulations, 2019
- The Environmental Management (Solid Waste Management) regulations, 2007
- The Environmental Management (Water Quality) regulations, 2009
- The Environmental Management (Air Quality) regulations, 2009
- The Environmental Management (Soil Quality) regulations, 2009
- Occupational Health and Safety Act 2003

- The Water Supply and Sanitation Act No. 12 of 2009
- Engineers Registration Act and its Amendments 1997 and 2007
- The Contractors Registration (Amendment) Act, 2008
- The Architects and Quantity Surveyors Act (1997)
- The Urb World Bank guidelines for Environmental Managementan Planning Act (2007)
- Public Health Act (2009)

STAKEHOLDERS ISSUES AND CONCERNS

Different stakeholders were consulted. Among of the issues that arise during consultation at the Ilala Municipal Council and community at Kinyerezi NSSF housing estate are:

Facilities to be developed

- Proposed on-site incinerator for public toilet for pads safe disposal and privacy to women.
- Public toilets should incorporate Change room and Shaving room
- The proposed facilities should be well protected

Awareness to the community

- Awareness to the people on the system operation, since it is a new technology
- Awareness to the community to avoid riots in the future
- Educate the community to avoid the use of detrimental disinfectants to the system so as to avoid system failure and contaminated manures.

PROJECT REQUIREMENTS AND WASTE GENERATION

Project requirements

The main materials for construction of Simplified sewerage system include cement, aggregates (stones), water, steel, sand, timbers, blocks, PVC pipes, and gravels. During the construction phase the project will require

not less than 100 workers both skilled and non-skilled laborers for each phase of project construction. During operational phase it is estimated that 30 unskilled workers will be retained for operating the system.
Equipment expected to be used during the construction works are Tippers, Concrete Mixers, poker vibrators, Wheel barrow, Compactor, etc.

Wastes generation

The major wastes generation associated with the project are solid wastes and liquid waste. During the maximum operation phase a total of 100m^3 per day of liquid waste is estimated to be received at the downstream receiving chamber of the Fecal sludge treatment facility close to the project site. During construction it is expected that at least 60kg of solid wastes will be produced.

POTENTIAL IMPACTS

The following impacts were identified to be likely to occur during mobilization phase:

- Employment opportunities
- Noise pollution
- Air pollution from dust emission
- Blockage of paths

The following impacts were identified to be likely to occur during the construction phase;

- Employment opportunities
- Increased socio-cultural interaction
- Increased Revenue to the nation through taxes, both direct and indirect
- Cost reduction for sewage management
- Increased HIV/AIDS and other sexual related diseases
- Land degradation and increased erosion
- Noise pollution

- Air Pollution from dust emission
- High Risk of Health associated with construction work
- Waste generation during construction
- Sewer leakage/overflow
- Blockage of paths

The following impacts were identified to be likely to occur during the operational phase;

- Improved social-economic livelihood and dignity within the beneficiary society
- Increased Revenue to the nation through taxes, both direct and indirect
- Cost reduction for sewage management
- Sewer leakage/overflow

MITIGATION MEASURES AND ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN (ESMP)

The options to minimize or prevent the identified adverse social and environmental impacts as well as a monitoring plan have been suggested in this report and are contained in the ESMP. Many of them are based on good engineering practices and the timely responsiveness of the responsible institution. The ESMP describes the implementation schedule of the proposed mitigation measures as well as planning for long-term monitoring activities. It defines the roles and responsibilities of different actors of the plan. The Approach environmental and social costs amount to Tshs 43,000,000.00. The estimated annual costs for carrying out the proposed environmental and social motoring program amounts to TSH 7,500,000.00.

DECOMMISSIONING PLAN

The decommissioning is not anticipated in the foreseeable future. However, if this will happen, may entail change of use (functional changes) or demolition triggered by change of land use. In view of this, specific mitigation measures

pertaining to environmental impacts of decommissioning works cannot be proposed at the moment with a reasonable degree of certainty.

PROJECT BUDGET

The investment cost for the proposed Simplified sewerage system is estimated to be around Tshs. 1.0 billion that will be financed The World Bank.

Environmental and Social Impacts Assessment for The Proposed Simplified sewerage system to be constructed at Kinyerezi NSSF housing estate, Kinyerezi Ward, Ilala District in Dar es Salaam Region

1.0 BACKGROUND AND JUSTIFICATION

The Government of the United Republic of Tanzania (GoT) through the Dar es Salaam Water and Sewerage Authority (DAWASA) under the Ministry of Water intends to implement an Off-Grid Sanitation Project (OGSP) in Dar es Salaam City to serve peri-urban areas not connected to the central sewerage system. DAWASA has received financing from the International Development Association (IDA) in the form of a credit to implement the project. Before implementing the project, the law in Tanzania requires an Environmental Impact Assessment to be conducted and approved by the relevant authority. To comply with the law in Tanzania, the DAWASA intends to apply a portion of the proceeds of the credit to eligible payments for consulting services for Preparation of Environmental and Social Impact Assessment (ESIA) and Resettlement Action Plan (RAP) Report for the construction of off-grid sanitation projects.

Dar es Salaam is the largest and most important commercial and industrial center in Tanzania. The city has an estimated population of about 5.0 million and is projected to double at the end of the project horizon of 25 years. About 10% of the population is served by sewers and the rest almost depend on on-site sanitation systems. The sewer coverage is only limited to the area within the city center with a total length of 67.8km and the system is based on a separate system and discharges their effluent into oxidation ponds, and into the sea through a sea outfall of about 1.03km long. The onsite sanitation systems result in Faecal sludge of which handling and management throughout the sanitation chain (from domestic containment, transportation as well as disposal and treatment) is currently hygienically inadequate thus posing environmental and public health risks. The Off-Grid project is intended to address these challenges. The Off-Grid project is divided into several subprojects which will

be implemented in the five municipalities of Dar es Salaam City. One of these is the Construction of Simplified Sewerage System at Kinyerezi NSSF housing estate, in Kinyerezi Ward, Ilala District. The project is planned to connect 250 households with an estimated population of 1,365 people.

This study was conducted following the Environmental Management (Environmental Impact Assessment and Audit) (Amendment) Regulations, 2018 along with the Environmental Impact Assessment and Audit Regulations of 2005. These Regulations provide legal procedures for implementing the requirements of the Environmental Management Act Cap.191 of 2004. The Regulations give a mandate to NEMC to oversee the EIA process, which culminates with an award of the EIA Certificate by the Ministry responsible for Environment.

Following the EIA Regulations, NEMC is mandated to screen projects and make decisions of the level of EIA required as well as evaluating the adequacy of respective environmental statements. Considering the nature and size of the proposed "Simplified Sewerage System in Ilala Municipality", the project falls under Category "B2" (Non-Mandatory) following Reg.4 (1)(c) and First Schedule of the amended 2018 Regulations which categorizes the *night soil collection and treatment* being under the '*List of small-scale activities and enterprises that require registration but shall not require Environmental Impact Assessment. Further, the projects shall not require screening and scoping, rather, the Project Brief shall be examined and issued with an Environmental Impact Assessment Certificate*'. The regulations require developers to prepare and submit to the National Management Council (NEMC) filled EIA registration forms and "Project Briefs" for all B2 projects. The preparation and content of the "Project Briefs" are provided under Reg.6 (1). The same has been followed in preparing this "Project Brief". The study for preparing this project brief was conducted from July to October 2020.

This project brief for the Proposed Construction of Simplified Sewerage System in Ilala Municipality is being submitted to NEMC together with EIA Registration Forms for EIA Certificate decision.

1.1 NATURE OF THE PROJECT

The proposed project concerns the construction of a Simplified sewerage system for public use at Kinyerezi NSSF housing estate, Kinyerezi Ward, Ilala District. The nature of the project enhances environmental protection through proper handling and disposal of domestic sewage. According to the First Schedule of the EIA and Audit Regulations (Amended) of 2018, the nature of the project is small and entails no significant impacts. The project can be categorized as Type B2, which according to the regulations are “small-scale activities and enterprises that require registration but shall not require Environmental Impact Assessment. Further, the projects shall not require screening and scoping, rather, the Project Brief shall be examined and issued with an Environmental Impact Assessment Certificate”.

2.0 PROJECT DESCRIPTION

2.1 Project Location

Kinyerezi is an administrative ward situated 523367 Eastings and 9245977 Northings in Ilala Municipal of the Dar es Salaam Region of Tanzania, Figure 1. According to the 2002 census, the ward has a total population of 5,811. Most of the streets in Kinyerezi ward are unplanned settlements restricted access roads for feacal sludge emptying trucks.

Currently, this area is being served through on-site sanitation management that involves domestic containment and emptying trucks that are not satisfactorily managed. Apart from illegal emptying, underground seepage of fecal sludge may also contaminate groundwater leading to water-related diseases within this area. To address the above challenges, we recommend the construction of a simplified sewerage system as the solution for fecal sludge management within the area. Depending on requirements for a simplified sewerage system with its limitation the project will be implemented at Kinyerezi NSSF housing estates, figure 2.

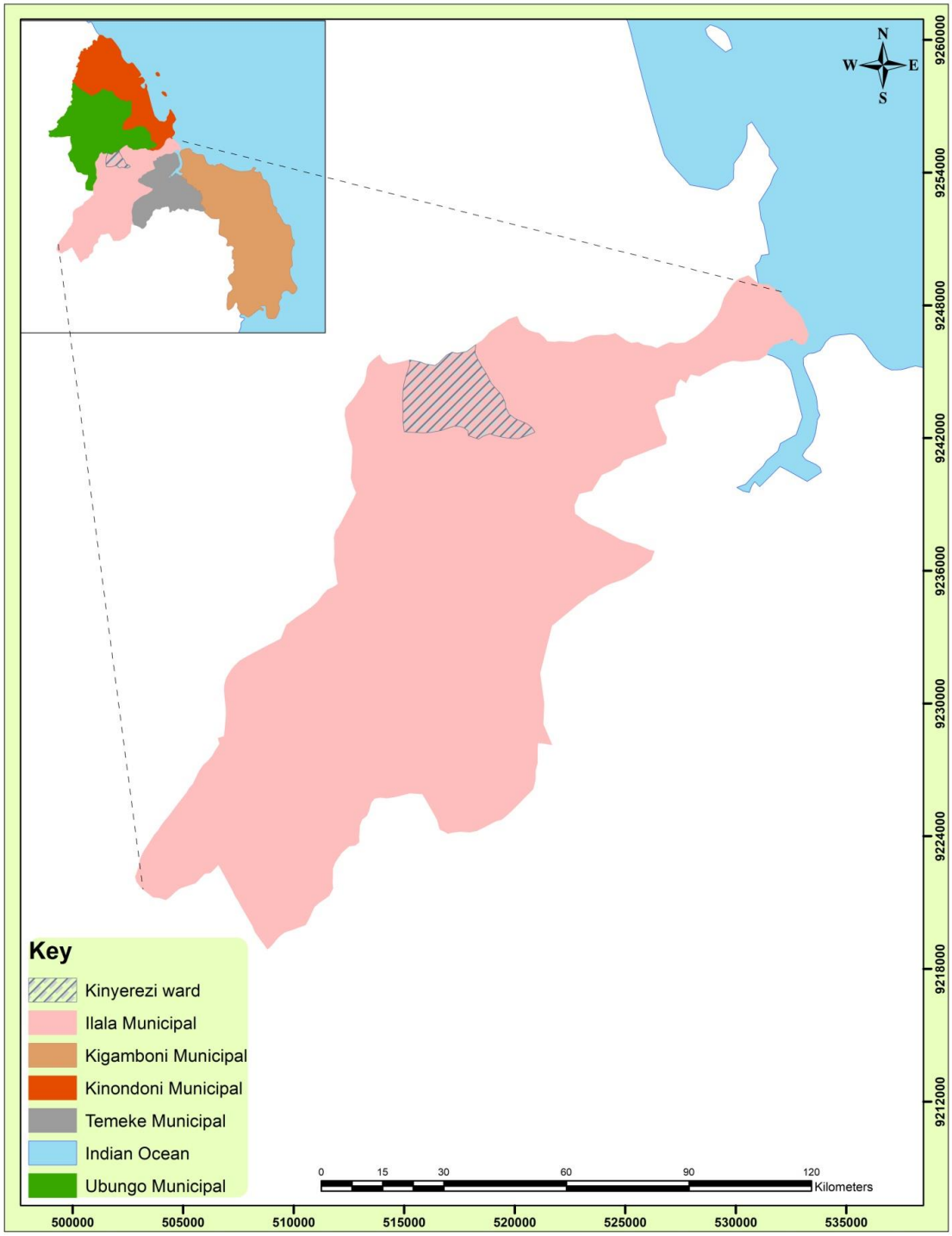


Figure 1: A Map of Dar es salaam region showing the project Municipal

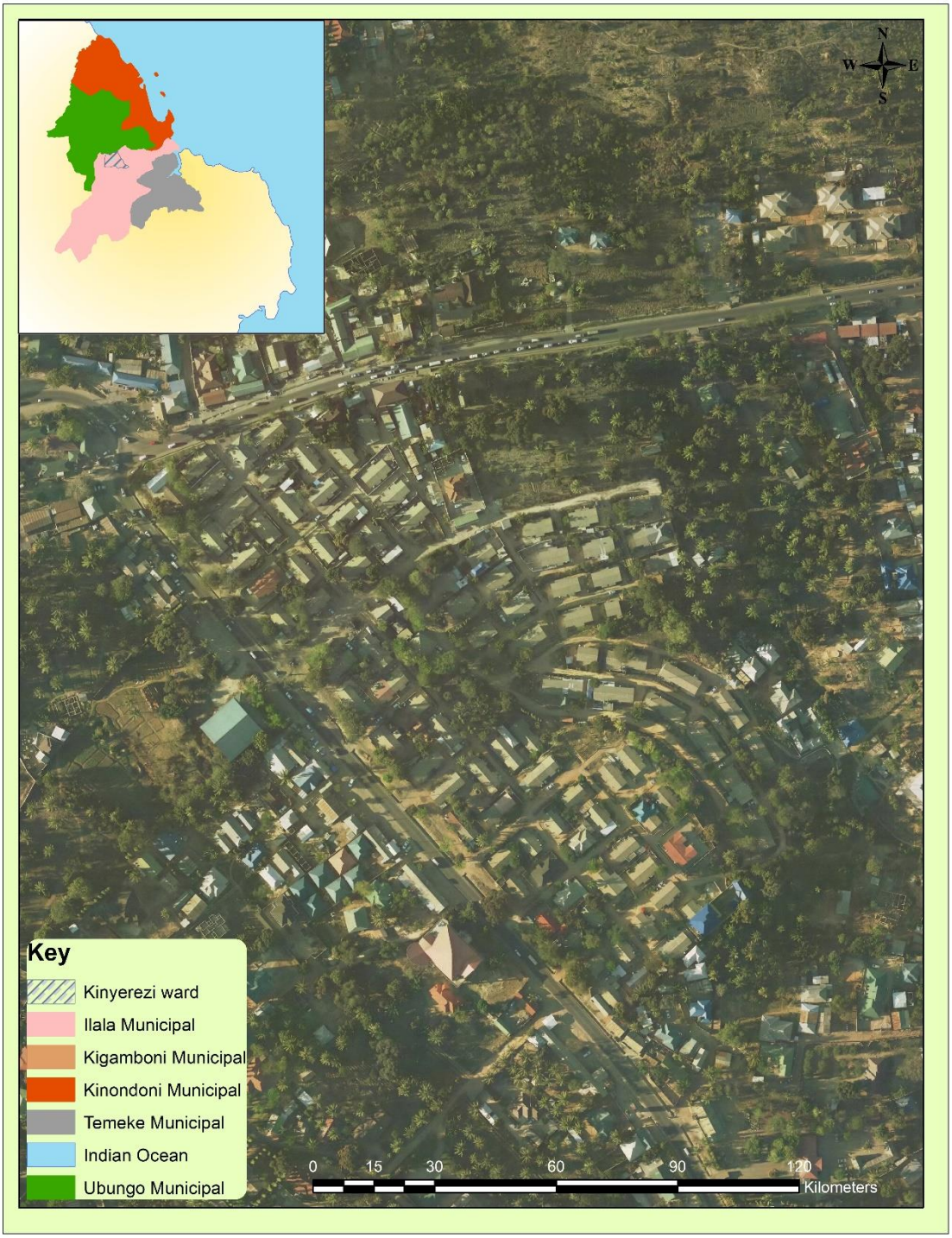


Figure 2: An Extract Google view to show the location of the project area

2.2 Accessibility

The project area is accessible through Nkurumah street then Pugu road to Segerea junction finally unto Segerea junction along Segerea road to Mbuyuni junction 17.2 Kilometers.

The project area is a planned settlement with good access roads for feacal sludge emptying trucks. However, emptying trucks have lots of cost implications.

2.3 Specific Features

The proposed project site is characterized by ground vegetation and short grasses, residential buildings can be observed afar from the project site, Figure 3.

Figure 3: Some vegetation and structures at the project site

2.4 Land Use and Land Ownership

The project site is surrounded by residential buildings, power lines, churches, parking lots, a solid waste dumping area and a few business structures access roads, Figure 4. The proposed project intends to use the existing alleys (*vichochoro)* for installing the simplified sewer pipelines. The local government in the project area has agreed with DAWASA through a formal meeting held on 08/07/2021 to use the alleys whether formal or non-formal for the construction of a simplified sewerage system and the associated appurtenances to improve the sanitation conditions, appendix II.

Figure 4: Solid waste dumping area, alleys *(vichochoro)*, and parking lots at NSSF Housing

2.5 PROJECT ACTIVITIES

2.5.1 Mobilization or pre-construction phase

This phase entails mobilization of the labor force, and equipment as well as the acquisition of various permits as required by the law.

Other activities during this phase include;

- Topographical Survey for setting out purposes,
- Construction Materials' source Investigation,
- Material transportation, storage and material preparation,

2.5.2 Construction phase

This phase entails all the necessary installations, site grading and placement of the facility components. The major activities include;

- Trench excavation and laying of 4" and 6" PVC pipes for collection of wastewater from households.
- Backfilling and paving of excavated trenches
- Construction of inspection chambers/junction boxes
- Construction of receiving chambers
- Connection of customers' latrines to the constructed network

2.5.3 Demobilization phase

This phase will involve the dismantling of temporary structures such as scar fording and removing/spreading spoil materials for proper restoration of the site. Other activities include;

- General cleanliness of the area, that is clearance of all sorts of solid wastes (plastics, wood, metal, papers, etc);
- Deposit all wastes to the authorized dumpsite;

2.5.4 Operation phase

The phase entails the actual usage of the Simplified sewerage system where as the individual household will be discharging night soil directly to the system. The main task will be occasional clearance of the blockages and timely replacement of leaking pipes undertaken by DAWASA with the sole cooperation from household owners at the vicinity.

2.5.5 Decommissioning Phase

Decommissioning is not anticipated in the foreseeable future as the completed facility will be serving a number of houses which at present incur many costs to dispose fecal sludge and if not so tend to discharge illegally. However, if this will happen, may entail change of use (functional changes) or demolition triggered by change of land use.

2.6 PROJECT DESIGN

Kinyerezi Simplified sewerage system will involve construction of a simplified sewerage network with a decentralized wastewater treatment plant. The system is planned to collect wastewater from surrounding households using 4" PVC pipes laid in shallow depth trenches. The system will operate under controlled gravity flow in accordance to designed gravity and velocity. Collected sewerage will be treated at the constructed wastewater treatment plant and treated effluent discharged to the adjacent stream upon attaining required quality standards.

2.6.1 Design criteria

2.6.1.1 Design Criteria Development

A shallow sewer system is a separate sewer system which utilizes gravity for conveying raw sewage from all households to an outlet downstream. It must be set deep enough to receive flows from each user but must be located so that this depth is kept to a minimum. It must have sufficient size and gradient to carry these flows. In addition, maintenance operations, public safety and convenience must be evaluated in the light of water availability and the potential for user participation. The Simplified sewerage Network components will be sized in accordance with design criteria guidelines with a view to effectively cater for the estimated 2036 faecal sludge production horizon.

2.6.1.2 Design Horizon

The project planning has been taken to be 15 years (from 2021 to 2036), the detailed engineering design are prepared taking into account the ultimate 2036 faecal sludge network capacity requirements. For instance, the Sewer network will be designed to carry the 2036 peak hour demand; the capacity of the receiving faecal sludge treatment plant to be constructed or existing Wastewater stabilization ponds, the former will be similarly determined based on ultimate postulated daily water demand pattern, the later will depend on the design capacity of the existing WSP.

2.6.1.3 Pipe materials

The most used materials for the condominial system are, PVC Domestic /PVC Reinforced. Although the PVC pipes are usually expensive than the ceramic ones, it is possible to compensate this disadvantage during the construction, due that the PVC pipes are easier and quicker to install. One must consider that the PVC pipes offer excellent flow conditions and are usually more water tight than the ceramic ones. On the other side, these ones offer a higher mechanical resistance. The Simplified network pipe will be designed for the maximum day demand of the target year 2036.

2.6.1.4 Minimum depth of sewer

The minimum recommended depth for the pipes are as shown in table 1 below:

Table 1: Minimum depth of sewer

Sewer type	Minimum depth
Side walk condominial branch	0,70 m
Front lot condominial branch	0,40 m
Back lot condominial branch	0,40 m
Side walk public sewer	0,80 m
Traffic road sewer	1,10 m

Wherever the sewer pipe crosses traffic road and the option of deep excavation is not feasible then concrete/steel duct should be put in use at such crossings.

2.6.1.5 Sewer ventilation

Ventilation to a shallow sewer network is provided through ventilation columns installed along individual water closet house connections. No ventilation columns are usually required along block and street sewers: only in cases of very long street sewer lengths (usually in excess of 5 km) , without any block sewer connections along the length, would the provision of suitable ventilation columns become necessary in order to prevent the sewage sewer from becoming septic. Such situations rarely occur in shallow sewer layouts and the fact that a majority of the sewers are laid at very shallow depths in itself ensures facilitated ventilation.

2.6.1.6 Inspection chambers

In shallow sewer systems, inspection chambers are located along block and street sewers and should be used in all of these situations:

(a) At the start of the branch
(b) At each time the condominial branch reaches 60 m of length
(c) At each time the public sewer reaches 100 m of length
(d) At the connection between the internal installation and the condominial branch.
(e) At any point where the pipe changes its direction or its slope

(f) At any point where, different upstream branches meet and discharge in the same downstream branch

The depth to invert of a sewer at the point where an inspection chamber is required will determine the dimensions of the chamber. Where the depths are shallow, usually up to 0.75 m, there is no necessity for the physical entry to the chamber for purposes of maintenance. However, at, greater depths than this the chamber dimensions have to be such that the maintenance crew can physically enter the chamber.

2.6.1.7 Maximum number of houses to be connected to a single sewer line

Hydraulically over 200 houses may be connected. Given the possible economic and operational advantages of connecting a large number of houses to a single sewer line, there is little justification for limiting the number of houses that may be connected to a sewer, provided sufficient pipe capacity is available. Since water consumption and wastewater generation patterns are often different from country to country, the maximum number of houses to be connected to a sewer should be computed on the basis of the peak flow and the maximum flow capacity corresponding to the minimum gradient

2.6.1.8 Minimum sewer gradient

Practice recommends that a 100 mm diameter pipe be laid at a minimum sewer gradient of 1 in 167.

2.6.1.9 Minimum sewer diameter

A minimum sewer diameter of 100 mm is usually recommended In fact, it i.e. definitely not advisable to increase the pipe diameter under the reduced falls proposed for shallow sewers, since this decreases the depth of flow, and solid will thus tend to be deposited frequently in the pipeline.

2.6.2. Technology description

2.6.2.1 Layout

To avoid deep excavations, long trunk pipes to interceptors, and large pumping stations, serious consideration is given to splitting the network into two or

smaller systems. Although network layout is also an important part of conventional design, the optimization of pipe lengths and network subdivisions takes on even greater importance in this system.

2.6.2.2 Hydraulics

Design period

Another approach to sewerage systems that can bring major benefits to the project is to reduce the design period of the sewerage system. A great advantage of using shorter term periods is that it avoids uncertainties of population growth and reduces the high costs of maintenance of large sewer systems with low flow. Other benefits of the reduced design period, are that it can also facilitate financing and achieve greater coverage with the same investment.

Design flow

Wastewater flow quantities are necessarily lower than the quantity of water supplied because water is lost through leakage, garden watering, house cleaning, etc. To determine the expected amount of wastewater, it is important to keep records of pumpage for each day and fluctuations during the day.

Where water use information is not available, the simplified sewerage system is - designed for a minimum flow of 1.5 l/s, infiltration is assumed to be 0.05-1.0 1/s/km of pipe.

2.6.3. Service Connection

In the simplified design, a 60-cm connection (or inspection) box is placed between the building and the service line. All the sewers or drains from the house or building enter the box. This box is usually located under the sidewalk in the public right of way, figure 5

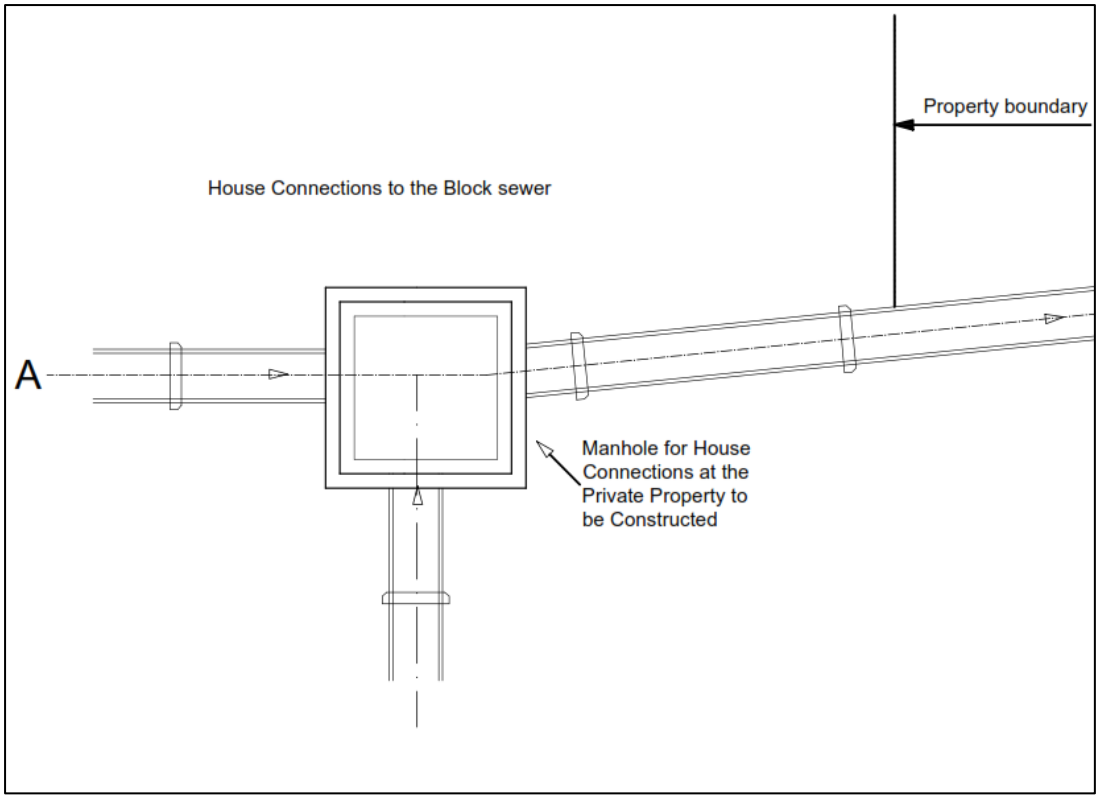


Figure 5: House connection detail

2.6.4 Depth of sewers

For any type of sewer connection, it is standard to have a minimum depth in which the pipes are laid should be sufficient to make house connections and have a layer of soil over the crown to protect the pipe against structural damage from external loads and frost. On simplified connections, the minimum sewer depths are usually much shallower than the conventional systems. Being as shallow as 0.65-m below sidewalks, 0.95-1.50-m below residential streets (depending on distance from the centerline of street), and 2.5-m below heavily traveled streets.

2.6.5 Manholes and other appurtenances

One of the most important differences between conventional and simplified sewer systems is that the former utilizes many manholes, whereas the latter type avoids its use as much as possible. The conservative criteria for manhole use contributes to the high cost of sewerage. figure 6 shows the detail of

manhole structure. The use of shallower depths is one way of reducing these costs.

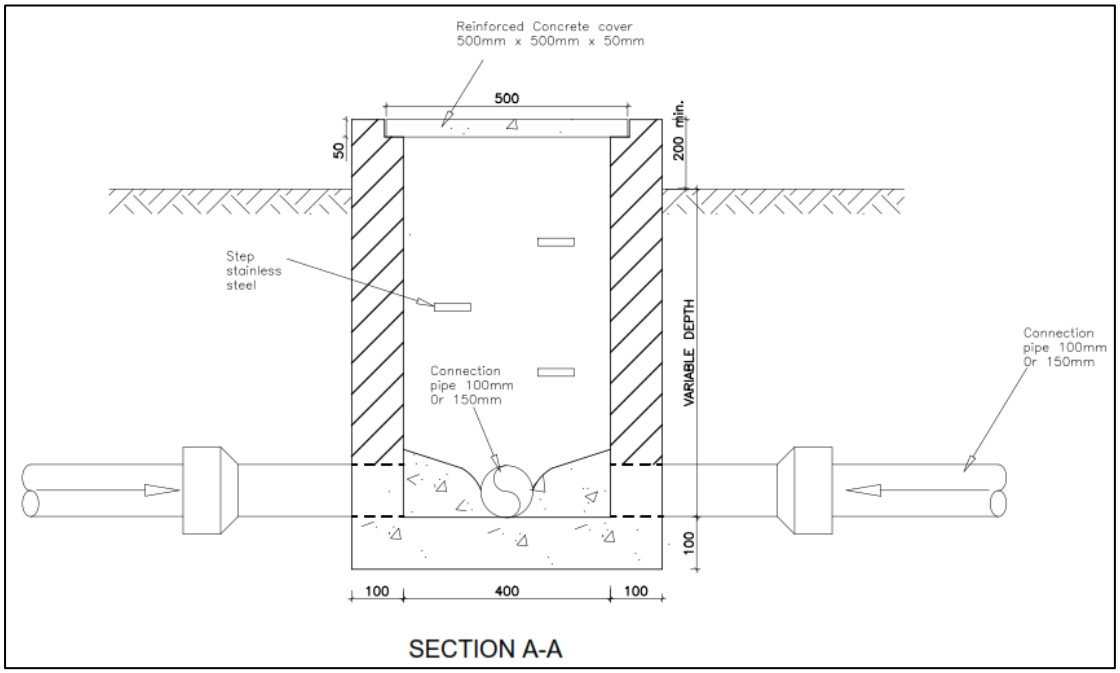


Figure 6: Standard Manhole detail

2.6.6 Construction Material

The types of materials used in SSS are similar to those used in conventional sewers. The most commonly used and readily available in the market are polyvinyl chloride (PVC) pipes. Additionally, PVC pipes offer the advantage of longer sizes, fewer joints (i.e less infiltration), light weight, water tightness and uniformity.

2.6.7 Simplified sewerage system house connection layout

The proposed construction of simplified sewerage system at Kinyerezi Housing Estate is expected to cover a total length of pipes of approximately 5,126m is as shown in Figure 7. Architectural, detailed drawings and other useful information have been appended in Appendix III of this project brief.

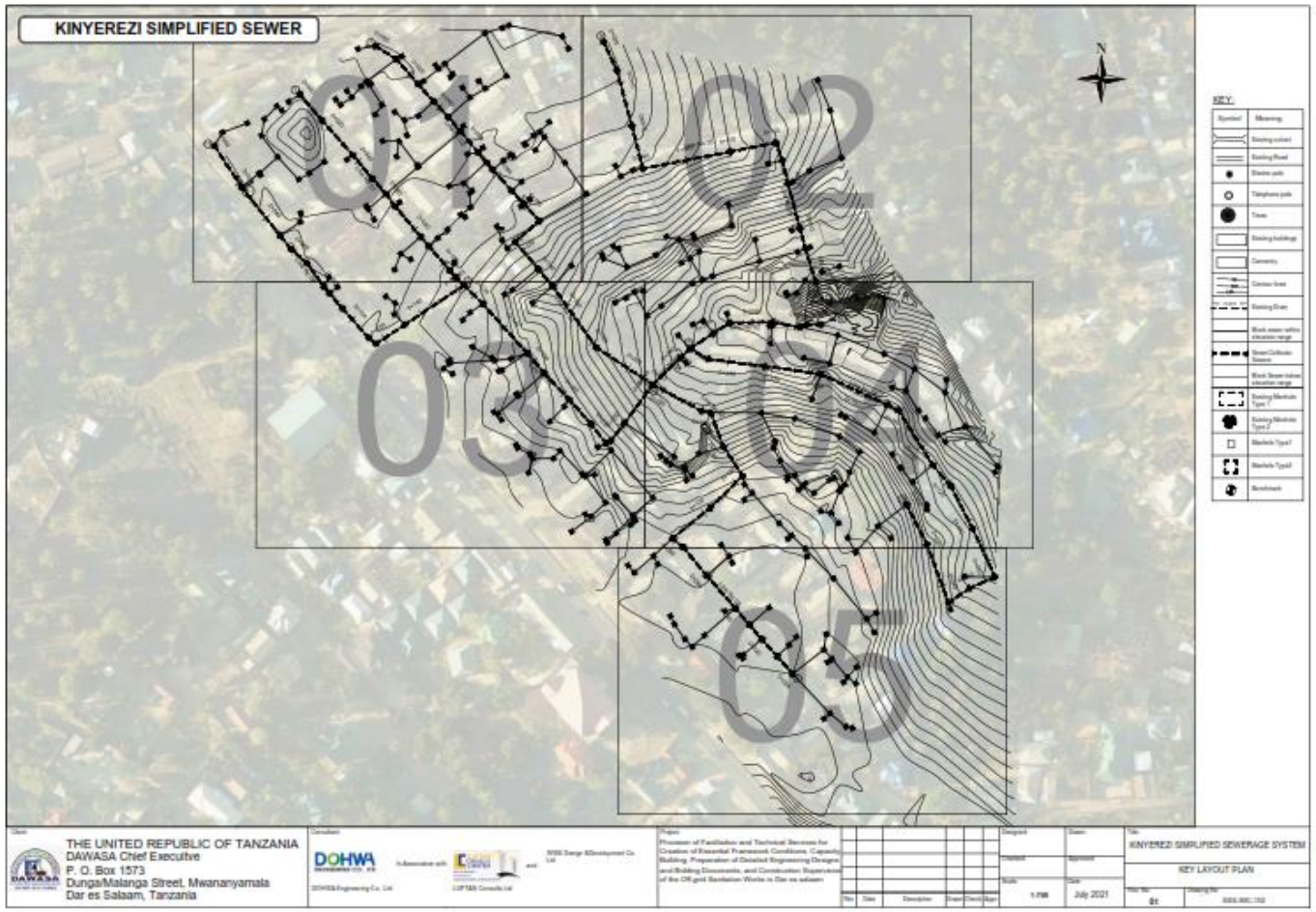


Figure 7: Simplified Sewerage system layout at Kinyerezi NSSF Housing

3.0 POLICIES, LEGISLATION AND INSTITUTIONAL ASPECT

According to the fundamental principles of environment, any developmental activities of this nature such as construction of simplified Sewerage System would have socio-economic and somehow environmental impacts that must be addressed and governed in order to serve public interest and sustainable development. Given the many existing and developing environmental laws, regulations and standards in Tanzania, it is worth considering resorting to constitutional provisions to protect and manage the environment. With increasing environmental awareness in recent decades, the environment has become a higher political priority and many constitutions now expressly guarantee a 'right to a healthy environment', as well as the procedural rights necessary to implement and enforce the substantive rights granted. The public or national interest in this aspect is addressed through government Policies and regulated by Principal Acts and Regulations. The implementation of the proposed project shall touch various sectors; therefore, the developer has to comply with number of cross-sectorial policies and legislations relevant to this project. Also, the listed institutions involved in environmental management for the project is included in this chapter.

3.1 RELEVANT POLICIES

This section focuses on various policies which guide the development aspects for sustainable vision, apart from the national environmental policy, there are numbers of sector policies that are to be reviewed when executing the proposed development and these include;

3.1.1 National Environment Policy 1997

This is the main policy document governing environmental management in the country. The NEP defines environmental issues as both natural and social concerns and adopts the key principle of sustainable development. The NEP has also proposed the framework environmental legislation to be taken into account by the numerous agencies of the Government involved in regulating

the various sectors. The NEP defines strategic plans for environmental management at all levels and provides an approach for mainstreaming environmental issues for decision-making particularly the use of Environmental Impact Assessment. During implementing the project, Contracting Authority should consider the requirements of the policy including environmental protection through implementing impacts mitigation, management and monitoring plans. Henceforth the preparation of this Improved Project Brief study aims at adhering to this policy through identifying impacts, proposing mitigation, management and monitoring plans.

3.1.2 National Land Policy of 1997

The National Land Policy states that "the overall aim of a National Land Policy is to promote and ensure a secure land tenure system, to encourage the optimal use of land resources, and to facilitate broad-based social and economic development without upsetting or endangering the ecological balance of the environment". This study partly responds to this requirement.

3.1.3 Construction Industry Policy (2003)

Among the major objectives of the policy, which supports a sustainable building development sector, include the promotion and application of cost effective and innovative technologies and practices to support socio-economic development activities such as sanitation, water supply, buildings, road-works, shelter delivery and income generating activities and to ensure application of practices, technologies and products which are not harmful to either the environment or human health. Proposed project is in-line with this policy as ultra-modern technology is used during construction and its operation.

3.1.4 National Health Policy (2003)

The Health Policy is a vital guide towards health development of any country. It is particularly, important in a country like ours where resources and technology are more limited than in other countries, which are relatively better off in both technology and resources. This Policy is a revision of the 1990

Health Policy, which emphasized on the need for increasing community involvement in health development and improved access and equity in health and health services.

The Policy recognizes the challenges of consolidating the principles of the previous health policy in community involvement, improved health services provision, access and equity while addressing the different dimensions of reforms that are taking place in the Public Sector.

The proposed project will adhere to policy requirements to ensure no transmission of such communicable diseases between construction workers and the community, protect workers from all sorts of health risks and hazards; and provide adequate sanitation services within the project and ensure that its activities are not a source of health issues.

3.1.5 National Gender Policy of 2000

The overall objective of the Gender and Development Policy is to promote gender equality and equal participation of men and women through facilitation of access to education, child care, and employment and decision making. Also this policy is to provide guidelines that will ensure that gender-sensitive plans and strategies are developed in all sectors and institutions. While the policy aims at establishing strategies to eradicate poverty, it emphasizes gender quality and equal opportunity of both men and women to participate in development undertakings and to value the role played by each member of society. The proposed project will adhere the requirements addressed under this policy.

3.1.6 National Human Settlements Development Policy (2000)

Among the objectives of this policy is to improve the level of the provision of infrastructure and social services for the development of sustainable human settlements and to make serviced land available for shelter to all sections of the community. Such infrastructure and services constitute the backbone of urban/rural economic activities. Simplified Sewerage System is one among of the important infrastructure for the Kinyerezi community and country at large

3.2 PRINCIPAL LEGISLATIONS AND REGULATIONS

The ESIA team reviewed several legislations relevant to the construction of Simplified Sewerage System. These encompass Principal Acts that support and provide guidelines to implement the intended project as discussed below.

3.2.1 Environmental Management Act (2004)

Among the major purposes of the EMA are to provide the legal and institutional framework for sustainable management of the environment in Tanzania; to outline principles for management, impact and risk assessment, the prevention and control of pollution, waste management, environmental quality standards, public participation, compliance, and enforcement; to provide the basis for the implementation of international instruments on the environment; to provide for the implementation of the National Environmental Policy; to provide for the establishment of the National Environmental Fund and to provide for other related matters.

Part III, Section 15(a) states that "*in matters about the environment, the Director of Environment shall coordinate various environment management activities being undertaken by other agencies to promote the integration of environmental considerations into development policies, plans, programs, strategies projects and undertake strategic environmental assessments to ensure the proper management and rational utilization of environmental resources on a sustainable basis for the improvement of the quality of human life in Tanzania*".

Part X of the law deals with Environmental Quality Standards. Section 140 of this act states that "*The National Environmental Standards Committee of the Tanzania Bureau of Standards established under the Tanzania Bureau of Standards Act, 1975 shall develop, review and submit to the Minister proposal for environmental standards and criteria concerning; water quality; discharge of effluent into the water; air quality; control of noise and vibration pollution; sub-sonic vibrations; soil quality, control of noxious smells; light pollution; and any other environmental quality standard*" Some of these standards have already

been published in the government *gazette* while others are not in place. This project shall consider all the standards specified by this act.

3.2.2 The Environmental Management (Fees and Charges) Regulations, 2021

These Regulations shall apply in relation to an act or service in respect of which fees and charges are payable under the Act and Regulations made thereunder. The regulations emphasize that "a person shall not, upon payment of fees and charges prescribed in the Schedule to these Regulations, carry on any of the following":

- Environmental Impact Assessment;
- Environmental Compliance Monitoring and Audit;
- Registration of Environmental Experts;
- Environmental Quality Standards;
- Noise and Vibrations; or
- other activities related to the environment

This project complies with the regulations since the proponent has already paid registration fees and review charges as directed by NEMC.

3.2.3 The Environmental Management (Control of hazardous Waste) regulations, 2021

The objective of these regulations is to protect the environment and human health by preventing or reducing the generation of Hazardous waste, the adverse impacts of the generation and management of hazardous waste and by reducing overall impacts of resource use and improving the efficiency of such use, which are crucial for the transition to a circular economy. The regulation requires that "any person generating, collecting, storing, transporting, treating, recycling, reusing, recovering and disposing of hazardous waste or any person exercising jurisdiction under these Regulations shall, assure that there are no adverse impacts to be generated or caused by the activity conducted. Project developer will comply with the requirements of

this regulation by reducing the construction materials which may generate hazardous impacts, as well as proper handling of such waste such as in use of fuels for various purposes etc.

3.2.4 The Environmental Management (Control of Noise and vibration) regulations, 2015

The regulations focus on the maintenance of a healthy environment for all the people in Mainland Tanzania, the tranquility of their surrounding and their psychological well-being by regulating noise and vibration levels to prescribe the maximum permissible noise and vibration levels from a facility or activity to which a person may be exposed. The project developer will make sure that all the guidelines under this policy will be considered to ensure the healthy environment to everyone.

3.2.5 The Environmental Management (Prohibition of Plastic Carrier bags) regulations, 2019

Regulations are meant to impose a total ban on the import, export, manufacturing, sale, and use of plastic carrier bags regardless of their thickness. Plastic carrier bags has a wide definition in the Regulations, as a bag made of plastic film, with or without handles, or gussets and to which its layer is in any thickness. The Regulations also categorically state that no person shall sell or offer for sale beverages or other commodities wrapped in plastics unless the nature of such commodities require wrappings by plastics, and restricts any licensing authority from issuing any licenses after the Regulations come into force. Project developer will make sure that there will be no use of plastic bags within the project site and the whole project life time, also in case of the need of carrier bags the proponent will make sure that there will be a n alternative bags which are allowed by the regulations. For the commodities that are wrapped in plastic, then the proponent will make sure that such plastic will be handled properly.

3.2.6 The Environmental Management (Solid Waste Management) regulations, 2007

The solid waste management regulation of 2007, provides general directive on management of solid waste as follows: -

Regulation detail the requirements and responsibilities for managing solid waste in Tanzania

Highlight waste minimization and cleaner production principles alongside the duty to safeguard the public health and the environment from adverse effects of solid waste. Detail permitting requirements, notably that any person dealing with solid waste as collector, transporter, waste depositor or manager of a transfer station will apply to the LGA for a permit. The local authority will also issue licenses to individuals or companies qualified to operate solid waste disposal sites; permit is required to operate an LGA waste disposal site. The proposed project is expected to generate solid waste in construction phase. Therefore, to comply with this regulation the Project developer will engage the registered solid waste collection contractor.

3.2.7 The Environmental Management (Water Quality) regulations, 2009

Regulations provide for institutional and legal framework for sustainable management and development of water resources; to outline principles for water resources management; to provide for the prevention and control of water pollution; to provide for participation of stakeholders and the general public in implementation of the National Water Policy. These regulations require the sustainable management of water sources and proper use of the available sources without causing any damage towards such sources. Also, the regulations emphasize that it is every one's responsibility to conserve and preserve the available water sources in Tanzania. During all phases of the project there will be water demand, hence the project developer will make sure that there will be a sustainable use of water. Also during construction and maintenance phase the developer will make sure that the water supply pipes will not be damaged in either ways

3.2.8 The Environmental Management (Air Quality) regulations, 2009

The Regulations were formed in order to: -

- Prohibit emissions and releases of hazardous substances into the environment
- Prescribe permissible emission limits and quantities of emissions of sulphur oxide, carbon monoxide, black smoke and suspended particulate matters, nitrogen oxide, ozone, hydrocarbons, dust and lead
- Empower NEMC to issue air pollutant emission permits, enforce compliance, undertake emergency prevention and issue stop orders
- Set baseline parameters on air quality and emissions based on a number of practical considerations and acceptable limits and ensure protection of human health and the environment from various sources of pollution.

The proposed project will adhere the requirements of this Act, emission limits will be monitored to the permissible limits.

3.2.9 The Environmental Management (Soil Quality) regulations, 2009

These Regulations, made by the Minister of State under sections 143, 144 and 230 of the Environmental Management Act, concern soil pollution and soil quality standards and provide with respect to a soil protection permit and compliance system. They also concern measures of enforcement. The object of these Regulations is to

- Set limits for soil contaminants in agriculture and habitat;
- Enforce minimum soil quality standards prescribed by the National Environmental Standards Committee.

Also, the regulations require that, the contaminants of volatile organic compounds in habitat and agricultural soils shall comply with parameters and upper limits as prescribed and contaminants of heavy metals in habitat; agricultural soils shall comply with parameters and upper limits as prescribed and contaminants of pesticides in habitat and agricultural soils shall comply with parameters and upper limits as prescribed. Local government authority may prescribe special or specific measures and guidelines for soil conservation

applicable to their respective areas of jurisdictions which are not below standards prescribed under these Regulations. The Project developer will comply with the requirements made under these regulations.

3.2.10 Occupational Health and Safety Act 2003

The provisions of this law require employers to provide decent working environment to employees to guarantee their health and safety. Occupational health and safety services are important for sustainable development of a country, as they reduce occupational accidents and diseases which can have huge economic burden to individuals, enterprises and the nation as whole. Improving health and safety of workers will significantly increase productivity at the workplaces to encourage more investments, increase job creation, higher morale, and job satisfaction hence industrial harmony. The law also entails employers to fulfil obligations of ensuring safety of the equipment's used by workers and providing proper safety gears as required.

3.2.11 The Water Supply and Sanitation Act No. 12 of 2009

This is also a new legislation that provides for sustainable management and adequate operation and transparent regulation of water supply and sanitation services; provides for establishment of water supply and sanitation authorities as well as community owned water supply organizations; and provides for appointment for service providers. The main aim of this law is to ensure the right of every Tanzanian to have access to efficient, effective and sustainable water supply and sanitation services for all purposes by taking into account among others protection and conservation of water resources and development and promotion of public health and sanitation; and protection of the interest of customers. Under this law, the Minister responsible for water affairs shall establish water authority and cluster water authorities in order to achieve commercial viabilities.

3.12 Engineers Registration Act and its Amendments 1997 and 2007

The Acts regulate the engineering practice in Tanzania by registering engineers and monitoring their conduct. It establishes the Engineering Registration Board (ERB), the law requires any local or foreigner engineer to register with ERB before practicing in the country. Project developer will continue to comply as it has utilized the services of registered engineering firm for its structural designs which it will continue to use to supervise the construction process.

3.2.13 The Contractors Registration (Amendment) Act, 2008

The Contractors Registration Act requires contractors to be registered by the Contractors Board (CRB) before engaging in practice. It requires foreign contractors to be registered by the Board before gaining contracts in Tanzania. Project Developer shall comply with the law requirement during the recruitment of contractors for project implementation.

3.2.14 The Architects and Quantity Surveyors Act (1997)

The Act requires Architects and Quantity Surveyors to be involved in the project to be registered by the Architects and Quantity Surveyor Board (AQSB) before engaging in practice. It also requires foreign contractors to be registered by the Board before gaining contracts in Tanzania. Project Developer has complied with the law requirement during the recruitment of architects who have designed the project and will continue to utilize registered persons in the project implementation.

3.2.15 The Urban Planning Act (2007)

The law provides for the orderly and sustainable development of land in urban areas, to preserve and improve amenities; to provide for the grant of consent to develop land and powers of control over the use of land and to provide for other related matters. Under Section 3, among others the law seeks to improve level of the provision of infrastructure and social services for sustainable human settlement development. This act established planning authorities which include the city, municipal, town and township councils in the country which have responsibilities including:

- Secure the orderly and environmentally sustainable development of area under its jurisdiction;
- Prepare general and detailed planning schemes;
- Control building densities and access to buildings;
- Recommending approval of building schemes and subdivision of plots by developers;
- Secure cooperation of all agencies, utility bodies, land owners and other bodies and institutions involved in the preparation and implementation of planning process;

3.2.16 Public Health Act (2009)

Provide for the promotion, preservation, maintenance of public health with a view to ensuring the provisions of comprehensive, functional and sustainable public health services to the general public. Part III (e) of the act requires premises owners to keep their premises free of mosquitoes and other disease vectors, vermin or causative agents; Section 54 prohibits causing or suffering from nuisance likely to be injurious or dangerous to health, land, premises, air or water; Part IV (c) assigns responsibility to City council to remove or appoint an agent to collect, transport and dispose solid and liquid waste and charge fees to beneficiaries of this service and responsibilities for prescribing types of wastes and guidelines for their collection and disposal; Section 101 it gives rights to any private sewer to connect it to any available public sewer to discharge foul or storm water therefore the project may connect to and discharge sewage or storm water into the available trunk main. However, the quality of the sewage should be as per agreed with the water authority.

The Contracting Authority will ensure that the project design, construction and operation does not constitute a nuisance; meets the requirements meets public health requirements

3.2.17 World Bank guidelines for Environmental Management

The main objective of this EMP is to establish a set of mitigation and monitoring measures to minimize the adverse social and environmental impacts that can take place during the implementation stage of the subproject. The measures especially focus on sensitive receptors or sensitive locations. The EMP also provides specific information about the monitoring program during construction stage including locations, frequency and reporting process. This project complies with these guidelines as it has ESMP which contains mitigation and monitoring plans of the identified impacts.

4.0 BASELINE INFORMATION

4.1 INTRODUCTION

This section provides baseline data on the relevant environmental characteristics of the project area. Much of the description of the environment is site specific. Other aspects such as that of climate and socio-economic issues are broad covering the whole Ilala City Council. The Consultant relied on primary data as collected from the site as well as secondary data and information gleaned from the literature for the project area.

4.2 PHYSICAL CHARACTERISTICS

4.2.1 Climate

The project area as compared to many other areas in Dar es Salaam city is influenced by coastal climatic conditions. The area experiences a modified type of equatorial climate.

- **Temperature, Sun hours and Radiation**

The region is generally hot and humid throughout the year with an average temperature of 29ºC. The hottest season is from October to March during which temperatures can raise up to 31ºC. It is relatively cool between July to September, with temperature around 20ºC. The maximum sun hours is 9 experienced from August to October, from November to January the sun hours is 8 while in February to March and May to July is 7 hours and the minimum is 5 hours in April. That means from October to March the operation in the project site will probably need more electricity for the purposes of culling at the office, while during coolest monthlies which is from July to September the consumption might go down see figure 8.

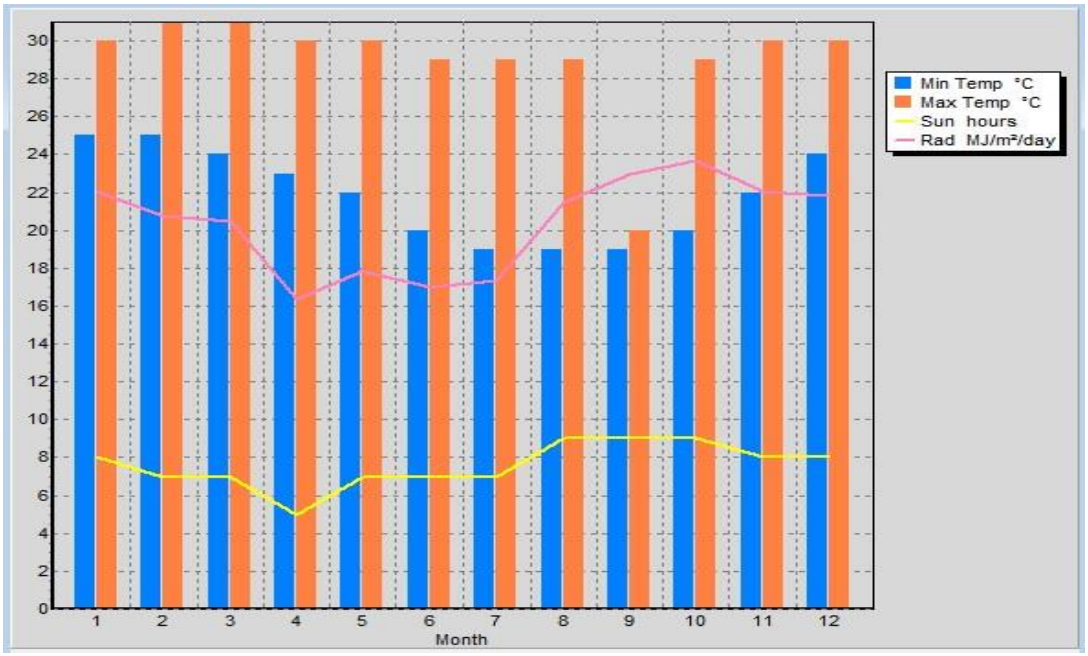


Figure 8: Annual temperature, sun hours and radiation of the site

The average radiation of an area is 20.3 MJ/m^2/day, with 16.3 MJ/m^2/day being the minimum in April and 23.7 MJ/m^2/day maximum in October.

- **Wind Speed**

The region experiences the average wind speed of 5.74 m/s. The maximum wind speed is 7.63 m/s experienced in June which blows from the South South East (SSE) direction which means if the project site will produce and air pollutant all activities downstream of SSE direction will be prone to that pollution. The wind is calm around December to March. The climate is also influenced by the south-westerly monsoon winds from April to October and north-westerly monsoon winds between November and March.

- **Rainfall**

There are two main rain seasons; a short rain season from October to December and a long rain season between March and May. Figure 9 shows the effective rainfall received at Dar es Salaam region.

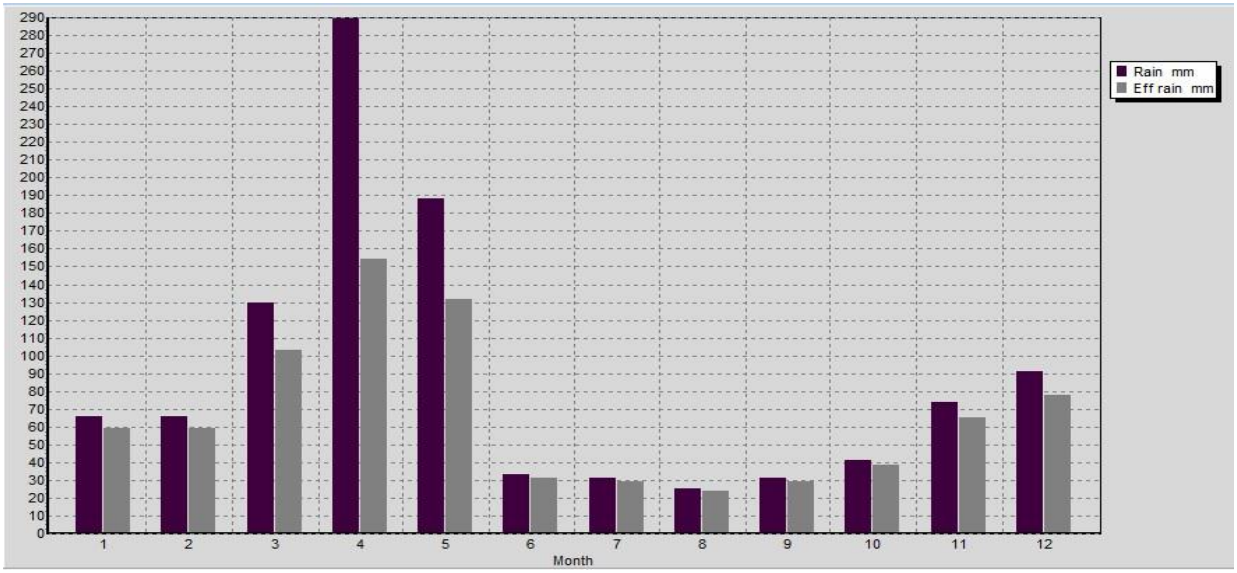


Figure 9: Average annual rainfall data for the site (Source Socio-Economic profile 2019)

4.2.2 Soils, Geology and Hydrogeology of the area

- **Hydrology**

As the area is already developed therefore it is covered by manmade drainage system along Pugu Road close to the project area. Rainwater simply flows to the public drainage system and some percolates through the soil as it easily permits percolation. No River or stream found close to the facility. However, there is potential for ground water in the project area as some surrounding buildings use borehole for their water demand.

- **Soils**

The soils at the project site are typical characterized with sandy and little clay with moderate humus at its upper layer.

4.2.3 Topography

The landscape of the project site is highly manipulated to make the topography flat and suitable for storage activities. The highest contour elevation at the project site is 96.5m Above Mean Sea Level (AMSL) on the western side while the lowest contour elevation is94m AMSL at eastern part of the project site, that

means the rainfall runoff at the project site are directed towards southern eastern side.

4.2.4 Air Quality and Noise Level

The ambient air quality at the project area was observed to be good because the area is for residential purposes only, just because of daily activities there will be particulate matter like dust.

4.2.5 Noise and Vibration

The noise and vibration levels at the project site are rated negligible as the only source of noise at the project site are motor vehicles using the street feeder road adjacent to the project area.

4.3 BIOLOGICAL CHARACTERISTICS

4.3.1 Flora and Fauna

Being in the municipal Centre, there are no flora species of conservation significances identified within the project site. Furthermore, there is no protected area or locations of ecological significance within the project site. The largest part of Apartment is covered with building and the remained small area is paved with concrete floor and pass ways therefore there is no any vegetation at the site. The presence of fuel station has no significant impacts to the biological features as the project area has already developed and modified

4.4 SOCIO-ECONOMIC SET-UP

4.4.1 Administrative boundaries

Ilala Municipality bears the status of an Administrative district that lies between longitude 39^{o} and 40^{o} east and between latitude 60 and 70 south of the Equator. As a part of Dar es Salaam City, it is located in the extreme eastern corner of the Region, bordering by Indian Ocean for a distance of about 10 kilometers to the east. On the southern part it is bordered by Temeke and Kigamboni Municipality, whereas on its western part it is bordered by Kisarawe District and on its Northern part it is bordered by Kinondoni and Ubungo Municipality.

4.4.2 Demographic characteristics

Ilala Municipality referring to the National Population Census of 2012. The Municipality had a total population of 1,220,611 people of which 595,928 were males and 624,683 were females with sex ratio of 95. Ward wise, Vingunguti ward had the highest population of 106,946 people and Kivukoni ward had the lowest population of 6,742 people. The population of females relative to males continues to be higher in almost all wards with exception of few wards like Mchikichini, Kariakoo, Jangwani, Gerezani, Mchafukoge, Kivukoni and Upanga Magharibi. The number of households was 300,674 and the average household size in the Municipality. Table 2 shows the population distribution by sex, average household size and sex ratio by wards in Ilala Municipality in 2012.

Table 2: Population Distribution by Wards and Sex

NO	WARD	MALE	FEMALE	TOTAL	NO. OF HOUSEHOLD	SEX RATIO
1.	Ukonga	39,413	40,621	80,034	19,290	97
2.	Pugu	24,159	25,263	49,422	11,815	96
3.	Msongola	12,147	12,314	24,461	5,704	99
4.	Tabata	35,909	38,833	74,742	19,527	92
5.	Kinyerezi	18,593	19,773	38,366	8,796	94
6.	Ilala	15,242	15,841	31,083	7,170	96
7.	Mchikichini	12,977	12,533	25,510	6,465	104
8.	Vingunguti	53,248	53,698	106,946	28,994	99
9.	Kipawa	35,866	38,314	74,180	18,339	94
10.	Buguruni	34,547	36,038	70,585	18,380	96
11.	Kariakoo	7,306	6,474	13,780	3,033	113
12.	Jangwani	9,174	8,473	17,647	4,190	108
13.	Gerezani	3,767	3,509	7,276	1,589	107
14.	Kisutu	4,069	4,239	8,308	2,249	96
15.	Mchafukoge	5,422	5,266	10,688	2,599	103

NO	WARD	MALE	FEMALE	TOTAL	NO. OF HOUSEHOLD	SEX RATIO
16.	Up/Masharikiki	5,461	5,706	11,167	2,756	96
17.	Up/ Magharibi	6,786	6,690	13,476	3,135	101
18.	Kivukoni	3,531	3,211	6,742	1,343	110
19.	Kiwalani	40,247	42,045	82,292	22,120	96
20.	Segerea	40,065	43,250	83,315	19,496	93
21.	Kitunda	27,340	29,792	57,132	13,061	92
22.	Chanika	21,164	22,748	43,912	11,123	93
23.	Kivule	34,707	37,325	72,032	16,485	93
24.	G/ Mboto	27,927	29,385	57,312	14,349	95
25.	Majohe	39,550	42,096	81,646	19,588	94
26.	Kimanga	37,311	41,246	78,557	19078	90
Total		**595,928**	**624,683**	**1,220,611**	**300,674**	**95**

Source: Population Census August, 2012

4.4.3 Economic Activities

- **Agriculture**

Agriculture and livestock sector is another important economic activity in Ilala Municipality whereby 13% of the population is employed in the sector. The livestock kept in the Municipality are cattle, goats, sheep, donkeys, pigs and chicken. Fishing in Indian Ocean also provides employment to a sizeable proportion of the people in the Municipality.

- **Tourism**

Tourism is currently one of the leading economic sectors in Tanzania and has unlimited potential to contribute even more to the development of the country. There are a number of tourist attractions at Ilala Municipal Council available are categorized into two groups of Landmarks, Museums and Art Galleries, libraries

and cultural centers including Zingiziwa Zoo and historical Mango tree at Kibasila and other attraction centers. There are several Hotels and Restaurants, Bars, Recreational areas, Conference facilities to accommodate tourists in the Municipality. Among those they are famous modest ones. Travels and tours are plenty.

- **Industrial developments**

Ilala Municipality has a number of developed industries. The most significant industries include medium industries which process food, beverage and textiles, building materials, manufacturing industries and Printing. Others include small scale industries which dominates wide range of food and textiles manufacturing printing and detergent. The small-scale industries comprise hulling and milling machine and fruit processing which add value to agricultural primary products. Table 3 shows the size and type of industries in Ilala Municipality.

Table 3: Size and type of industries in Ilala Municipality

Size of Industry	**Type of Products**	**Number of Industries**
Small Scale	Food, textiles, building material, manufacturing, printing and detergent	775
Medium Scale	Food beverage, textiles building material manufacturing industries printing tailors	359
Large Scale	Building industries detergent, assembly manufacturing, printing food beverage, metals extracts industries.	218
Total		**1,352**

Source: Ilala Municipal Council, 2018

4.4.4 Education

Education is an important tool needed for clear understanding, judgment and decision making in most issues ranging from economic, political and social. The

Municipality has invested in education sector in different levels which are pre-primary, primary, secondary and vocational training colleges.

For the purpose of promoting education status in the region as a whole, pre-primary education establishment and development has become not only crucial but also necessary for the targeted groups. The Municipality has a total of 237 pre-primary schools out of which 121 are government owned and 116 schools are private owned. See Table 4.

Table 4: Distribution of Pre-Primary school by ownership and by Division 2018

Division	Public pre-school	Private pre-school	Total
Ilala	39	11	49
Ukonga	62	93	153
Kariakoo	20	12	31
Total	121	116	237

Source: Ilala Municipal Council, 2018

4.4.5 Economic infrastructures

- **Railway Transport**

Currently Ilala Municipality has two types of railway transport. The Tanzania Railways Corporation (TRC) starts at Ilala- Dare s Salaam to Tabora- Kigoma and the other line is to Tabora - Mwanza. The line was originally established during British colonial rule to move minerals. It now taken out both mainly for cargo carried as compared to passengers.

- **Air Transport**

Ilala Municipal Council is enjoying the services of Mwalimu Nyerere International Airport and it is the main entrance of incoming and outgoing passengers through air. The airport is managed by Tanzania Airport Authority.

- **Marine Transport**

On this side the Dar es Salaam port which is under Tanzania Port Authority is at Ilala Municipal Council and hence majority of passenger using ships and

speed boats have to pass through Ilala Municipal Council. The port is the main gate way through to Zanzibar Islands and serving many of land locked countries such as Uganda, Burundi, Rwanda and Democratic Republic of Congo (DRC)

- **Communication Networks**

Communication network in the Municipality is attributed by big Companies which not only Influence Social development, but also economic development in Ilala Municipality. Main Communication Companies Operating in the Municipal are: - AIRTELL, VODACOM, ZANTEL, TIGO, TTCL and HALOTEL. Almost all the newspapers and magazines are made available in the Municipality. The Televisions easily accessible in Ilala Municipality include ITV, TBC1, TBC 2, Star TV, East Africa Television, Capital Television, Tumaini TV, Mlimani TV, Clouds TV and Azam TV.

Tanzania Telecommunication Company Limited (TTCL) still provides services in land based telephone services. Postal services are available throughout the Municipal with at least one fully fledged postal office in each division to coordinate postal services.

4.4.6 Social Services Infrastructure

- **Water Supply and sanitation**

The coverage of the population with clean and safe water which is the right of every Tanzanian is unsatisfactory. In urban areas sewage disposal is a problem and sanitation is also inadequate. Financing for the construction and rehabilitation of urban water supplies is called for. Emphasis should be made on water schemes which can be easily maintained by the users themselves. The provisional of an adequate supply of water for domestic, livestock, institutional, commercial and industrial use is the prerequisite to community health, economic and social development. Governmental, NGO and individual investment partners can pick suitable Wards to work with. Sanitation is most acute in urban centres where investment is needed in toilet facilities by households and public investment in public toilets and garbage collection and disposal.

- **Health service**

The dispensary is the first facility in the healthcare system where people's health problems are dealt with. The location and coverage of dispensaries is the first step towards realization of adequacy of health facility network in a given locality. Table 4.4 shows the distribution of these dispensaries in the Municipality for the 2018. The number of public dispensaries has remained the same for the two consecutive years. Private owned dispensaries accounted for 77.5% of all dispensaries in Ilala Municipality and only 22.5% were government owned. Ukonga division has the highest number of dispensaries compared to the other two divisions.

Table 5: Distribution of dispensaries by ownership and by Division

Division	**Year 2017**			**Year 2018**		
	Public	**Private**	**Total**	**Public**	**Private**	**Total**
Ilala	3	42	45	3	43	46
Ukonga	27	38	65	27	40	67
Kariakoo	1	22	23	1	27	28
Total	32	102	134	32	110	142

Source: Ilala Municipal Council, 2018

The private sector has the larger number of health centres and hospitals compared to the public sector. While the public sector had 3 health centres, the private sector had 13 health centres. Likewise, the number of private hospitals was 6 while there was only 1 public hospital (see Table 6).

Table 6: Distribution of Health Centres and Hospitals by ownership and by Division

Division	**Number of health centres**		**Number of Hospitals**	
	Public	**Private**	**Public**	**Private**
Ilala	1	3	1	2
Ukonga	1	6	0	3
Kariakoo	1	4	0	1
Total	3	13	1	6

Source: Ilala Municipal Council, 2018

Electricity

The main source of electricity is from TANESCO.

4.4.7 Solid Waste management

Ilala Municipality is estimated to produce about 1,100 tons of solid waste per day, basing on a generation rate of 0.8 kg per person per day, Table 7. The collection rate is around 550-600 tons per day which is approximately 50-65% of all solid waste generated per day. Usually solid waste composition can be affected by economic and consumer pattern. Feedback on waste composition is very important in evaluating the requirements or specifications for equipment need, treatment system and management plans.

Table 7: Shows the estimated amount of solid waste generated in each ward per day

Sn	Ward	Projected Population 2017	Solid Waste production (tones)
1	Minazi Mirefu	49,011	24,505.5
2	Buyuni	28,725	14,362.5
3	Chanika	38,136	19,068
4	Zingiziwa	32,782	16,391
5	Majohe	75,702	37,851
6	Ukonga	96,895	49,947.5
7	G/Mboto	53,119	26,559.5
8	Msongola	57,300	28,650
9	Kivule	58,981	29,490.5
10	Kitunda	60,503	30,251.5
11	Kipunguni	60,180	30,090
12	Pugu Station	26,856	13,428
13	Pugu	34,101	17,050.5
14	Mzinga	33,988	16,994
15	Kisukuru	37,664	18,832
16	Kiwalani	59,874	29,937
17	Kimanga	66,355	33,177.5

18	Tabata	96,133	48,066.5
19	Segerea	51,524	25,762
20	Liwiti	56,156	28,078
21	Kipawa	83,010	41,505
22	Vingunguti	77,188	38,594
23	Mnyamani	58,360	29,180
24	Buguruni	78,881	39,440.5
25	Kinyerezi	62,723	31,361.5
26	Bonyokwa	29,707	14,853.5
27	Jangwani	16,256	8,128
28	Mchikichini	32,524	16,262
29	Kisutu	11,057	5,528.5
30	Kariakoo	18,685	9,342.5
31	Gerezani	11,514	5,757
32	Kivukoni	9,215	4,607.5
33	Ilala	38,838	19,419
34	Up/Magharibi	16,368	8,184
35	Mchafukoge	14,059	7,029.5
36	Up/Mashariki	11,400	5,700

Source: Ilala Municipal Council, 2018

Note: Calculations based on the assumption that production of solid waste per day per person is 0.8 kg.

Variation in some Wards is due to business conducting during the day time where there are many people from different parts of the City

4.4.8 Waste Collection and Transportation

In regard to solid waste collection and transportation, there has been an increase in rates of solid waste collected and transported to the disposal site since 2000, when Council opted to work in partnerships with the private sector as contractors of solid waste collection and transportation, the collection rate

decreased from 650 tons in 2015 to 550 tons per day 2018 and disposed off. The decrease was due to decrease of skip buckets, decrease in number of skip loaders, and decrease in number of refuse tracks notwithstanding the slightly improvements, but primary challenges that need to be addressed to further improve the situation. Primary factors contributing to low level of solid waste collection are: -

- ✓ Fast population growth resulting in daily waste generation levels that exceed the handling capacities of the council
- ✓ limited financial resources which constrain the ability of the council to secure the necessary infrastructures and appropriate equipment in adequate numbers to provide the services

4.4.9 Housing

Life forms at the project site are mixed, such that there are residential, institutional and commercial activities. Housing and settlement in the area shows that the majority of buildings have houses roofed with corrugated iron sheets while few buildings are covered with tiles. The walls of building are of concrete blocks and a small proportion of households have houses with walls built from burnt bricks and stones. On the increase is the number of houses built and later covered with glass. On the other hand, the houses of most households have tiles floors followed by those which have cement screed.

5.0 STAKEHOLDER VIEW ON THE PROPOSED PROJECT

During this study, different stakeholders were consulted. Among these include the Ilala Municipal Council and community at Kinyerezi NSSF housing estate (see Figure 10). Consultations were made through meetings.

Figure 10: Stakeholder's consultation meeting at Ilala Municipal office and Kinyerezi NSSF housing estate community

During the meeting, the consultant gave a brief explanation on the proposed Simplified sewerage system. The project description covered proposed location, type and design (a typical design was displayed). The stakeholders were given chance give their views on the project. Moreover, the consultant offered chance to clarify issues where stakeholders wanted to be given more explanations. The comments by stakeholders were analyzed and incorporated in the design of mitigation measures. Table 5 summarizes the issues raised. The names of the stakeholders consulted are given in Appendix I and minutes of meetings are given in appendix IV.

Table 8: Stakeholders issues and concerns

Institution	Name	Position	Issues/ concerns	
IMC	Ally Babu	MEHO	-For SSS if there is water shortage clogging of the system is inevitable -Public toilets should incorporate Change room and Shaving room -Proposed on-site incinerator for public toilet for pads safe disposal and privacy to women.	Section 5.2.2
IMC	Xaveria Marandu	MCDO	-Educate the community to avoid the use of detrimental disinfectants to the system so as to avoid system failure and contaminated manures.	Section 7.3.2.1
IMC	TP. Emmanuel Richard	Town Planner	-The proposed projects should help to solve community problems not bring chaos -The proposed facilities should be well protected -The provided sites for proposed projects are owned by the municipal thus no any ownership conflicts	Section 7.3.2.1 Appendix II Section 7.3.1.1
IMC	Ando Mwakalinga	MELWU	-Awareness to the people on the system operation, since it is a new technology	Section 7.2.2.7
IMC	Bertha Katanzi	Architect	-Costs of using the facility should be indicative	Section 7.3.1.3
IMC	James Batinagwa	Ag. HoD Construction	-Awareness to the community to avoid riots in the future	Section 7.2.2.7

6.0 PROJECT REQUIREMENTS AND WASTE GENERATION

6.1 Project requirements

6.1.1 Construction materials and labour force

The main materials for construction of Simplified sewerage system include cement, aggregates (stones), water, steel, sand, timbers, blocks, PVC pipes, and gravels. All materials are available in the local sources in Tanzania. The estimated quantities of the materials to be included in the BoQ.

6.1.2 Labour force

The labour force will be determined by the Contractor; nevertheless, it is projected that during the construction phase the project will require not less than 100 workers both skilled and non-skilled laborers for each phase of project construction. During operational phase it is estimated that 30 unskilled workers will be retained for operating the system. Employees will be working for twelve hours (10hours per day), but whenever necessary there will be and additional time depending on agreement between employee and the employer.

6.1.3 Machinery and Equipment

The proposed project development will employ various standard construction equipment and machinery. Equipment expected to be used during the construction works are Tippers, Concrete Mixers, poker vibrators, Wheel barrow, Compactor, etc. All equipment and machineries for construction works needed by the proposed project will be determined when the bill of quantities (BoQ) and selection of Contractor is finalized. This equipment shall be temporary and shall be demobilized once project is completed. On the other hand, the hand tools which will be used during construction phase constitutes; Shovels, hoes, hammer, pickaxe, buckets etc.

6.2 Wastes generation

The major wastes generation associated with the project are solid wastes and liquid waste. The solid wastes so produced will be collected and properly disposed at the collection points ready for transportation to the dumpsite.

6.2.1 Liquid waste management

During the maximum operation phase a total of 100m^3 per day of liquid waste is estimated to be received at the downstream receiving chamber of the Fecal sludge treatment facility close to the project site.

6.2.2 Solid waste management

From experience point of view, households connected to the simplified sewerage system tend to throw solid wastes especially used sanitary pads into their toilet sinks thinking flushing will help but he results has always been immediate blockage.

The project design will ensure installation of garbage screen at each household level to prevent the system blockage from single individual's fault. This among others will render the household with the blockage to ensure the situation is well and timely handled at their own costs.

Therefore, solid wastes should be properly disposed at the collection points waiting for solid waste pickup trucks. Table 9 below shows solid and liquid wastes to be generated by the project and the methods of their disposal.

Table 9: Management of construction and operation wastes

Solid waste			
Type of waste	**Sources**	**Estimated Quantity (Kg)**	**Disposal / Management procedure**
Biodegradable materials mainly domestic waste (food, paper, wood etc.)	- Construction crew	30-50	Accessible litter bins within the camp site and later to the city waste disposal system (engage a private company)

Non- biodegradable materials (plastic, glass)	- Construction crew	5-10	Recycling/ reuse (Plastics to be sent to plastic recyclers and glass bottles to be sent to glass recyclers)
Liquid waste			
Type of waste	**Sources**	**Estimated Quantity (m^3)**	**Disposal / Management procedure**
- Excreta (domestic) human - Grey water /cleaners	- Toilets and floor cleaning	100	Use of existing septic tanks and pit latrines and after construction will use the Simplified sewerage system for further treatment downstream

7.0 POTENTIAL IMPACTS

7.1 Mobilization Phase

7.1.1 Positive impacts

7.1.1.1 Employment opportunities

Labour force for the project will be originated from Kinyerezi Ward and the surrounding communities in Ilala areas. Even though during construction the employment will be on short term basis, employees will have been benefiting from the project. Some will witness their incomes and livelihood improvement.

7.1.2 Negative impacts

7.1.2.1 Noise pollution

Noise pollution is likely to occur due to the application of construction equipment and generators at the site.

Mitigation Measure

- The proponent shall maintain equipment in good running conditions to ensure that ambient noise level and vibrations pollution into the environment is very minimum to comply with Tanzania standards.

- The noisy construction activities will be scheduled at normal working hours. Regular inspection and maintenance of construction vehicles and equipment will be done to ensure that they have mufflers installed and worn parts are replaced

7.1.2.2 Air Pollution from dust emission

Air pollution is likely to occur due to the emission of suspended particulate matter (dust) to the atmosphere from the construction activities.

Mitigation Measure

- Mixing equipment shall be sealed properly and vibrating equipment will be equipped with dust removing devices.

- Also all vehicles that generate excessive black smoke will not be used.
- Adequate training and use of personal protective equipment (PPE) such as eye glasses and dust masks will be ensured in order to reduce risks associated with dust.

7.1.2.3 Blockage of paths

During the mobilization activities for the implementation of the project the accessibility to different places in area where the SSS expected to be established will be affect due to on-going activities such as survey and present equipment's for other activities.

Mitigation Measure

- Provision of information to residents before any activities to avoid disturbance to the work and accessibility.
- Installation of the signs to keep the residents aware of the on-going activities
- Establishment of diversion depending on the specific sewer line locality

7.2 Construction Phase

7.2.1 Positive Impacts

7.2.1.1 Employment opportunities

Labour force for the project will be originated from Kinyerezi Ward and the surrounding communities in Ilala areas. Even though during construction the employment will be on short term basis, employees will have been benefiting from the project. Some will witness their incomes and livelihood improvement.

7.2.1.2 Increased socio-cultural interaction

Increased socio-cultural interaction is another anticipated positive impact. The implementation of the project will bring many people from different cultural backgrounds. The interactions may bring about social changes in the communities around the project areas. Interaction with technocrats as a result

of new immigrants (customers) into the area will stimulate adoption of the new technologies.

7.2.1.3 Increased Revenue to the nation through taxes, both direct and indirect

DAWASA is expected to increase its revenue collection on implementing this project. This will be through monthly payment of sanitation services by the respective household. The revenue collected will contribute towards expansion of the water supply and sanitation service within DAWASA service area.

7.2.1.4 Cost reduction for sewage management

The proposed facility will make it easier for the Institutions and households which at present incur unbearable costs for proper dislodging the septic tanks when full. That simply means the households in the vicinity and the institutions will benefit through direct connection to the downstream treatment facility depending on the nature of topography.

7.2.2 Negative impacts

7.2.2.1 Increased HIV/AIDS and other sexual related diseases:

Local communities surrounding the project area have to be aware of the fact that HIV/AIDS is present in their areas but accede to it not being at an alarming rate. The communities were worried that with an influx of people into the project area the pace of spread will accelerate especially during the construction phase.

Mitigation Measures

- Contractor shall enforce a code of conduct in the project area to encourage respect for the local community and to maintain self-cleanliness of the working area at all times.

- The contractor shall deploy locally available labour to reduce risk of spreading communicable diseases (especially STDs).

- In order to prevent more HIV/AIDS infection, during the implementation phase, the project should include information education and communication component (IEC) in its budget. This will help to raise more awareness on HIV/AIDS, and means to suppress its incidence.

- A safety, health and environment induction course shall be conducted to all workers, putting more emphasis on HIV/AIDS, which has become a national disaster.

7.2.2.2 Land degradation and increased erosion

Establishment of new facility within the project area might result into land degradation and promote soil erosion.

Mitigation Measures

- Unnecessary trench excavation close to the buildings and sensitive re-alignments shall be avoided.

- Lined drainage channels at sensitive terrains shall be provided to control speed and volumes of storm-water.

- The contractor should plant grass or any other vegetation cover to minimise exposed soil surface.

- Directing flow to properly designated channels within the facility site.

- Timely backfilling

- Paving the erosion prone alleys

7.2.2.3 Noise pollution

Noise pollution is likely to occur due to the application of construction equipment and generators at the site.

Mitigation Measure

- The proponent shall maintain equipment in good running conditions to ensure that ambient noise level and vibrations pollution into the environment is very minimum to comply with Tanzania standards.

- The noisy construction activities will be scheduled at normal working hours. Regular inspection and maintenance of construction vehicles and equipment will be done to ensure that they have mufflers installed and worn parts are replaced

7.2.2.4 Air Pollution from dust emission

Air pollution is likely to occur due to the emission of suspended particulate matter (dust) to the atmosphere from the construction activities.

Mitigation Measure

- Mixing equipment shall be sealed properly and vibrating equipment will be equipped with dust removing devices.
- Also all vehicles that generate excessive black smoke will not be used.
- Adequate training and use of personal protective equipment (PPE) such as eye glasses and dust masks will be ensured in order to reduce risks associated with dust.

7.2.2.5 High Risk of Health associated with construction work

Construction activities exposes the workers to a lot of risks for example risk of getting into contact with fecal sludge matter, injuries, COVID-19 pandemic etc

Mitigation measure

- The project proponent shall ensure that all personnel are provided with appropriate protective gear.
- All works shall be planned and conducted in accordance with relevant OHS Guidelines. First Aid Kit as well as regular medical check-ups for the workers will be provided during the entire working hours.
- Adequate number of firefighting equipment/extinguishers will be provided in every few distance to help putting off fire in case of occurrence.
- Excavated pits should be protected by warning tape and guardrails to prevent workers and passersby from falling

- Provision of hand washing equipment and soap at every entrance and exit and at random passage ways within the construction site.

- Ensure all workers to take precautionary measures against COVID-19 by washing hands with soap frequently, practicing social distancing and using face masks of their preference.

7.2.2.6 Waste generation during construction

A lot of waste will be generated especially during construction stage. For example, pipework is likely going to produce some plastics which need to be disposed of. Construction of waste water chambers will both generate wastes. Other wastes will be generated from cleaning of construction equipment and containers like mixers and paint buckets.

Mitigation measures:

- Stick to the design specifications
- Provide waste containers
- Provide training to workers and orient them towards environmental protection values

7.2.2.7 Sewer leakage/overflow

Sewer leakage/overflow is likely to occur during house connections to the newly constructed system.

Mitigation Measure

- Ensure proper methodology for house connections

- Ensure availability of a standby cesspit emptier to desludge the pit latrines and septic tanks before connection

- Sensitization of the local community to avoid puncturing the sewer pipes

- Ensure sealed and watertight connection at each pipe junctions

7.2.2.8 Blockage of foot-paths

During construction of the SSS at Kinyerezi different equipments will be used to ensure the sewer are well installed, these equipment and on-going activities

are expected to cause disturbance to residents especially the blockage of the foot paths which are the exact route of the sewer lines..

Mitigation Measure

- Provision of information to residents before any activities to avoid disturbance to the work and accessibility.
- Installation of the signs to keep the residents aware of the on-going activites
- Remove of equipment from the path when there are no activities undertaken.

- **Operation Phase**

7.3.1 Positive Impacts

7.3.1.1 Improved social-economic livelihood and dignity within the beneficiary society

The project will improve the living conditions in Ilala Municipal specifically Kinyerezi ward whereby the project operation phase will do away with illegal faecal sludge dislodging especially during rainy season or during the night. The monthly charged fee for each connected household will be such as affordable by the intended customer. Thus, there will be increased money circulation that result into increased income consequently better standard of living of people in the project area.

7.3.1.2 Increased Revenue to the nation through taxes, both direct and indirect

DAWASA is expected to increase its revenue collection on implementing this project. This will be through monthly payment of sanitation services by the respective household. The revenue collected will contribute towards expansion of the water supply and sanitation service within DAWASA service area.

7.3.1.3 Cost reduction for sewage management

The proposed facility will make it easier for the Institutions and households which at present incur unbearable costs for proper dislodging the septic tanks when full. That simply means the households in the vicinity and the institutions will benefit through direct connection to the downstream treatment facility depending on the nature of topography.

7.3.2 Negative Impacts

7.3.2.1 Sewer leakage/overflow

Sewer leakage/overflow is likely to occur due to the possibility of blockage or pipe rupture resulted from human activities.

Mitigation Measure

- Ensure timely maintenance of the blocked sewer section.
- Installation of screen at receiving individual household interceptor Manhole.
- Sensitization of the local community to avoid dumping solid wastes into the toilet sinks.
- Installation of flushing mechanism so as to scour any possible deposited silt/sludge.
- Inspection of the sewer lines and manholes for any possible pre-mature leakage/overflow

8.0 ACTION PLAN FOR PREVENTION AND MANAGEMENT OF ACCIDENTS DURING IMPLEMENTATION STAGE

The project shall be implemented in compliance to labour laws in Tanzania, in particular, the Occupational Health and Safety Act (2003). Clauses to protect the health and safety of workers shall be included in the contract documents for implementation stage.

8.1 Occupational Health and Safety

The proponent is committed to protect the health and safety of its employees and those of its contractors, to ensuring that activities are conducted in a manner that protects the environment and people. The Contractor shall provide and enforce the use of appropriate personal protective equipment for all workers e.g. overalls, gloves, masks, etc. (wherever required). Tanzanian/international construction standards will be followed for quality and safety to workers. First aid facility will be installed at the construction site.

8.1.1 Emergency preparedness Plan

The proponent is committed to ensure the availability of the emergency preparedness plan in place prior to commencement of construction phase. Among others the plan should contain; identified risks, Team Build up, Availability of critical information, updated alert and response procedures and ensuring that the plan is working by putting it to some tests.

8.2 Security

The whole proposed project will take care of security matters of the site by fencing the storage area and provide gates for entrance and exit purposes. The project proponent shall have a 24 hours security services from a private company to secure the whole project premise at the site. The project proponent will install the best firefighting system at the site. The purpose of fire protection is to protect life, goods, and activities within the project site.

The following are some of the active and passive fire-fighting equipment that will be employed;

- Portable Fire Extinguishers

8.3 Monitoring, Maintenance and repair

The management of the facility will be upon both DAWASA and Ilala Municipal Council to ensure the approved design or plan is implemented accordingly. Furthermore, provision of basic services will be executed at high quality as intended.

9.0 ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN

9.1 Environmental and Social Management Plan

The Environmental and Social Management Plan (ESMP) presents the implementation schedule of the proposed mitigation measures for both environmental and social impacts. The ESMP for the proposed Construction of Simplified Sewerage System at Kinyerezi NSSF housing estate Kinyerezi Ward is summarized in Table 10. The ESMP also indicates environmental costs needed to implement the recommended mitigation measures. The site selection process has been done, however engineering designs are being prepared and will soon be incorporated with the mitigation measures recommended in this report. Additional recommendations are provided in the ESMP to enable the Simplified sewerage system to be constructed and operated in environmentally friendly manner.

DAWASA in collaboration with Ilala Municipality shall be the main implementer of the ESMP through. The environmental measures incorporated in the detailed engineering design will be attached to the Bills of Quantities and Contract Documents. Moreover, there will be an Environmental, Social, Health and Safety (ESHS)Code of Conduct to be signed by the Contractor(s) to show their commitment in the implementation of the Environmental, Social, Health and Safety. The implementation of the Code will be supervised by DAWASA or his consultant.

The ESHS Code is a set of Guidelines attached to the Bidding Document and Contract to be adopted by Contractor during project implementation. It contains the commitment and obligations of the Contractor and its subsidiaries (i.e. Sub-

Contractors and staff) to undertake construction activities in accordance with all applicable Laws, Rules, and Regulations. The Contractor and its subsidiaries shall comply with the Code of Conduct with high ethical standards. Failure to observe the Code, will subject the firm to disciplinary action, including Contract termination. Violation of the Code, is violation of Law which may result to civil and/or criminal penalties to Contractors, Supervisors or Firm.

Some of the issues to be included in the ESHS shall include;

- Site specific **ESMP, HSMP**,
- Traffic Management Plan **(TMP), where applicable**
- HIV/AIDS Awareness Program,
- Occupational Health and Safety Awareness Program.
- Sexual Harassment Prevention Policy
- Child Labour Prevention Policy

The environmental and social mitigation and enhancement measures incorporated in the detailed engineering design will be attached to the Contract Documents. The Contractor shall take stock of the contents of the Project Brief.

Table 10: Environmental and Social Management Plan for the Proposed Construction of Simplified sewerage system at Kinyerezi NSSF housing estate, Kinyerezi Ward, Ilala Municipal

Impact	Mitigation Measure	Responsible Institution	Estimated One Time Cost (TZS)	Estimated Annual cost (TZS)
Mobilization Phase				
Increased waste generation	○ Stick to the design specifications ○ Provide waste containers ○ Provide training to workers and orient them towards environmental protection values	DAWASA	To be included in the BOQ	
Noise pollution during construction	○ The proponent shall maintain equipment in good running conditions to ensure that ambient noise level and vibrations pollution into the environment is very minimum to comply with Tanzania standards ○ All construction works will be scheduled at normal working hours.	DAWASA	500,000.00	

Impact	Mitigation Measure	Responsible Institution	Estimated One Time Cost (TZS)	Estimated Annual cost (TZS)
	○ Proper inspection and maintenance of construction vehicles and equipment will be done to ensure that they have mufflers installed and worn parts are replaced			
Construction Phase				
Increased waste generation	○ Stick to the design specifications ○ Provide waste containers ○ Provide training to workers and orient them towards environmental protection values	DAWASA	To be included in the BOQ	
Increased HIV/AIDS and other STD	○ The contractor shall enforce a code of conduct in the project area to encourage respect for the local community and to maintain self-cleanliness of the working area at all times.	DAWASA	5,000,000.00	

Impact	Mitigation Measure	Responsible Institution	Estimated One Time Cost (TZS)	Estimated Annual cost (TZS)
	○ The contractor shall deploy locally available labor to reduce the risk of spreading communicable diseases (especially STDs). ○ To prevent more HIV/AIDS infections, during the implementation phase, the project should include an information education and communication component (IEC) in its budget. This will help to raise more awareness on HIV/AIDS and means to suppress its incidence. ○ A safety, health, and environment induction course shall be			

Impact	Mitigation Measure	Responsible Institution	Estimated One Time Cost (TZS)	Estimated Annual cost (TZS)
	conducted for all workers, putting more emphasis on HIV/AIDS, which has become a national disaster.			
Land degradation and increased erosion	• The contractor should pave the walkways prone to erosion whose quantities are shown in the BoQ ○ To obtain the construction materials official negotiations should be performed with wards leaders to avoid conflict.	DAWASA	25,000,000	
Noise pollution during construction	○ The proponent shall maintain equipment in good running conditions to ensure that ambient noise level and vibrations pollution into the	DAWASA	1,000,000.00	

Impact	Mitigation Measure	Responsible Institution	Estimated One Time Cost (TZS)	Estimated Annual cost (TZS)
	environment is very minimum to comply with Tanzania standards ○ All construction works will be scheduled at normal working hours. ○ Proper inspection and maintenance of construction vehicles and equipment will be done to ensure that they have mufflers installed and worn parts are replaced			
Dust generation during construction	○ Mixing equipment shall be sealed properly and vibrating equipment will be equipped with dust-removing devices. ○ Also, all vehicles that generate excessive black smoke will not be used.	DAWASA	3,000,000.00	

Impact	Mitigation Measure	Responsible Institution	Estimated One Time Cost (TZS)	Estimated Annual cost (TZS)
	○ Adequate training and use of personal protective equipment (PPE) such as eyeglasses and dust masks will be ensured to reduce risks associated with dust.			
Health Risks associated with construction works	○ The project proponent shall ensure that all personnel is provided with appropriate protective gear. ○ All works shall be planned and conducted following relevant OHS Guidelines. First Aid Kit as well as regular medical check-ups for the workers will be provided during the entire working hours.	DAWASA	3,000,000.00	

Impact	Mitigation Measure	Responsible Institution	Estimated One Time Cost (TZS)	Estimated Annual cost (TZS)
	○ An adequate number of firefighting equipment/extinguishers will be provided every few distances to help to put off the fire in case of occurrence. ○ Excavated pits should be protected by warning tape and guardrails to prevent workers from falling ○ Adhere to good maintenance			
Bad odour and Spread of disease	○ Detection and management of the leaked pipes ○ Repairing of the leaking pipes	DAWASA		
Blockage of Footpaths	○ Provision of information to	DAWASA	5,000,000.00	

Impact	Mitigation Measure	Responsible Institution	Estimated One Time Cost (TZS)	Estimated Annual cost (TZS)
	residents before any activities to avoid disturbance to the work and accessibility. ○ Installation of the signs to keep the residents aware of the on-going activities ○ Remove of equipment from the path when there are no activities undertaken.			
Demobilization phase				
Noise pollution during construction	○ The proponent shall maintain equipment in good running conditions to	DAWASA	500,000.00	

Impact	Mitigation Measure	Responsible Institution	Estimated One Time Cost (TZS)	Estimated Annual cost (TZS)
	ensure that ambient noise level and vibrations pollution into the environment is very minimum to comply with Tanzania standards ○ All construction works will be scheduled at normal working hours. ○ Proper inspection and maintenance of construction vehicles and equipment will be done to ensure that they have mufflers installed and worn parts are replaced			
Operational Phase				
Health Risks associated with construction works	○ The project proponent shall ensure that all personnel is provided with appropriate protective gear.	DAWASA	Depend on the operational manual	

Impact	Mitigation Measure	Responsible Institution	Estimated One Time Cost (TZS)	Estimated Annual cost (TZS)
	○ All works shall be planned and conducted following relevant OHS Guidelines. First Aid Kit as well as regular medical check-ups for the workers will be provided during the entire working hours. ○ Adhere to good maintenance			
Total			**43,000,000.00**	**43,000,000.00**

10. 0 MONITORING PLAN

10.1 Environmental Monitoring

The national EIA guidelines require the developer to prepare and undertake monitoring plan of implemented development projects. Monitoring is needed to check if and to what extent the impacts are mitigated, benefits enhanced and new problems addressed. Recommendations for monitoring have been included in the Table 11. The monitoring plan also assigns responsibilities for different actors. Moreover, the ward and street environmental committees will shoulder the long-term monitoring of the project.

Table 11: Monitoring Plan for the Proposed Construction of Simplified sewerage system at NSS Housing Kinyerezi Ward, Ilala Municipal

Environmental Impact	Mitigation Measure	Parameter	Monitoring Frequency	Sampling Area	Measurement Unit	Method	Target Level/Standard	Responsibility for monitoring	Estimated Annual (or once cost (TZS)
		Mobilization Phase							
Respiratory diseases due to dust emission	-Dust suppression -Use of efficient equipments	Presence of nuisance dust PM2.5 PM10	Daily	Immediate working area	µg/m^3	Physical -visual	25 µg/m^3 for PM2.5 and 50 µg/m^3 for PM10	Contractor/Kinyerezi ward	1,000,000.00
Air Quality	-vehicles that generate excessive black smoke will not be used. -use of personal protective equipment (PPE)	Smell and Odor	Daily	Around the Inspection chambers	Presence of smells	Smelling (nasal)	Absence of nuisance smells	Kinyerezi Ward/DAWASA/Ilala Municipal Council	2,500,000.00
Land pollution due to Waste Generation	-Provision storage containers	Amount of waste generated	Weekly	At the working area	Kg, tones and Cubic Meters for liquid waste	Physical measurement or estimation	All waste contained	Contractor/Kinyerezi Ward/DAWASA/Ilala Municipal Council	4,000,000
Accidents, injuries, and Health risks	-Provision of PPEs	Number of health risk recorded	Daily	At working area	Accidents/injuries	Counting and records	NO/Minimum accident	Contractor/Kinyerezi Ward/DAWASA/Ilala Municipal Council	In BOQ

Environmental Impact	Mitigation Measure	Parameter	Monitoring Frequency	Sampling Area	Measurement Unit	Method	Target Level/Standard	Responsibility for monitoring	Estimated Annual (or once cost (TZS)
HIV/AIDS	-Enforce of code of conduct	Number of HIV/AIDS Cases	Monthly	Workers	Training	Numbers	No Cases	Contractor/Kinyerezi Ward/DAWASA/Ilala Municipal Council	5,000,000.00
Damage of habitats for Biodiversity		Habitats/Removal of biodiversity	Once (at commencement)	Working area	Destruction of habitat or removal of biodiversity	Area affected	Minimal disturbance to biodiversity	Contractor/Kinyerezi Ward/DAWASA/Ilala Municipal Council	1,000,000.00
		Construction phase							
Respiratory diseases due to dust emission	-Dust suppression -Use of efficient equipments	Presence of nuisance dust PM2.5 PM10	Weekly	Immediate working area	Presence of nuisance dust	Physical-visual	25 µg/m^3 for PM2.5 and 50 µg/m^3 for PM10	Contractor/Kinyerezi Ward	None
Air Quality	-vehicles that generate excessive black smoke will not be used. -use of personal protective equipment (PPE)	Smell and Odor	Weekly	Around the Inspection chambers	Presence of smells	Smelling (nasal)	Absence of nuisance smells	Kinyerezi Ward/DAWASA/Ilala Municipal Council	2,500,000.00
Waste Generation	-Provision storage containers	Amount of waste generated	Weekly	At the working area	Amount of waste	Physical measurement or estimation	All waste contained	Contractor/Kinyerezi Ward/DAWASA/Ilala Municipal Council	In BOQ

Environmental Impact	Mitigation Measure	Parameter	Monitoring Frequency	Sampling Area	Measurement Unit	Method	Target Level/Standard	Responsibility for monitoring	Estimated Annual (or once cost (TZS)
Health risks	-Provision of PPEs	Number of health risk recorded	Daily	At working area	Accidents	Counting	NO accident	Contractor/Kinyerezi Ward/DAWASA/Ilala Municipal Council	In BOQ
HIV/AIDS	-Enforce of code of conduct	Number of HIV/AIDS Cases	Monthly	Workers	Training	Numbers	One per month during construction phase only	Contractor/Kinyerezi Ward/DAWASA/Ilala Municipal Council	5,000,000.00
Biodiversity		Habitats/Removal of biodiversity	Once (at commencement)	Working area	Destruction of habitat or removal of biodiversity	Area affected	Minimal disturbance to biodiversity	Contractor/Kinyerezi Ward/DAWASA/Ilala Municipal Council	1,000,000.00
		Demobilization Phase							
Dust	-Dust suppression -Use of efficient equipments	Presence of nuisance dust PM2.5 PM10	Weekly	Immediate working area	Presence of nuisance dust	Physical-visual	25 µg/m^3 for PM2.5 and 50 µg/m^3 for PM10	Contractor/Kinyerezi ward	None
Air Quality	-vehicles that generate excessive black smoke will not be used. -use of personal protective equipment (PPE)	Smell and Odor	Weekly	Around the Inspection chambers	Presence of smells	Smelling (nasal)	Absence of nuisance smells	Kinyerezi Ward/DAWASA/Ilala Municipal Council	2,500,000.00

Environmental Impact	Mitigation Measure	Parameter	Monitoring Frequency	Sampling Area	Measurement Unit	Method	Target Level/Standard	Responsibility for monitoring	Estimated Annual (or once cost (TZS)
Waste Generation	-Provision storage containers	Amount of waste generated for solid waste -For liquid waste, pH, BOD,COD, NH_3, TSS, TDS, N, P, SO_2, Color, Electrical Conductivity, Temperature, Oil and Grease, E. coli, Faecal and Total Coliforms,	Weekly Monthly	At the working area,	Amount of waste mg/m^3, mg/l, NTU, TCU, µS/cm, µg/L,	Physical measurement or estimation Laboratory Measurments	All waste contained	Contractor/Kinyerezi Ward/DAWASA/Ilala Municipal Council	In BOQ
Health risks	-Provision of PPEs	Number of health risk recorded	Daily	At working area	Accidents	Counting	NO accident	Contractor/Kinyerezi Ward/DAWASA/Ilala Municipal Council	In BOQ
HIV/AIDS	-Enforce of code of conduct	Number of HIV/AIDS Cases	Monthly	Workers	Training	Numbers	One per month during construction phase only	Contractor/Kinyerezi Ward/DAWASA/Ilala Municipal Council	5,000,000.00

Environmental Impact	Mitigation Measure	Parameter	Monitoring Frequency	Sampling Area	Measurement Unit	Method	Target Level/Standard	Responsibility for monitoring	Estimated Annual (or once cost (TZS)
Biodiversity		Habitats/Removal of biodiversity	Once (at commencement)	Working area	Destruction of habitat or removal of biodiversity	Area affected	Minimal disturbance to biodiversity	Contractor/Kinyerezi Ward/DAWASA/Ilala Municipal Council	1,000,000.00
		Operation phase							
Leakage/Overflow	-Frequent monitoring and inspection of the network -Frequent maintenance	pH, BOD, COD, NH_3, TSS, TDS, N, P, SO_2, Color, Electrical Conductivity, Temperature, Oil and Grease, E. coli, Faecal and Total Coliforms,	Monthly	Around the Inspection chambers	mg/m^3, mg/l, NTU, TCU, µS/cm, µg/L,	Laboratory Measurments	- Absence of nuisance smells and any pre-mature leakage	DAWASA/Kinyerezi ward	12,000,000.00
Air Quality	-vehicles that generate excessive black smoke will not be used. -use of personal protective	Smell and Odor	Monthly	Around the Inspection chambers	Presence of smells	Smelling (nasal)	Absence of nuisance smells	Kinyerezii Ward/DAWASA/Ilala Municipal Council	2,500,000.00

Environmental Impact	Mitigation Measure	Parameter	Monitoring Frequency	Sampling Area	Measurement Unit	Method	Target Level/Standard	Responsibility for monitoring	Estimated Annual (or once cost (TZS)
	equipment (PPE)								
Waste Generation	-Provision storage containers	Amount of waste generated	Monthly	At the working area	Amount of waste	Physical measurement or estimation	All waste contained	Contractor/Kinyerezi Ward/DAWASA/Ilala Municipal Council	In operation manual
Health risks	-Provision of PPEs	Number of health risk recorded	Monthly	At working area	Accidents	Counting	NO accident	Contractor/Kinyerezi Ward/DAWASA/Ilala Municipal Council	In operation manual
HIV/AIDS	-Enforce of code of conduct	Number of HIV/AIDS Cases	Annually	Workers	Training	Numbers	One per month during construction phase only	Contractor/Kinyerezi Ward/DAWASA/Ilala Municipal Council	In operation manual

Table 12: Monitoring Plan for the Proposed Construction of Simplified sewerage system at Kinyerezi NSSF housing estate, Kinyerezi Ward, Ilala Municipal

Decommissioning phase

Parameter	Monitoring Frequency	Sampling Area	Measurement Unit	Method	Target Level/Standard	Responsibility for monitoring	Estimated Annual (or once cost (TZS)
Dust	Daily	Immediate working area	Presence of nuisance dust	Physical-visual	-	Contractor/Kinyerezi ward	None
Air Quality	Daily	In and around the Faecal Sludge Plant	Presence of smells	Smelling (nasal)	Absence of nuisance smells	Kinyerezi Ward/DAWASA/Ilala Municipal Council	2,500,000.00
Waste Generation Parameters for Liquid waste, pH, BOD, COD, NH_3, TSS, TDS, N, P, SO_2, Color, Electrical Conductivity, Temperature, Oil and Grease, E. coli, Faecal	Weekly	At the working area	Amount of waste mg/m3, mg/l, NTU, TCU, µS/cm, µg/L,	Physical measurement or estimation Laboratory Measurments	All waste contained	Contractor/Kinyerezi Ward/DAWASA/Ilala Municipal Council	In BOQ

Parameter	Monitoring Frequency	Sampling Area	Measurement Unit	Method	Target Level/Standard	Responsibility for monitoring	Estimated Annual (or once cost (TZS)
and Total Coliforms							
Health risks	Daily	At working area	Accidents	Counting	NO accident	Contractor/Kinyerezi Ward/DAWASA/Ilala Municipal Council	In BOQ
HIV/AIDS	Monthly	Workers	Training	Numbers	One per month during construction phase only	Contractor/Kinyerezi Ward/DAWASA/Ilala Municipal Council	5,000,000.00
						Total	**7,500,000.00**

11. 0 DECOMMISSIONING PLAN

11.1 Decommissioning

The decommissioning is not anticipated in the foreseeable future. However, if this will happen, may entail change of use (functional changes) or demolition triggered by change of land use. In view of this, specific mitigation measures pertaining to environmental impacts of decommissioning works cannot be proposed at the moment with a reasonable degree of certainty.

A decommissioning plan that takes environmental issues into consideration shall be prepared by the developer prior to the decommissioning works. Currently the study is discussing the preliminary plan that will be used as insight for Decommissioning plan in future.

This plan will serve to ensure that the decommissioning and ultimate dispositions of the residential buildings are considered during the initial design and construction of that facility.

11.2 Aim of the Preliminary Plan

The preliminary plan serves to establish decommissioning as an important consideration from the inception of the project, during design and throughout the operation of the project. The plan has the following purposes:

a) To ensure that the Sewer network project designers are aware of decommissioning during the initial design stage of the project.
b) To identify the ultimate decommissioning options and final project status. Appropriate options would be evaluated and narrowed to the decommissioning method of choice as the end of project life is approached.
c) To notify the regulatory agencies that, important aspects of decommissioning are considered as early as possible during the initial design of the project.

11.3 Content of the Preliminary Plan

The preliminary plan provides general description of the proposed decommissioning methods considered feasible for the project though with low level of significance. The description is intended to demonstrate that the methods considered are practical and that they protect the health and safety of the public and decommissioning personnel.

Design personnel should study the proposed decommissioning methods and ensure that the design incorporates all features that will facilitate decommissioning like;

i). An estimate of manpower, materials and cost anticipated to support decommissioning processes.

ii). A description of the anticipated final disposition and status of the structures at site as well as reinstatement of the project area.

iii). Identification of records that should be maintained during construction and operation which might facilitate decommissioning.

11.4 Project Decommissioning Methodology and Schedule

The proponent shall implement all aspects of project decommissioning, including but not limited to, all engineering works, environmental assessment, permitting, construction, and mitigation activities associated with the removal of the structures. The proponent shall monitor environmental impacts during and after project removal to respond to defined events during the monitoring phase, some of the considerable issues to be addressed by the plan are:

1. Decommissioning will involve, but not limited to the specified list, because some issues or problems may raise during subsequent monitoring and audits;

- Wherever possible, the pipelines, toilets and Manholes will continuously be rehabilitated and renovated. The solid wastes have to be disposed in accordance to the instruction directives given in EMSP and Ilala Municipal Council Office that is decommissioning permit.

- Employees will be terminated from their employments. In doing this, three important things will be observed;

  i. The proponent have to ensure that their contributions to the pension fund will be made monthly as required by the law

  ii. A training programme will be facilitated to ensure that appropriate skills to responsible workers is adequately given.

  iii. Terminations benefits such as transport and disturbance allowances will be provided to all employees.

2. On decommissioning the proponent will search for experts' opinions in order to convert the entire premises into or other uses.

3. The restoration plan for the entire premises will be made by proponent (with expertise from environmental engineers and economists) and then forwarded to NEMC for approval

4. DAWASA shall obtain all permits required to undertake decommissioning of the project.

The demotion process will begin soon after closure plan has completed and approved by the responsible organs. The proponent will make inventory to all components that need to be displaced, removed and or disposed. This inventory will include like building structures, equipment, and sanitary facilities that need to be demolished/dismantled. Lastly, mode of disposal will have to be finalized. The information will assist in the preparation of the final decommissioning plan for approval by NEMC.

After the approval of the decommissioning plan the metal parts will be removed first within the first three (3) months (it's important to ensure that they are not vandalized). The second three (3) months of the decommissioning will be used to remove concrete structures and foundations. All disturbed areas will be landscaped and re-vegetated using indigenous trees.
Project decommissioning has five phases;

1. Pre-removal monitoring: Pre-removal monitoring includes environmental and socio-economic status of the project site and the surrounding. This monitoring is essential to identify if there is any environmental or social liability which need to be settled before the permit to closure is given. This period will also be used to inventories all assets and facilities that need to be disposed of and to prepare a final decommissioning plan for approval by NEMC
2. Permitting: DAWASA shall obtain all permits required to undertake removal of the project structures. This basically will include NEMC, Ilala Municipal Council and other stakeholders that will be recommended at that particular time.
3. Interim Protective Actions: This will take care of any interim protective measure that needs to be implemented to protect human health and environment, if any.
4. Project Removal: As noted above, the removal of the project will be completed within one year.
5. Post-Removal Activities: Post-Project removal monitoring will continue for one year

12.0 PROJECT BUDGET

The investment cost for the proposed Simplified sewerage system is estimated to be around Tshs. 1.0 billion that will be financed The World Bank

Appendix I: List of Stakeholders Consulted

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT FOR CONSTRUCTION OF OFF GRID SANITATION PROJECTS, DAR ES SALAAM

LIST OF STAKEHOLDERS CONSULTED

SN	DATE/TAREHE	NAME/JINA	INSTITUTION/TAASISI	POSITION/CHEO	PHONE NO./SIMU	SIGNATURE/SAINI
1	06/07/2020	Jumanne K. Sraun	ILALA	MD	0752687584	[signature]
2	12/7/2020	KHERI A. SULTANI	ILALA	Ag. MKIC	0713-237348	[signature]
3	13/7/2020	Reginald Mlay	Ilala MC	Mtto	0754584489	[signature]
4	13/07/2020	Charles Wambura	ILALA MC	- Afisa Afya	0784842309	[signature]
5	13.07.2020	Ally Babu	— do —	Afisa Afya Mazingira	0713065586	[signature]
6	13/07/2020	XAVERIA MABANDA	- do -	AFISA MAENDELEO YA JAMII	0715741228	[signature]

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT FOR CONSTRUCTION OF OFF GRID SANITATION PROJECTS, DAR ES SALAAM

LIST OF STAKEHOLDERS CONSULTED

SN	DATE/TAREHE	NAME/JINA	INSTITUTION/TAASISI	POSITION/CHEO	PHONE NO./SIMU	SIGNATURE/SAINI
	08/07/020	Juma Kusi	SOKO LA KIGOGO FRESH	M/KITI WA SOKO	0657214437	
	08/07/2020	HAFSA MUNGI	MTAA WA KIPUNGUNI 'B'	AFISA MTENDAJI WA MTAA	0756 888570	
	9/07/2020	FADIGA M. LEGEKE	MIVINJENI/B	M/KITI WA MTAA	0659355149	
	9/07/2020	DOMINICA P. BALAMA	MTAA WA LONDO	AFISA MTENDAJI	0658-777047	
	09/07/2020	HAMISA W. MTENDAMEMA	IMC - KATA YA VINGUNGUTI	AFISA AFYA MAZINGIRA	0657143154	
	09/07/20	MOHAMEDI KIRUNGA	NGOBEDI MTAA	M/KITI	0715 295833	

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT FOR CONSTRUCTION OF OFF GRID SANITATION PROJECTS, DAR ES SALAAM

LIST OF STAKEHOLDERS CONSULTED

SN	DATE/TAREHE	NAME/JINA	INSTITUTION/TAASISI	POSITION/CHEO	PHONE NO./SIMU	SIGNATURE/SAINI
1	13/07/2020	Eng. JOHN MAGORI	IMC	PROJECT ENGINEER	0713824546	
2	13/07/2020	TP. EMMANUEL RICHARD	IMC	TOWN PLANNER	0754423147	
3	13/07/2020	Abdon Mapunda	IMC	ENVIRONMENTAL EXPERT	0715464941	
4	13/07/2020	ANDO MWANKILA	IMC	MCELM	0712423614	
5	13/07/20	Justine Magoda	IMC	MBBRSO	0712710720	
6	-"-	Teni Luther	IMC	Arch	0713389226	

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT FOR CONSTRUCTION OF OFF GRID SANITATION PROJECTS, DAR ES SALAAM

LIST OF STAKEHOLDERS CONSULTED

SN	DATE/TAREHE	NAME/JINA	INSTITUTION/TAASISI	POSITION/CHEO	PHONE NO./SIMU	SIGNATURE/SAINI
	10/7/2020	Gaudensia Kukama	IMC	Afisa Afya Kata Kinyerezi	0712246353	
	13/7/2020	JAMES BATINAGWA	IMC	KAIMU MKUU WA IDARA USENZI	0784224959	
	13/7/2020	BERTHA KATANZI	IMC	Mbunifu Majengo	0752626449	

Appendix II: Permit to use the walkways/alleys for SSS infrastructures

HALMASHAURI YA MANISPAA YA ILALA
BARUA ZOTE ZIPELEKWE KWA MKURUGENZI WA MANISPAA

S. L. P. 20950
SIMU: 2128600
FAX NO. 2121486

Ofisi ya Mkurugenzi,
1 Mtaa wa Mission
S. L. P. 20950,
11883 – Dar es Salaam.

Kumb. Na. IMC/EE.22/1/50

Tarehe: 11/12/2020

Afisa Mtendaji Mkuu,
Mamlaka ya Maji safi na Maji taka-DAWASA,
Kanda ya Ilala,
S.L.P 1573,
DAR ES SALAAM.

YAH: KURUHUSU UJENZI WA MIRADI YA DEWATS KATIKA MAENEO YALIYOPENDEKEZWA

Husika na kichwa cha habari hapo juu.

2. Baada ya ziara ya ukaguzi wa maeneo yaliyopendekezwa ambayo ni Zingiziwa, Kivule na Kinyerezi lil kujenga miradi ya uchakataji maji taka (DEWATS) iliyofanywa na timu ya wataalamu kutoka Ofisi ya Mkurugenzi wa Manispaa ya Ilala ambayo ni;-

i. Idara ya Ujenzi – Heri Athumani
ii. Idara ya Ardhi - Ramadhani Chamwite
iii. Idara ya Mipango miji – Alfred Mbyopyo
iv. Idara ya Mazingira – Shabani M. Yusuph

3. Tumejiridhisha kwamba hayana athari kwa mazingira kulingana na umuhimu wake, hivyo basi tunaruhusu ujenzi wa miradi hiyo ufanyike katika maeneo hayo ili kuboresha usafi wa mazingira kwa jamii zinazoishi maeneo yanayozunguka miradi.

4. Asante kwa ushirikiano.

Abdon Mapunda
Kny: MKURUGENZI WA MANISPAA

HALMASHAURI YA JIJI LA DAR ES SALAAM

BARUA ZOTE zI1'ELEKWE KWA AHSA MTENDAJI MTAA WA KINYEREZJ

S.L.P : 20950OFISI YA AFISA
SIMU : 0756 851122MTAA WA

MTENDAJI,
KINYEREZI, S.L.P 20950,
DAR ES SALAAM.

08/07/2021

MTENDAJI MKUU,
DAWASA,
S.L.P 1573,
DAR ES SALAAM.

YAH•. IDHINI YA KUTUMIA MAENEO PENDEKEZWA KWA AJILI YA UJENZI WA MIRADI YA USAFI" WA MAZINGIRA

Tafadhali husika na mada tajwa hapo jUU

Tafadhali rejea mawasiliano yako ya awali kati ya DAWASA na ofisi ya Mkurugenzi kUhUSU Utoaji wa'rnaeneo ya wazi kwa ajili ya Ujenzi wa miradi ya Usafi wa mazingira kwenye maeneo ya pembezoni iliyo chini ya ufadhili wa Benki ya Dunia (WSSP II).

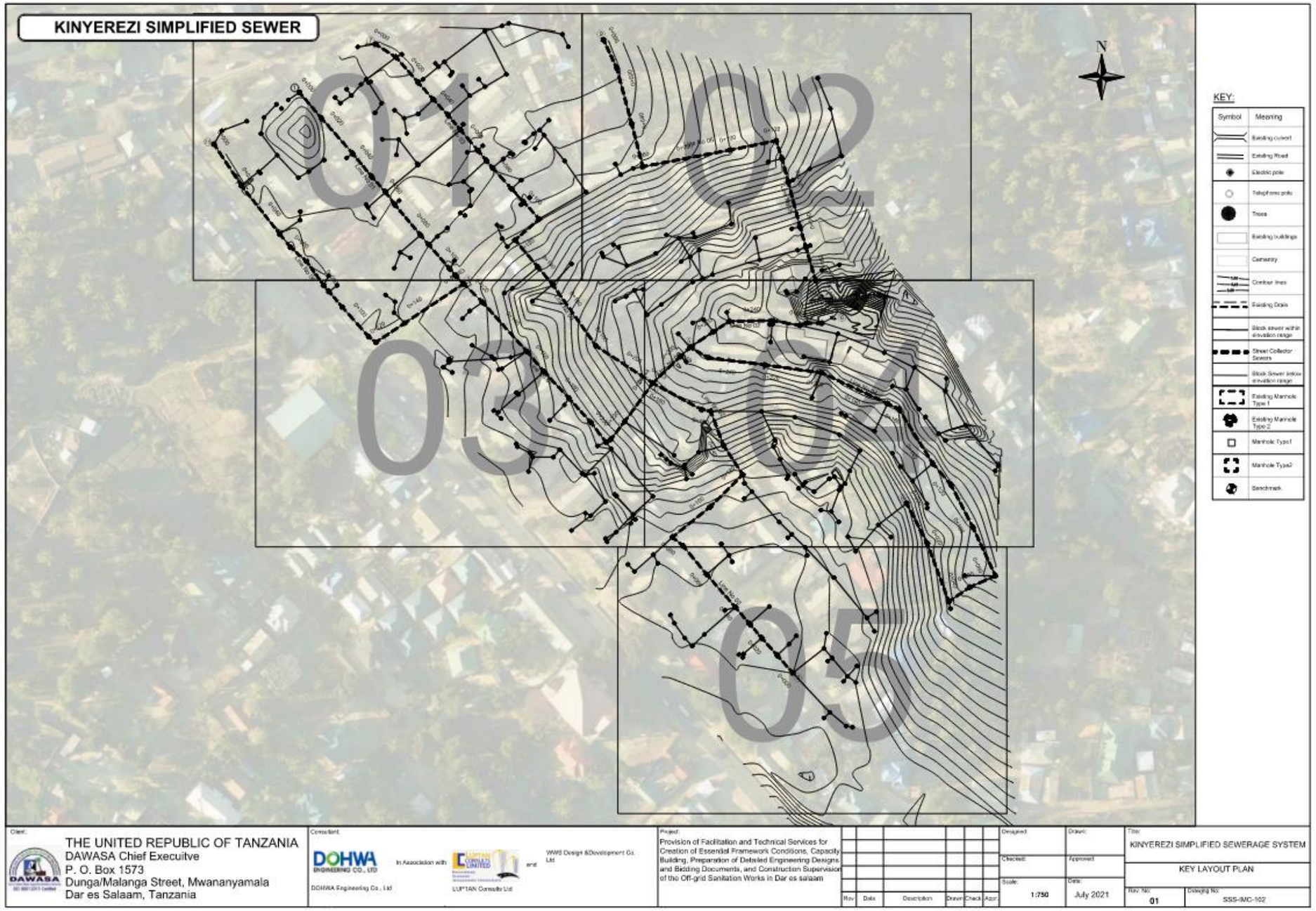
Kwa barua hii tunakujulisha kuwa Serikali ya mtaa imetoa idhini ya kutumia maeneo yaliyopendekezwq kwa ajili ya Ujenzi wa miradi ya ukusanyaji na uondoshaji majitaka (Simplified Sewerage System). Maeneo yatakayotumika kwaajili ya mradi ni njia rasmi na zisizorasmi zilizipo hapa mtaani.

Wako katika kazi,

GODBLESS MWANGA
MEO-KINYEREZI

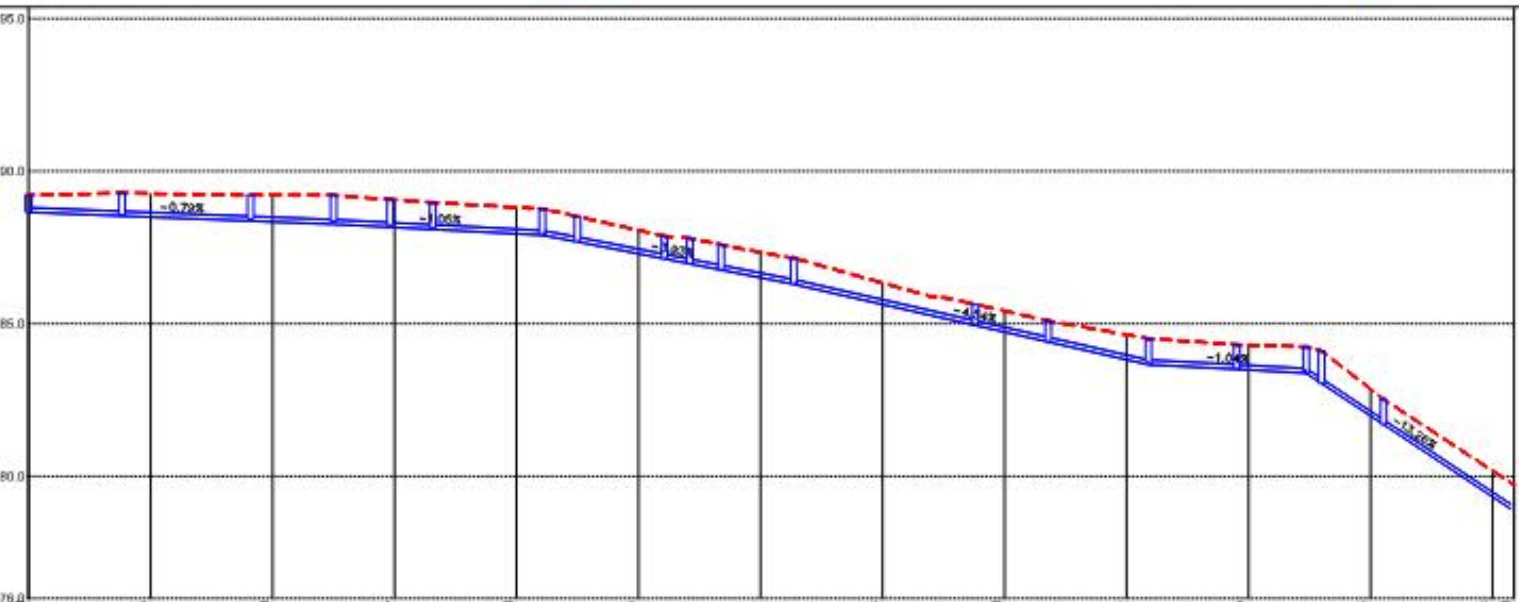
AFISA MTENDAJI
MTAA WA KINYEREZI.

Appendix III: Architectural Drawings



KEY:

Symbol	Meaning
—	Existing DAWASA Pipe
—	Block Sewer
—	Collector Sewer
●	Electric pole
○	Telephone pole
●	Trees
▨	Existing buildings
—	Contour lines
-----	Existing Drain
□	Existing Manhole Type 1
○	Existing Manhole Type 2
□	Manhole Type1
□	Manhole Type2



DATUM 76.00

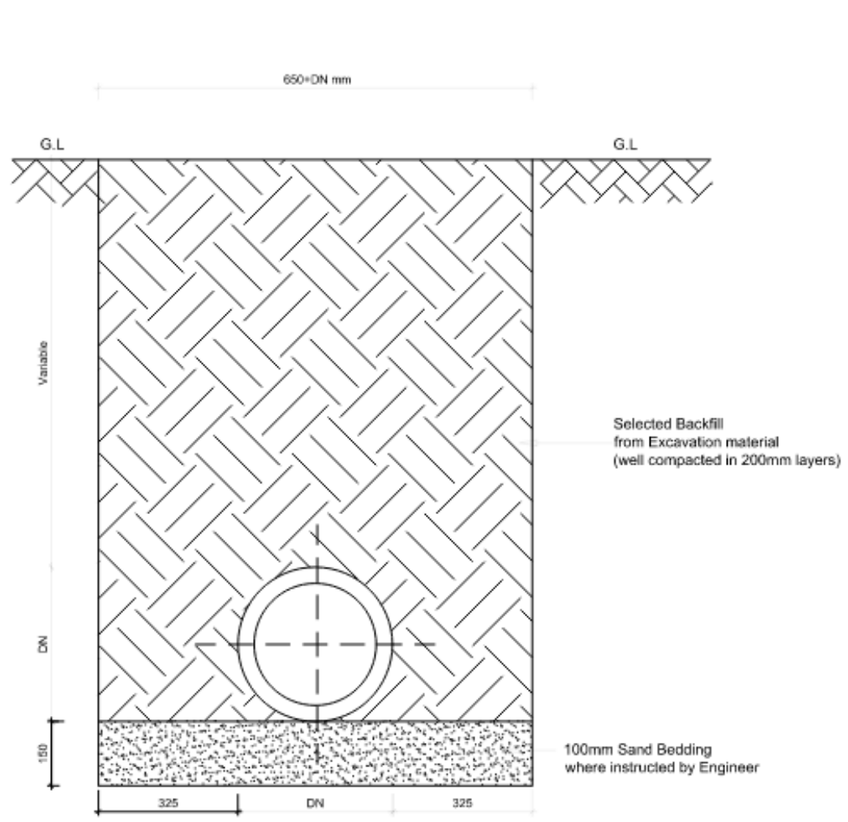
EXISTING LEVEL	89.2	89.26	89.21	89.06	88.81	88.08	87.34	86.33	85.41	84.64	84.30	82.85	80.18	79.71
DESIGN LEVEL	88.727	88.570	88.413	88.230	88.021	87.388	86.583	85.711	84.603	83.895	83.562	82.063	79.402	78.934
CUT/FILL DEPTH		0.694	0.799	0.827	0.788	0.692	0.754	0.622	0.611	0.743	0.737	0.799	0.774	
CHAINAGE		0+020	0+040	0+060	0+080	0+100	0+120	0+140	0+160	0+180	0+200	0+220	0+240	

VERTICAL GEOMETRY	59.589 -0.79%	34.017 -1.05%	41.341 -3.93%	57.841 -4.54%	25.704 -1.04%	34.147 -13.29%

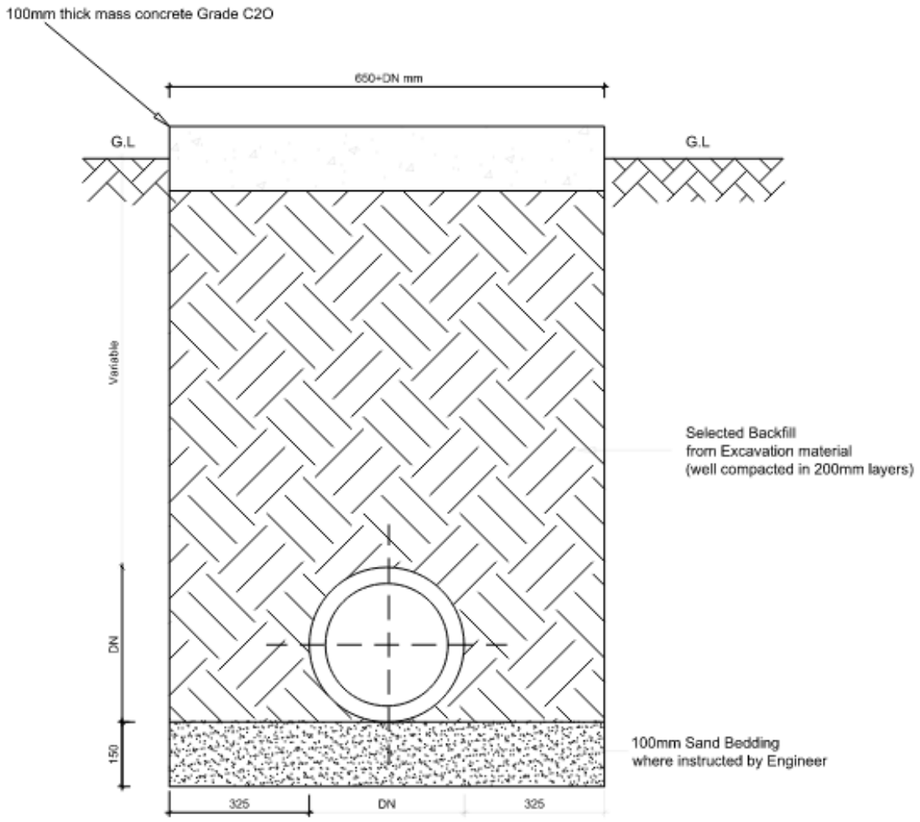
Client: THE UNITED REPUBLIC OF TANZANIA DAWASA Chief Execuitve P. O. Box 1573 Dunga/Malanga Street, Mwananyamala Dar es Salaam, Tanzania	Consultant: DOHWA ENGINEERING CO., LTD In Association with LUPTAN Consults Ltd and WMS Design &Development Co. Ltd DOHWA Engineering Co., Ltd	Project: Provision of Facilitation and Technical Services for Creation of Essential Framework Conditions, Capacity Building, Preparation of Detailed Engineering Designs and Bidding Documents, and Construction Supervision of the Off-grid Sanitation Works in Dar es salaam	Title: KINYEREZI SIMPLIFIED SEWERAGE SYSTEM PLAN AND PROFILE FOR LINE No 01 0+000.00 to 0+243.53

Rev	Date	Description	Drawn	Check.	Appr.

Designed:		Drawn:	
Checked:		Approved:	
Scale:	1:500	Date:	June, 2021
Rev. No:	01	Drawing No:	SSS/MC/PP 212



BEDDING IN NORMAL AND ROCKY SOIL



TYPICAL ENCASEMENT OF SEWER PIPE ALONG THE WALK WAYS

Notes:
1. Minimum width of trench excavation is 750mm and Maximum width is 850mm. In the areas where available width is less than the required width to excavate, the contractor will inform the engineer for approval.
2. Minimum depth for excavation for collector sewers is 0.8m and for block sewer is 0.4m. Excavation depths will vary depending on the slope requirement and existing ground level as per drawing.
3. The contractor will be required to confirm all levels to maintain slope of pipeline as indicated in the hydraulic setting out data

Client:
THE UNITED REPUBLIC OF TANZANIA
DAWASA Chief Execuitve
P. O. Box 1573
Dunga/Malanga Street, Mwananyamala
Dar es Salaam, Tanzania

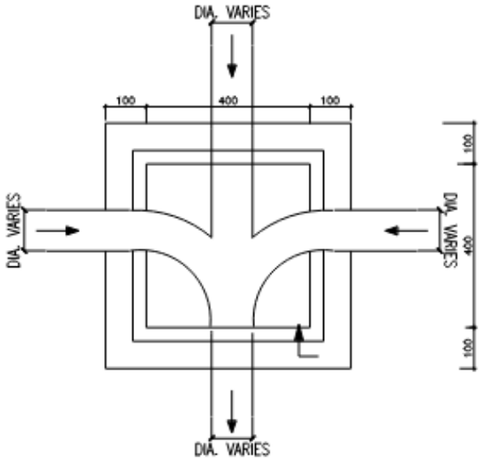
Consultant:
DOHWA ENGINEERING CO., LTD — In Association with — LUPTAN Consults Ltd — and — WKS Design &Development Co. Ltd
DOHWA Engineering Co., Ltd

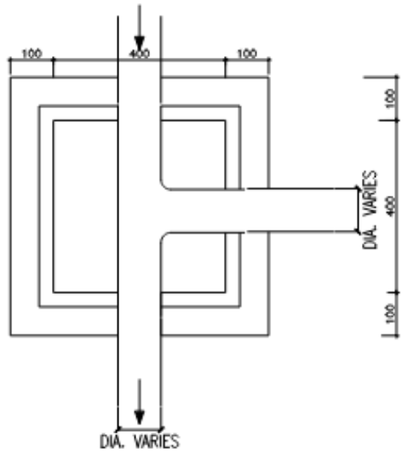
Project:
Provision of Facilitation and Technical Services for Creation of Essential Framework Conditions, Capacity Building, Preparation of Detailed Engineering Designs and Bidding Documents, and Construction Supervision of the Off-grid Sanitation Works in Dar es salaam

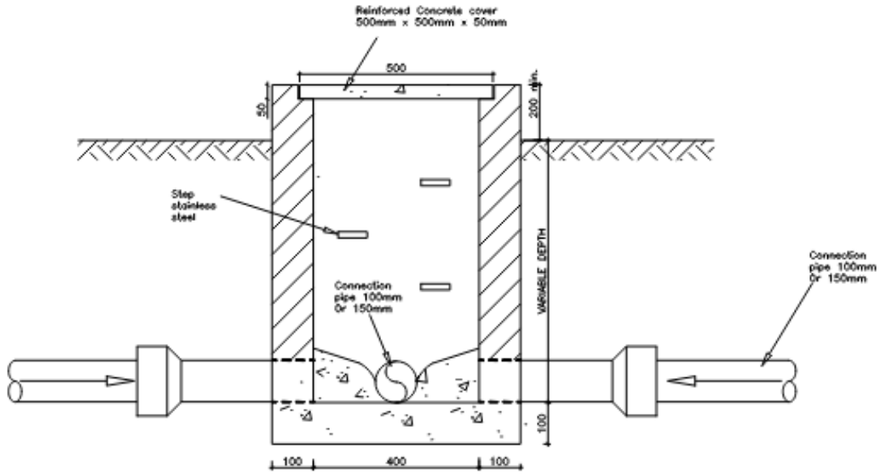
Rev	Date	Description	Drawn	Check	Appr

Designed: | Drawn:
Checked: | Approved:
Scale: NTS | Date: July, 2021

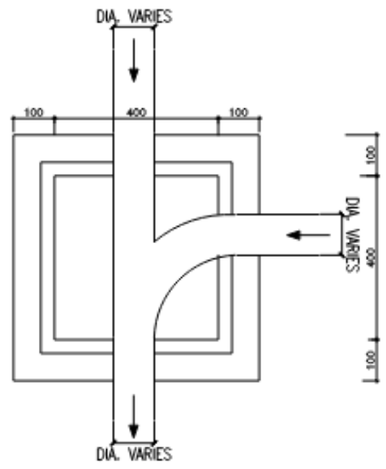
Title: SIMPLIFIED SEWER SYSTEM STANDARD DETAILS DRAWINGS
TYPICAL CROSS SECTIONS AND TRENCH DETAILS
Rev. No: 01 | Drawing No: SSS-STD-301

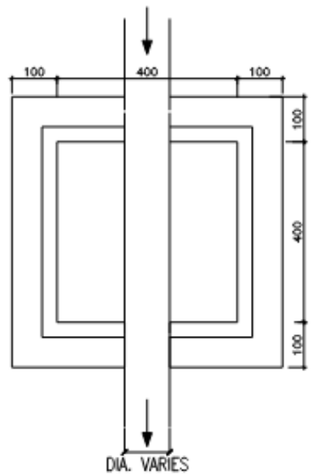




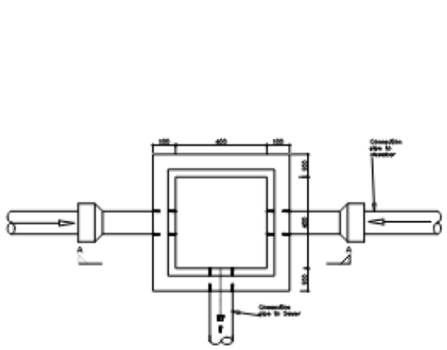


SECTION A-A

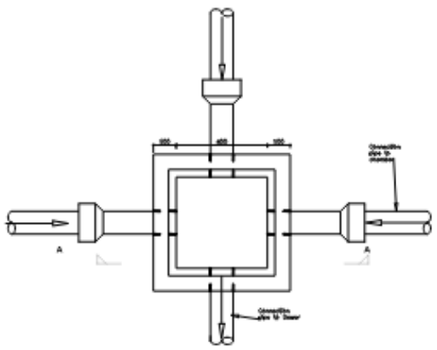




STANDARD MESH DETAILS FOR CONCRETE REINFORCEMENT					
TYPE	WIRE SPACING		WIRE DIAMETER		WEIGHT/SQUARE METERS (kg/m2)
	Main mm	Cross mm	Main mm	Cross mm	
A252	200	200	08	08	3.95
A396	200	200	10	10	3.95
STEEL	HIGH TENSILE , ACCORDING TO BS 4482				



PLAN
INSPECTION CHAMBER
CONNECTIONS TYPE I



PLAN
INSPECTION CHAMBER
CONNECTIONS TYPE II

Client:
THE UNITED REPUBLIC OF TANZANIA
DAWASA Chief Executive
P. O. Box 1573
Dunga/Malanga Street, Mwananyamala
Dar es Salaam, Tanzania

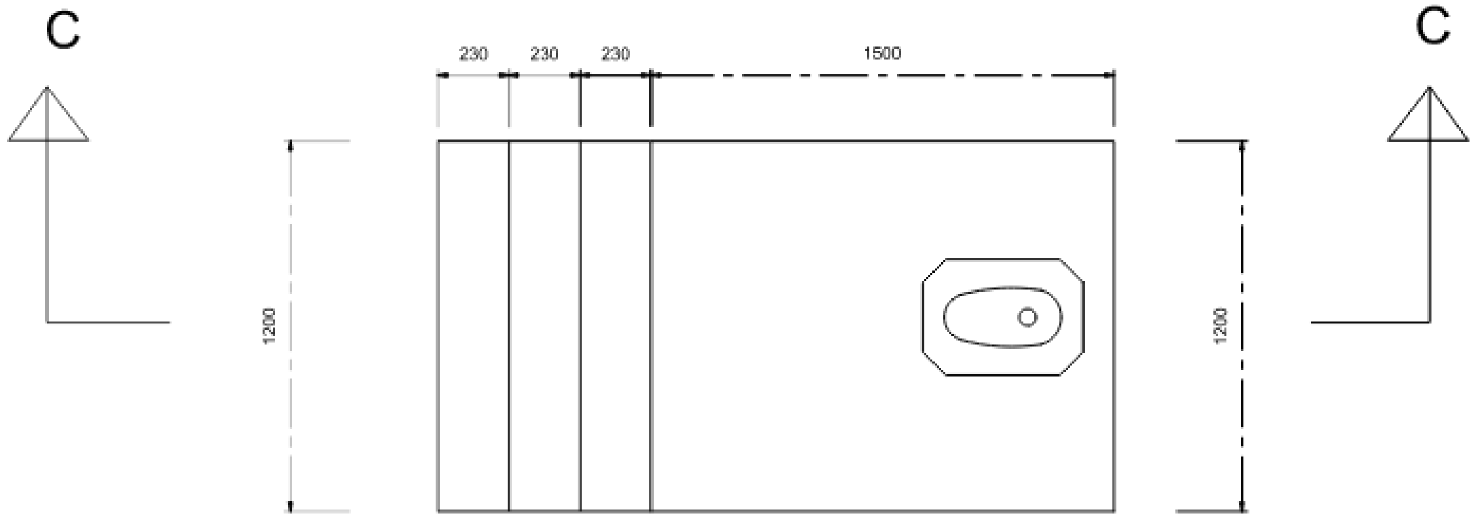
Consultant:
DOHWA ENGINEERING CO., LTD
DOHWA Engineering Co., Ltd
In Association with
LUPTAN Consults Ltd
and
WWS Design &Development Co. Ltd

Project:
Provision of Facilitation and Technical Services for Creation of Essential Framework Conditions, Capacity Building, Preparation of Detailed Engineering Designs and Bidding Documents, and Construction Supervision of the Off-grid Sanitation Works in Dar es salaam

Rev	Date	Description	Drawn	Checked	Appr

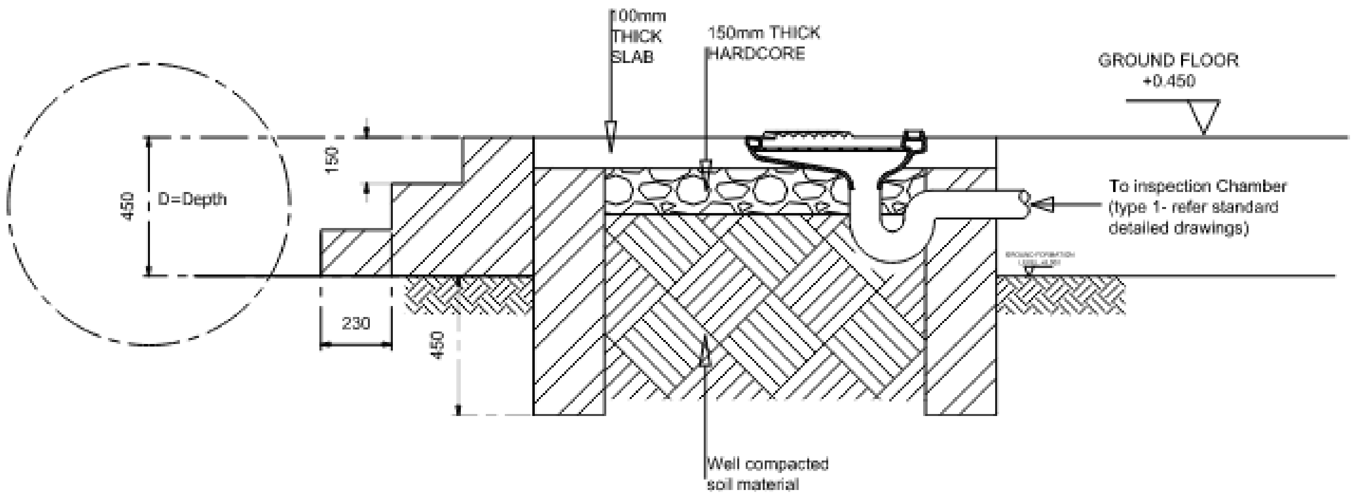
Designed:
Drawn:
Checked:
Approved:
Scale: NTS
Date: June, 2021

Title:
SIMPLIFIED SEWER SYSTEM
STANDARD DETAILS DRAWINGS
INSPECTION CHAMBER 400mm x 400mm
GENERAL ARRANGEMENT
REV. NO: 01
Drawing NO: SSS/MC/STD 303



TOP PLAN

Scale 1:10



SECTION C-C

Scale 1:10

NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SHOWN
2. DO NOT SCALE FROM THIS DRAWING
3. THE SCALES GIVEN ON THIS DRAWING REFER TO THE A1 SIZE ORIGINAL DRAWING
4. THE SUBGRADE SHALL BE COMPACTED TO 99% MAXIMUM DRY DENSITY BEFORE THE PLACEMENT OF HARDCORE
5. CONCRETE SHALL BE CLASS C30/37 FOR STRUCTURAL MEMBERS AND CLASS C8/10 FOR BLINDING
6. THE MAXIMUM SIZE OF AGGREGATE SHALL BE 20mm UNLESS OTHERWISE SHOWN
7. REINFORCEMENT SHALL BE HIGH TENSILE DEFORMED TYPE WITH A CHARACTERISTIC YIELD STRESS OF AT LEAST 429N/mm^2
8. COVER TO REINFORCEMENT SHALL BE:
   - FOUNDATIONS 50mm
   - SLABS 25mm
   - WALLS AND BEAMS 30mm
9. LAPS TO ALL REINFORCEMENT SHALL BE 50 * BAR DIAMETER UNLESS OTHERWISE SHOWN

Client:
THE UNITED REPUBLIC OF TANZANIA
DAWASA Chief Execuitve
P. O. Box 1573
Dunga/Malanga Street, Mwananyamala
Dar es Salaam, Tanzania

Consultant:
DOHWA Engineering Co., Ltd In Association with LUPTAN Consults Ltd and WWS Design &Development Co. Ltd

Project:
Provision of Facilitation and Technical Services for Creation of Essential Framework Conditions, Capacity Building, Preparation of Detailed Engineering Designs and Bidding Documents, and Construction Supervision of the Off-grid Sanitation Works in Dar es salaam

Rev	Date	Description	Drawn	Check	Appr.

Designed:	Drawn:
Checked:	Approved:
Scale: SHOWN	Date: June, 2021

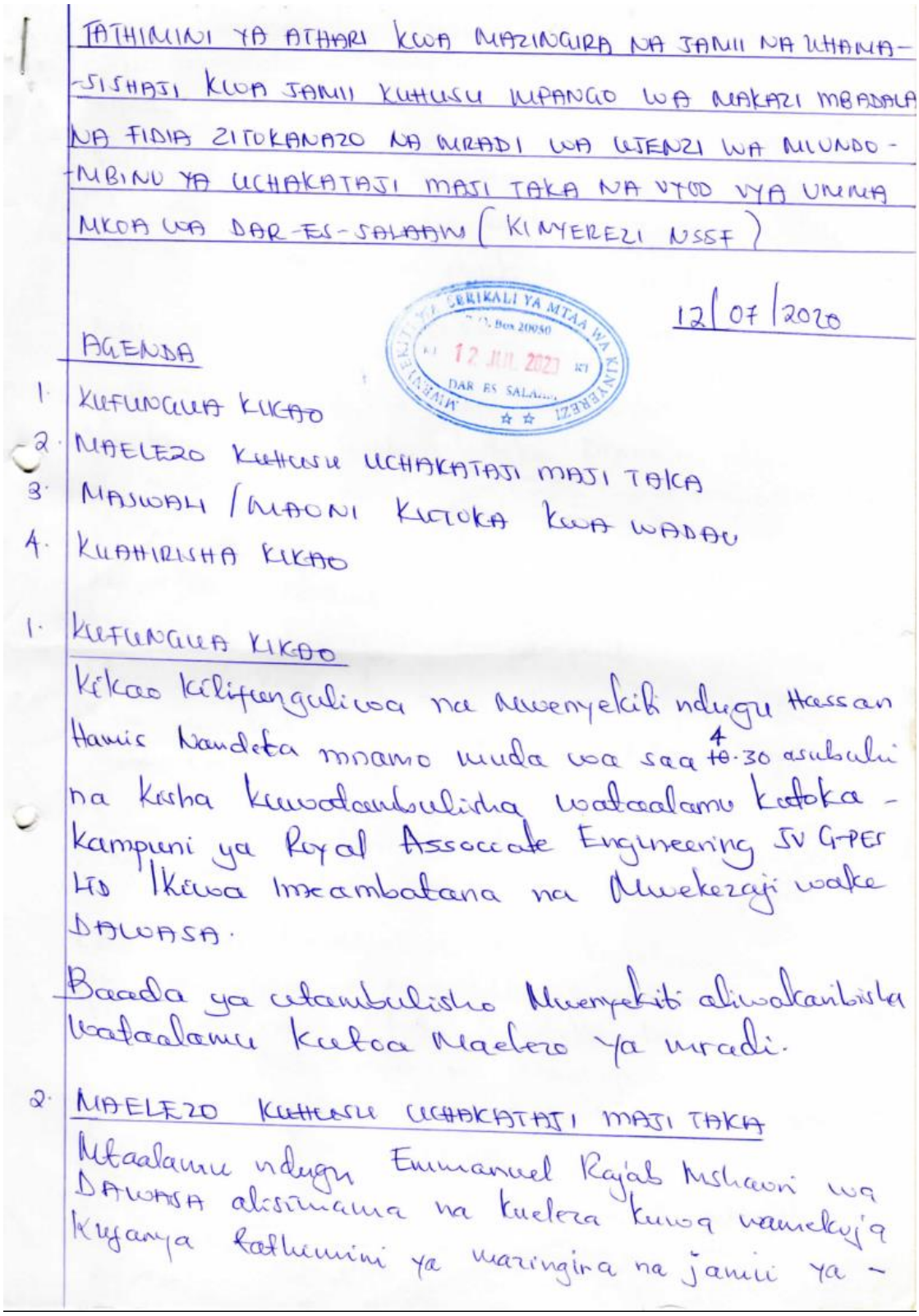
Title:
SIMPLIFIED SEWER SYSTEM STANDARD DETAILS DRAWINGS

DEMONSTRATION TOILET

Rev. No: 01

Drawing No: SSS-STD-305-02

Appendix IV: Minutes of Meetings



MKOA WA DAR ES-SALAAM (KINYEREZI NSSF)

12/07/2020

AGENDA

1. KUFUNGUA KIKAO
2. MAELEZO KUHUSU UCHAKATAJI MAJI TAKA
3. MASWALI / MAONI KUTOKA KWA WADAU
4. KUAHIRISHA KIKAO

1. KUFUNGUA KIKAO

Kikao kilifunguliwa na Mwenyekiti ndugu Hassan Hamis kandeka mnamo muda wa saa 4:30 asubuhi na kisha kuwatambulisha wataalamu kutoka kampuni ya Royal Associate Engineering JV G-PES LTD /Kiwa Inzambatana na Mwekezaji wake DAWASA.

Baada ya utambulisho Mwenyekiti aliwakaribisha wataalamu kutoa Maelezo ya muradi.

2. MAELEZO KUHUSU UCHAKATAJI MAJI TAKA

Mtaalamu ndugu Emmanuel Rajab Mshana wa DAWASA alisimama na kueleza kuwa wamekuja kufanya tathmini ya mazingira na jamii ya -

Ujenzi wa (DEWATS) Mtambo wa Kuchakata Maji taka. Hivyo wananchi ni muhimu Kushirikishwa Ili Kuweza Kupata Maswali na Maoni yao.

faida ya huu mtambo utasaidia kupata gesi, mboleo na maji ya kumwagilia bustani, na mtambo huu hauna harufu na ni rafiki kwa jamii.

3. MASWALI / MAONI KUTOKA KWA WADAU

Walter Abel Shangali - Je nami ntafaidika na gesi.
Mtaalamu ndugu Shaban kutoka DAWASA alijibu Lazda ya mtambo kukamilika [illegible] watawanganishiwa gesi.

Mr Nyoni - Alishukuru [illegible] mradi, na kusema huu mradi utapunguza kipindu pindo.

Florence Chikoya - Je kuna gharama yoyote tutalipia?
Mtaalamu kutoka DAWASA ndugu Adam alijibu ujenzi wote wanafanya DAWASA.

Juma Seif - Aliuliza je taka ngumu zitatumika?
Mtaalamu alijibu hapana sio taka ngumu.

John Emmy - Ameshukuru kwa kuletewa huu mradi na pia kuuliza eneo hilo litakuwa na ukubwa gani?
Mtaalamu ndugu Adam kutoka DAWASA alisema wao wanashirikiana na Manispaa hivyo maeneo yote ni Manispaa wanatoa ni maeneo ya Manispaa ndio tunayatumia.

Mr. Kimangale - Huu mradi ni NSSF peke yake au na Maeneo Mengine.
Mtaalamu alijibu huu mfumo upo katika Maeneo

tofauti tofauti ambayo tunapewa na Manispaa.

Mwenyekiti wa mtaa wa kinyerezi alishukuru kwa huu mradi na kusema ni jambo nzuri na anashukuru kwa asilimia kubwa.

Mtaalamu ndugu Robert kishiki alieleza kwenye huu mradi wanandhi waache kutupa pampers / vitambaa na makopo kwani itasababisha kuziba kwa mabomba.

Mtaalamu aliongeza kwa kusema huu mradi hautaathiri nyumba ya mtu.

4. KUAHIRISHA KIKAO

Kikao kilicalinishwa na mwenyekiti mnamo muda wa saa 5.30.

Sahihi ya Mwenyekiti

Nandeta.

HASSAN HAMIS NANDETA
0713 583550 / 0784 21 5515
0742 922694

TATHIMINI YA ATHARI KWA MAZINGIRA NA JAMII NA UHAMASISHAJI KWA JAMII KUHUSU MPANGO WA MAKAZI MBADALA NA FIDIA ZITOKANAZO NA MRADI WA UJENZI WA MIUNDOMBINU YA UCHAKATAJI MAJI TAKA NA VYOO VYA UMMA MKOA WA DAR ES SALAAM

MAHUDHURIO KWA AJILI YA MIKUTANO, MAJADILIANO

MWEKEZAJI: DAWASA

MSHAURI: ROYAL ASSOCIATES ENGINEERING JV G-PES LTD

WILAYA... ILALA ... KATA... KINYEREZI ... MTAA... KINYEREZI ... TAREHE... 12/7/2020

S/N	JINA	WADHIFA	NAMBA YA SIMU	SAHIHI
1	John S.P. Nyonji	Mwenyekiti Quarter	0653411110	
2	Walter A Shangali	Mpangaji Nyumba	0716 236643	
3	MUSSA A. DIBWA	MJUMBE	0715 065747	
4	Stephen K. Haonga	Mpangaji nyumba	0655-584721	
5	KIMANGALE ABDULLAH	MWENYE NYUMBA	0715 655988	
6	ABIHUDI ELIAMIN	EHO - KINYEREZI	0676 204325	
7	[illegible]	Mwenyekiti nyumba	076 567555	
8	PASCO K. KILEO	Mjumbe		
9	[illegible]	[illegible]	0658 787683	
10	Florency Magina Chikoya	Mjumbe	0752314107	
11	ARNOLD [illegible]	MKAZI	0766114506	
12	ROBERT SITE GA	MKAZI	0713-961465	
	JULIETH JELEMIA	Mjumbe	0769112000	
13	LIDYA J. NCHIMBI	MWENYE NYUMBA	0784 654373	
14	HOSSENI MROSHO	MKAZI	0713-963673	
15	DANIEL S. MADEBE	MPANGAJI	0716100187	
16	Luqano Mselwa	Mpangaji	0713979997	
17	ABDALLAH KIALOZI	MKAZI	0693-804113	AB
18	ANORD AUDAX	MKAZI	0783886431	
19	SALMA D MBINDA	MKAZI	0717-798485	
20	HASSAN H. NANDEGA	M/KITI WA MTAA	0713-583550	
21	Godfrey Mychuwa	MKAZI	0713 677026	
22	Pongwa S. Hassan	Mjumbe	0655-775517	

Appendix V: A copy of Screening decision from NEMC

THE UNITED REPUBLIC OF TANZANIA

VICE PRESIDENT'S OFFICE
UNION AND ENVIRONMENT

NATIONAL ENVIRONMENT MANAGEMENT COUNCIL(NEMC)

Telephone: +255 22 2774889,
Direct line: +255 22 2774852
Mobile: 0713 608930
Fax: +255 22 2774901
Email: dg@nemc.or.tz
Website: www.nemc.or.tz

35 Regent Street,
P. O. Box 63154,
11404 Dar es Salaam,
TANZANIA.

In reply please quote:
EC EIA 2021 6447

Date: 06 05 2021

Managing Director,
Dar es Salaam Water & Sewerage Authority (DAWASA),
P.O.Box 1573,
Dar es Salaam.

RE: SCREENING DECISION FOR THE PROPOSED SIMPLIFIED SEWERAGE SYSTEM TO BE CONSTRUCTED AT KINYEREZI NSSF HOUSING ESTATE, KINYEREZI WARD, ILALA MUNICIPALITY

We acknowledge receipt of your letter dated 10/03/2021 Submitted with Project Brief for the above mentioned project.

Following the review of the submitted documents, the Council has reached a decision that your project will end up in a Project Brief Stage. You are required to submit 10 copies of the **Detailed Project Brief** which will guide the Council in review process. However, the following should be taken into consideration to the documents;

i) Description of all project components
ii) Description on Land use and attach legal documents of Land ownership;
iii) Discussion on waste management (generation type, quantity and management option for each identified waste type);
iv) Baseline information for the project area;
v) Discussion on Impacts and mitigation measure in all project phase;
vi) Environmental Social and Monitoring Plan &Environmental Management Plan;
vii) Decommissioning Plan(DP);
viii) Discussion on Occupational Health and Safety issues (including emergency preparedness plan);
ix) Stakeholder Consultation: all relevant stakeholders must consult at all levels from Mtaa, Ward, Municipal Council and Region. Their views and concerns

All correspondence should be addressed to the Director General

raised should be responded by the Proponent and incorporated in the Detailed Project Brief. Consultation forms should bear **date** of consultation and each consulted stakeholder should **sign** against his/her **name** as the law requires; and

x) Attachment of Certificate of Occupancy.

Note: The Detailed Project Brief should conform to the EIA and Audit (Amendment) Regulations, 2018 particularly Regulation 6(1) for the contents of the comprehensive project brief.

Upon submission of the reports you will be required to pay to the Council the amount given to you for review process as per generated **control number.** Thereafter, the Council will arrange for site verification visit for the proposed site as part of the review process. **However, transportation cost for the site visit team to and from the site will be covered by the proponent.**

Please, do not hesitate to contact us in case you need additional information or clarification on this process through Telephone No. +255 752364553 from Monday – Friday around 8:00am to 04:00pm.

We look forward to your cooperation on this matter.

Yours Sincerely,

A.N Sembeka,
For: Director General.

Cc: Royal Associate Consulting Engineers
P.O Box 37705 001100,
Nairobi,

and

M/S G Pes Limited.
P.O Box 35539,
Dar es Salaam.

All correspondence should be addressed to the Director General

Annex I: Generic Environmental Management for Construction Activities

ENVIRONMENTAL MANAGEMENT OF CONSTRUCTION ACTIVITIES

Proper environmental management of construction projects can be achieved only with adequate site selection and project design. As such, the Environmental and Social Assessment (ESA) for subprojects involving any new construction, or any rehabilitation or reconstruction for existing projects, should provide information as to screening criteria for site selection and design including the following:

1.1 SITE SELECTION

Sites should be chosen based on community needs for additional projects, with specific lots chosen based on geographic and topographic characteristics. The site selection process involves site visits and studies to analyze: (i) the site's urban, suburban, or rural characteristics; (ii) national, state, or municipal regulations affecting the proposed lot; (iii) accessibility and distance from inhabited areas; (iv) land ownership, including verification of the absence of squatters and/or other potential legal problems with the land acquisition; (v) determination of site vulnerability to natural hazards, (i.e. intensity and frequency of floods, earthquakes, landslides, hurricanes, volcanic eruptions); (vi) suitability of soils and subsoils for construction; (vii) site contamination by lead or other pollutants; (viii) flora and fauna characteristics; (ix) presence or absence of natural habitats and/or ecologically important habitats on-site or in the vicinity (e.g. forests, wetlands, coral reefs, rare or endangered species); and (ix) historic and community characteristics.

1.2 PROJECT DESIGN

Project design criteria include, but are not limited to, the consideration of aspects such as heating, ventilation, natural and artificial light energy efficiency, floor space (ft2) per bed/ward, requirements for x-ray rooms, adequacy of corridors for wheelchair/bed access, adequate water supply and sanitation systems, historical and cultural considerations, security and handicapped access.

1.3 CONSTRUCTION ACTIVITIES AND ENVIRONMENTAL RULES FOR CONTRACTORS

The following information is intended solely as broad guidance to be used in conjunction with local and national regulations. Based on this information, environmental rules for contractors should be developed

for each project, taking into account the project size, site characteristics, and location (rural vs. urban).

After choosing an appropriate site and design, construction activities can proceed. As these construction activities could cause significant impacts on and nuisances to surrounding areas, careful planning of construction activities is critical. Therefore the following rules (including specific prohibitions and construction management measures) should be incorporated into all relevant bidding documents, contracts, and work orders.

1.3.1 Prohibitions

The following activities are prohibited on or near the project site:

- Cutting of trees for any reason outside the approved construction area;
- Hunting, fishing, wildlife capture, or plant collection;
- Use of unapproved toxic materials, including lead-based paints, asbestos, etc.
- Disturbance to anything with architectural or historical value;
- Building of fires;
- Use of firearms (except authorized security guards);
- Use of alcohol by workers.

1.3.2 Construction Management Measures

Waste Management and Erosion:
Solid, sanitation, and, hazardous wastes must be properly controlled, through the implementation of the following measures:

Waste Management:

- Minimize the production of waste that must be treated or eliminated.
- Identify and classify the type of waste generated. If hazardous wastes (including health care wastes) are generated, proper procedures must be taken regarding their storage, collection, transportation, and disposal.
- Identify and demarcate disposal areas indicating the specific materials that can be deposited in each.
- Control placement of all construction waste (including earth cuts) to approved disposal sites (>300 m from rivers, streams, lakes, or wetlands). Disposal of in authorized areas all of garbage, metals, used oils, and excess material

generated during construction, incorporating recycling systems and the separation of materials.

Maintenance:

- Identify and demarcate equipment maintenance areas (>15m from rivers, streams, lakes, or wetlands).
- Ensure that all equipment maintenance activities, including oil changes, are conducted within demarcated maintenance areas; never dispose of spent oils on the ground, in watercourses, drainage canals, or in sewer systems.
- Identify, demarcate and enforce the use of within-site access routes to limit the impact to site vegetation.
- Install and maintain an adequate drainage system to prevent erosion on the site during and after construction.

Erosion Control

- Erect erosion control barriers around the perimeter of cuts, disposal pits, and roadways.
- Spray water on dirt roads, cuts, fill material and stockpiled soil to reduce wind-induced erosion, as needed.
- Maintain vehicle speeds at or below 10mph within the work area at all times.

Stockpiles and Borrow Pits

- Identify and demarcate locations for stockpiles and borrow pits, ensuring that they are 15 meters away from critical areas such as steep slopes, erosion-prone soils, and areas that drain directly into sensitive water bodies.
- Limit extraction of material to approved and demarcated borrow pits.

Site Cleanup

- Establish and enforce daily site clean-up procedures, including maintenance of adequate disposal facilities for construction debris.

1.3.3 Safety During Construction

The Contractor's responsibilities include the protection of every person and nearby property from construction accidents. The Contractor shall be responsible for complying with all national and local safety requirements and any other measures necessary to avoid accidents, including the following:

- Carefully and mark pedestrian-safe access routes. o If school children are in the vicinity, include traffic safety personnel to direct traffic during school hours.
- Maintain a supply of supplies for traffic signs (including paint, easel, sign material, etc.), road marking, and guard rails to maintain pedestrian safety during construction.
- Conduct safety training for construction workers before beginning work.
- Provide personal protective equipment and clothing (goggles, gloves, respirators, dust masks, hard hats, steel-toed and –shanked boots, etc.,) for construction workers and enforce their use.
- Post Material Safety Data Sheets for each chemical present on the worksite.
- Require that all workers read, or are read, all Material Safety Data Sheets. Clearly explain the risks to them and their partners, especially when pregnant or planning to start a family. Encourage workers to share the information with their physicians, when relevant.
- Ensure that the removal of asbestos-containing materials or other toxic substances is performed and disposed of by specially trained workers.
- During heavy rains or emergencies of any kind, suspend all work.
- Brace electrical and mechanical equipment to withstand seismic events during the construction.

1.3.4 Nuisance and dust control

To control nuisance and dust the Contractor should:

- Maintain all construction-related traffic at or below 15 mph on streets within 200 m of the site.
- Maintain all on-site vehicle speeds at or below 10 mph.
- To the extent possible, maintain noise levels associated with all machinery and equipment at or below 90 dB.
- Insensitive areas (including residential neighborhoods, hospitals, rest homes, etc.) more strict measures may need to be implemented to prevent undesirable noise levels.
- Minimize production of dust and particulate materials at all times, to avoid impacts on surrounding families and businesses, and especially to vulnerable people (children, elders).
- Phase removal of vegetation to prevent large areas from becoming exposed to wind.

- Place dust screens around construction areas, paying particular attention to areas close to housing, commercial areas, and recreational areas.
- Spray water as needed on dirt roads, cut areas, and soil stockpiles or fill material.
- Apply proper measures to minimize disruptions from vibration or noise coming from construction activities.

1.3.5 Community Relations

To enhance adequate community relations the Contractor should:

- Following the country and EA requirements, inform the population about construction and work schedules, interruption of services, traffic detour routes, and provisional bus routes, as appropriate.
- Limit construction activities at night. When necessary ensure that night work is carefully scheduled and the community is properly informed so they can take necessary measures.
- At least five days in advance of any service interruption (including water, electricity, telephone, bus routes) the community must be advised through postings at the project site, at bus stops, and in affected homes/businesses.

3.1.6 Chance Find Procedures for Culturally Significant Artifacts

The Contractor is responsible for familiarizing themselves with the following “Chance Finds Procedures”, in case culturally valuable materials are uncovered during excavation, including:

- Stop work immediately following the discovery of any materials with possible archeological, historical, paleontological, or other cultural value, announce findings to project manager, and notify relevant authorities;
- Protect artifacts as well as possible using plastic covers, and implement measures to stabilize the area, if necessary, to properly protect artifacts
- Prevent and penalize any unauthorized access to the artifacts o Restart construction works only upon the authorization of the relevant authorities.

1.4 ENVIRONMENTAL SUPERVISION DURING CONSTRUCTION

	The bidding documents should indicate how compliance with environmental rules and design specifications would be supervised, along with the penalties for non-compliance by contractors or workers. Construction supervision requires oversight of compliance with the manual and environmental specifications by the contractor or his designated environmental supervisor. Contractors are also required to comply with national and municipal regulations governing the environment, public health, and safety.

COMMENTS RESPONSE TABLE ON THE PROJECT BRIEF FOR THE PROPOSED SIMPLIFIED SEWERAGE SYSTEM TO BE CONSTRUCTED AT KINYEREZI NSSF HOUSING ESTATE, KINYEREZI WARD, DAR ES SALAAM CITY COUNCIL

Project title: Proposed Construction of Simplified Sewerage System

Location: Kinyerezi NSSF Housing Estate, Kinyerezi Ward, Dar es Salaam City Council

Developer: Dar es Salaam Water Supply and Sanitation Authority (DAWASA)

Name of Consultant: Prof. Rubhera RAM Mato (PhD), CEng. (T)

S/N	COMMENTS	RESPONSE	LOCATION
2.0 SPECIFIC COMMENTS			
01	Comment number 1(viii) - attached copy of approved ToR from the council is not readable.	The attached copy of the approved ToR is the one received from the Council via the EIA Online system	Appendix V
02	Comment number 7, 8, 9 - responded at page 74 table 12; should describe which parameters should be monitored after treatment of wastewater before being allowed to be discharged into the adjacent stream.	The parameters to be monitored have been described accordingly	Table 11, Page 74