



**BUSITEMA
UNIVERSITY**
Pursuing Excellence

FACULTY OF ENGINEERING

DEPARTMENT OF MINING AND WATER RESOURCES

ENGINEERING

DESIGNING A CONVENTIONAL SEWAGE SYSTEM.

CASE STUDY: NSAMBYA POLICE BARRACKS

SUBMITTED BY

WAISWA GRACE

BU/UP/2013/312

Graycie62@gmail.com

0754001801



MAIN SUPERVISOR: MADAM ABBO JACQUELINE

CO-SUPERVISOR: MADAM. NAKABUYE HOPE NJUKI

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ABSTRACT

The Police Barracks of Nsambya in Kampala, currently has a faulty wastewater collection system. Untreated wastewater is seen over flowing through defective joints and manholes and carried by the storm channels (Nakivubo channel) into Lake Victoria.

This creates many potential health, environmental, and social risks for the city. The city is in need of a plan to deal with its wastewater. The following project proposal presents a conceptual design for a wastewater collection system of Nsambya police Barracks. Such a design can serve as a model that can be implemented to the other sections of the city. The design of this collection system involved quantifying the wastewater and determining peak discharge, the design concept simulation of the sewage system and Economic evaluation of the system. A conventional gravity collection system will be designed based on the conclusion that for the city of Kampala, a uniform, consistent, simple collection system would be the most appropriate.

DECLARATION

I **WAISWA GRACE**, BU/UP/2013/312 hereby declare and confirm that this report is original copy of my work and has never been presented or submitted by any other person for any other Academic awards at any institution of higher learning except me.

Signature..........

Date..... 29th / MAY / 2017.....



APPROVAL

This project has been submitted for examination with approval from the following supervisors:

MAIN SUPERVISOR: Madam Abbo Jacqueline

Signature.....

Date.....

CO-SUPERVISOR: Madam Nakabuye Hope Njuki

Signature.....

Date.....

DEDICATION

I dedicate this project to my dearest Daddy and Mummy, Mr. Waigolo William & Mrs. Akayoroit Catherine and my sister Tibaga Esther who by their support, love and care I have made it finally. You indeed a blessing in my life, I will always love you.

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Additionally, special regards go to BR. Peter and Mr. Siraji (Head of jet Team-Department of public health KCCA) for the time and help offered during consultation.

LIST OF ABBREVIATIONS

NWSC	National Water and Sewerage Corporation
SSD	Sewerage Services Department
STP	Sewage Treatment Plant
PVC	Polyvinyl Chloride
CSO	Combined Sewer Overflow
CO	Conduit
GPS	Global Positioning System
n	manning's constant
GE	Ground Elevation
IE	Invert Elevation
HG	Hydraulic Grade line
m	meter
mm	millimeters
ml	militre
Km	Kilometer

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CHAPTER ONE: INTRODUCTION

This chapter briefly gives the general information relevant to the research topic whilst clearly showing the problem of interest that forced the researcher to undertake the project. It as well shows how this study will provide solution to the identified problem, the objectives and scope of study.

1.1.0 Background.

Sewerage system plays an important role in ensuring public health, environmental protection and enhancing the standard of living of the general population. Sanitary sewers are constructed primarily to transport the wastewater of a community to a point of treatment or ultimate disposal, (sperling, 1995)

In Uganda, sewage systems consist of public sewage systems and private on site system. The former to be operated and maintained by national water and sewerage corporation (NWSC), while the latter is managed by developers or owners of the facilities. Sewage system has traditionally been considered to comprise basically of sewer networks to treatment plant which must convey waste water to the treatment plant (Huitued-Jacobsen *et al* 2002).

Under the high pressure of population growth, the demographic change and the transformation to a free market economy, Uganda faces a lot of challenges in various sectors, including wastewater and solid waste management. Especially the augmentation of municipal wastewater and solid wastes in urban areas can be seen as a direct consequence of the rapidly growing urbanization rate. Today, insufficient water supply for urban inhabitants and the lacking coverage of sewage disposal are based on slower developments of urban infrastructure in the city areas. (Schilling *et al* 1998)

The sewerage system of Kampala was constructed in 1940 and expanded in 2004, with about 50 km sewer lines. Till to date about 531 km sewerage network have been developed in different phases at different times to keep pace with the expansion of the city. (Dairy Monitor 30th Jan 2012).

The Kampala SSD currently operates two Sewage Treatment Plants (STP); Conventional Sewage Treatment Works (CSTW) in Bugolobi, Waste Stabilization Ponds (WSP) in Lubigi

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