



FACULTY OF ENGINEERING
DEPARTMENT OF WATER RESOURCES ENGINEERING

FINAL REPORT
DESIGN AND SIMULATION OF AN AUTOMATED WATER SUPPLY SYSTEM FOR
BUSITEMA UNIVERSITY MAIN CAMPUS

By

OGWAL PAUL

BU/UG/2011/173



ogwalpaul@gmail.com

0774928551/0754824200

SUPERVISORS: 1. MR. MUGISHA MOSES

2. MR. SSEMBATYA MARTIN

FINAL YEAR PROJECT REPORT SUBMITTED IN PARTIAL FULFILMENT FOR THE
AWARD OF BACHELOR OF SCIENCE DEGREE IN WATER RESOURCES
ENGINEERING

ABSTRACT

A water supply system is the one that distributes water to different points for different purposes namely; domestic use, agricultural use, industrial use, institutional use and other demands. A dependable supply of water is essential to human activity, and planning for adequate water supplies is one of the most important activities.

This research was on the design of an automated water supply for Busitema University main campus. Included is a review of relevant literature about a water supply system, automation devices, components of the system and their design procedures to come up with such a system.

The study objectives included: a water resources assessment in correlation to the universities' projected population demand; determination of the hydraulics in the system; automation of the system between the pump and reservoir, and an economic analysis was done.

It also provides a discussion of the material selection, data collection, analysis methods and the results to be expected. Lastly, at the end of this project, a sustainable water supply system was designed for Busitema University Main campus. The project once implemented will promote an efficient use and monitoring of the water supply system which are necessary for a reliable supply of water to the University.

DECLARATION

I, Ogwal Paul declare that all the educative material contained in this booklet is an account of my own efforts and has never been submitted to any university or institution for an academic award.

OGWAL PAUL

Date 05./06./2015..



APPROVAL

This report has been submitted after the approval of the following supervisors.

Mr. MUGISHA MOSES

Date...../...../.....

Mr. SSEMBATYA MARTIN

Date...../...../.....

ACKNOWLEDGEMENT

I thank the Almighty God for all the blessings He has bestowed on me since my childhood.

I extend my sincere gratitude to my main supervisor Mr. Mugisha Moses, Co- supervisor Mr. Ssembatya Martin and lecturers for guidance rendered to me. All your untiring efforts are commendable.

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Acronyms and Abbreviations

| | |
|---------|---|
| MWE: | Ministry of Water and Environment |
| DWD: | Directorate of Water Development |
| GI: | Galvanized Iron |
| GPS: | Global Positioning System |
| PN: | Nominal Pressure |
| HDPE: | High Density Poly Ethane |
| SP: | Submersible Pump |
| NWSC: | National Water and Sewerage Corporation |
| Cumec: | Cubic meter/sec |
| Lpcd | litres per capita demand |
| M.b.g.l | Meters below ground level |
| M.a.s.l | Meters above sea level |
| VC | Vice Chancellor |
| Univ. | University |
| OD | Outer diameter |
| Lps | litres per second |

CHAPTER ONE

INTRODUCTION

1.1 Back ground

A water supply system is the one that distributes water to different points for different purposes namely; domestic use, agricultural use, industrial use, institutional use and other demands. A dependable supply of water is essential to human activity, and planning for adequate water supplies is one of the most important activities (Chin, 2006).

Such planning requires knowledge of present consumption, future needs, and available supplies. Sustainability of available water resource in many regions of the world is now a dominant issue. This problem is quietly related to poor water allocation, inefficient use, and lack of adequate and integrated water management.

In Busitema University, the water supply system was first installed in 1978 and there were mainly two ground water sources of which one was by electric power and the other was for emergency, thus manually powered by the generator. But due to increasing population the water supply is not effective thus facing a number of challenges (Estates Management office, 2015).

According to Jhinga and Sharma (2007), water demand is quickly superseding land as the world's most limiting factor with the global water use growing at a rate twice that of population increase during this century where availability of water per person per year sinks below approximately 1700 cubic meters. With an increased cost and competition of piped water, there is widespread shortage of water. This therefore shows that water is a limited resource and its effective conservation should be practiced.

Busitema University is supplied by ground water. The current water supply system at the university is incapable of supplying a continuous flow of water to the university premises. These water irregularities have also been escalated by the frequent break down of the pump at the ground water source and loss of water through leakages in the system due to an obsolete system.

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